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ARAB-GERMAN  
YOUNG ACADEMY  
OF SCIENCES AND  
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# Arab-German Research Cooperation for Sustainable Solutions

Interdisciplinary Projects on Implementation Measures for  
Green Energy, Urban Mobility & Innovative Agriculture by  
the Arab-German Young Academy of Sciences and Humanities  
(AGYA)



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# AGYA Research Project on Green Hydrogen and Energy Transition in the MENA Region & Europe

The world needs a substantial energy system transition to reduce greenhouse gas emissions and to slow down global warming. Many transition scenarios include green hydrogen (gh2) as important energy carrier to meet carbon neutrality targets. In many scenarios, gh2 takes over the role of fossil fuels, dividing the world into gh2 net exporting or net importing countries. Europe, for example, is expected to depend on massive imports of gh2. Northern African countries such as Algeria, Egypt, Morocco and Tunisia, on the other hand, position themselves as possible export markets, replacing reduced demand for fossil fuel exports.

The aim of this collaborative AGYA research project of the *Working Group Energy, Water and Environment* is to investigate future visions and comprehensive scenarios of green hydrogen production using Algeria and Egypt as case studies of low carbon innovation. New cooperation possibilities are emerging, aiming at knowledge

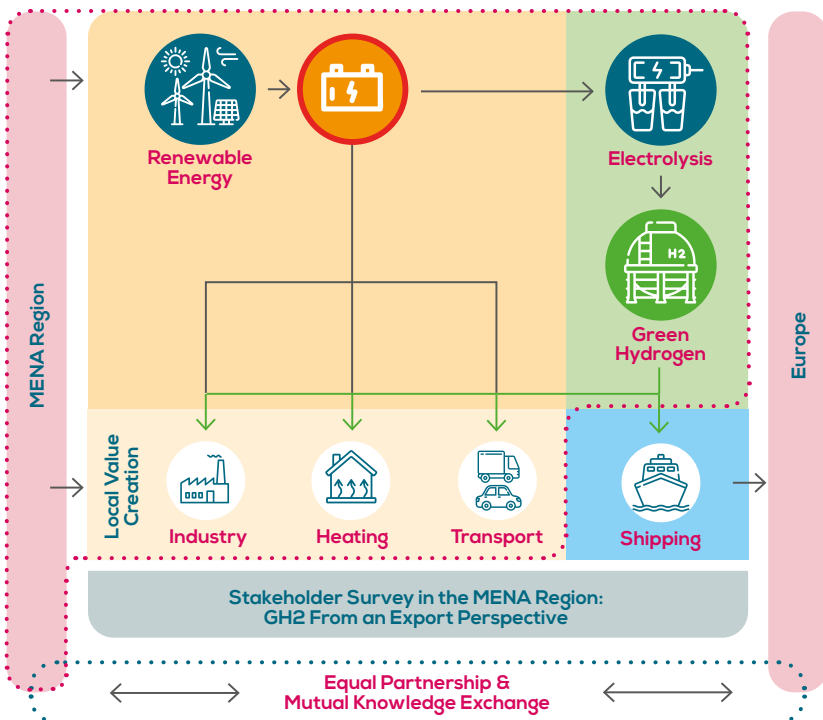
exchange on equal terms and building new energy infrastructure. A collaborative effort is required to transform energy systems in the MENA region as well as in Europe. Promoting green hydrogen collaboration requires both political impetus, as well as the involvement of local communities to shape the conditions of a low carbon future.

The ongoing research project shows that under certain conditions, gh2 can be a great opportunity for the MENA region to diversify its economies. A long-term cooperation with sufficient guarantees would encourage local authorities to invest in this field. For a domestic value chain of diverse hydrogen products, capacity building and knowledge transfer with the European partners are necessary conditions.

**Watch an insightful panel discussion on the future of green hydrogen in Arab countries and Germany here:**



## Green Hydrogen from an Export Perspective



## Policy Recommendations: Sustainable Urban Mobility

The transport sector remains the troubled child of decarbonisation. Successful change in Arab countries as well as in Germany must include bottom-up approaches to traffic avoidance measures. Based on a transdisciplinary workshop with representatives of civil society initiatives from Amman, Beirut, Berlin, Bogotá, Cairo and Ramallah, several recommendations for action were developed. The recommendations are anchored around three thematic clusters: Cycling in cities, transport and gender equity, as well as sustainable transport policies.

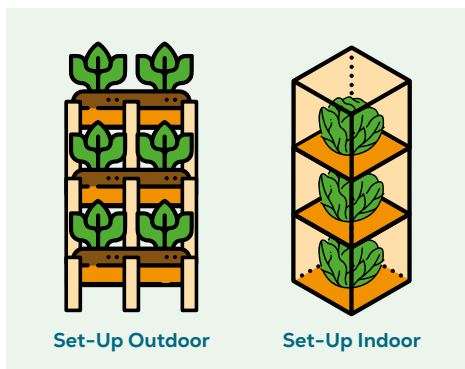
Download the policy paper 'Concepts for Sustainable Urban Mobility: Bottom-up Approaches and Case Studies' by AGYA member Dr. Philipp Blechinger (Berlin) and his team here:



## Vertical Farming and Innovative Urban Agriculture

In urban agriculture, vertical farming is an innovative approach to produce high quantities of nutritious and quality fresh food all year round, without relying on long transport distances, favourable weather, high soil fertility, or high water use. AGYA member Dr. Sonja Buxbaum-Conradi (Hamburg) together with her team at the Helmut-Schmidt University developed two DIY vertical farming system prototypes, one for outside and one for inside. The designs are modular and scalable so that they can be adapted to local and personal needs. AGYA alumna Dr. Henda Mahmoudi (Dubai) has tested the prototype with farmers and researchers from Sudan, Tunisia, and the United Arab Emirates.

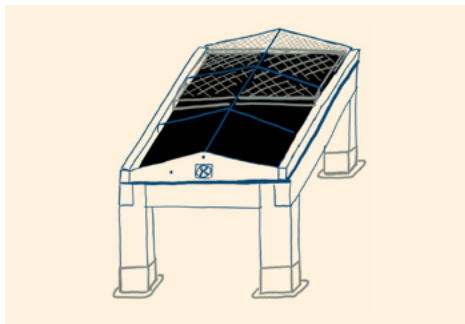
Find the construction manual for vertical farms here:



## Solar-Powered Date Dryer and Sustainable Agriculture

This is a low-tech and low-cost prototype of a solar-powered date dryer! More than 40% of the food produced for human consumption across the Sub-Saharan African countries is lost or wasted. Most of these losses occur at the post-harvest process stages, one of the reasons being a lack of appropriate drying facilities. This solar-based date dryer as a solution to avoid these losses and to improve the quality of one of the most important agricultural products in Arab countries has therefore been suggested and constructed by AGYA members Dr. Philipp Blechinger (Berlin) and Dr. Amro Babiker (Riyadh).

Find the construction manual for the date dryer here:



## About AGYA

The Arab–German Young Academy of Sciences and Humanities (AGYA) was established in 2013 as the first bilateral young academy worldwide. It is based at the Academy of Scientific Research and Technology (ASRT) in Egypt and the Berlin–Brandenburg Academy of Sciences and Humanities (BBAW) in Germany. AGYA promotes research cooperation among outstanding early-career researchers (3–10 years after PhD) from all disciplines who are affiliated with a research institution in Germany or any of the Arab countries: Algeria, Bahrain, Comoros, Djibouti, Egypt, Germany, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates, Yemen.

The academy effectively supports the interdisciplinary projects and collaborative initiatives of its members in various fields of scientific research, science policy and education. The AGYA members jointly initiate and implement yearly more than 50 interdisciplinary projects and collaborative initiatives on research topics such as Arab and German Education; Common Heritage and Common Challenges; Energy, Water and Environment; Health & Society; Innovation and Transformation.

AGYA is funded by the German Federal Ministry of Education and Research (BMBF) and various Arab cooperation partners.

## About the AGYA Working Group Energy, Water & Environment

Finite resources are a general worldwide challenge, from the limited supply of fossil fuel to a clean and hospitable environment, freshwater, safe foods, and sustainable agriculture. Limited access to resources and resource scarcity hinder development, destabilize societies and, therefore, create a need for both scientific analysis and political guidance.

The *AGYA Working Group Energy, Water & Environment (EWE)* fosters the continuous exchange of knowledge in the interconnected and interdisciplinary field of water, energy, and the environment. AGYA members bring together scholars and stakeholders such as representatives of 'smart cities' from different countries to learn from each other, for mutual benefit. They engage in multidisciplinary projects to develop new approaches to the just and sustainable use of resources, for example converting organic waste into biogas. Their research innovative new materials and technological developments. Political, economic, and social conditions play an essential role in accepting new technologies.

Some of the questions that move the AGYA Working Group are: What local perspectives and strategies relate to sustainable resource supply in Arab countries and Germany? How to find smart and

innovative solutions as well as policy strategies to adapt to resource scarcity? How to integrate new materials to improve the efficacy of clean energy production? Overall, what are best practices and success stories in the field of water, energy, and the environment?

Working Group members:

Mahmoud Abdel-Hafiez (Germany), Tital Sayed Abdelhalim (Sudan), Mohammad Adm (Palestine), Abdelhamid Younis Alhassi (Libya), Nageh Allam (Egypt), Linda Amman (Germany), Mohammed Al-Saidi (Qatar), Shima Eissa (UAE), Walid Elgaher (Germany), Ali Elgayar (Libya), Amro Babiker Hassan Eltayeb (Saudi Arabia), Lahcen El Youssefi (Morocco), Dörthe Engelcke (Germany), Zeina Hobaika (Lebanon), Mujtaba Ali Isani (Germany), Hana Maalej (Tunisia), Lilia Makhoulfi (Algeria), Hanna Pfeifer (Germany), Hiba N. Rajha (Lebanon), Marc Ringel (Germany), Lobna Said (Egypt), Ahmed Siddig (Sudan), Mohamed Vall (Mauretania), Irene Weipert-Fenner (Germany), Faouzia Zeraoulia (Algeria)

Members in Charge:

Philipp Blechinger (Germany), Djamel Djenouri (United Kingdom) and Amr Rizk (Germany).

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