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**NEOM – DRIVING THE HYDROGEN ECONOMY INTO REALITY**

**DEUTSCHE WASSERSTOFFVOLLVERSAMMLUNG  
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NEOM ENERGY - HYDROGEN & GREEN FUELS



**Jordan**

**Saudi  
Arabia**

**Egypt -  
Sinai**

**Gulf of Aqaba**

**Gulf of Suez**



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**Red Sea**

**Egypt**





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# NEOM – AN ACCELERATOR TO HUMAN PROGRESS



- A region in the North West of Saudi Arabia being built from ground as a **living laboratory** and a vision what a **New Future** might look like



- Place for **exceptional liveability, thriving businesses, and reinventing environmental conservation**



- One of the **first climate positive** societies, powered by abundant **low-cost renewable energy**



- **Laws** conducive to a **modern** and vibrant economy and **society**



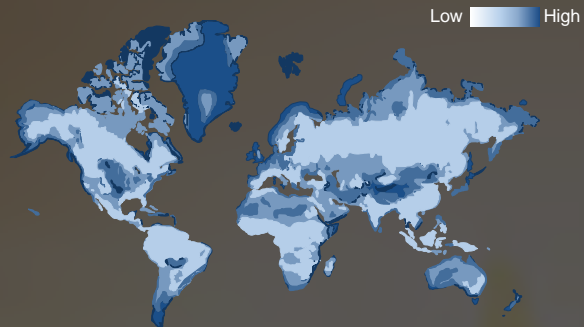
- **The world's innovation hub**, utilizing and driving most advanced technologies



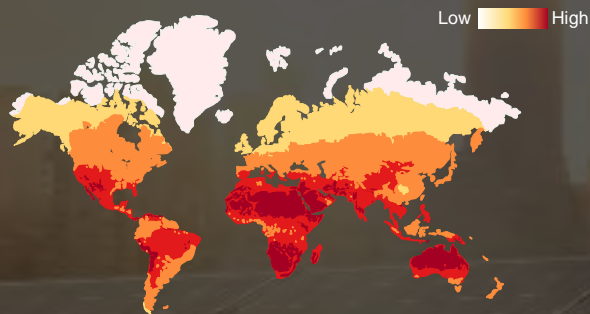


# NEOM HOSTS AN UNRIVALED COMPLEMENTARY WIND & SOLAR PROFILE WITH HIGH CAPACITY FACTORS

Highest wind speed regions, m/s



Highest solar radiation regions, kWh/m<sup>2</sup>



Regions with high joint wind speed and solar radiation<sup>1</sup>

★ Exemplary regions with favorable wind and solar PV conditions



**NEOM's complimentary solar and wind profile results in record low levelized cost of electricity and high-capacity factors**

<sup>1</sup> Map is a graphical combination of the two maps on the left  
SOURCE: NEOM Energy and Water Team, IRENA, Meteonorm

NEOM is a unique opportunity to build an innovative carbon-free energy ecosystem from scratch



# NEOM WILL BECOME AN INTEGRATED HUB FOR THE 2<sup>ND</sup> WAVE OF ENERGY TRANSITION



- A dedicated energy strategy based on zero-liquid discharge water technologies and 100% renewables



- An ambition to become the world's largest producer and exporter of green hydrogen, chemicals and fuels through dedicated partnerships and alliances



- An accelerator for the 2<sup>nd</sup> wave of energy transition and next horizon decarbonization technologies





# NEOM WILL LEVERAGE ON MULTIPLE ASSETS TO BECOME A LEADING GREEN HYDROGEN SUPPLIER

- Strategic Location for export
- Benefit from substantial domestic off-take opportunities
- Existing production and logistic assets in the Kingdom
- An integral part of the kingdom's ambition to become the world's largest supplier of clean energy





# HELIOS – MAKING A BOLD MOVE TO ACTIVATE A GLOBAL MARKET FOR GREEN HYDROGEN



## A \$5bn investment together with Air Products and ACWA Power

- Over 4 GW of dedicated solar PV and Wind Power, 2000 MW of water electrolysis, an own marine export facility and desalinated water from renewables with zero-liquid discharge
- Producing 650 tons of green hydrogen per day, converted into 1.2 mn tons of green Ammonia per year
- Technology providers thyssenkrupp and Haldor Topsoe
- Air Products exclusive off-taker to use ammonia as hydrogen carrier for global H2-mobility markets
- Onstream in early 2025, saving over 3 mn tpy of CO<sub>2</sub> emissions





# THE HYDROGEN INNOVATION AND DEVELOPMENT CENTER WILL PROVIDE A JOURNEY TO THE HYDROGEN ECONOMY

- An **incubator** for green hydrogen and fuels and a satellite for KSA CCE Accelerator Hub
- A **demonstrator** for technologies for scale up
- A **seeding ground** for new technologies and a teaching hub

## ***Hydrogen Production***



- Novel technologies for water electrolysis
- First unit ("Element One") for giga plant
- Module assembly

## ***Carbon Capture Technologies***



- Evaluation of different carbon capture technologies

## ***Synthetic, green Fuels & Chemicals***



- Hydrogen Mobility
- Demonstration of synthetic/ e-fuels
- Green Maritime Fuels Hub

## ***Academia, R&D Partnerships***



- Joint research partnerships
- Curriculums and teaching





# NEOM - A CRADLE FOR THE 2<sup>ND</sup> WAVE OF ENERGY TRANSITION

Sustainable,  
energy intensive  
Industry

3



1



Low-cost clean  
energy

2



Low-cost and  
zero-liquid  
discharge  
clean water

- Low-cost clean power
- Low-cost clean water
- Brine
- Hydrogen / Green Fuels

4



Sustainable  
Food Supply



Brine  
processing



Green  
Hydrogen

Joint innovation: NEOM to lead the world by scaling up green fuels production and pioneering brine processing



# EXECUTION OF H2 STRATEGIES - CHALLENGES

- A **clear definition** of what is green and how to account for it
  - maximization of utilization factor of green hydrogen plant
  - cross-border definition of true CO2 footprint accounting
- Political and dogmatic discussions about preference of fuels and the terminology of good or bad carbon need to stop
- Existing regulatory instruments (e.g REDII) need to be adjusted for this
- Carbon has to become a value – so does CO2
- Development of smart swapping mechanisms





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