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# **Africa's extraordinary green hydrogen potential**

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**How harnessing Africa's 50 Mt  
green hydrogen potential by 2035  
can unlock competitive and  
decarbonized growth across the  
continent and beyond**

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Capturing a fraction of Africa's massive solar energy resource to produce cheap and abundant green hydrogen, delivering affordable energy, accelerating and decarbonising growth across the continent and beyond.

 **1,230 GWp**  
new solar energy generation

Tapping Africa's unparalleled solar potential in three hubs across Africa

 **50 Mt**  
green hydrogen per year

to unlock vast amounts of green hydrogen

 **140 Mt** green steel  
**160 Mt** green fertiliser

will decarbonise Africa's heavy industry (steel, fertilizer mining, and transport) and strengthen its global competitiveness, saving an estimated 500 Mt in GHG emissions

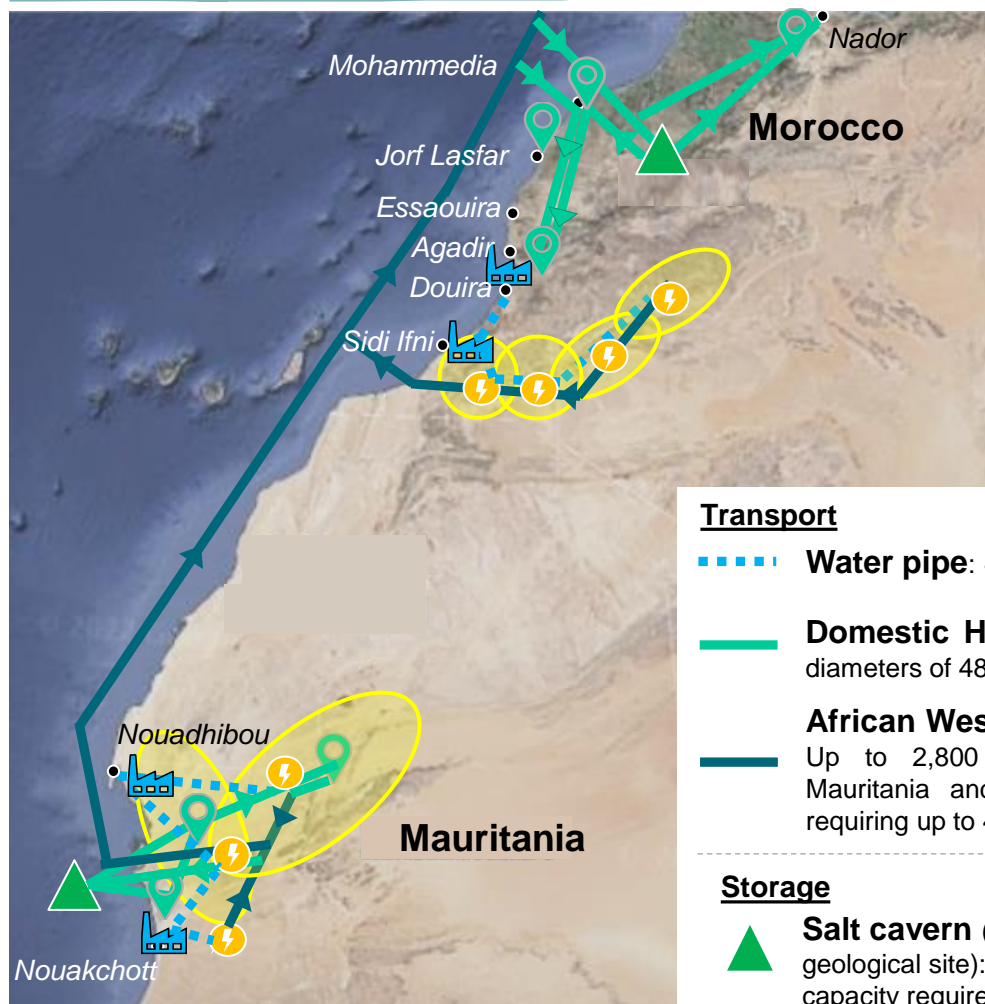
 **3,800 Mm3**  
of clean fresh water, each year

whilst producing and distributing huge volumes of clean water for needs of the sector and households – up to 5% of domestic needs

 **< 2 €/kg**  
Equivalent to €90 / barrel oil

at a price which competes well with oil, meaning Africa becomes an important player in international energy markets as they evolve and decarbonize

### Illustration for Northwestern African Hub, in 2035



#### Production

##### Solar2H2 production domains

- 360 GWp solar capacity in 7 areas
- Solar yields (2,200 to 2,400 kWh/kWp/y)
- 225 kha in Morocco and 315 kha in Mauritania dedicated to production sites (<0.5% of countries' area)



##### Desalination plants:


- 200 Mm3/y produced for electrolysis
- 800 Mm3/y for other usages





##### Electrolysis platforms:

- 7 electrolysis domains with a total capacity of 250 GW

#### Transport

 **Water pipe:** ~2,700 km of water pipe (60 inches)

 **Domestic H2 pipeline:** 1,900 km of H2 greenfield pipes; diameters of 48" and sections with up to 2 parallel pipes

 **African West Stream / International H2 backbone:** Up to 2,800 km offshore international backbone along Mauritania and Morocco west coast to Spain – sections requiring up to 4 parallel 48 inches greenfield pipes

#### Storage



**Salt cavern** (existing or potential geological site): ~100 Mm3 storage capacity required

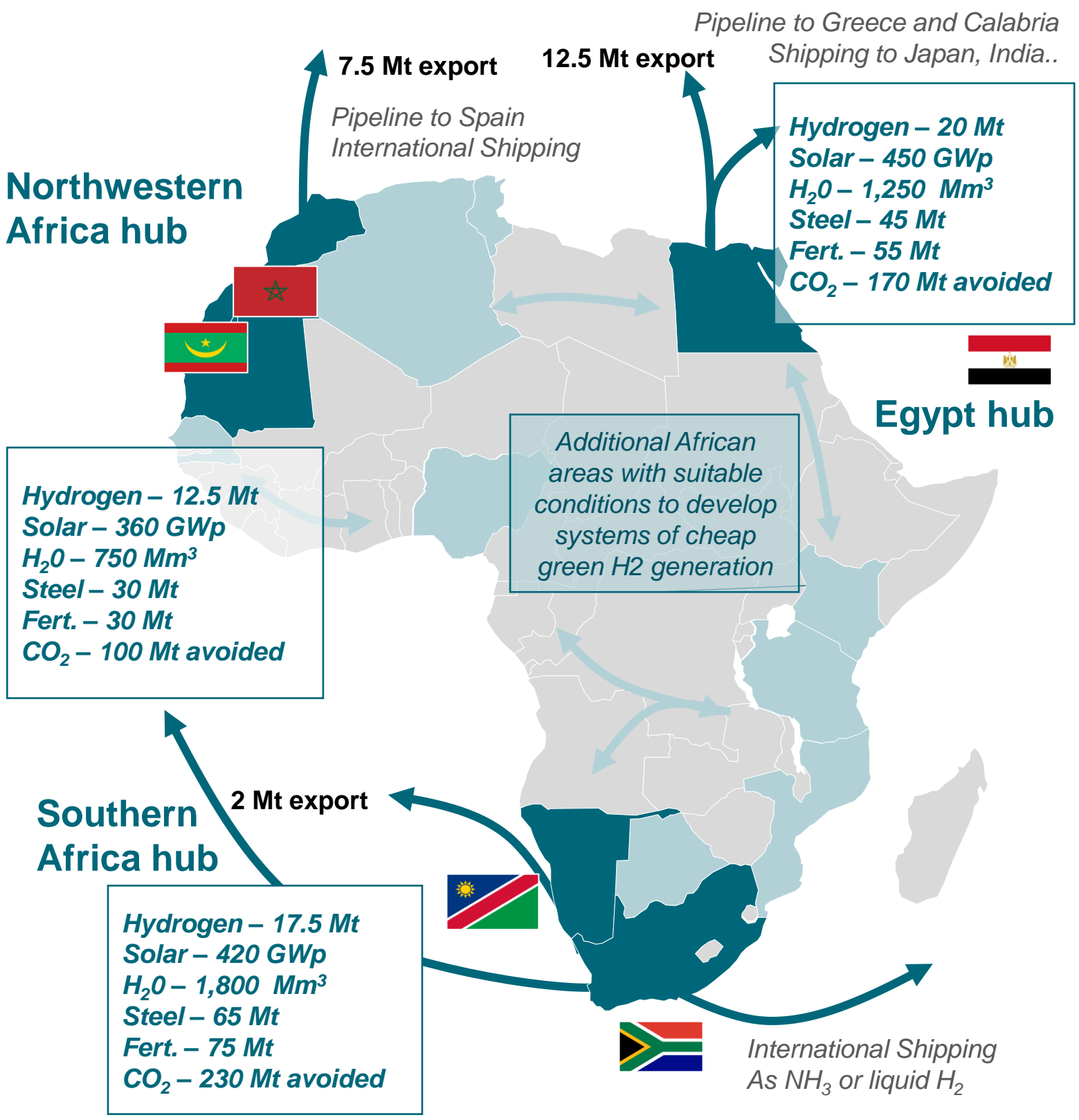
#### Off-takers



**H2 Off-taker**

**By 2035, more than 50Mt / year of cost competitive green hydrogen can be produced to meet local demand, grow the domestic economy, support local communities, and for export to major international off-takers as hydrogen reshapes global energy integration.**

*This will mean the development of domestic green hydrogen production, storage and transport infrastructure and international networks of pipelines, ports and shipping.*



**3 hubs identified with qualified H<sub>2</sub> production volumes of 50mt by 2035**      **Countries identified with additional production potential**

# Multiple value creation impacts both for local production countries and green H2 import countries – Vision at 50 Mt H2 production / year

## Cost competitive energy

1.55-1.90 € / kg H2 at delivery points (equivalent to 79-96€ per Brent oil barrel, comparable to historical prices plus CO2)

## Growth for local economies

An average of 40 Bn€ of direct GDP created / year all along the project lifetime corresponding to ~5% of the current considered countries' GDPs

## Impact for local communities

Development of an at scale freshwater system: ~3,500 Mm3 production capacity available on the 5 different countries, i.e. more than 5% of the current volumes consumed locally

## Direct employment

Massive creation of permanent quality jobs along the value chain

## Global energy integration

Supply of ~25Mt H2 (equiv. ~70 Mtoe) to international markets.  
~15% of the current EU gas demand

## Domestic energy transformation

Massively increased generation and transmission capacity, skills and investment

## Decarbonisation

~500 Mt CO2 / y avoided in 2035, either by direct usage of H2 or the supply of green commodities (~40% of African CO2 emissions in 2020)

## Key success factors

**1** **Activate national planning and incentive schemes**, ensuring the development of domestic policy and regulatory frameworks which mobilise private sector investment and innovation to develop and integrate domestic value chains with international markets..

**2** **Successful pilot projects at demonstration and commercial scale** involving key private and public sector stakeholders in all aspects of the green hydrogen value chain, from generation and storage, to distribution and application.

**3** **Aggregate mass scale off-take and demand**, both domestically and internationally, working jointly to design, finance, build and operate the core storage and transport infrastructure.