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Africa's extraordinary green hydrogen potential

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

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

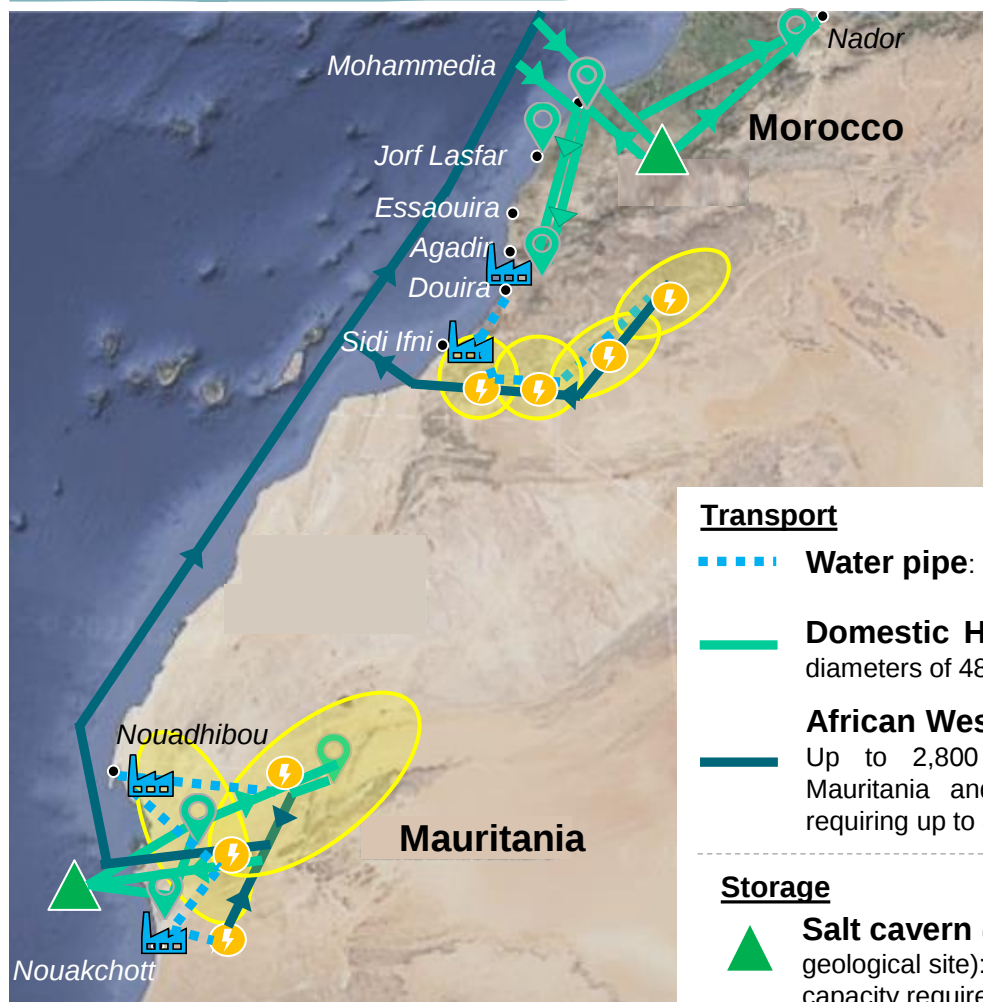
whilst producing and distributing huge volumes of clean water for needs of the sector and households – up to 5% of domestic needs



< 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

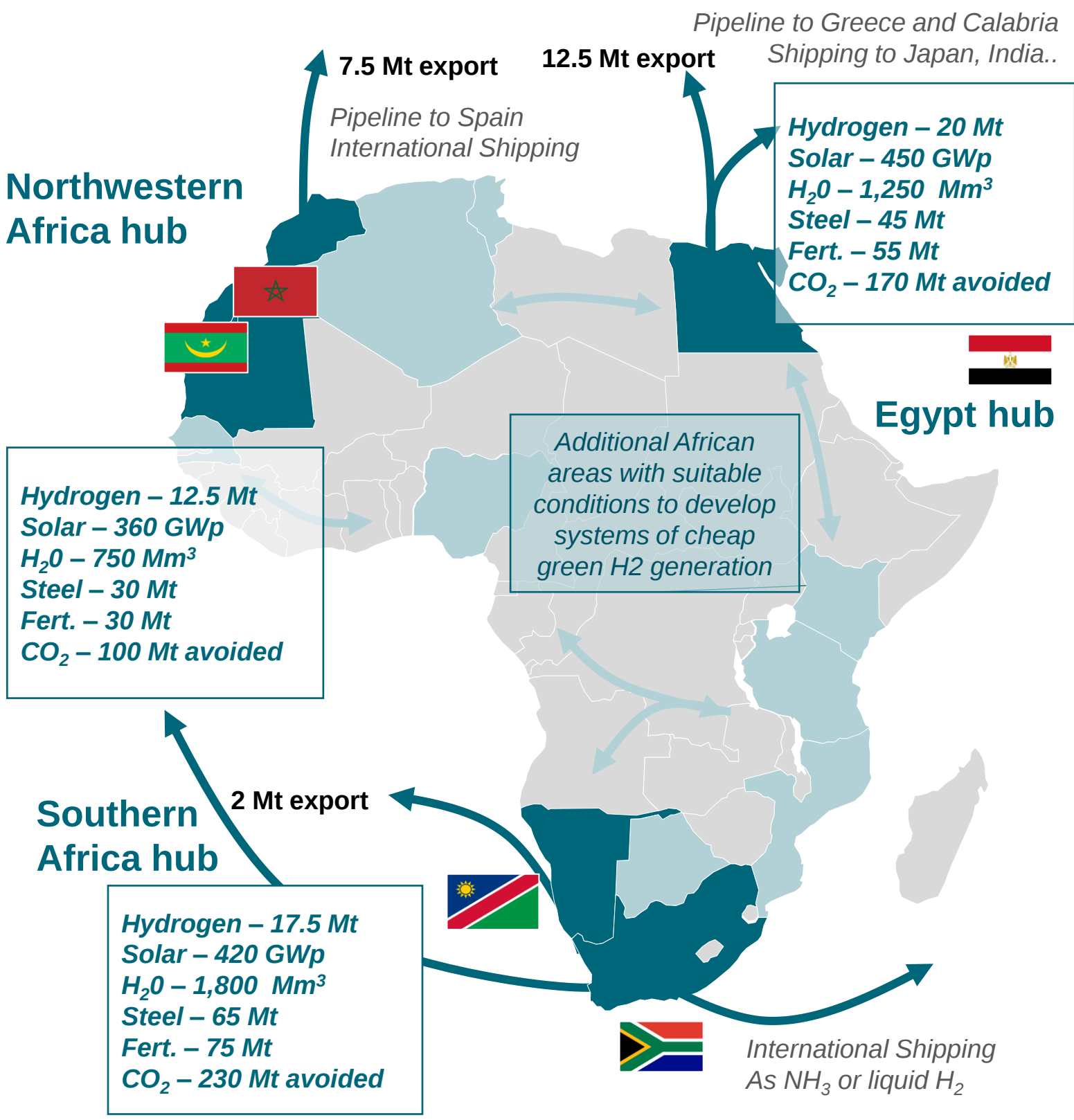
- Salt cavern** (existing or potential geological site): ~100 Mm3 storage capacity required

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 H2 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.