




# Idrogeno: tecnologia, mercati e opportunità

Advisory & Financing Solutions

Venezia, 9 Giugno 2026

Empowering  
Communities to Progress. |  **UniCredit**

# UniCredit sostiene attivamente la transizione energetica

## Associazioni di settore che guardano all'idrogeno

European Clean  
Hydrogen Alliance



**H2.B** ZENTRUM  
WASSERSTOFF.  
BAYERN

**SUSTAINABLE  
STEEL  
PRINCIPLES**

**net-zero  
banking alliance**

## Alcuni dei progetti seguiti nei nostri mercati principali

**H2 Green Steel**

 **Stegra**

EUR 3,550,000,000

Project Finance  
Pathfinder Bank

Svezia, 2023

**Thyssenkrupp nucera**

 **thyssenkrupp  
nucera**

EUR 605,000,000

IPO  
Joint Bookrunner

Germania, 2023

**De Nora**

 **DE NORA**

EUR 545,000,000

IPO  
Joint Bookrunner

Italia, 2022

**Tree Energy Solutions**

 **TES**

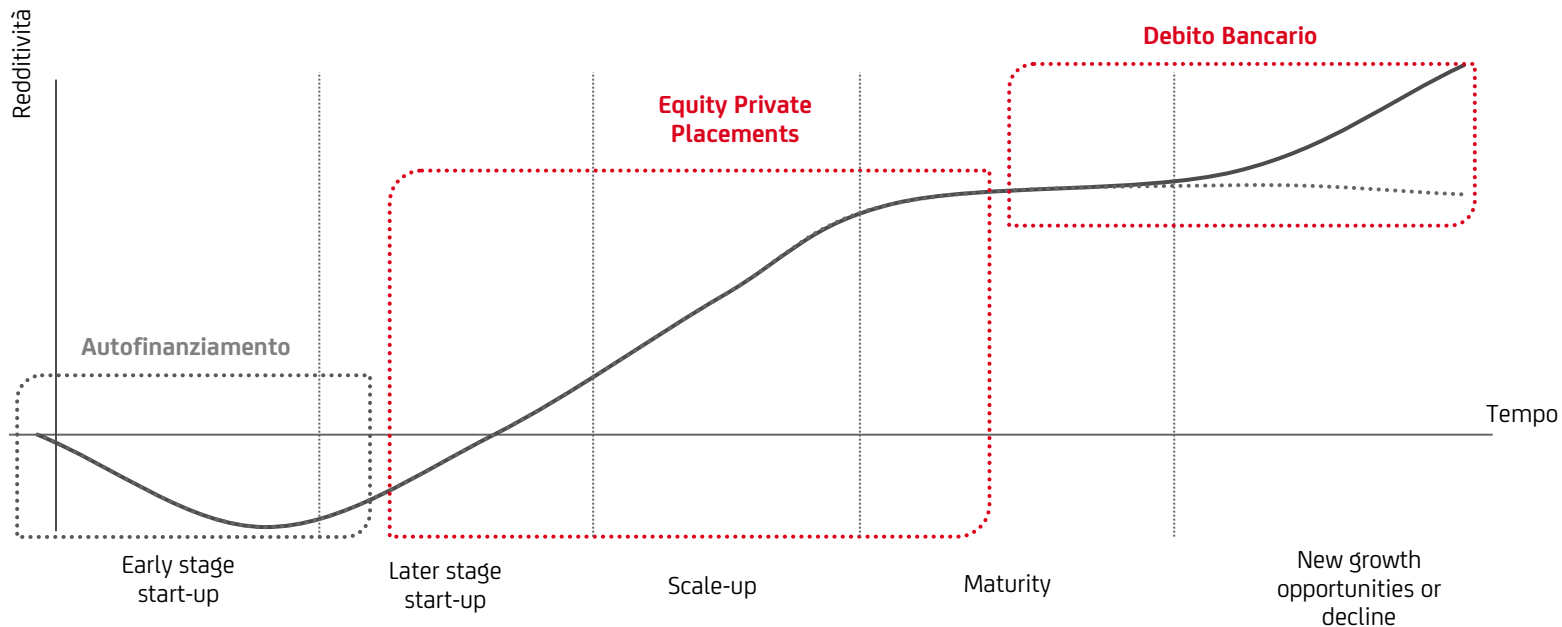
EUR 66,400,000

Aumento di capitale  
FF2 Round




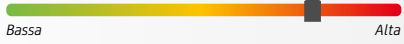












Germania, 2022



# » Il ruolo della banca lungo il ciclo di vita di un progetto

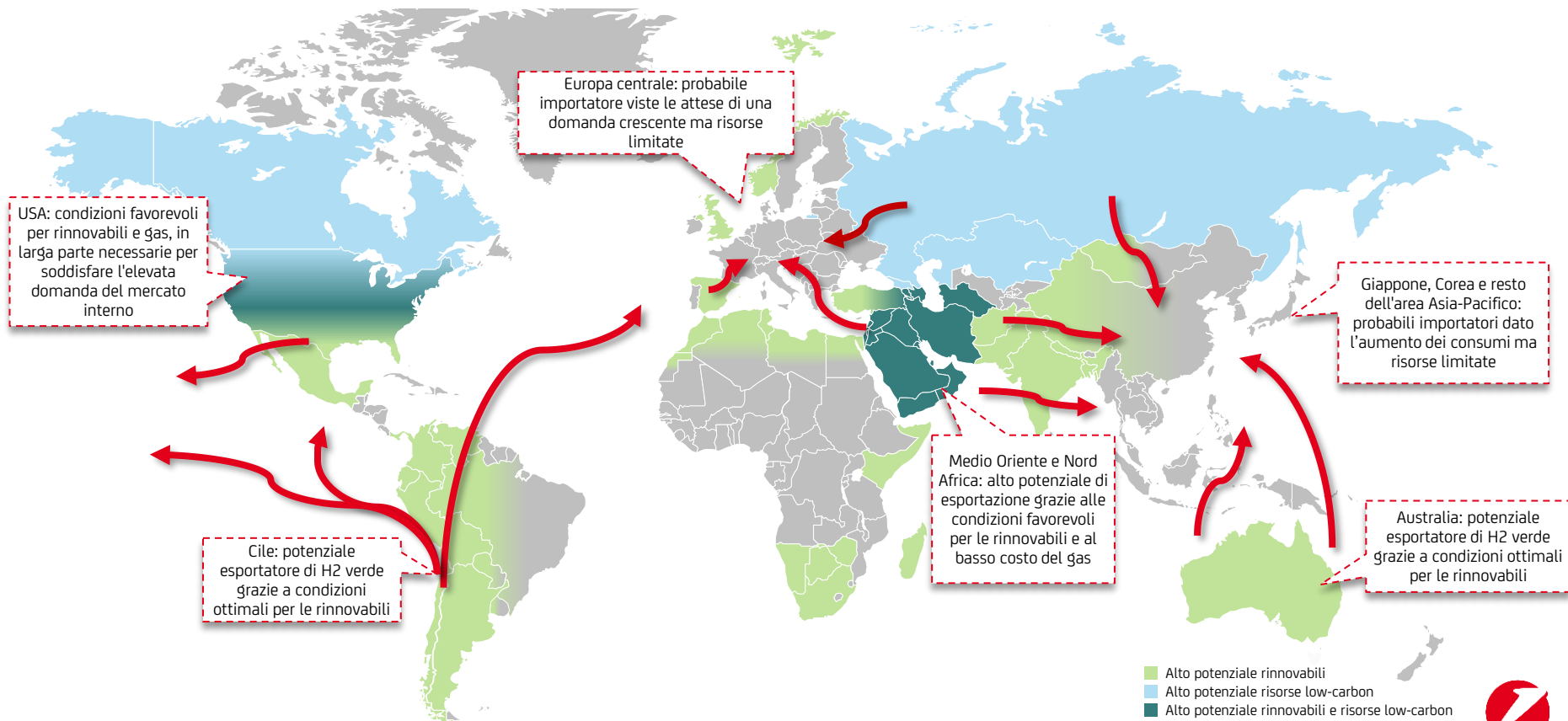


# Principali aree di attenzione di investitori / finanziatori

Aree di attenzione	Rilevanza	Descrizione
<b>1</b>  Mercato		<ul style="list-style-type: none"> <li>In che modo il progetto si inserisce nel contesto della strategia europea/globale sull'idrogeno?</li> </ul>
<b>2</b>  Tecnologia		<ul style="list-style-type: none"> <li>La tecnologia adottata è già stata validata in progetti simili?</li> </ul>
<b>3</b>  Autorizzazioni		<ul style="list-style-type: none"> <li>Sono stati ottenuti tutti i permessi necessari per l'inizio dei lavori di costruzione e, in una fase successiva, per l'avvio delle operazioni?</li> </ul>
<b>4</b>  Offtake		<ul style="list-style-type: none"> <li>Il principale cliente è in grado di garantire la sostenibilità dei flussi di cassa? Quanto sono vincolanti gli impegni presi?</li> </ul>
<b>5</b>  Dati finanziari		<ul style="list-style-type: none"> <li>Quali fattori potrebbero influire sulla redditività economica e sulle operazioni?</li> </ul>
<b>6</b>  Costruzione		<ul style="list-style-type: none"> <li>Quali sarebbero le conseguenze in caso di ritardi e sfioramento dei costi?</li> </ul>
<b>7</b>  Operations		<ul style="list-style-type: none"> <li>Il progetto è adeguatamente protetto dal rischio di interruzioni operative?</li> </ul>
<b>8</b>  Health, Safety & Environment ("HSE")		<ul style="list-style-type: none"> <li>Vengono rispettati gli standard HSE nazionali e internazionali applicabili?</li> </ul>

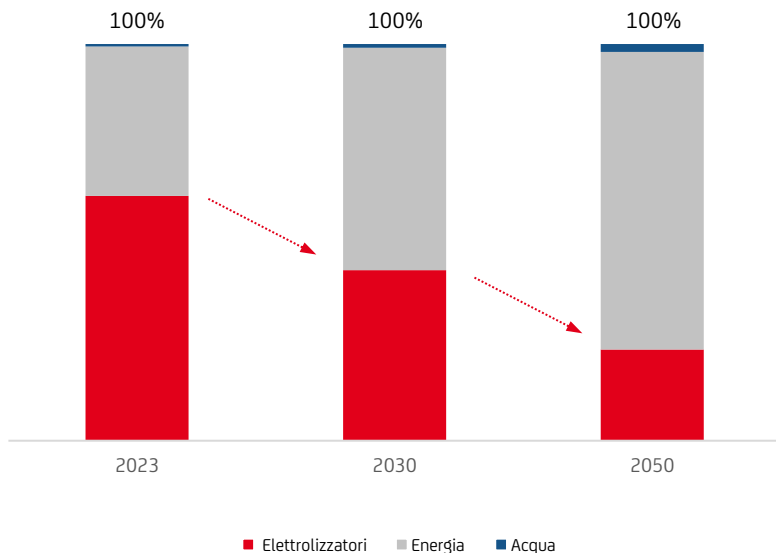


# » La mappa dei principali poli di produzione dell'idrogeno sarà dettata dalla disponibilità di energia pulita a basso costo...

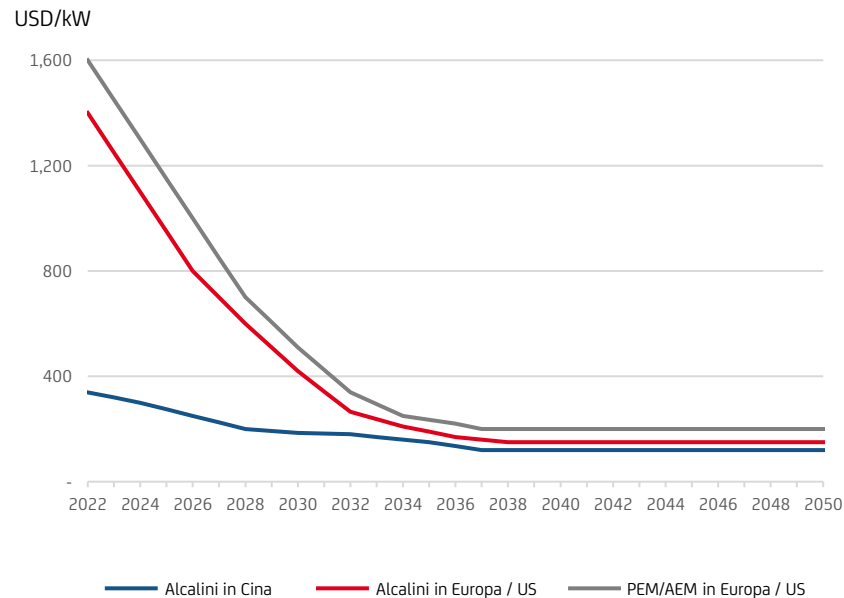


# »» ...dato che a tendere l'energia rappresenterà la prima componente del costo di produzione dell'idrogeno verde

Composizione del costo di produzione dell'idrogeno verde (%)



Investimento atteso per un elettrolizzatore a livello di EPC (USD/kW)





# Logistica e infrastrutture giocheranno un ruolo chiave per la diffusione dell'idrogeno

## Percorsi di trasformazione del H2 per facilitarne il trasporto

Nonostante l'elevata densità energetica per unità di massa, la bassa densità volumetrica dell'idrogeno ne complica trasporto e stoccaggio; per questo, il suo condizionamento (fisico o chimico) è fondamentale

Fisica

### H2 liquido, LH2

Raffreddamento a -253°C tramite criocompressione

- ✓ Alternativa credibile nelle regioni ad alta domanda con spazio limitato
- ✗ Maggiore intensità energetica, costi più elevati e maggiori perdite di energia rispetto alla conversione in GNL



Trasformazione Chimica

### Ammoniaca, NH3

Reazione con l'azoto per la conversione e successiva riconversione in H2

- ✓ Possibilità di sfruttare le infrastrutture esistenti, può trasportare il 50% di volume in più rispetto all'LH2 e richiede solo -30°C
- ✗ Elevato fabbisogno energetico per la riconversione / tossicità



### Metanolo, MeOH

L'idrogeno reagisce con il monossido di carbonio (syngas) per formare metanolo

- ✓ Settore maturo, possibilità di sfruttare le infrastrutture esistenti
- ✗ Tossicità (ancorchè inferiore rispetto all'ammoniaca)

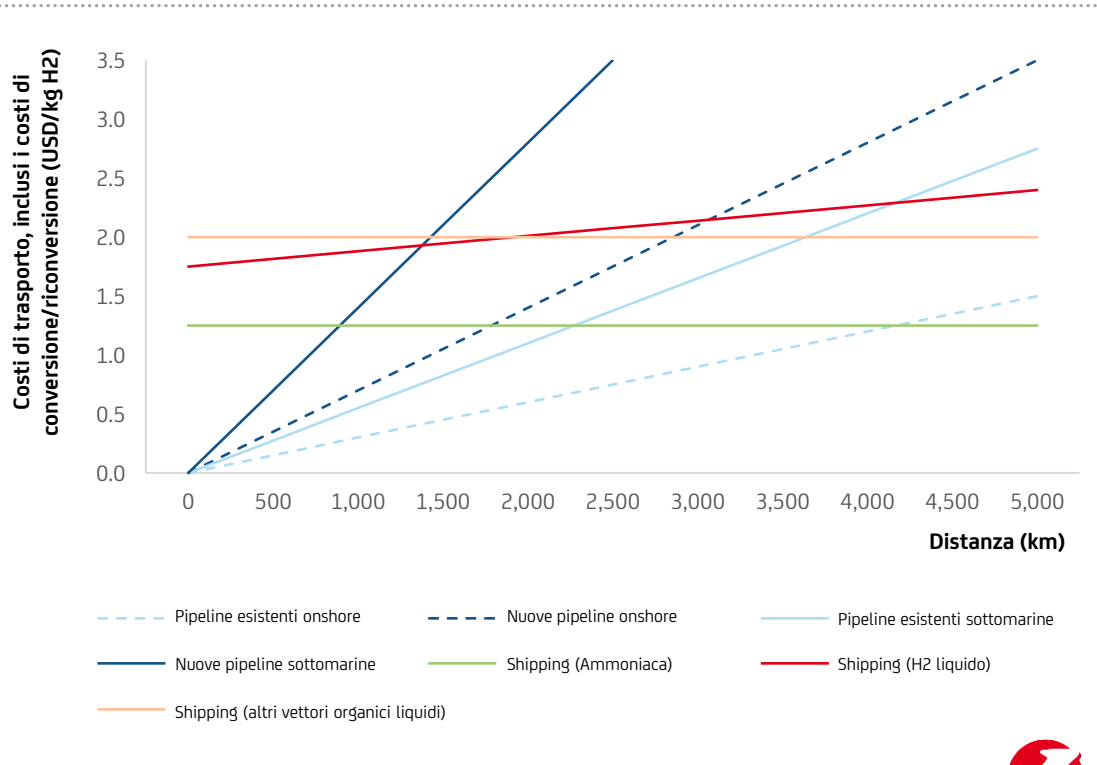


### Vettori Organici Liquidi (LOHC)

- ✓ La conversion è esotermica
- ✗ Bassa efficienza nella riconversione, tossicità, infiammabilità e disponibilità del toluene

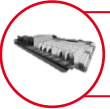





## Costi di trasporto, inclusi i costi di conversione/riconversione (USD/kg H2)



# » La produzione su larga scala richiederà tempo, nel breve c'è spazio per soluzioni locali

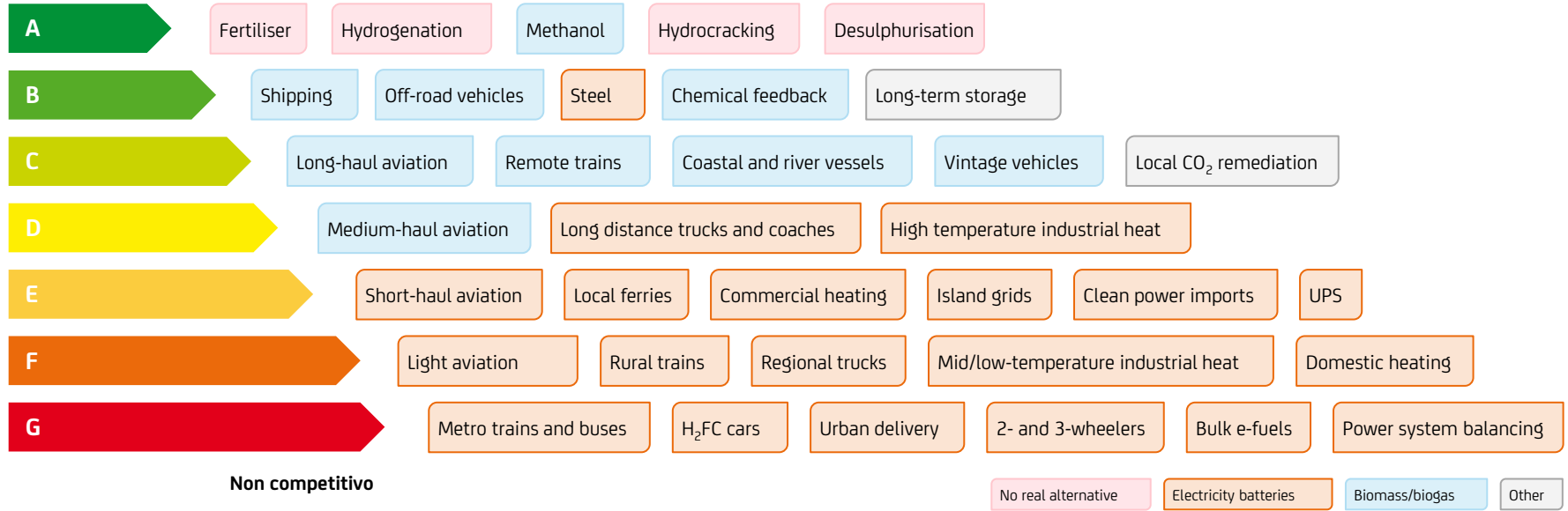
- Lo sviluppo e l'utilizzo iniziale dell'idrogeno saranno probabilmente più concentrati a livello locale (hydrogen hubs), mentre la nascita di una catena del valore su larga scala e integrata a livello globale richiederà tempo

Percorsi di approvvigionamento dell'idrogeno	 Locale (regionale)	 Central electrolysis	 Import via nave	 Import via pipeline
<b>Inizio</b>	2023 - 2028	2025 - 2030	2030 - 2040	2035 - 2040
<b>Settori target</b>	<p><b>Breve termine:</b> mobilità (stazioni di rifornimento), applicazioni industriali</p> <p><b>Medio termine:</b> produzione di calore ed energia</p>	<p><b>Breve termine:</b> industria regionale (regioni costiere)</p> <p><b>Medio termine:</b> collegamento alla rete principale (industria, riscaldamento ed energia)</p>	<p><b>Medio termine:</b> agrochimica (ammoniaca)</p> <p><b>Lungo termine:</b> mobilità/trasporti, grandi stazioni (LH2)</p>	<p><b>Medio termine:</b> industria, acciaio, chimica/raffinerie</p> <p><b>Lungo termine:</b> produzione di calore ed energia</p>
<b>Capacità</b>	5-20 TWh / anno	5-20 TWh / anno	100-500 TWh / anno	> 1.000 TWh / anno
<b>Criticità</b>	<ul style="list-style-type: none"> <li>Durata e complessità delle procedure di approvazione</li> <li>Accettazione locale</li> </ul>	<ul style="list-style-type: none"> <li>Limitata disponibilità di siti</li> <li>Distanza elevata dei siti dai consumatori</li> <li>Limitata integrazione nelle reti di teleriscaldamento regionali</li> </ul>	<ul style="list-style-type: none"> <li>Lunghi tempi di sviluppo e costruzione delle infrastrutture</li> <li>Dipendenza dalle infrastrutture di distribuzione del porto</li> <li>Elevato fabbisogno di investimenti</li> <li>Lunghi processi di pianificazione e approvazione</li> </ul>	<ul style="list-style-type: none"> <li>Elevato fabbisogno di investimenti</li> <li>Lunghi processi di pianificazione e approvazione</li> </ul>



# » La Clean Hydrogen Ladder (by Michael Liebreich): uno strumento utile per mappare le possibili applicazioni dell'idrogeno

Inevitabile





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