Fisterra energy

Blackstone Portfolio Company

Dii Desert Energy Partners' Meeting

February 9th, 2021

Agenda

1. About Fisterra and Blackstone
2. Green Hydrogen Evolution or Revolution

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Fisterra: Brief Overview

Overview of Fisterra

- Fisterra Energy is an energy company **specialized in energy infrastructure investments**
- Formed in January 2013 with the aim to **identify and develop medium and large scale power projects**
- Fully **owned and financially backed by Blackstone**, one of the world's leading investment firms (www.blackstone.com)
- Energy investments in various international markets with **primary focus in Europe, Latin America, Africa and Middle East**
- **Highly experienced management team**, having spent most of their careers in the energy and infrastructure investment sector:
  - Led by Pedro Barriuso, former head of Iberdrola Renewables, and managed by a highly senior professional team with excellent track record
  - Team has completed billions of dollars in energy investments and has managed the development, construction and / or operation of more than 30 GW
  - More than 25 years in the energy investment activity

Blackstone: Brief Overview

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Overview of Blackstone

- Founded in 1985, Blackstone is among the **world's largest asset managers**, with ~$584.4 Bn of assets under management
- Blackstone Energy Partners has built a leading energy private equity franchise with an **extensive and successful track record** of investing in exceptional companies and management teams seeking to facilitate growth and realize the full potential of businesses
- Blackstone's energy team has **invested / committed over $17Bn of equity** across a broad range of geographies and throughout the full energy value-chain: power, midstream, services & equipment, upstream, and downstream
- Blackstone has generated **top-quartile returns** over two decades investing in energy
- Blackstone, through its energy-focused private equity funds, currently has **28 energy sector investments**

Selected Energy Investments

CHENIERE
EAGLECLAW MIDSTREAM
Fisterra energy
LIGHTSTONE GENERATION
PRIMEXX ENERGY PARTNERS
JETTA
GUIDON ENERGY
PBF Energy
LONESTAR GENERATION
HEX
GEOSOUTHERN ENERGY CORPORATION

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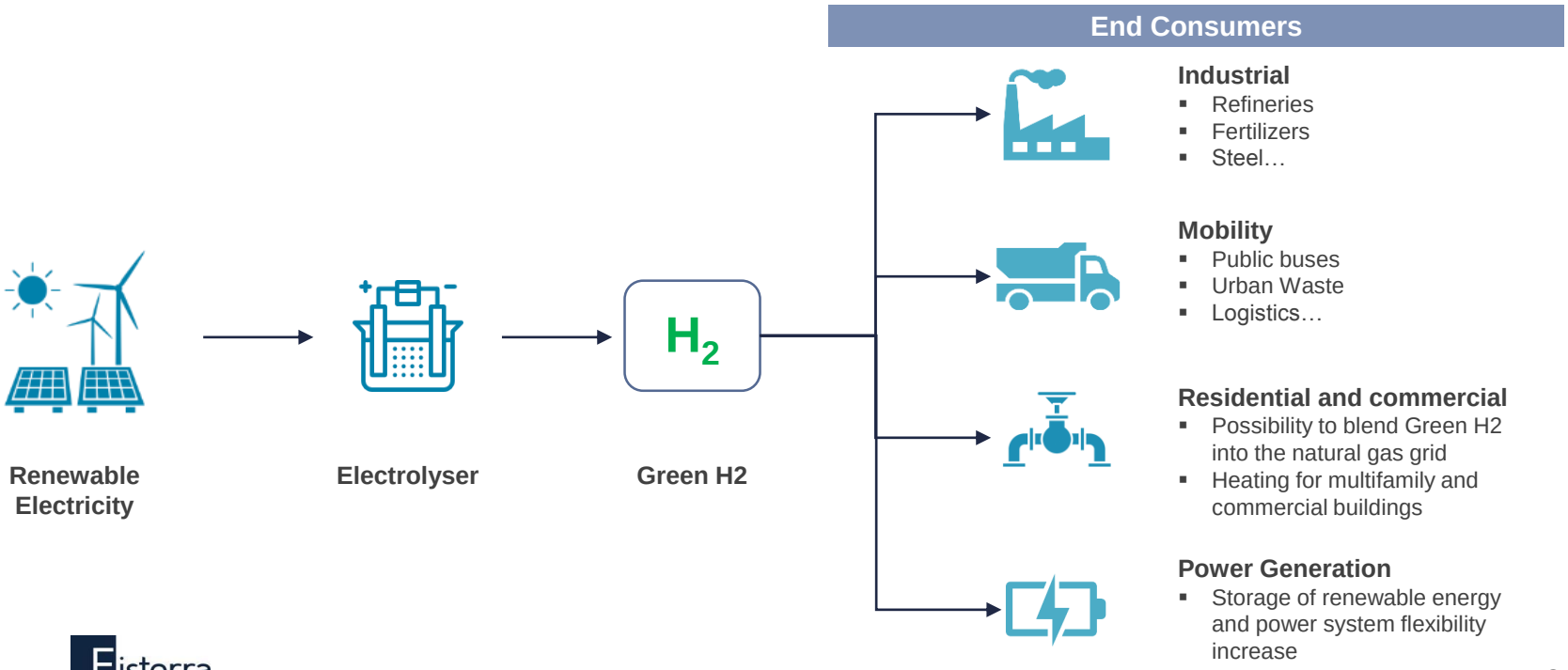
Hydrogen Introduction

Simple energy production process that can be run on 100% renewable sources

- H2 is a **universal, light and highly reactive fuel** obtained through various chemical processes including, amongst others, **electrolysis.** The electrolysis consists in the **use of an electrical current to separate the hydrogen from the oxygen in water**
- If **electricity used** is obtained from **renewable sources**, energy is produced without emitting carbon dioxide, **obtaining "green" H2**



Sources: International Energy Agency (IEA), McKinsey.

H2 Uses and Existing Demand

Hydrogen could be used to fuel the most difficult sectors to decarbonize

Potential H2 uses and targeted clients

Industrial *(Developed)*

Oil refining, ammonia production, methanol production and **steel production**

Existing demand

Refining

Steel

Methanol

Ammonia

*Current demand focused on **industrial sector,** mainly **oil refining and steelworks***

Mobility *(Under development)*

Cars, trucks, trains shipping, aviation and refuelling stations

There is a window for H2 in mobility through public fleets (buses, hauling…)

Residential/ Commercial *(Under development)*

Heating for multifamily and commercial **buildings**

*Demand for **mobility and heat power expected to increase** in the short and medium term, substituting traditional fossil fuels that not environmental friendly*

Storage & Transportation *(Under development)*

Gas System Operator (GSO)
Possibility to blend Green H2 into the natural gas grid

Liquid Organic Hydrogen Carriers (LOHC)

Ammonia

Power *(Under development)*

Seasonal Storage of renewable energy and power system **flexibility increase**

CCGT/repurposed coal plants

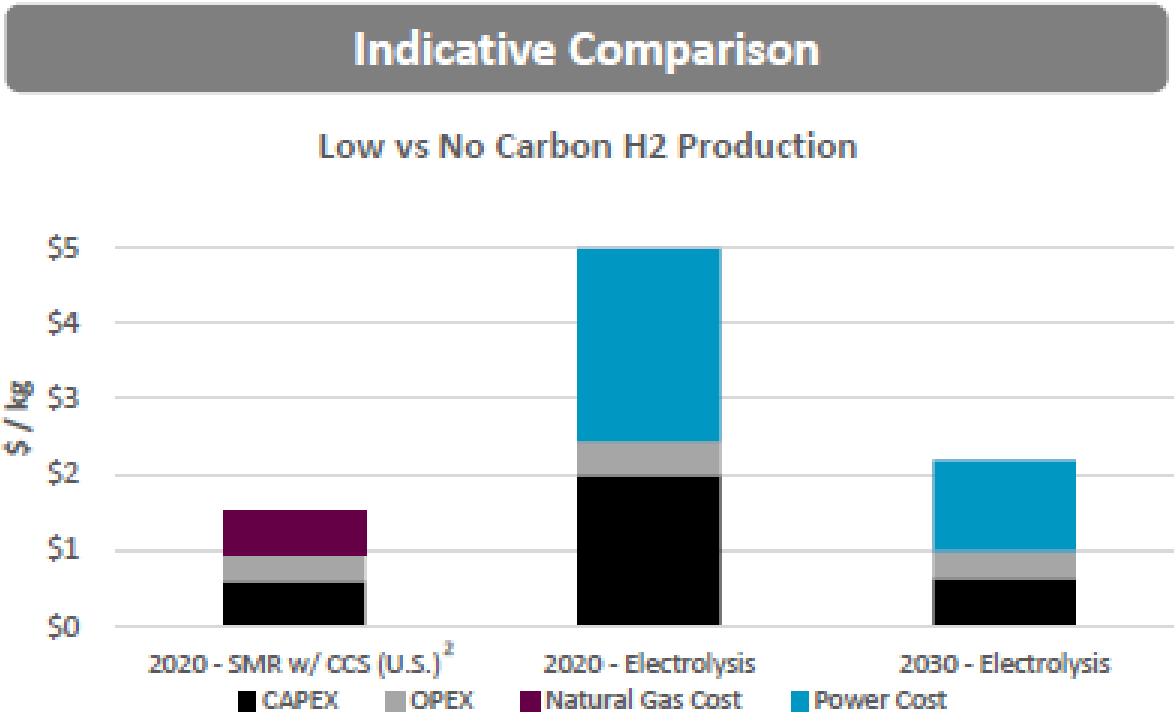
Fuel Cells

*Additional uses for the **power system and concrete** are under development*

Key considerations from a large financial investor

Clean Hydrogen is a multi-year secular trend with strong regulatory and industry tailwinds that is necessary to achieve the recently announced net zero carbon targets

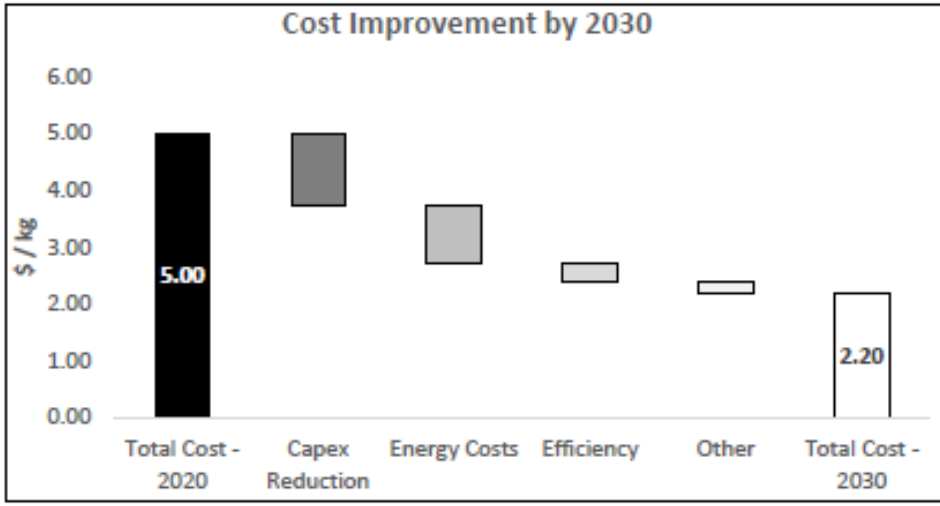
- Green Hydrogen is not far from being a competitive source of energy able to displace fossil fuels
- Potential of hydrogen is clear but there are barriers to overcome



Key considerations from a large financial investor

- Coordinated initiatives are needed to prioritize Low Carbon and Renewable hydrogen and overcome the inherent advantages of ‘grey’ hydrogen
- Subsidies are necessary in the short term, but the sector will emerge when price competitiveness is achieved

Scaled production of equipment and decreasing energy costs are the keys to green hydrogen’s competitiveness beyond 2030



Capex[1]: Reductions driven by scaled production (adoption), learning rate, and technological improvements

Energy: Utilizing renewables decreases power costs from $0.05/kWh to $0.03/kWh

Efficiency: Less energy required to produce same amount of hydrogen (approximately 5% - 10% improvement)

Other: O&M costs decline due lower component costs and operating system knowledge

Key considerations from a large financial investor

International co-operation expected to contribute to an accelerated growth of clean hydrogen in order to achieve decarbonisation objectives at EU level and in the MENA region. Unprecedented political and business momentum for Green H2

H2 growth prospects at European level in a nutshell

€2.2trn **Green H2 market in Europe by 2050**	**40 GW** **EU targeted installed capacity by 2030**	**€400bn** **EU investment target by 2030**
c.65% **Share of green H2 production cost to come from electricity by 2050**	**>8,000x** **Growth in the European electrolyser market by 2050**	**+c.100%** **Increase in European power demand from electrolysers by 2050**

Highlights

Double Power Demand

Could become the **largest electricity customer**

Energy Challenges

Contributes to **decarbonisation**, improve **air quality** and strengthen energy **security**

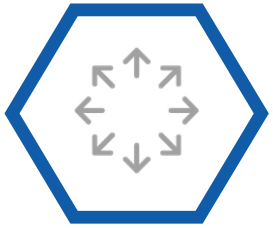
Enable Renewables

Solar and wind, whose **availability** is **not** always **well matched with demand**

Good Timing

Policy and technology innovation have the power to build **global clean energy industries**

Versatile



It can be **produced, stored, transported and used** in different ways

Gas Grid Reconfiguration

Due to "decentralized" H2 role, its molecules would have to be **transported through existing gas grids**

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Sources: Goldman Sachs Global Investment Research, European Commission.

Key considerations from a large financial investor

. The hydrogen value chain comprises several processes

COMPONENT SUPPLIERS

Original Equipment Manufacturers (OEM) in the different parts of the value chain: (i) electrolysers or chemical reactor for production, (ii) pipes, bottles, compressed gas trucks or carriers for transport, (iii) cars, fuel cells, CCGTs or industrial equipment for end users.

HYDROGEN PRODUCTION

Various methods exist to produce hydrogen: electrolysis, SMR, or gasification. The use of CCS is also expected in the production of low carbon hydrogen. New technologies such as pyrolysis are developing.

HYDROGEN TRANSPORT

Hydrogen can be transported either through (i) pipes, (ii) small metal tanks for small quantities, (iii) compressed gas trucks and (iv) cryogenic containers or (v) carriers to transport liquid hydrogen.

PROJECT DEVELOPERS

Includes activities from project design, financing, EPCI (Engineering, Procurement, Construction and Installation) and project commissioning.

HYDROGEN TREATMENT

Hydrogen needs to be treated either for storage, transport or consumption. Current treatments include (i) compression/pressure regulation, (ii) purification, (iii) liquefaction/regasification and (iv) hydrogen conversion.

HYDROGEN DISPENSING

This includes either (i) refuelling stations for the use of hydrogen in transport, which requires storage facilities, compressors, a precooling system and dispensers, or (ii) local distribution network for its use in buildings or facilities.

ENERGY PRODUCTION

To produce hydrogen, energy is needed. This can either be renewable or produced through fossil fuels, which will result in different types of hydrogen (grey, low carbon or renewable hydrogen).

HYDROGEN STORAGE

Different methods of hydrogen storage exist: (i) Liquid at -253ºC, (ii) compressed at 350-700bar in tanks or pipes, (iii) fixed on carbon surface by adsorption phenomena, (iv) chemical storage, (v) through the use of hybrids and (vi) salt caverns.

END-USE APPLICATIONS

The end-use application of hydrogen has consequences through the whole value chain as it affects the hydrogen production method, the treatment and level of purification needed and how and where it needs to be stored, transported and dispensed.

Key considerations from a large financial investor

- For green hydrogen, cost of production is mainly dependent on:

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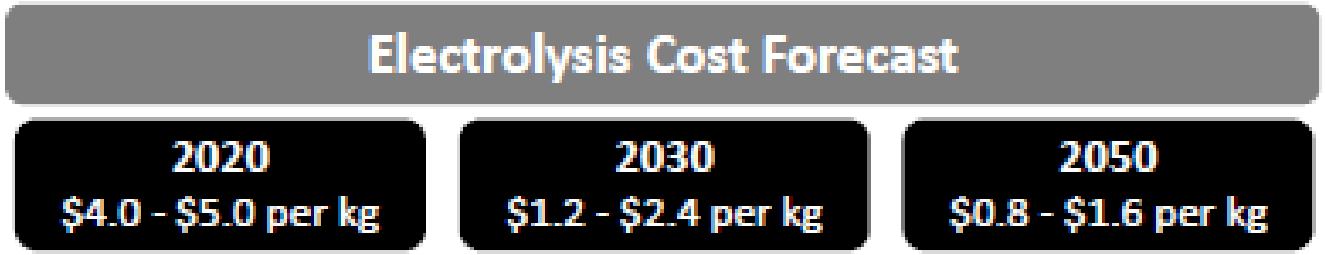
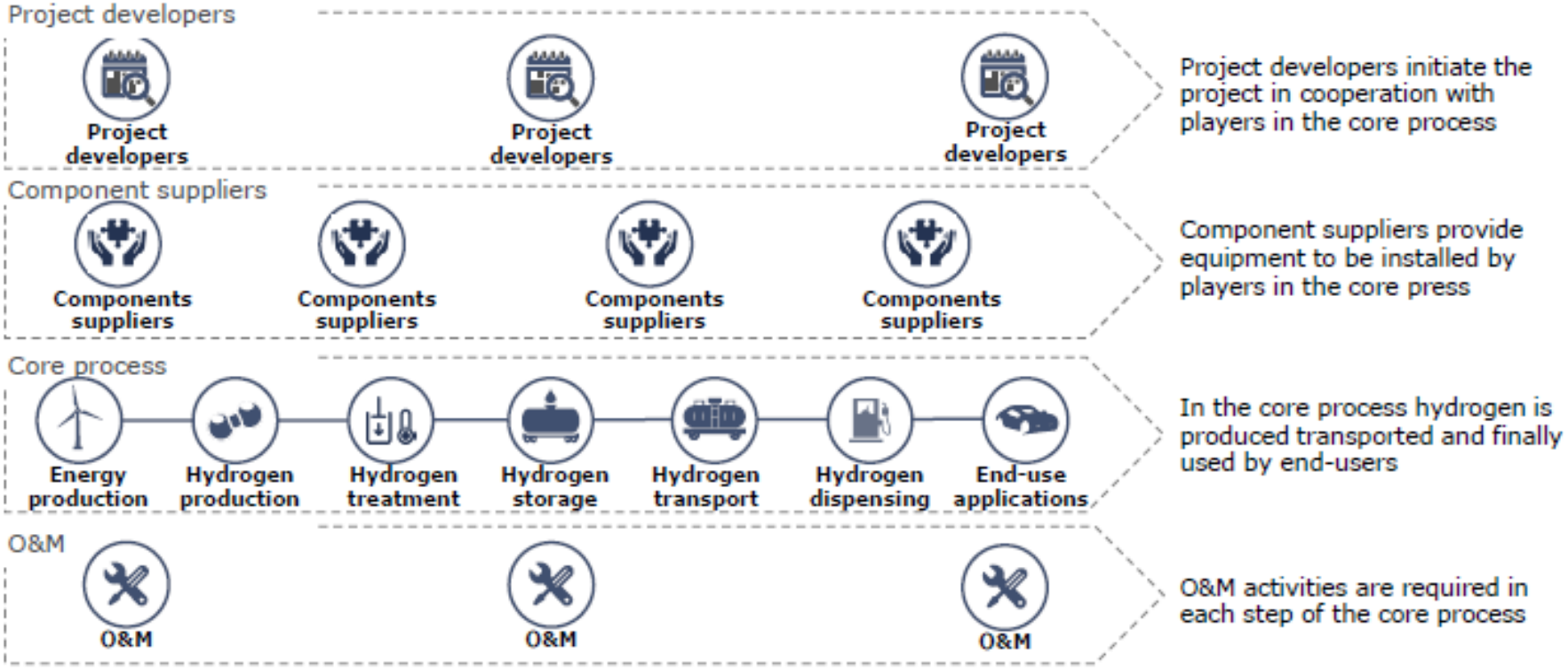
- cost of electricity,
  - Accelerating roll-out of renewables and its falling costs are expected to drive power prices down
- load factors
  - A combination of renewable electricity generation could provide baseload supply (wind, solar PV, hydro, biomass...) plus storage
  - Connection to HV grid could be very relevant
- Logistics
  - Storage and transport of green hydrogen is also relevant. Pipelines and deep water ports, plus large storage capacity is essential
  - Efficient distribution networks



Key considerations from a large financial investor

In order to establish the hydrogen economy, a coordinated approach will be needed to ensure that hydrogen production, treatment, storage and transportation and end use demand are developed alongside each other in full chain projects. Economic, technical and logistical issues will need to be overcome through encouraging investment, supporting R&D and developing suitable support mechanisms.



Key considerations from a large financial investor

Optimal locations for the development of Green H2

- **Abundant renewable resources of a variety of technologies (mainly wind and solar)**

- **Existing high voltage interconnection points (400 kv and 220 kv)**

- **Access to high pressure natural gas network**

- **Access to water supply**

- **Proximity to deep-water port**

- **Space to include fuels storage facilities, ammonia production, etc.**

- **Adjacent facilities available**

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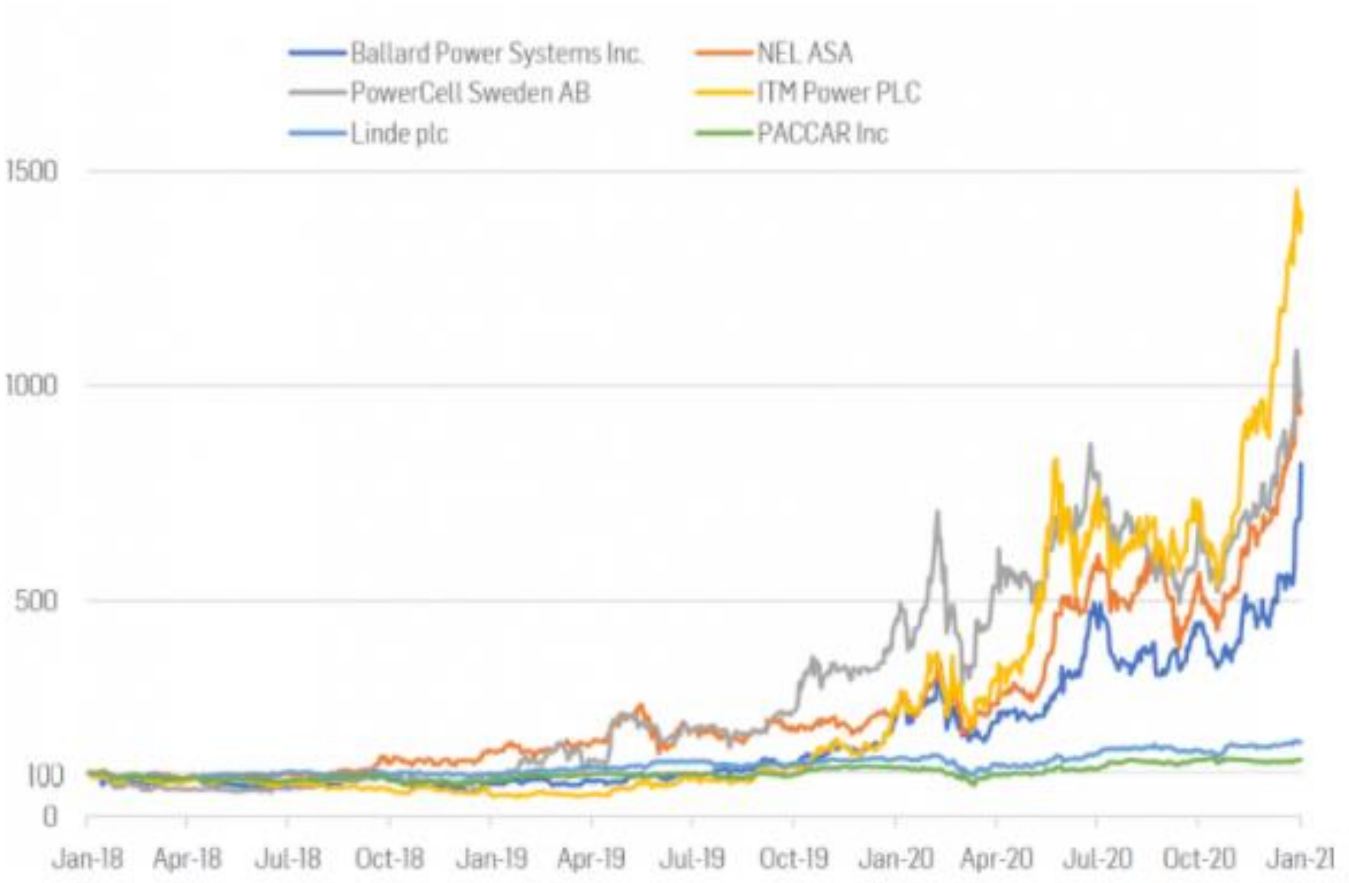
Key considerations from a large financial investor

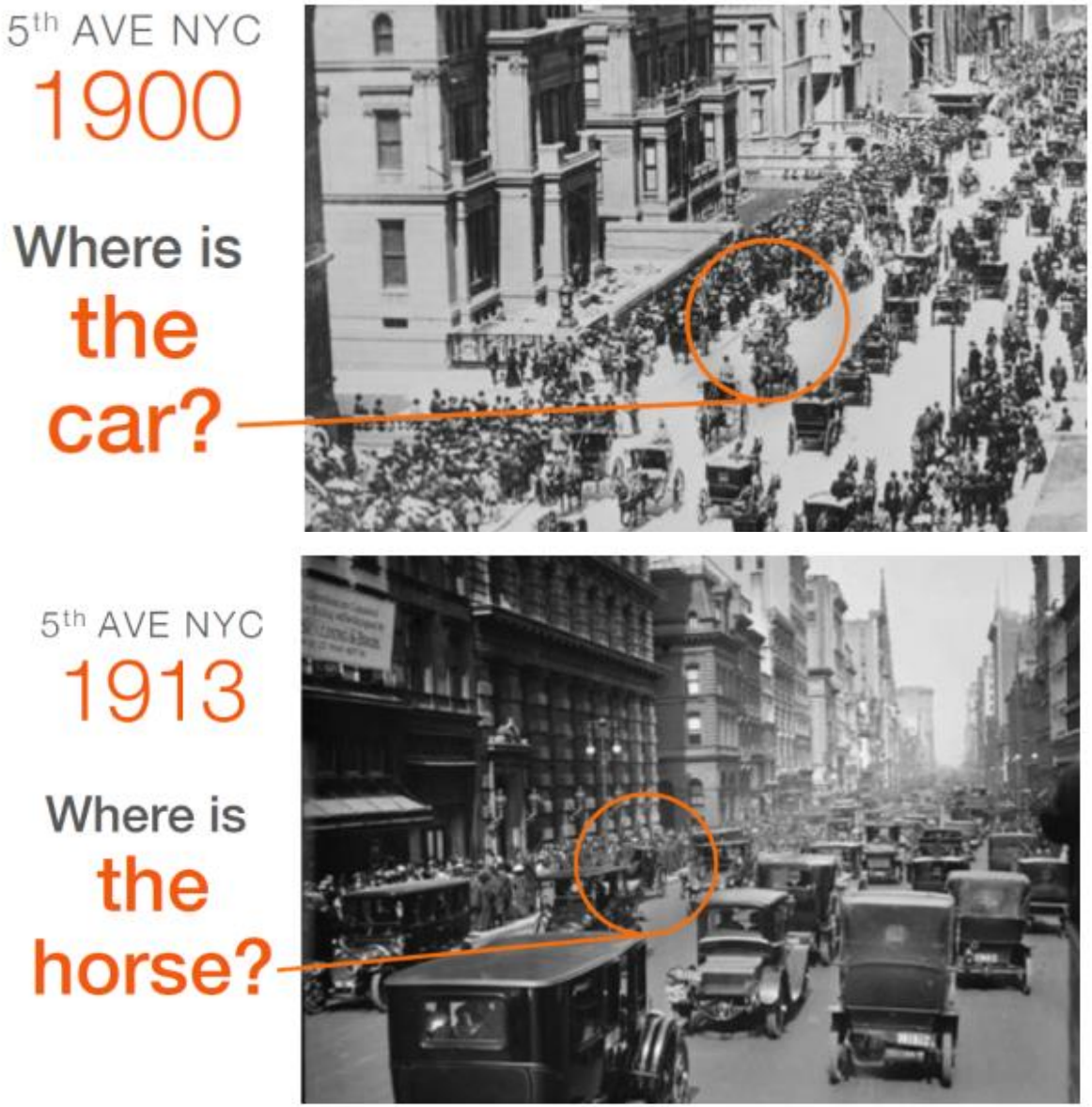
Hydrogen-exposed companies have seen a significant surge in their share prices recently, propelled by heightened investor interest and supportive ESG-tailwinds



Performance of selected hydrogen stocks in last three years to January-12, 2021 (TR, USD)

Key considerations from a large financial investor

Energy guru Tony Seba calls this "*technology convergence*." *Convergence happens when a group of technologies come together to make new things possible.*



Key considerations from a large financial investor

All the necessary elements are there for the Hydrogen revolution to attract huge amount of capital investment

This capital will spread out throughout the entire value chain:

- From project development to equipment manufacturing
- From logistics to O&M
- final demand will convert itself into final green hydrogen consumer due to
  - Price competitiveness of green hydrogen
  - Pressure from the financial community incorporated in the ESG criteria adopted by the large financial investors
  - Pressure form the final customers who are fully aware of climate change implications for society
  - Fastest growing corporations are those who switch to carbon free economy
- This is happening at an unprecedented speed and scale

We are all here to drive this revolution