



Americas hydrogen and syngas technical training seminar

Introduction

Diane Dierking

Catalysing the net zero transition

Our aspiration is to lead across our four businesses

Clean Air

Leading in autocatalyst markets

Catalyst Technologies

#1 in syngas-based chemicals and fuels technology

Hydrogen Technologies

Market leader in performance components for fuel cells and electrolyzers

PGM Services

(Platinum Group Metals Services)

#1 recycler of PGMs¹

Portfolio transitioning and growing over time

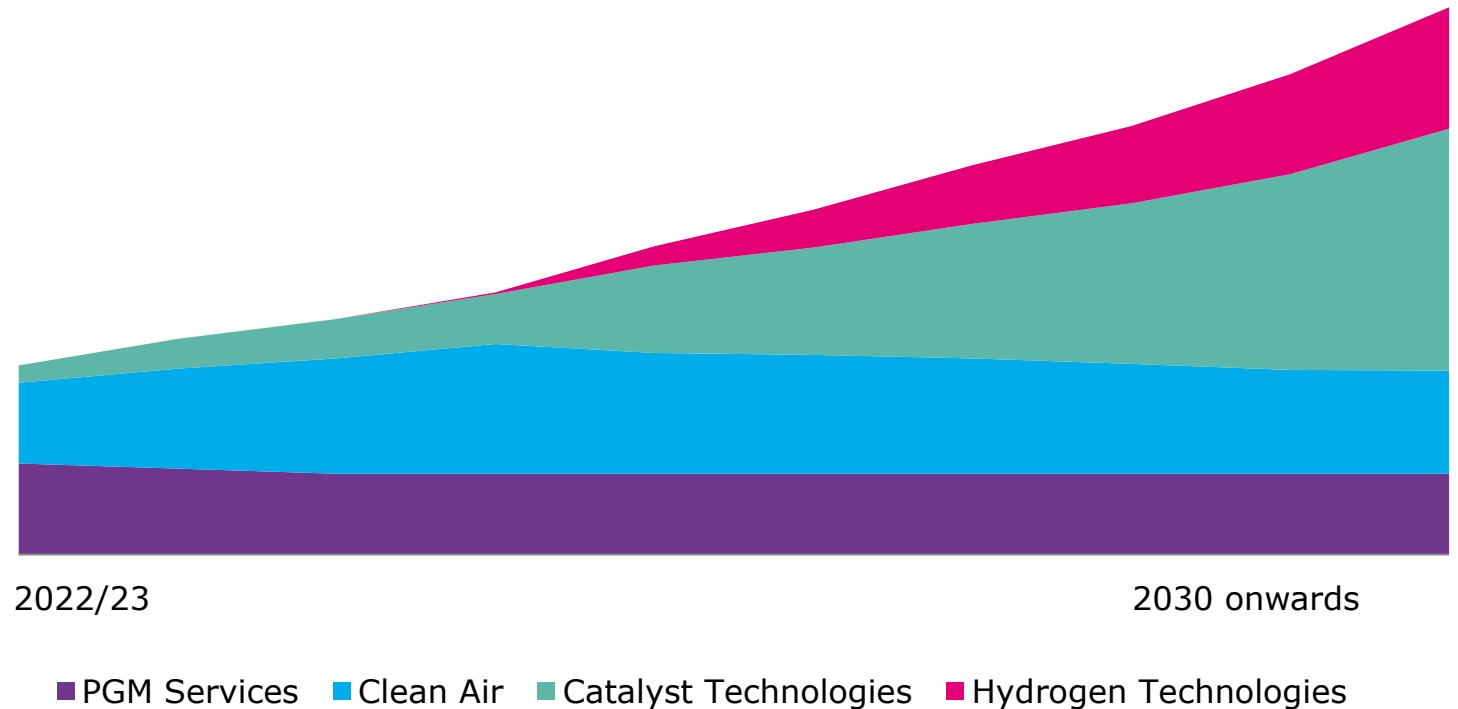
Accelerating to high single digit growth¹ over the medium term, and strong long-term growth

Beyond 2030, growth businesses expected to be **bigger than the size of JM today...**

Illustrative chart

Development of underlying operating profit

Structural growth markets accelerating and opportunities are larger than previously expected



The energy transition creates significant new opportunities

1 There is an urgent need for the world to decarbonize...

2 Driving strong demand for hydrogen and sustainable fuels

3 Hydrogen is essential for:

Decarbonizing hard to abate industrial processes



Building blocks for **sustainable fuels** and **chemicals**

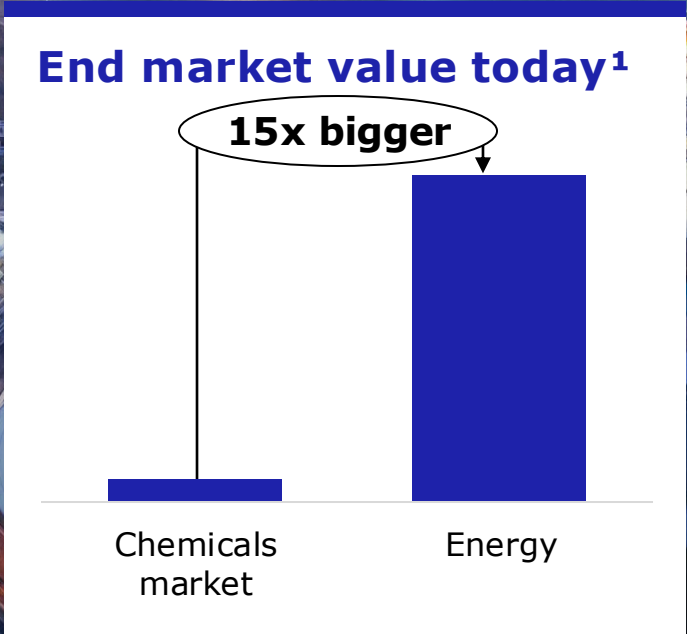


Balancing power grids in an increasingly renewable world



JM is well-positioned

Shift from chemicals to energy markets creates significantly larger value pools for Catalyst Technologies



Regulatory environment and incentives support low carbon hydrogen demand

US

Inflation Reduction Act – c.US\$370bn clean energy incentives

Tax credits for low carbon hydrogen projects



EU

Legislation puts **renewable and low carbon hydrogen on equal footing** in terms of CO₂ reduction required



China

First long-term plan for hydrogen promoting hydrogen production, infrastructure development and use



UK

10GW of low carbon and electrolytic hydrogen production capacity by 2030



Middle East

Kingdom of Saudi Arabia: 2.9 million tons of low carbon and electrolytic hydrogen by 2030, 4 million tons by 2035



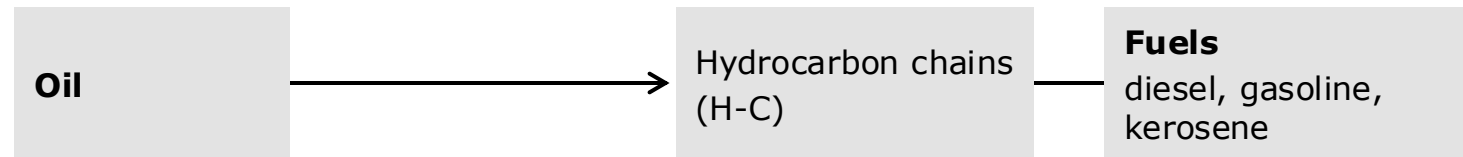
Japan

Target of **12 mtpa hydrogen supply by 2040** (6x today) supported by c.\$110bn investment

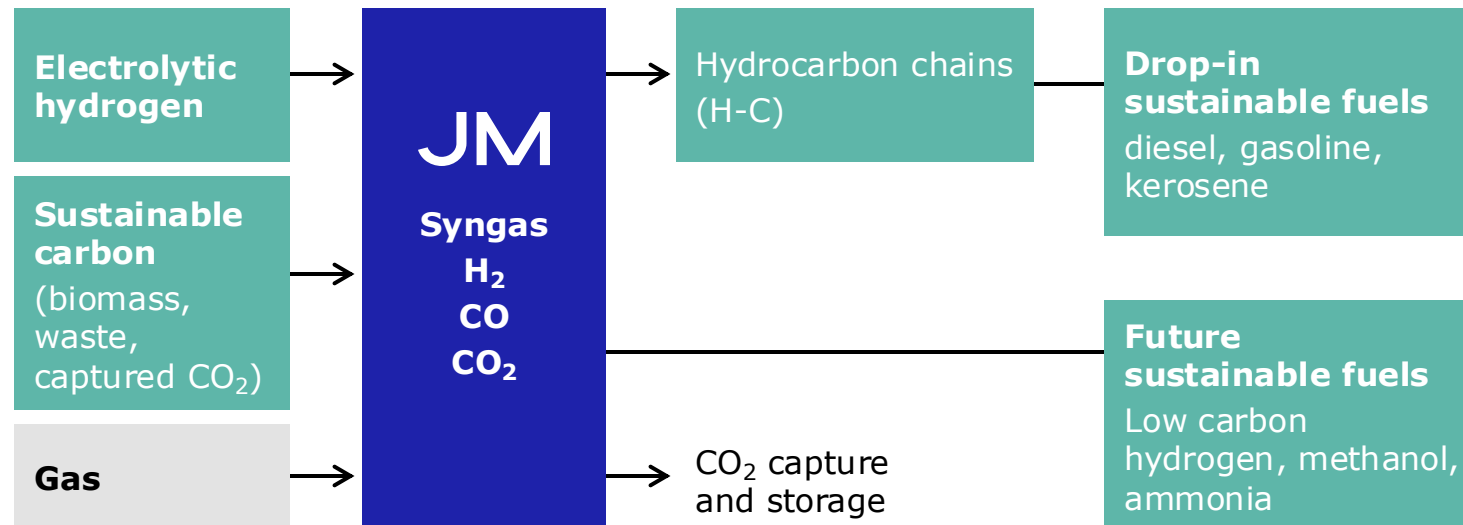


Syngas is a key gateway to sustainable fuels and low carbon hydrogen

Fossil based route



Sustainable route



We are moving from breaking down long hydrocarbon chains....

...to building up short hydrocarbon chains through syngas to create sustainable fuels

Leading market positions in syngas and building partnerships for the future

Syngas processes	Global segment position
Methanol	#1
Hydrogen	#1
Formaldehyde	#1
Ammonia	Top 3

Example customers and partners



Building alliances and partnerships are increasingly important for go-to-market

JM is one of the few players in syngas with an integrated offer

Key players in syngas¹



JM's integrated catalyst and licensing offer delivers:

Strong value proposition through combination of process design and catalyst

Security of catalyst supply in a growing market

Long lasting customer relationships

Strong recurring sales

Fast route to market for new technologies

Main pathways to low carbon hydrogen production

Traditional method of producing hydrogen from natural gas

Mature technology

High capital cost to capture required CO₂

Steam methane reforming (SMR)

JM

JM's LCH™ technology

Mature technology

Higher CO₂ capture at lower capex compared to SMR

Exceeds current standards for carbon intensity to be classified as low carbon hydrogen

Autothermal reforming (ATR)

JM

Higher feedstock efficiency¹

Lower carbon intensity¹

Exceeds current standards for carbon intensity to be classified as low carbon hydrogen

Autothermal reforming (ATR) and gas heated reforming (GHR)

JM

Low carbon hydrogen: strong competitive advantage

Market leader in syngas

Expertise in deploying world scale plants

Existing customers

Portfolio of proven **technologies to meet different customer needs**

ATR: world-class uptimes

ATR-GHR:

- Up to 99% CO₂ capture¹
- 12% lower capex and 7% lower feedstock usage²

Current pipeline of >35 projects





JM is here for you!

While we are very excited to be part of energy transition...

We are very committed to supporting the plants in operation today and to the people who run them – you!

The purpose of our training this week...

Share knowledge you need to run your plant efficiently & reliably

Our priorities for our time together...

JM is the best for technical expertise.

1

JM products help solve any issues you encounter

2

JM invited great guest speakers to increase your contacts beyond catalyst needs.

3

You learned a lot and had fun doing it!

4