



Presentation to Investors / Analysts – Opportunities in Process Technologies

30th January 2014



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Introduction and Welcome

Neil Carson
Chief Executive



Johnson Matthey

Programme

14.00	Introduction and Welcome	Neil Carson
14.10	Opportunities in Process Technologies <i>Q&A and coffee break after this session</i>	Geoff Otterman
15.30	Adding Value Through Technology	Iain Martin
	Process Technologies and the Chemicals Market	Iain Martin
	Process Technologies in China	Henry Liu
	Summary <i>Q&A and coffee break after this session</i>	Geoff Otterman
16.50	Process Technologies and the Oil and Gas Market	Don Roche
	Summary and Key Messages <i>Q&A after this session</i>	Geoff Otterman
17.30	Closing Remarks and Final Q&A	Neil Carson
18.15	Drinks Reception and Dinner	

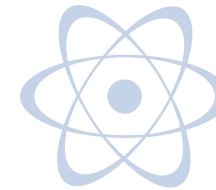
Introduction



A world leading
technology company



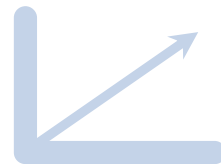
Success founded on
continued investment in
R&D and product
development



Differentiation
through technology



Proven strategy in
place to develop new
business areas



Well positioned in
growth markets



Delivers value



Opportunities in Process Technologies

Geoff Otterman
Division Director, Process Technologies



Johnson Matthey

Agenda

-
- | | | |
|-----------|---------------------------------------|-----------------------|
| 01 | Opportunities in Process Technologies | Geoff Otterman |
| 02 | Adding Value Through Technology | Iain Martin |
| 03 | PT and the Chemicals Market | Iain Martin |
| 04 | PT in China | Henry Liu |
| 05 | PT and the Oil and Gas Market | Don Roche |
| 06 | Summary | Geoff Otterman |
-

Our Aims Today

Provide

an **overview** of
Process Technologies'
activities, markets
and competitive
strengths



Insight

into the growth
drivers in Process
Technologies' markets



Explain

how the division is
well placed to
benefit from growth
in these markets



Highlight

prospects for the
development of
the businesses
in the division



What is Process Technologies?

Core technology strengths combined with expertise and know how of our people

Catalysts

- High performance catalysts
- Pellets, granules and powders often sold on tonne scale
- Replacement cycle or continuous dosing
- Investment in new product development



Processes

- Provides 'blue print' (flowsheet) on how to build and operate a plant
- Strong engineering know how
- Ability to integrate catalyst with process scale up
- Investment to improve existing process technologies and develop new ones

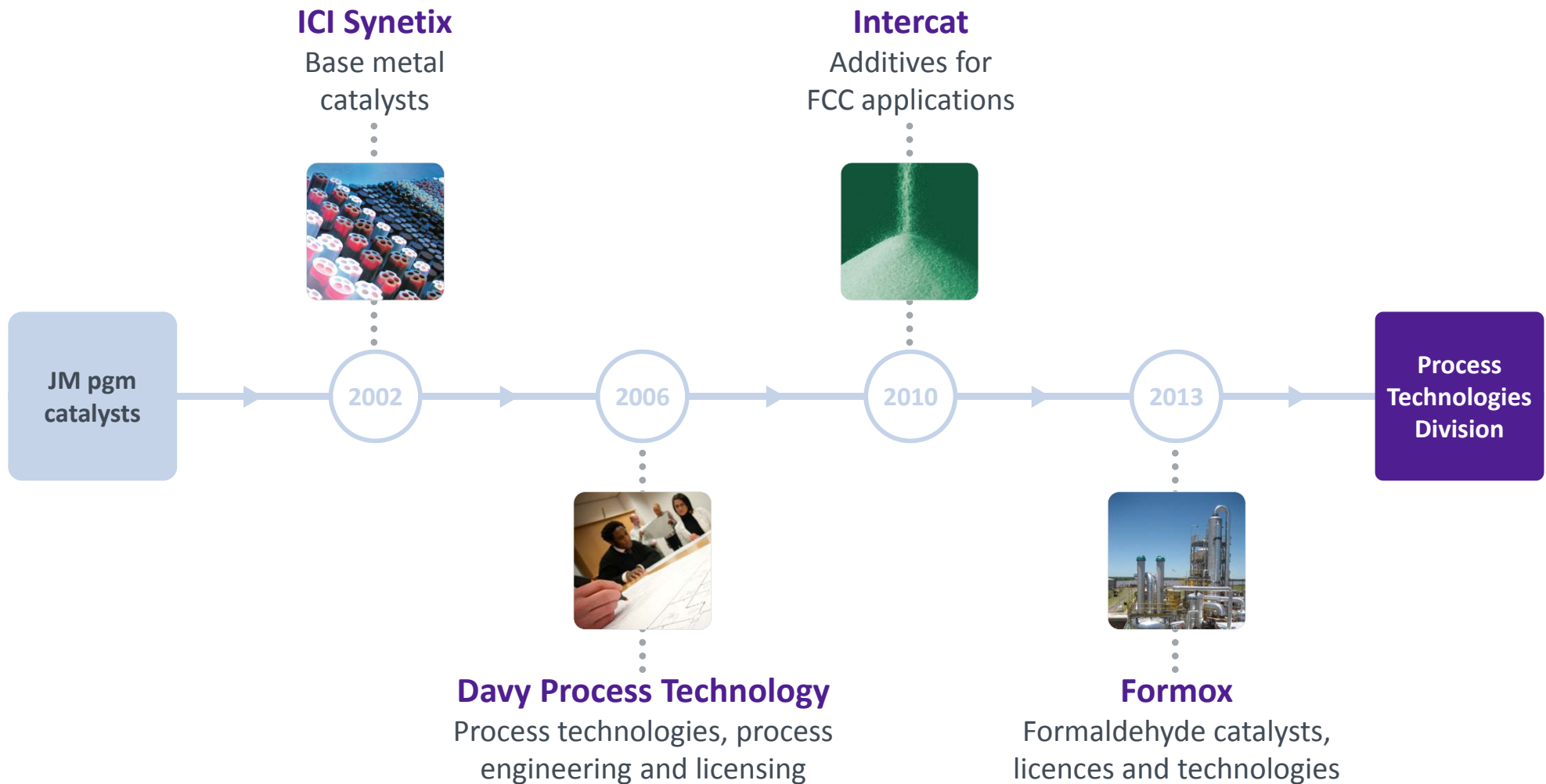


For our customers

- Optimised plant efficiency
- Performance guarantee
- Support and service from JM

History of Process Technologies

Building blocks for a new division



Development of the Division



People

- World class scientists and engineers
- Threading together new business
- Attracting industry experts
- Process and industry know how



R&D

- Continued investment
- Aligned with core technology competences

Process Technologies



Acquisitions

- Market leaders
- Differentiate through R&D
- Customer relationships
- Potential for investment



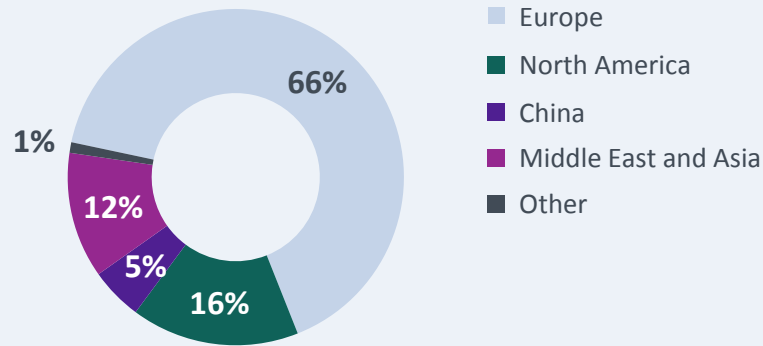
Capex

- Added capacity in anticipation of demand
- Supporting regional growth
- Investing for the long term

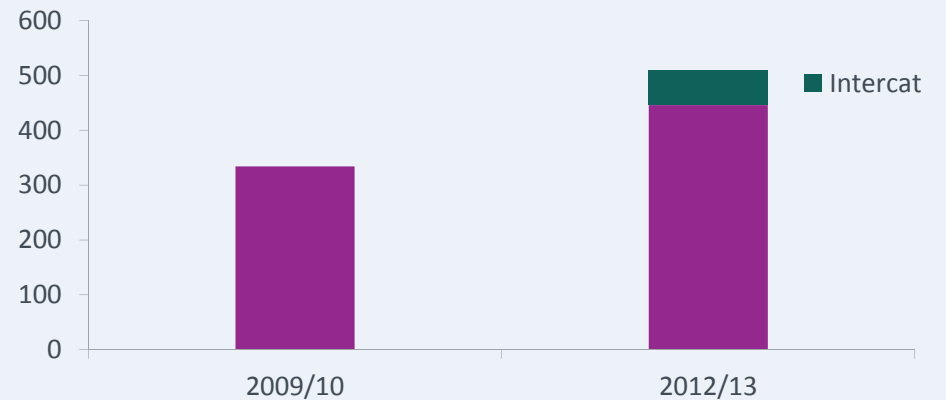
Overview of Process Technologies

Global leader in process catalysts and process technology

>2,300 Employees; 10% in R&D

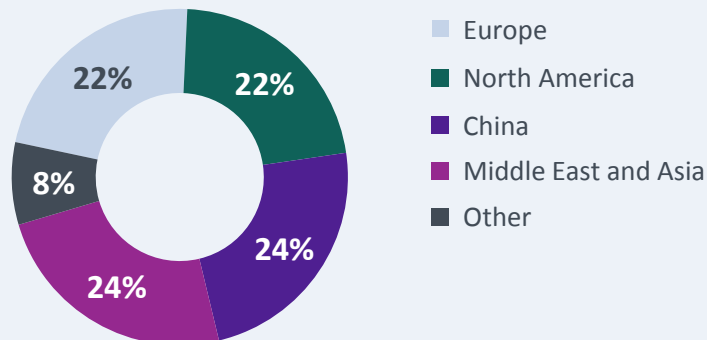


15% CAGR in Sales

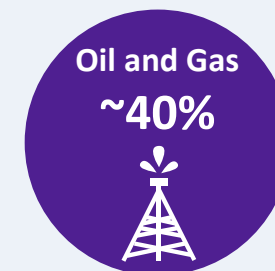


Broad Geographical Spread

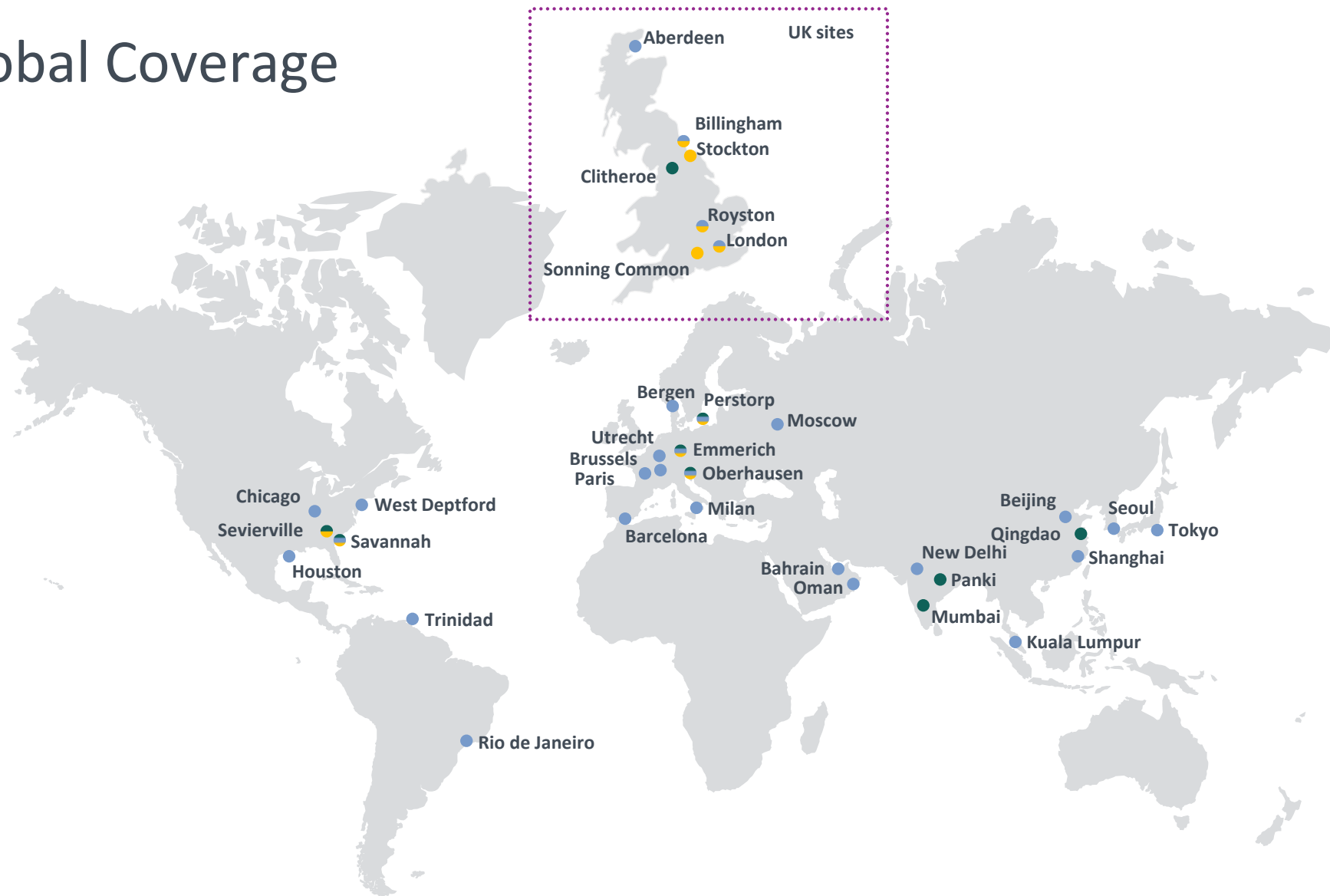
Sales by Destination (1H 2013/14 £288m)



Two Key Market Sectors



Global Coverage



● 9 Manufacturing Sites
 ● 10 Technology Centres
 ● 28 Sales Offices

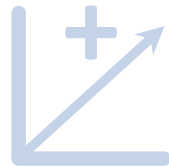
Process Technologies Division Strategy

Delivering double digit growth



Maintain leading positions in catalysts and process technologies for chemicals markets

- Leverage catalyst and process expertise for superior growth in existing and new markets



Invest for growth

- Maintain R&D spend at ~5% of sales p.a.
- Capex ~£80-100m p.a. / 2x depreciation
- Improvement in ROIC



Develop larger presence in oil and gas markets

- Exploit existing technology advantages
- Develop process technology to complement catalysts



Expand capabilities

- R&D – including new materials
- External partnerships
- Targeted acquisitions

Serving Two Market Sectors

Chemicals

- Syngas
- Petrochemicals
- Oleo / Biochemicals

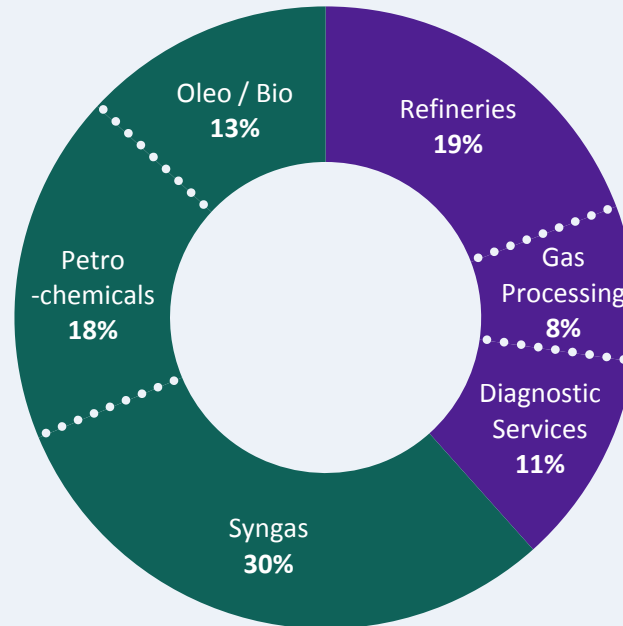
~60% of PT sales 

What we do

- Catalysts and process technology

Competitors

- Clariant, Haldor Topsøe, BASF



#1 or #2
in majority of our markets

Oil and Gas

- Refineries
- Gas Processing
- Diagnostic Services

~40% of PT sales 

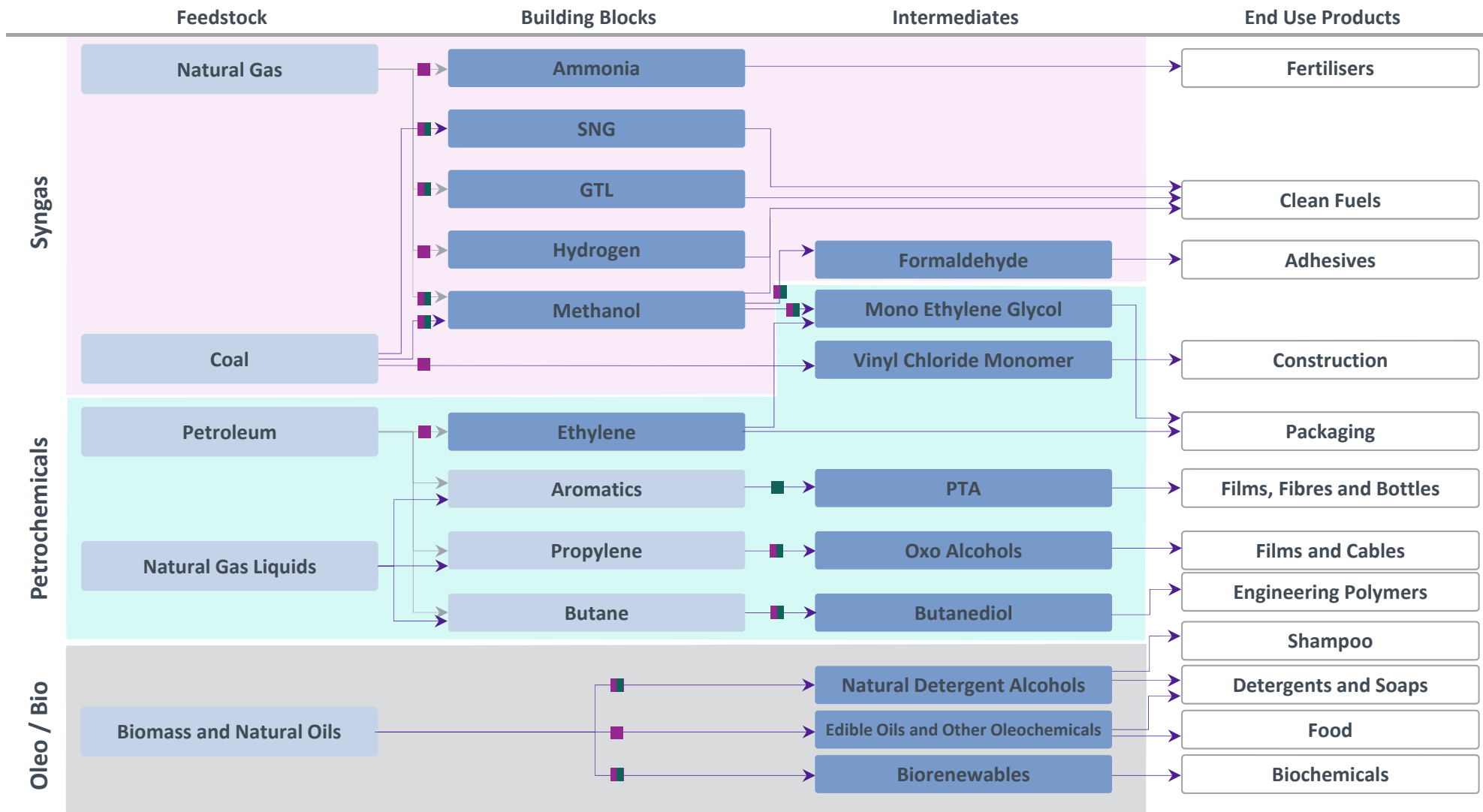
What we do

- Catalysts and diagnostics

Competitors

- Grace, Albemarle, UOP, Clariant

PT's Chemicals Markets



Expanding Activities in Chemicals Markets

JM Today

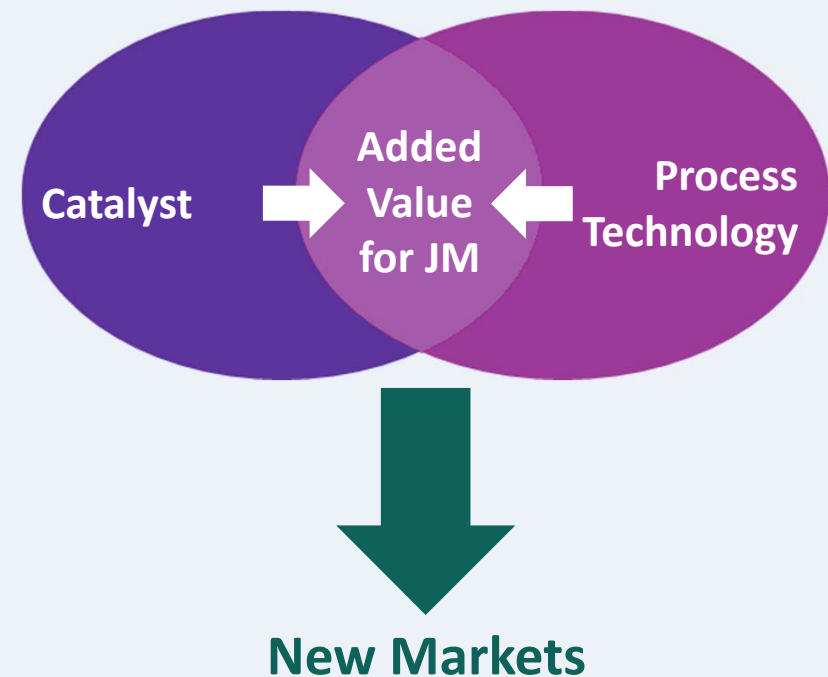
- JM a significant player in targeted markets

Opportunity

- Opportunity for JM to grow within £2bn p.a. chemical catalysts and process technology market

Expansion

- Expansion through:
 - Increasing catalyst + process offering within current portfolio
 - Developing into new markets



PT's Oil and Gas Markets

JM has strong positions in targeted high value markets

Refineries Hydrogen Leading position in reforming, shift and purification catalysts for hydrogen manufacture

Refineries Additives Unique product offering in FCC additives and dosing systems for improving efficiency and environmental performance of FCC units

Gas Processing Strong position in market for removal of sulphur and mercury from gas streams to very low levels

Diagnostic Services High value, specialist offerings across the whole oil and gas value chain

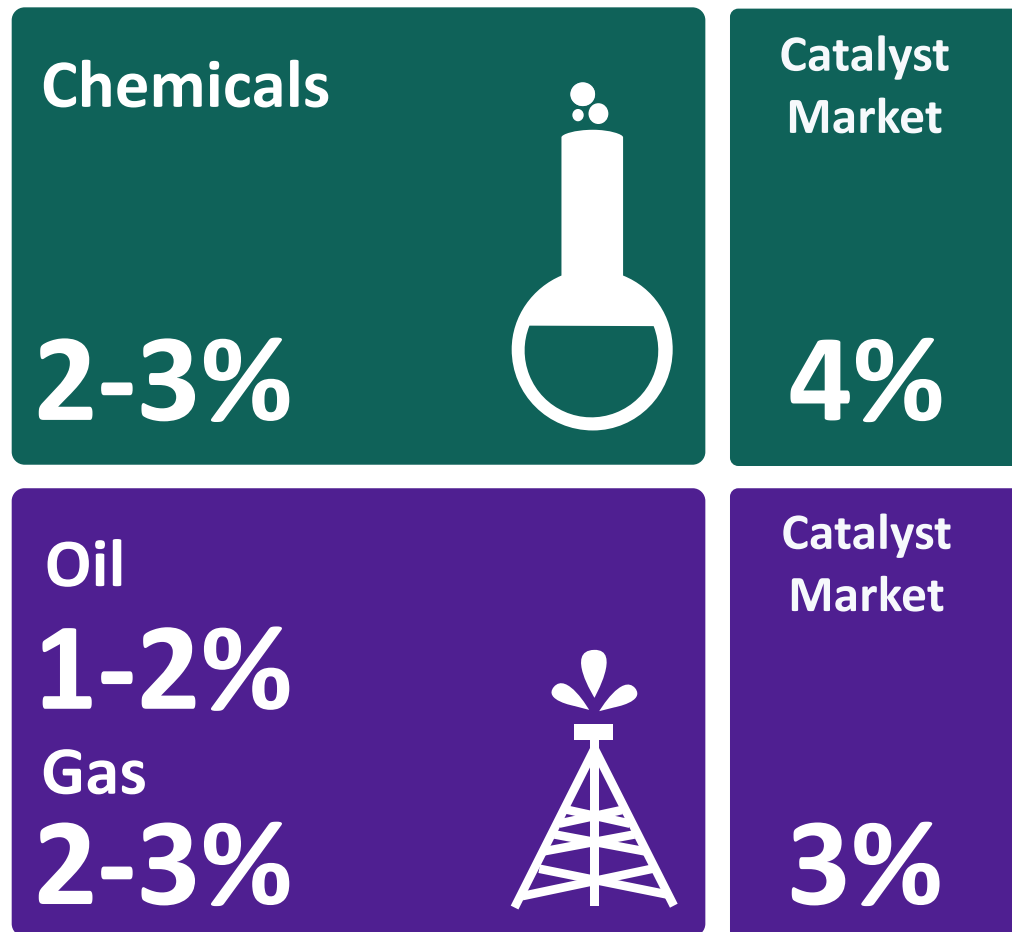


Opportunities to apply PT's skills in current and additional areas of oil and gas market:

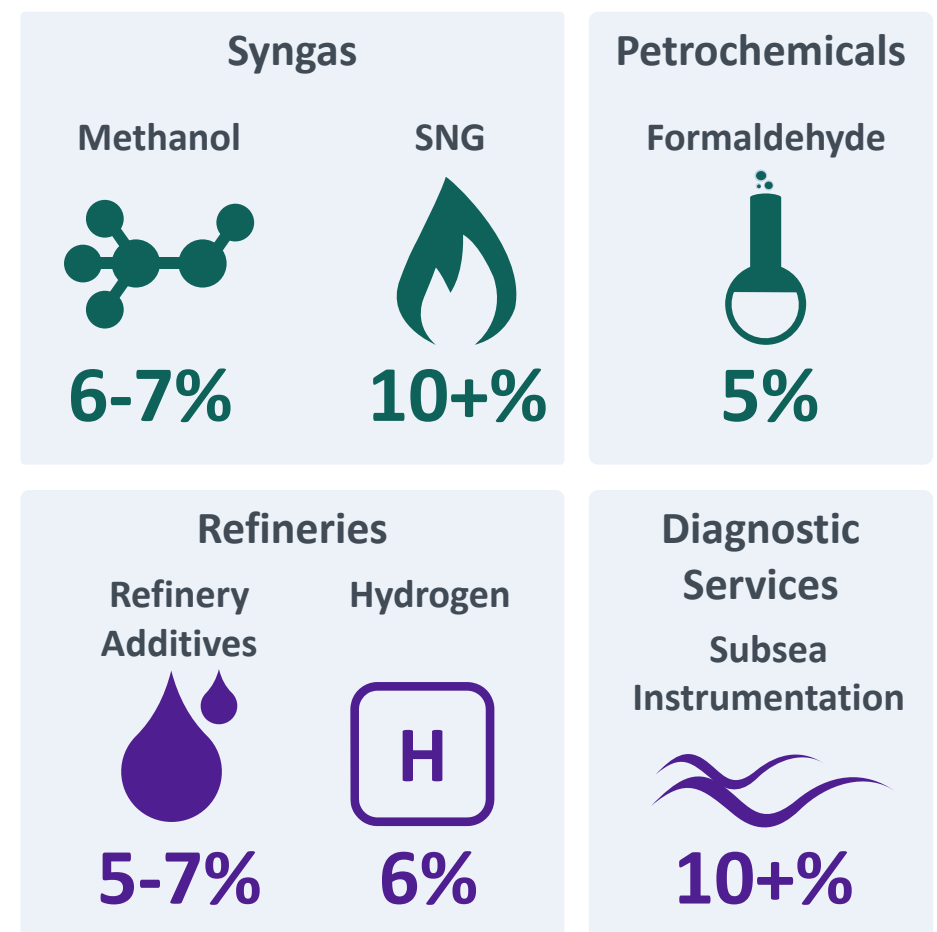
- By innovation and leveraging core competences in advanced materials
- By partnering and acquisition

Robust Growth in Existing Markets

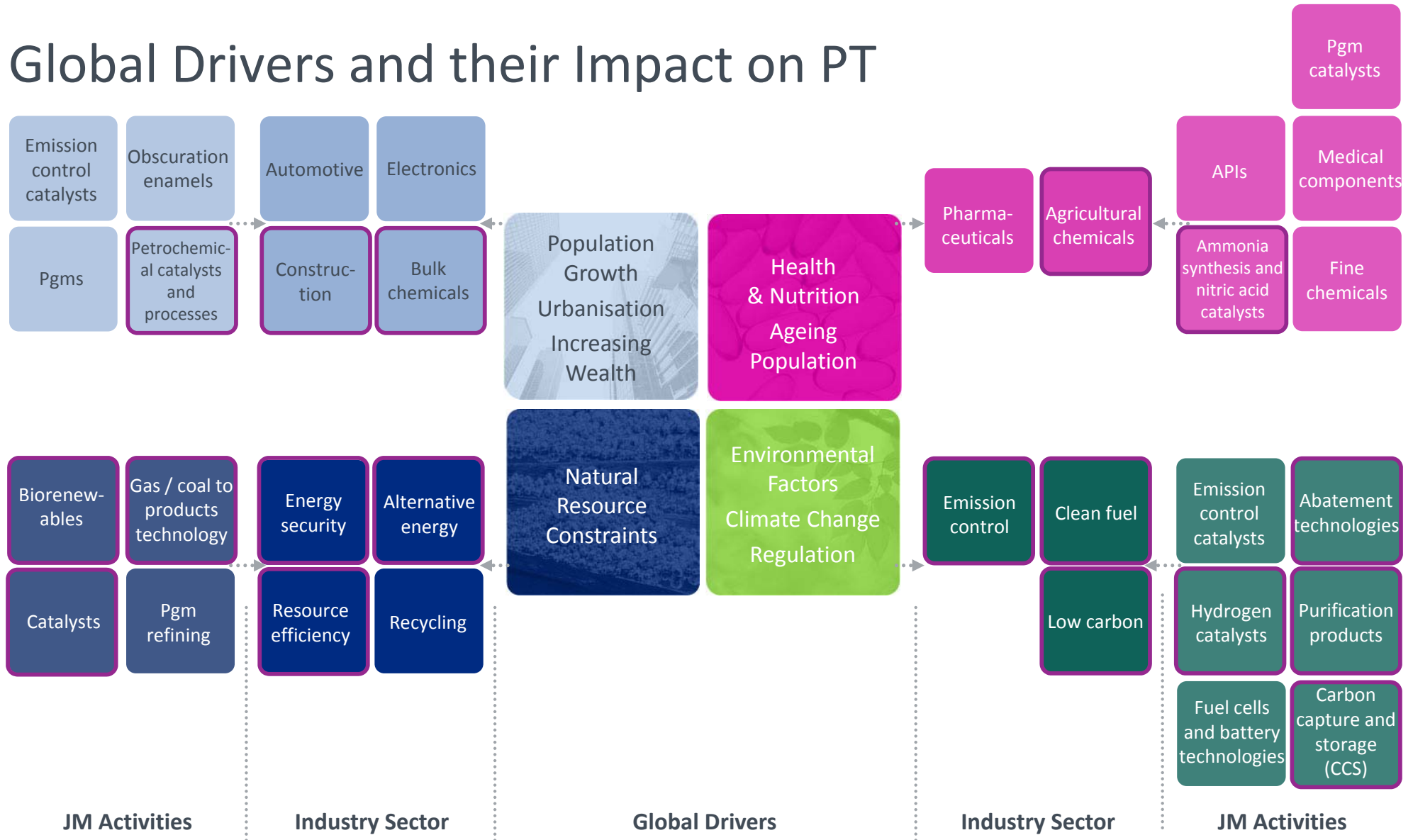
Underlying Market Growth



Superior Growth Markets



Global Drivers and their Impact on PT



Change provides opportunity

Change Drives Growth for PT

Key opportunities beyond underlying growth



- **Shale gas**, its new availability and the effect on process economics

Could add **£100m** p.a.
in sales by 2020



- Greater **global demand for fuels**, particularly cleaner fuels made from dirtier and less accessible feedstocks

Could add **£50m** p.a.
in sales by 2020



- The Chinese imperative for fuel security and the need for **coal-based chemicals**

Could add **£100m** p.a.
in sales by 2020



- Demand for **asset performance and integrity** are increasing across our markets

Could add **£30m** p.a.
in sales by 2020



Shale Gas



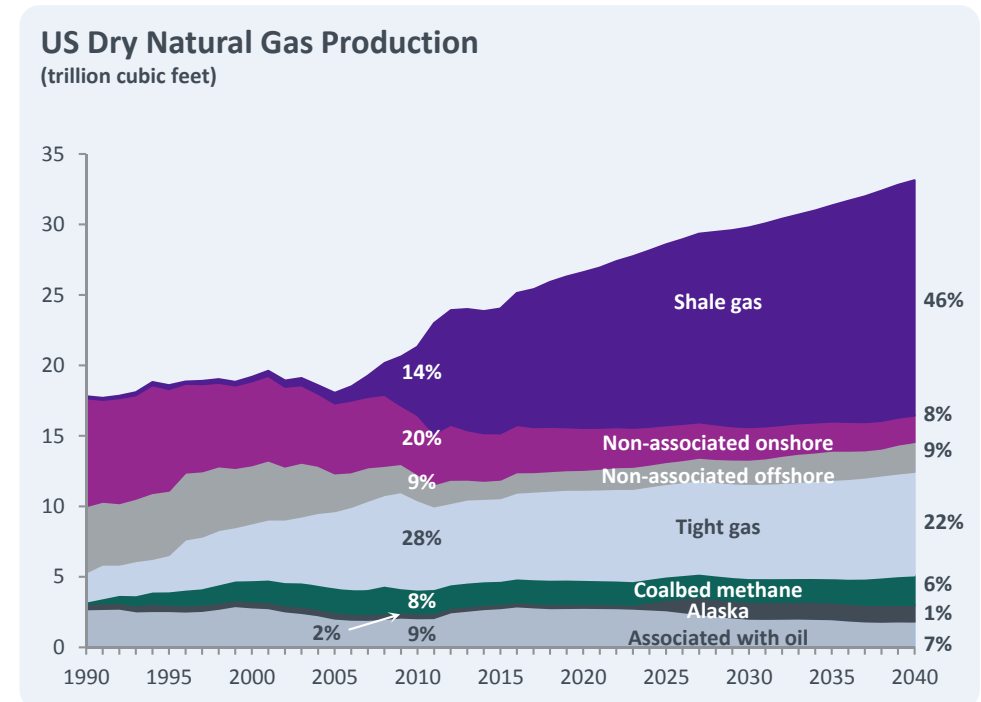
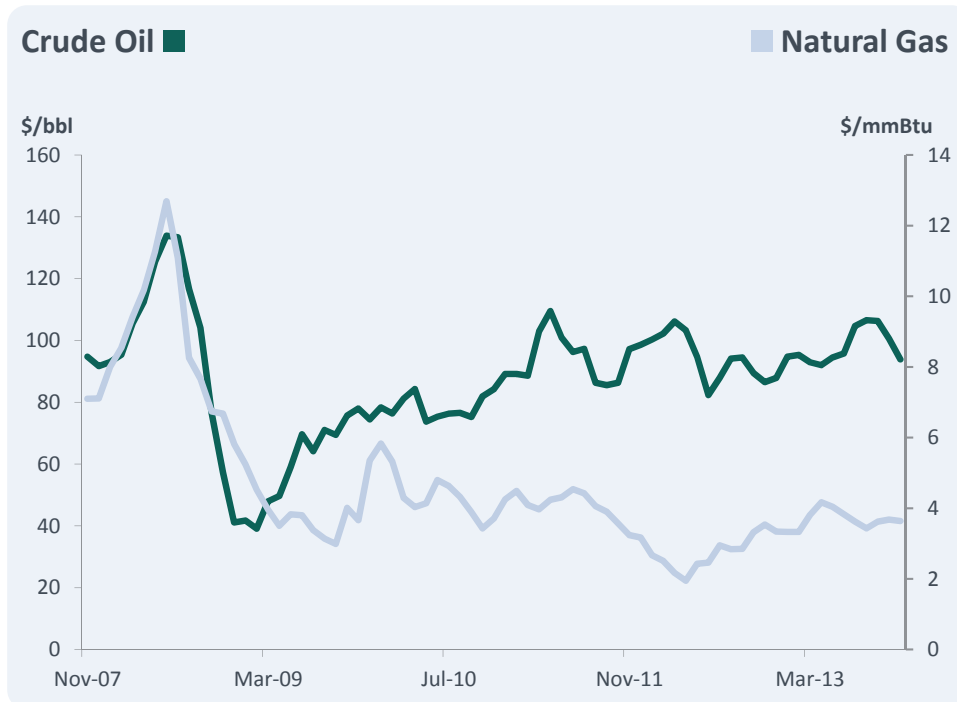
Could add **£100m** p.a. in sales by 2020

The Changes

- New era of low cost natural gas in US
- Natural gas liquids (NGL) feedstocks from shale gas provide favourable economics for petrochemicals
- Stimulated investments >\$100bn in US chemicals to 2030

Key Opportunities

- New ammonia and methanol capacity
- Gas to liquids to monetise gas



Source: EIA

Source: EIA



Global Demand for Fuels



Could add **£50m** p.a. in sales by 2020

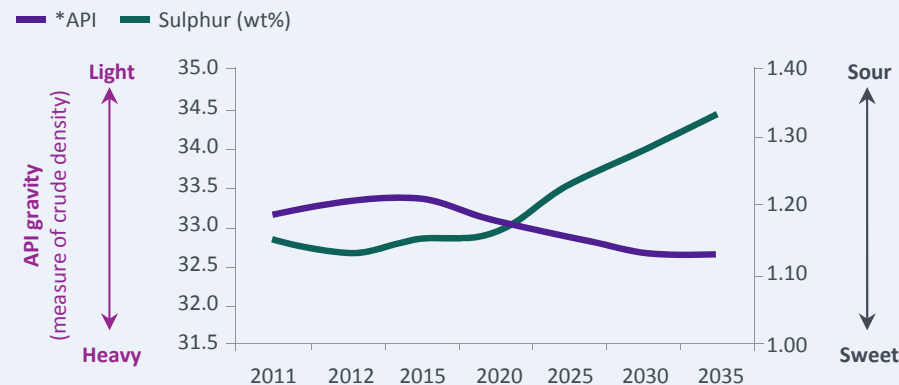
The Changes

- Product slate shift towards middle distillate (diesel)
- Trend towards heavier and sourer crudes
- FCC capacity growth in Asia (fuels) and Middle East (chemicals)
- Efforts to maximise production from depleted fields

Key Opportunities

- Strong growth in hydrogen demand
- Greater demand for refinery additives
- Tracers to maximise field productivity

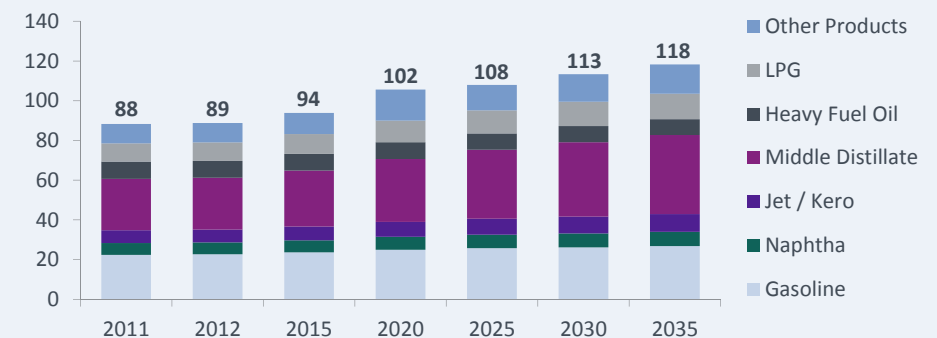
Average Global Crude Oil Quality



Source: Hart Energy

Global Demand by Product – Shift to Distillate

(million barrels per day)



Source: Hart Energy



Coal-based Chemicals



Could add **£100m** p.a. in sales by 2020

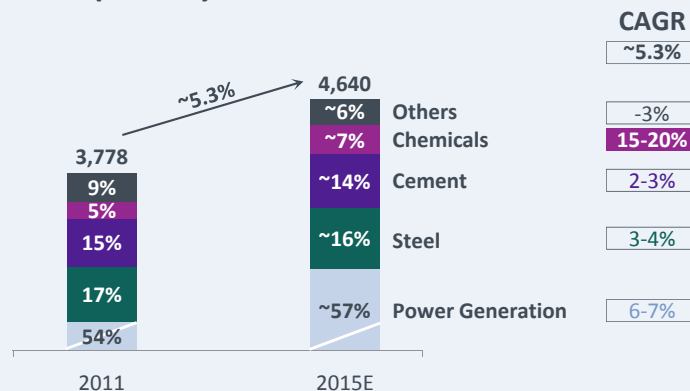
The Changes

- Energy demand growth drives uptake of coal resources in China
- China is now the major market for coal to chemicals
- Coal miners and energy companies investing in capacity
- Air quality requirements driving a move from coal to gas as an urban fuel in China

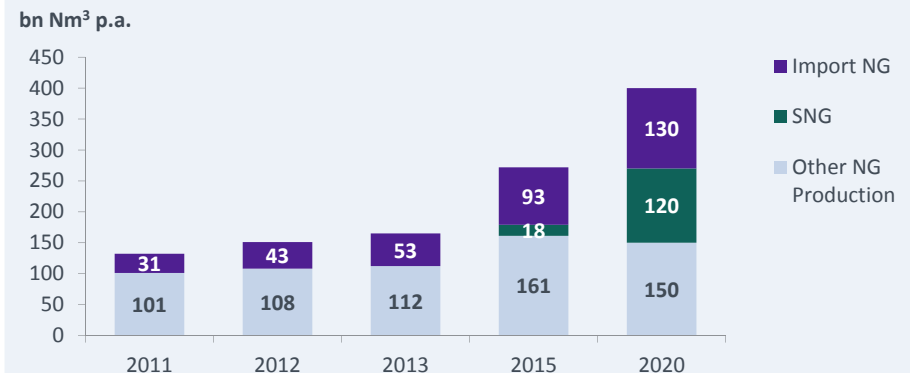
Key Opportunities

- Huge investment in new capacity in China requiring catalytic processes
- Coal to SNG (substitute natural gas)
- Coal to methanol to olefins
- New methanol derivative technologies e.g. MEG

China Coal Consumption by Sector
(million tonnes)



China Natural Gas Consumption / Demand



Source: CCB International 2012, CCTD, SXCoal, A.T. Kearney analysis

Source: China Petroleum and Chemical Industry Federation



Asset Performance and Integrity



Could add **£30m** p.a. in sales by 2020

The Changes

- Capex pressures mean
 - Greater value from more efficient processes and better catalyst technology
 - Use / reuse of older assets
- Financial and reputational risks of poor asset assurance

Key Opportunities

- High efficiency catalysts for high efficiency reactors
- Process changes, revamps and repurposing
- Smart technology for flow control, asset inspection and product assurance



Adding Value and De-risking for Customers

Why choose JM?

For a new plant

Choosing JM's technologies enables our customers to:

- Maximise the credibility of a new project when raising finance
- Reduce the capex required to build the plant
- Deliver maximum productivity, reliability and flexibility from the asset
- Minimise energy consumption and emissions

When the plant is running

JM's R&D, technical support, products and services allow our customers to:

- Optimise and further improve plant operation
- Reduce operating costs
- Maintain reliability and availability

Customers' assets cost £bns to build and £100ms to run



Choosing JM's products and services provides credible technology and de-risks investment

The JM Advantage

How we stay ahead



Use Technical Strength

- Produce superior products, reduce our production costs
- Additional services that are difficult for our competitors to replicate



Build Capacity and Capability

- Local to growth markets



Protect Value

- Strong know how and IP
- In-house capabilities
- Continuous improvement faster than our competitors



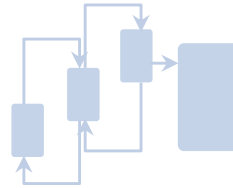
Integrate Technical and Commercial Skills

- Enable development of existing and new market areas

Key Takeaways...



Strong and defensible
position in all
our markets



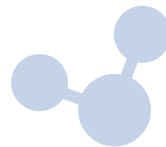
Able to leverage both
catalyst and process
technology



Technology and
know how investment




Global drivers support
increasing demand for
PT's offerings



Stable margins



Double digit growth
on average for the
foreseeable future



Adding Value Through Technology

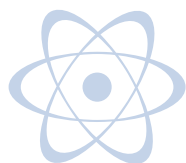
Iain Martin

Technology Director, Process Technologies



Johnson Matthey

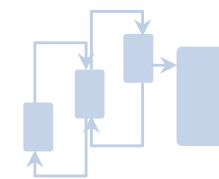
Introduction



- Strong technology underpins **leading market positions**



- High level of **targeted** R&D investment to support future growth
 - ~5% of sales p.a.



- Ability to **integrate** catalyst and process development
 - Greater value to JM
 - Creates opportunities to develop new markets
 - Increased resilience to competitive threat



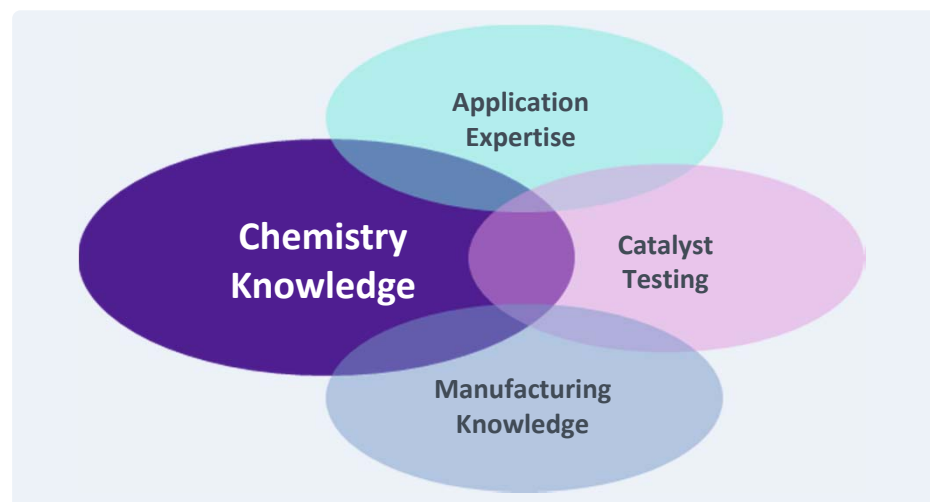
Unique Position in Market

- Technology **licensing** and **catalyst** know how spanning many decades
- Recognised **technology leader** with broad portfolio
- **Adding value** through deep understanding of customer operations
- Strong track record of introducing **new technologies**
- **Independent** from chemical majors



Serious Science Applied to Catalyst Design

- **Expert** scientists and engineers
- **World class** catalyst research and development facilities in UK and USA
- **Broad catalysis platforms:** base metals, pgms, zeolites, absorbents
- **Core skills** in catalysis underpin technology leadership:
 - Catalyst design and preparation
 - Characterisation and analysis
 - Testing under industrial conditions
 - Reaction engineering
- Strong catalyst **application knowledge**



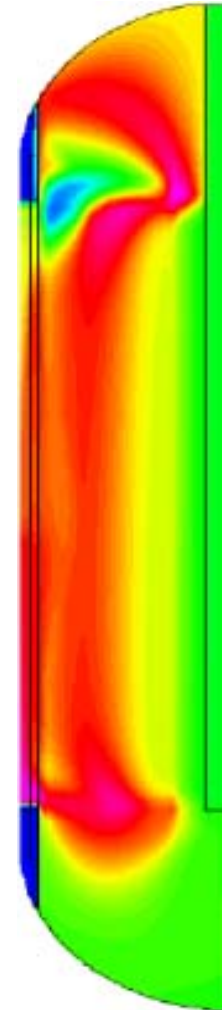
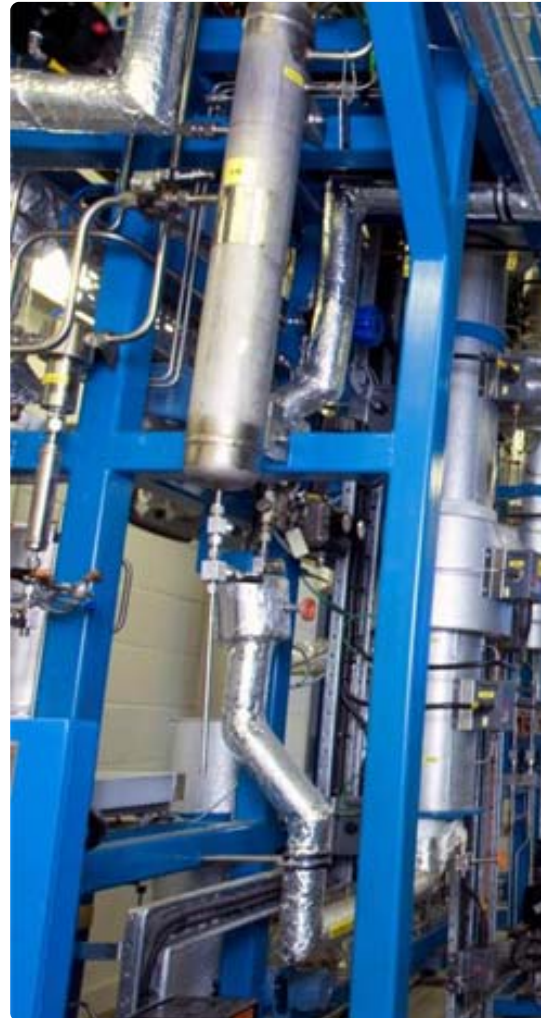
Translating Catalyst Design into Manufacturing

- Close linkage between laboratory, pilot and commercial facilities
- Wide range of **state of the art** scale up equipment available
- Research focus on improved production processes
- Comprehensive global manufacturing and supply chains
- Global network provides **'in field'** **technical support**



Creating Processes Around the Catalyst

- Existing processes are made **more competitive** and new processes are developed
- Strong synergy with in-house catalyst capabilities
- Design, build and operate **'mini plants'** to commercialise technology
- Proven ability to **scale up** directly to commercial scale



Effective Technology Transfer To Realise The Value

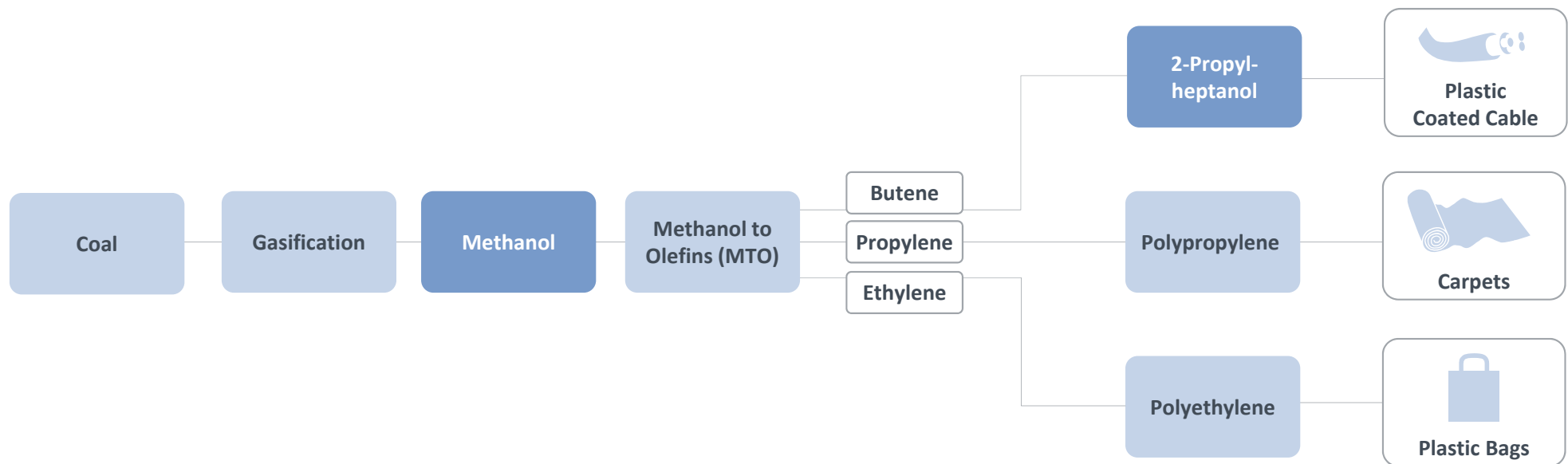
- **Manage** the risks associated with first demonstration of catalyst or process technology
- Successfully operate **strategic alliances** with major operating companies to accelerate commercialisation
- Transfer **technical know how** through basic engineering packages
- Support licensees during long term plant operation to best effect



R&D in Action

Creating new markets

2-Propylheptanol (2PH) – a growing intermediate for improved plasticiser performance



Adding Value Through Technology

- Innovation enables us to **increase sales margin** for our customers compared to our competitors
- Catalyst cost is generally **relatively small** contribution to total cost
- Seek to **share value**
 - Improved catalyst price
 - Licence fees
 - Technology transfer fees
 - Services

Simplified Customer Production Cost Model for Terephthalic Acid

Raw Materials	\$/tonne
Paraxylene	725
Acetic Acid	15
Catalyst	5
Utilities	15
Fixed Costs	25
Total Cash Cost	785
Depreciation and ROCE	115
Cost of Production	900
Sales Price	1,000
Margin	100 \$/tonne

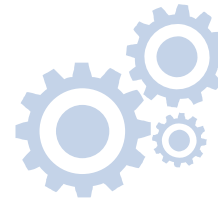
Adding Value Through Technology – Key Takeaways...



Talented and enthusiastic staff continue to be at core of our success



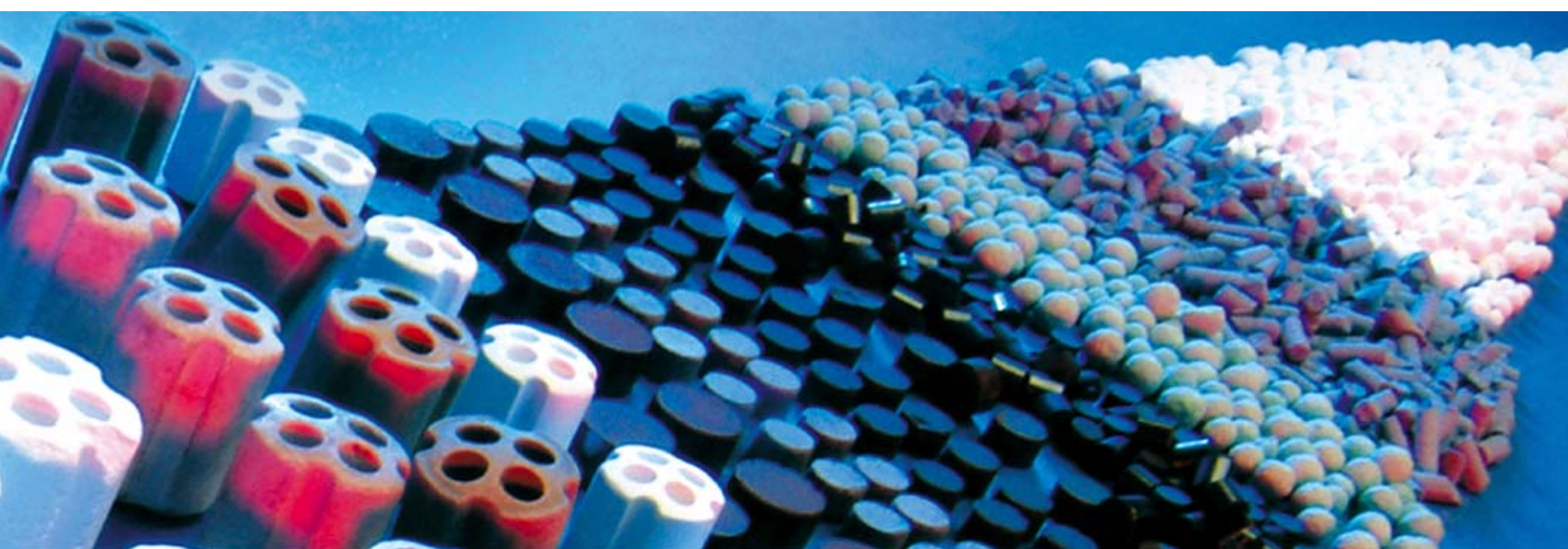
Investing for **growth** in facilities in Europe, USA and Asia



Unique technology capability provides **confidence in ability** to maintain strong positions in existing markets and to establish new business areas with strong growth prospects



Focus on **protection** of knowledge to sustain the growth



PT and the Chemicals Market

Iain Martin

Technology Director, Process Technologies



Johnson Matthey

Chemicals Drivers

Global Drivers



Chemicals Drivers

Petrochemical Demand Growth

Growth in primary petrochemical and derivative demand, regional and product slate shifts



Shale Gas

New projects and growth based upon US shale gas, shift from oil to syngas based chemistry



Coal-based Chemicals

Chinese growth for chemical and energy security

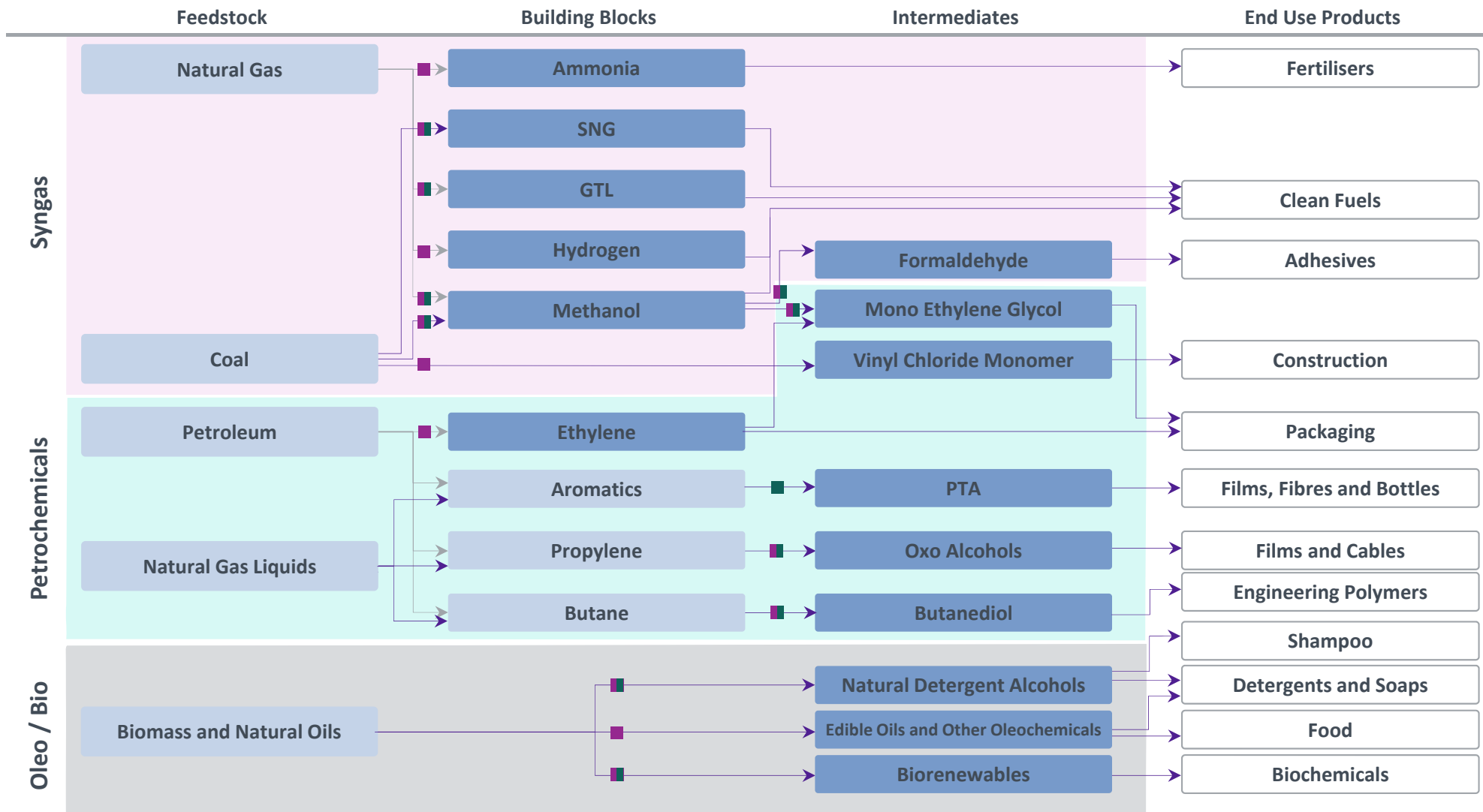


Renewable Feedstocks

Consumer demand for renewable chemicals, advantaged feedstock position over oil, legislation for renewable fuels



PT's Chemicals Markets



Methanol

JM Offer

- World leading technology licensing and full range of catalysts

Market Drivers

- Coal to chemicals in China
- Shale gas based opportunities in the US

Methanol Market

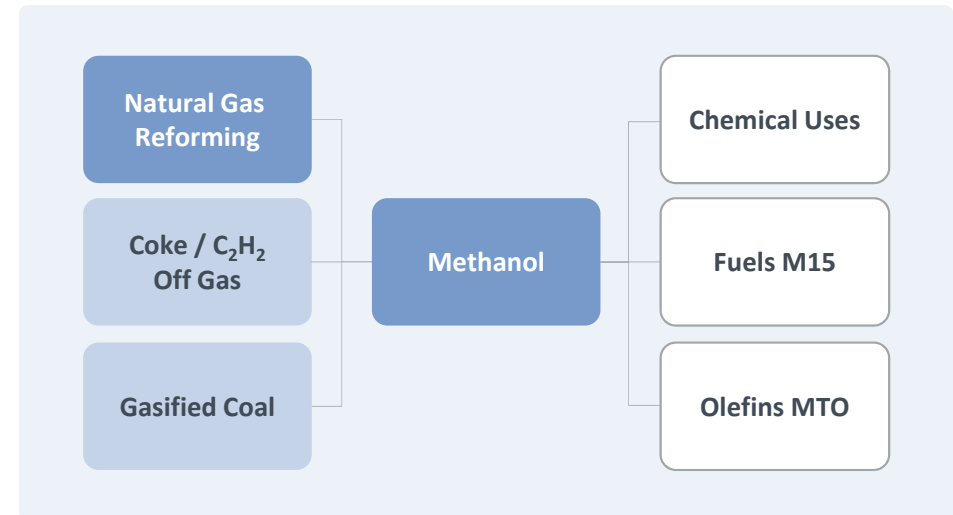
- **Methanol product market:** 65mtpa demand
- **Market demand growth:** 6-7% p.a.
- **Growth in capacity next five years:** 5% p.a.

Methanol Catalyst Market

- **JM share of sector (installed value):** #1 catalysts
- **Catalyst installed market value:** £425-475m
- **Replacement catalyst market:** £80-120m p.a.
- **Catalyst lifetime:** 4-5 years

Competitors (Licensing / Catalysts)

- Lurgi / Clariant
- Haldor Topsøe



Formaldehyde

JM Offer

- Licensing, engineering and procurement of formaldehyde plants and oxide catalysts for formaldehyde manufacture

Market Drivers

- Market generally grows in line with GDP
- China forecast to experience fast growth rates (around 7% p.a.) and significant volume increases in demand during 2011 to 2016
- Potential for accelerated growth if wood sector can be targeted
- Increasing use of formaldehyde in new chemical intermediates

Formaldehyde Market

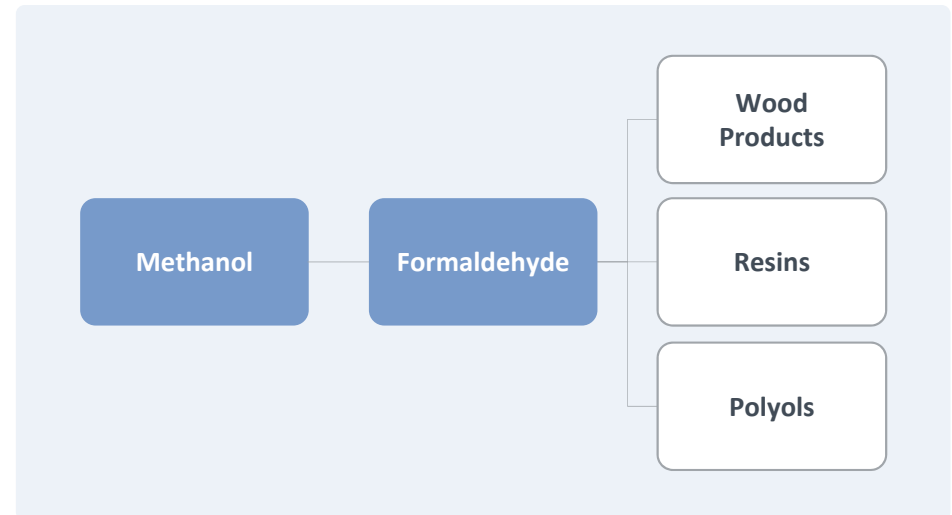
- **Formaldehyde market:** 43mtpa, ~£6bn p.a.
- **Market growth:** 5% p.a.

Oxide Catalyst Market

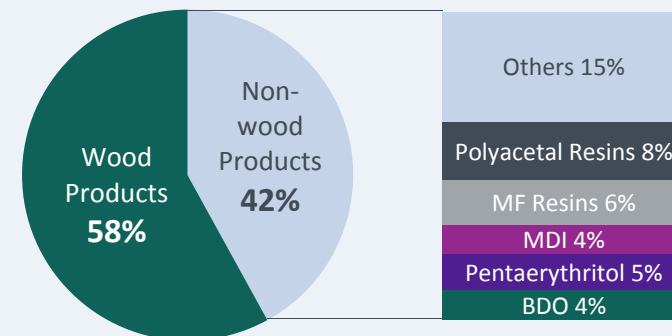
- **JM share of sector:** #1 in oxide catalyst market (~1/3 total)
- **Replacement catalyst market for oxide:** £43m p.a.

Competitors

- DB Western (process licensing only)
- Alder (catalyst and process licensing)
- Clariant (catalyst only)



World Consumption of Formaldehyde



Gas to Liquids

JM Offer

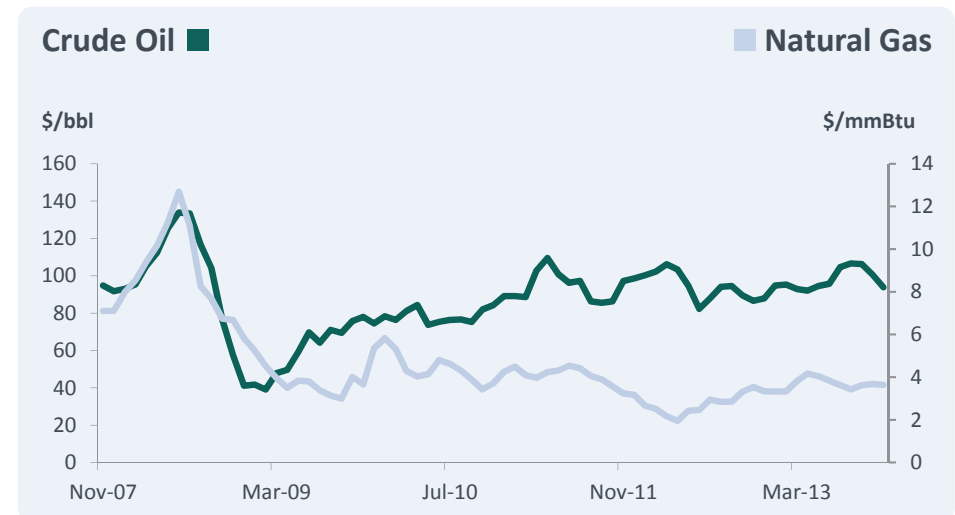
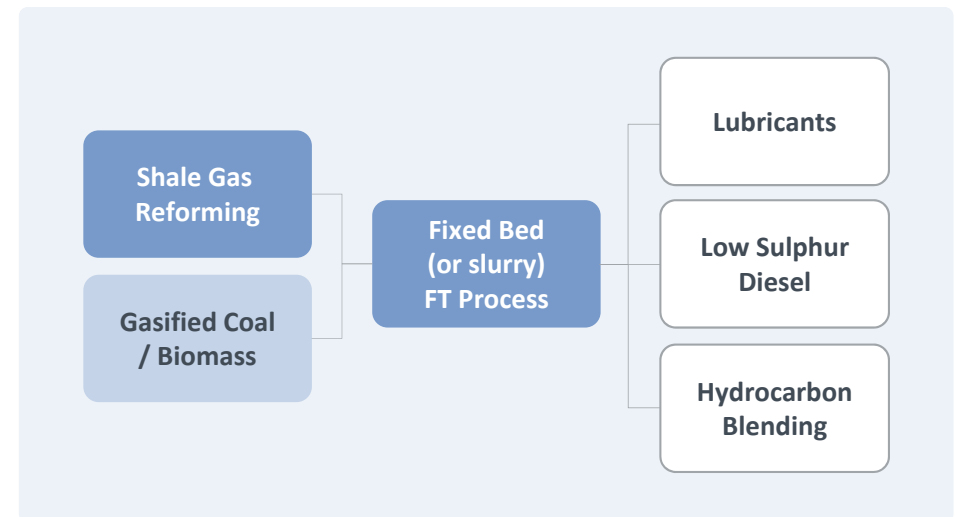
- Licensing:** fixed bed Fischer Tropsch process and reactor licensing with BP
- Catalysts:** syngas and Fischer Tropsch catalysts

Market Drivers

- Spread of oil vs NG price and access to large amounts of low cost natural gas (Qatar, Australia, Russia)
- Shale gas in North America major driver
- Competitive dynamics vs other shale gas uses

GTL Product Market

- **GTL market:** 200,000bbl per day, ~\$9bn p.a.
- Oryx and Shell Pearl, Qatar
- **Growth:** Expect capacity to double to 400,000bbl per day by 2020



Source: EIA

Low Pressure Oxo Alcohols

JM Offer

- Licensed process with catalysts
- Developed, co-marketed and licensed with **Dow Chemical Company** for >40 years
- 52 licences sold

Market Drivers

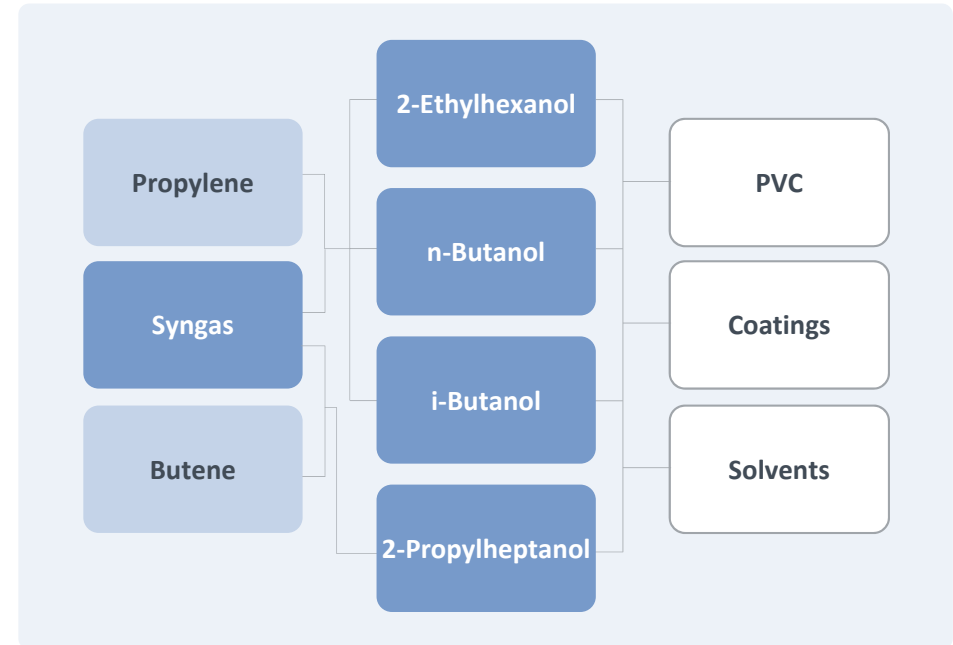
- Market drive towards high molecular weight plasticiser alcohols: **development of a 2PH** variant to convert C4 streams from MTO projects

Market

- **JM / Dow share of sector: #1**
- **Licensing market:** Typically one plant per year
- **Hydrogenation catalyst replacement market:** >£10m p.a.
- **Typical plant size:** 200-300ktpa

Competitors

- MCC
- Oxea
- Eastman



Mono Ethylene Glycol (MEG)

JM Offer

- Novel process developed in partnership with **Eastman Chemical Company** and now available for licensing

Market Drivers

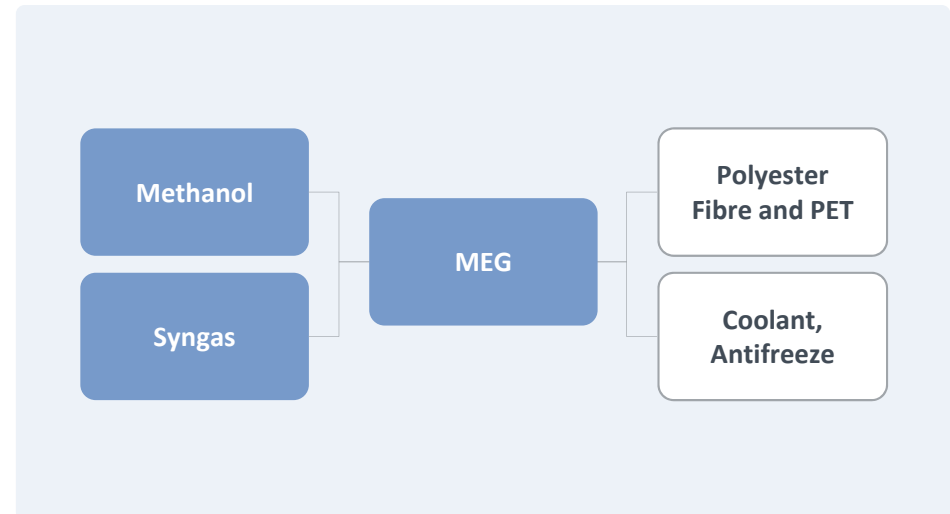
- China production deficit, imports ~7 million tonnes p.a.
- High cost of traditional oil based and MTO routes via ethylene oxide
- JM Davy / Eastman route offers lower cost process
- Opportunity to meet market needs based on coal or natural gas derived syngas and methanol

MEG Market

- **Total market:** ~£22bn p.a., 24.5mtpa
- **Growth:** 5-6% p.a. (8-9% p.a. China)
- **New capacity 2013-15:** ~4mtpa
- **Typical plant capacity:** 200-500ktpa
- **JM share of sector:** New
- **Licensing market size:** +12 million tonnes by 2020

Competitors

- Sabic, Shell and Dow for ethylene to MEG route via ethylene oxide
- China technology providers for syngas to MEG route via dimethyl oxalate (DMO)
- Ube for syngas route to MEG via DMO



Opportunities in Biorenewables

JM Offer

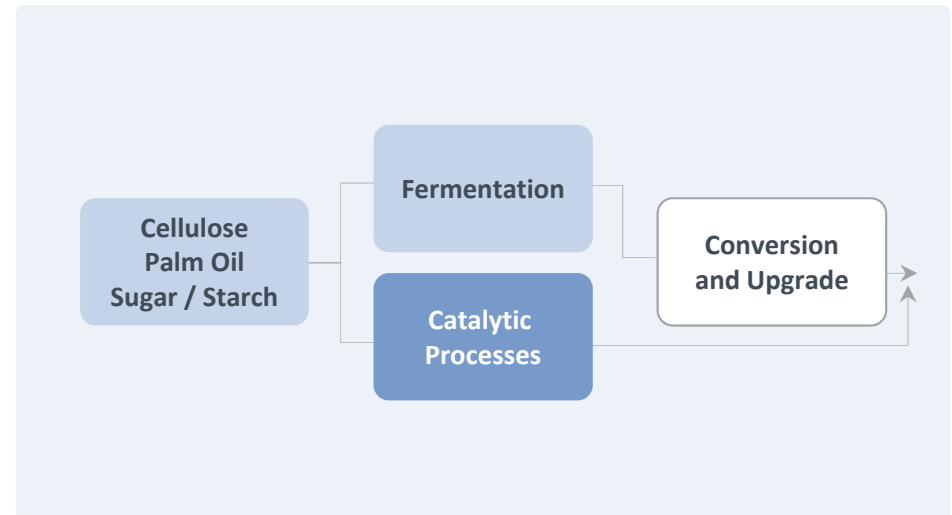
- Catalysts and licensed processes for the emerging biofuels and biochemicals markets

Market Drivers

- **Biofuels:** climate change regulations and energy security
- **Biochemicals:** consumer demand for green, sustainable materials, and advantaged economics from low cost sugar

JM Position:

- >1mtpa of products already manufactured using JM processes
- Involved in collaborations with a number of key bio process technology developers
 - Catalyst
 - Process technology scale up and commercialisation



A man in a white lab coat, hard hat, and safety glasses is working on industrial machinery. The machinery consists of several vertical white tubes with black and silver components, likely part of a chemical processing or pharmaceutical manufacturing system. The background is slightly blurred, showing more of the industrial environment.

Process Technologies in China

Henry Liu
Country Director, China

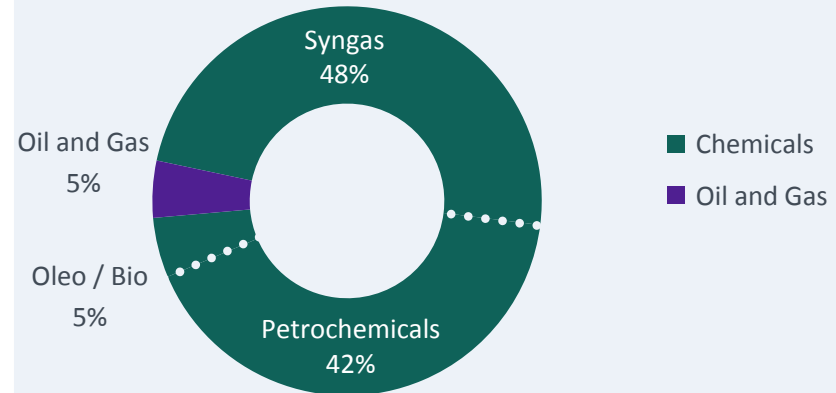


Johnson Matthey

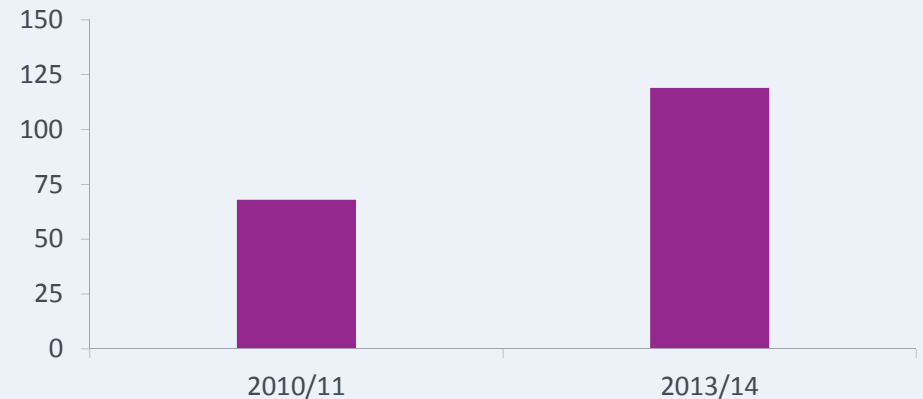
PT in China – Overview

- First office in China in 2001
- **~120 employees** and growing
- All areas of PT now operating in China
- Forecasted **double digit** CAGR over next ten years
- Offices in Beijing and Shanghai
- JV in Qingdao for catalyst manufacturing
- **58 licences** granted in China
 - **22** for coal to chemicals with **leading** share of sector

PT Sales to China (2012/13 £119m)



Employees Doubled in Three Years



Chinese Market Drivers

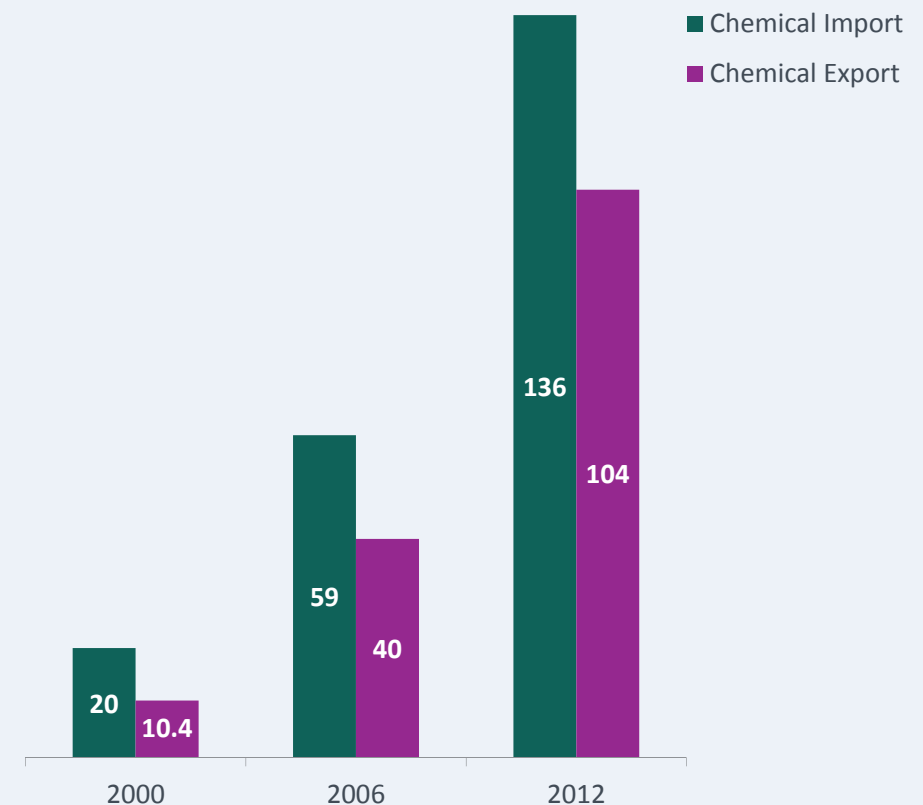
Key Drivers

- Economic growth
 - GDP ~7% over next few years
 - Chemical demand growth normally 2x GDP
- Energy security
 - China imports >50% of its oil demand
 - Government looking to reduce import deficit
- Environment protection
 - Air pollution recognised as a major issue in cities
- Feedstock availability
 - Rich coal resources

Policy and Regulation

- Chinese government encouraging coal to chemicals
 - Supported in the 'China Chemical 12th Five Year Plan'
 - Proven competitive chemical route
- Chinese government plan to reduce direct use of coal for power generation

China Chemical Trade Balance (£bn)

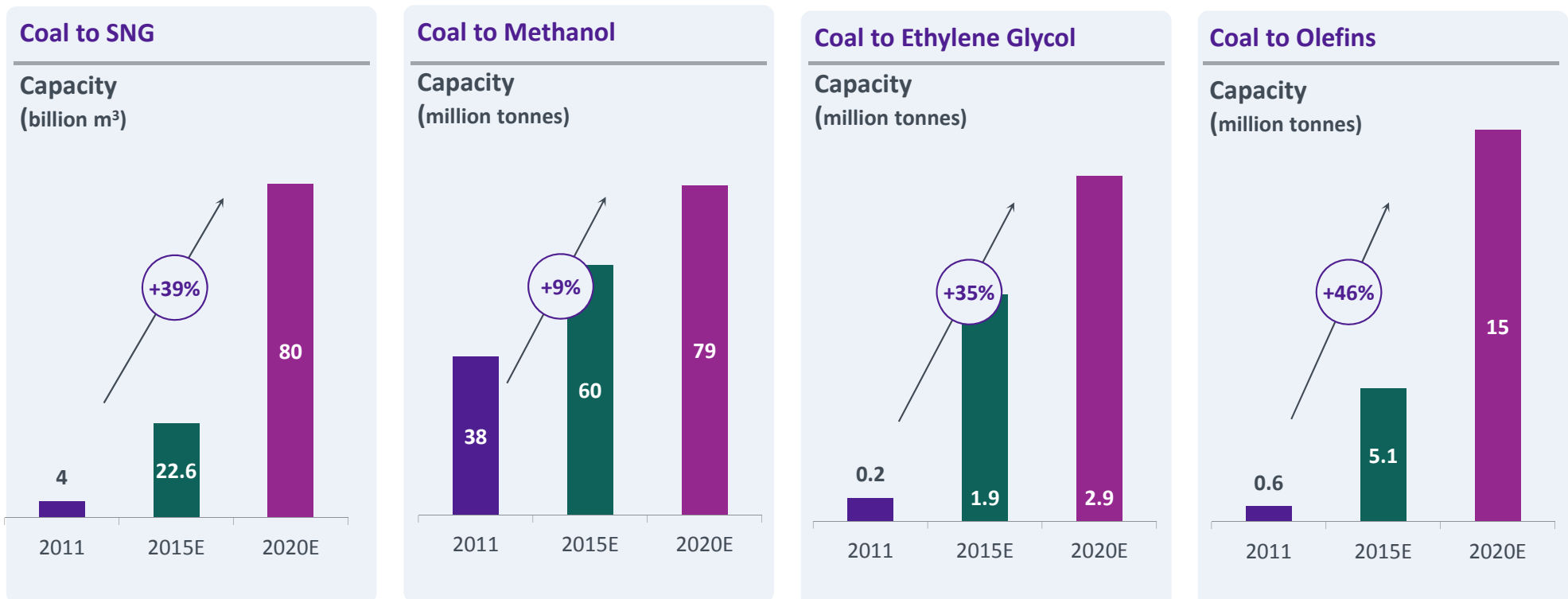


Source: China Petroleum and Chemical Industry Federation

Coal to Chemicals

Coal is an appealing and available chemical feedstock

- China has 13% of the global coal reserves

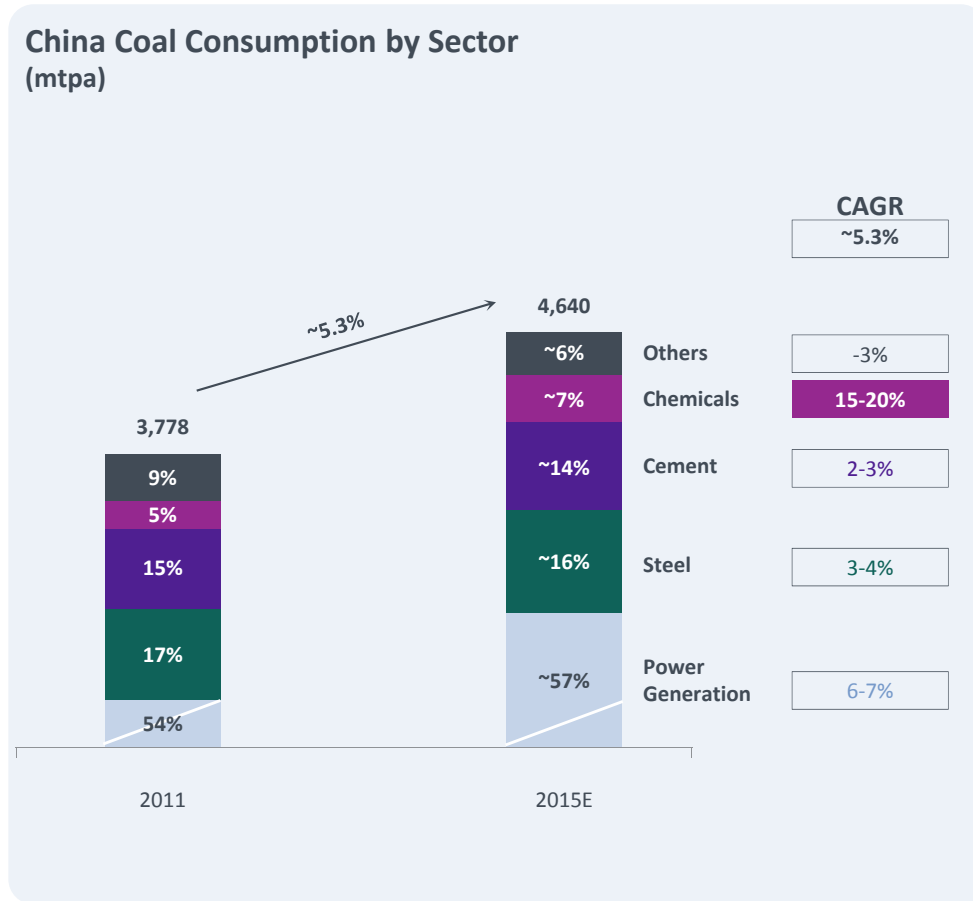


Source: China Petroleum and Chemical Association and JM estimates

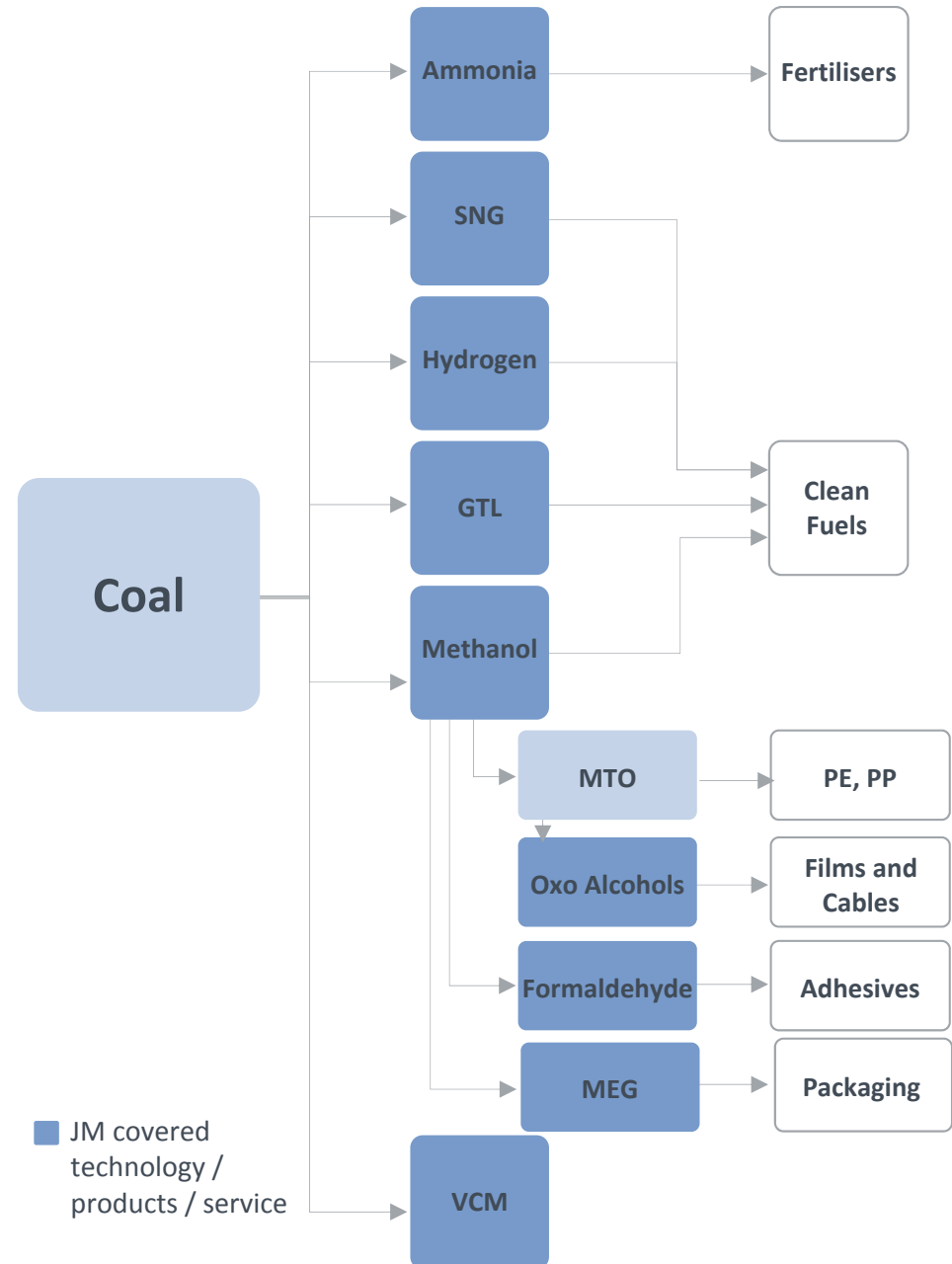
As a result of multiple investments and operational improvement, technological maturity of emerging coal to chemicals is advancing fast

Coal to Chemicals Flowsheet

Coal to chemicals is growing 15-20% CAGR



Source: CCB International 2012, CCTD, SXCoal, A.T. Kearney analysis



Substitute Natural Gas

Market Drivers

- Energy security and urban air quality
- Coal to gas play driven by China: Gas demand will be met by mix of domestic, imported, shale, LNG and SNG



SNG Market Growth

- **SNG market (2020):** ~80bn Nm³ p.a.
- **Market:** ~£20bn in 2020 at £7/mmbtu
- 1 plant operating
- 9 projects with full approval (~23bn Nm³ p.a.)
- 13 projects with preliminary approval (~54bn Nm³ p.a.)



Substitute Natural Gas

JM Offer

- Licensed technology, engineering services and catalyst supply
 - 7 plants licensed by JM Davy – first plant started up summer 2012
 - Total licence fees and catalysts ~£50m in next two years



Market Size

- **JM share of sector:** #1 in SNG sector
- **New plants (licences and first catalyst fill):** £300m-£400m between now and 2020
- **Replacement catalyst market:** ~£50m-£100m p.a. when plants are running
 - Highly dependent on how the plants will be run
- Very large catalyst volumes required

JM Projects	Bn Nm ³ p.a.
Datang (started up)	1.33
Datang Fuxin 1	1.33
Xinwen yili	2
Datang Keshiketeng 2	1.33
Datang Fuxin 2	1.33
Datang Keshiketeng 3	1.33
Suxin	1.33

Competitors

- Haldor Topsøe
- Lurgi
- Local

The JM Advantage in China

Focused on defensible and profitable long term growth in China



Customers

- Established **strong relationships** with coal to chemicals customers in China
- **Leading** positions in key technologies
- Customers in China **want the best** technology



Technologies and Products

- JM Davy is a **strong brand** in the industry
- Proven process technologies
- Leading catalysts and process technologies designed to meet Chinese market needs



Resources and Capabilities

- Continuously adding **best in class** people in our offices in China
- Building **technical capabilities**
- Planning ahead for manufacturing capacity requirements

PT and the Chemicals Market – Key Takeaways...



Strong position in our target markets



Expanding portfolio through **R&D investment** and through leveraging **catalyst and process technology** expertise



Very good visibility on **capex to support growth**



Attractive opportunities in new feedstocks (shale, coal to chemicals)



PT and the Oil and Gas Market

Don Roche
Director, Oil and Gas



Johnson Matthey

PT in Oil and Gas

Three main sectors

Refineries
Gas Processing
Diagnostic Services

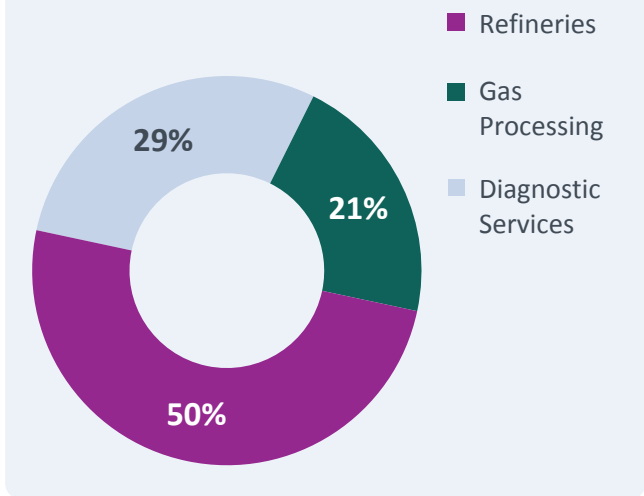
Opportunities for growth

Oil	Gas	
1-2%	2-3%	

Key strengths

- Advanced materials expertise
- Ability to integrate catalyst, process and provide services
- Matching catalyst to changing plant conditions
- Unique measurement and chemistry capability

Oil and Gas Sales



Refineries		Diagnostic Services	
Refinery Additives	Hydrogen	Subsea Instrumentation	
5-7%	6%	10+%	

PT's Oil and Gas Markets

JM has strong positions in targeted high value markets

Refineries Hydrogen Leading position in reforming, shift and purification catalysts for hydrogen manufacture

Refineries Additives Unique product offering in FCC additives and dosing systems for improving efficiency and environmental performance of FCC units

Gas Processing Strong position in market for removal of sulphur and mercury from gas streams to very low levels

Diagnostic Services High value, specialist offerings across the whole oil and gas value chain



Opportunities to apply PT's skills in current and additional areas of oil and gas market:

- By innovation and leveraging core competences in advanced materials
- By partnering and acquisition

Refineries – Hydrogen Catalysts

JM Offer

- Hydrogen catalysts to industrial gas producers, refiners and chemical plants

Market Drivers

- Hydrogen demand driven by increased diesel production, sulphur treatment in fuels and hydrogen for chemicals

Hydrogen Catalyst Market

- JM share of sector: #1
- Market growth: 6% p.a.

Typical Plant

- First fill and replacement catalyst charge: £1-2m every 4-5 years

Competitors

- Clariant
- Haldor Topsøe

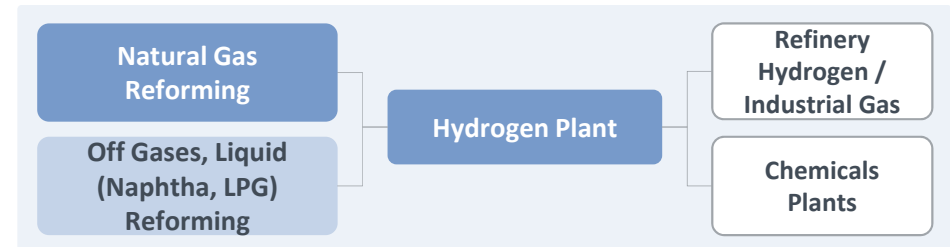


Image courtesy of Air Products and Chemicals Inc.

Keeping Ahead of Competitors

- Catalyst R&D and process improvements to reduce operating costs and capex for our customers
- Partnering with industrial gas suppliers to access outsource market

Refineries – FCC Additives

JM Offer

- Fluidised bed catalyst additives with loading equipment for FCC applications
- Provides environmental control and performance products

Market Drivers

- Gasoline demand in emerging markets
- Environmental regulations on SOx and NOx and the need for chemicals from FCC units

Refinery Additives Market

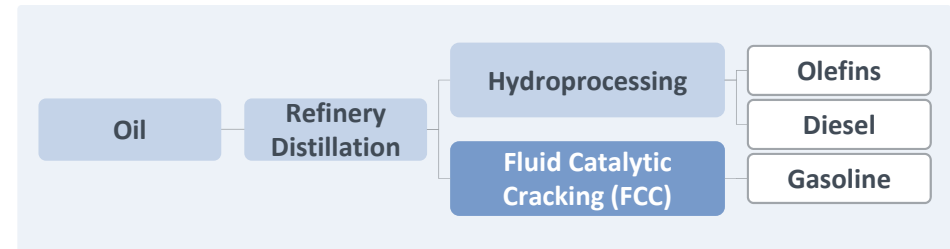
- **JM share of sector:**
 - Environmental additive market (#1)
 - Performance additive market (#3)
- **Market growth:** 5-7%

Typical Sale

- **Annual catalyst additive sale / plant:** ~£0.5m

Competitors

- Grace
- Albemarle
- BASF



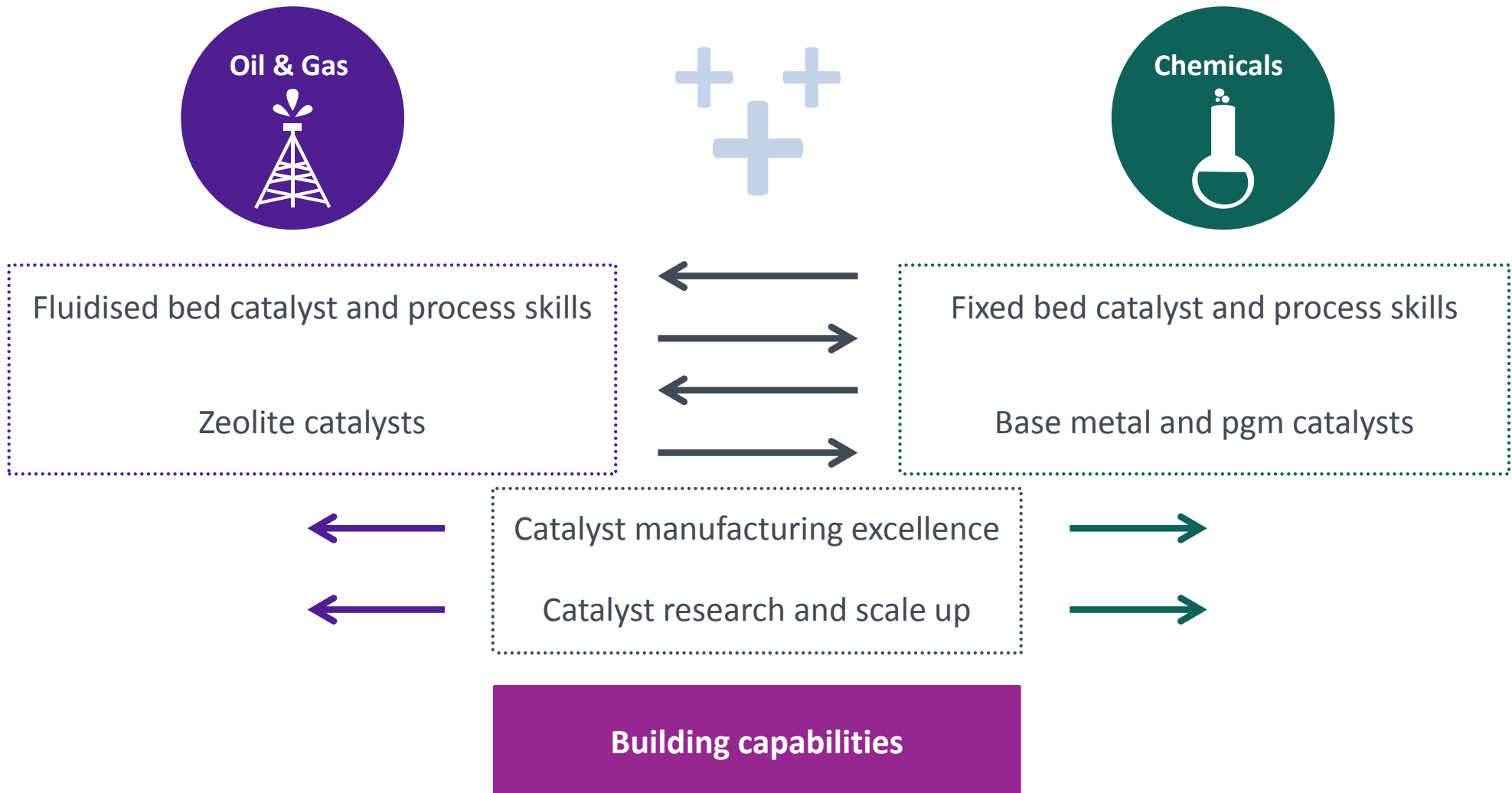
Keeping Ahead of Competitors

- Superior R&D with advanced materials combined with process technology improvements

Opportunities for Accelerated Growth

- Apply advanced materials expertise to develop higher value products
- Leverage technology strengths to access new markets across whole of PT

Building Capabilities Across PT



Accelerating Growth

Oil and Gas drivers



Petrochemical demand changes impact refining



Feedstock changes in refining and chemicals



Shale gas and oil



Emission, energy and product regulations

Technology / competences

Catalyst development and manufacturing



Advanced material science R&D



Process technology development and improvements



Measurement and analytical skills



**Organic growth,
targeted
acquisitions**

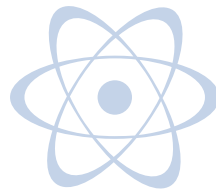
**Accelerated
growth**



PT and the Oil and Gas Market – Key Takeaways...



Leading positions
in target markets
across the
value chain



Strong technology
skills supported by
R&D investment



Building synergies
across PT to
strengthen our
capabilities



Attractive opportunities
for growth both
organically and by
acquisition



Summary

Geoff Otterman
Division Director, Process Technologies

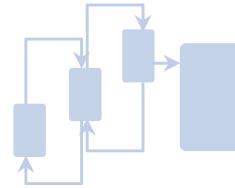


Johnson Matthey

Key Takeaways...



Strong position in all
our markets



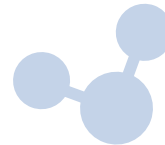
Able to leverage both
catalyst and process
technology



Technology and
know how investment



Global drivers support
increasing demand for
PT's offerings



Stable margins



Double digit growth
on average for the
foreseeable future



Closing Remarks

Neil Carson
Chief Executive



Johnson Matthey

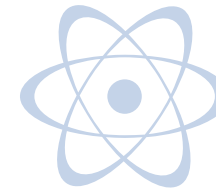
Summary



A world leading
technology company



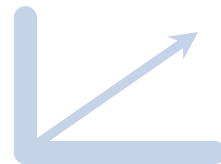
Success founded on
continued investment in
R&D and product
development



Differentiation
through technology



Proven strategy in
place to develop new
business areas



Well positioned in
growth markets



Delivers value



Johnson Matthey

JM Executive Board

Neil Carson
Chief Executive

Robert MacLeod
Group Finance Director

Larry Pentz
Executive Director

John Walker
Executive Director
Emission Control Technologies

Presentation Team

Geoff Otterman

Division Director
Process Technologies

Iain Martin

Technology Director
Process Technologies

Henry Liu

Country Director
China

Don Roche

Director
Oil and Gas

Other Senior Management

Paul Armitage

Managing Director
Syngas

Antoine Bordet

Managing Director
Johnson Matthey Davy Technologies

Dr Jane Butcher

General Manager
Chemical Catalysts

Dr Andrew Heavers

Business Development Director

Andy Hurst

Managing Director
Tracerco

Mohammed Khan

General Manager
Purification

Graeme McGregor

Managing Director
Refineries

Simon Slattery

Division Finance Director

Joe Stevenson

Business Development Director

Dr Sally Jones

Director
Investor Relations

Katharine Burrow

Investor Relations Analyst

Glossary

2PH	2-Propylheptanol	NG	Natural gas
API gravity	Measure of how heavy / light a petroleum liquid is compared to water	NGL	Natural gas liquids
bbbl	Oil barrel, a unit of volume	Nm ³	Normal cubic metre (volume of gas under standard conditions of 0°C and 1atm pressure)
C ₂ H ₄	Ethylene	NOx	Nitrogen oxides
CAGR	Compound annual growth rate	p.a.	Per annum
DMO	Dimethyl oxalate	PE	Polyethylene
FCC	Fluid catalytic cracking	PET	Polyethylene terephthalate
FT	Fischer Tropsch	Pgm	Platinum group metal
GTL	Gas to Liquids	PP	Polypropylene
IP	Intellectual property	PT	Process Technologies
JM	Johnson Matthey	PTA	Purified terephthalic acid
JV	Joint venture	PVC	Polyvinyl chloride
ktpa	Kilo tonnes per annum	R&D	Research and development
LNG	Liquefied natural gas	ROCE	Return on capital employed
LPG	Liquefied petroleum gas	ROIC	Return on invested capital
MEG	Mono ethylene glycol	SNG	Substitute natural gas
mmBtu	Million British Thermal Units	SOx	Oxides of sulphur
MTO	Methanol to olefins	Syngas	A mixture of hydrogen and carbon oxides
mtpa	Million tonnes per annum	VCM	Vinyl chloride monomer



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