

# Hydrocarbon Dynamics

*Advancing Crude Oil Mobility*



AGM Presentation

May 2023

# Disclaimer Page

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# Corporate Summary

## ASX listed - Energy focused

### Board & Management

Stephen Mitchell	Non-Executive Chairman
Bill Tarantino	CEO - Chemical Division
Nick Castellano	Executive Director
Ray Shorrocks	Non-Executive Director
Andrew Seaton	Non-Executive Director
Julie Edwards	Company Secretary & CFO

### Capital Structure

Cash:	\$1,035,000 (31 March 2023)
Rights Issue Cash:	\$750,000
Share Price:	\$0.01
Issued Capital:	649.7m Shares (including Rights Issue New Shares) 62.6m Options exercisable @ 2 cents expiring 12 May 2025
Market Capital:	\$6.5 million

### Shareholder Summary

S Mitchell	14.7%
S McGregor Super Fund	8%
Lowell Resources Fund	4.5%
Chag Pty Ltd	3.1%
HSBC	2.6%
Yavern Creek Holdings Pty Ltd	2.3%
Top 20 Holders	50%

### Recent Highlights

- Santos repeat business and Canadian trial converted to repeat business
- North Sea purchase order with large national European company
- Gulf of Mexico trial on two oil platforms
- First United Arab Emirates order for tank cleaning
- Numerous field and lab trials underway including with a US super major
- More distributors and agents added to the network

# Value Creation Strategy

Our Value Creation Strategy underpins everything we do

- 1 Execute on Strategic Priorities to Market HCD Products and Technology to the Oil Industry
- 2 Evaluate Additional Energy Technologies for Investment
- 3 Evaluate Upstream Projects

# PhaseShift™ Technology Platform

Driving value for crude oil production, transmission and storage

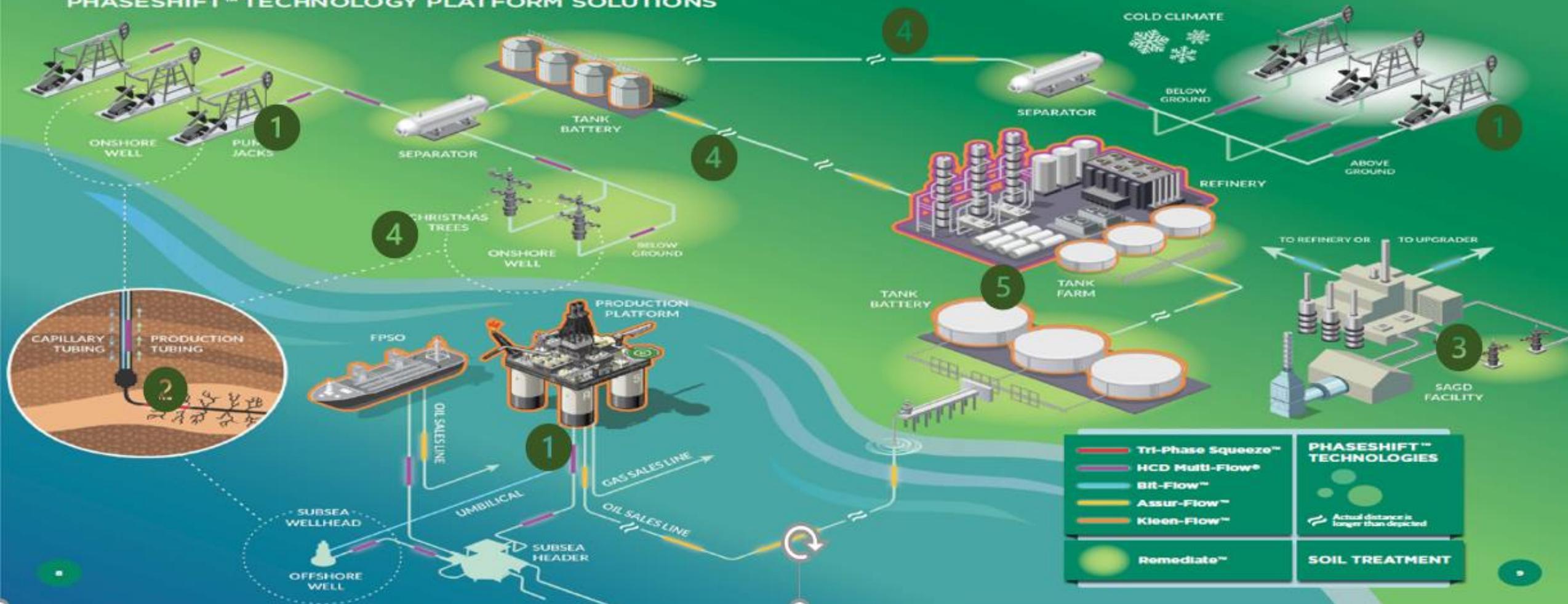
## Key Products & Applications:

- **HCD Multi-Flow®** – Improves oil production onshore and offshore by reducing viscosity and mitigating paraffin and asphaltene depositions in production equipment
- **Assur-Flow™** – Provides flow assurance for onshore and offshore pipelines by liquefying paraffin and asphaltene depositions. Reduces reliance on traditional solutions of heat, solvents and mechanical pigging
- **Kleen-Flow™** – Liquefies oil sludge in transport and storage facilities, transforms the way cleaning operations are undertaken and recovers saleable hydrocarbons from the sludge
- **Bit-Flow™** – Heavy crude oil viscosity reduction allowing substantial savings on costs of diluents and chemical treatments
- **Remediate™** – Reclamation of oil contaminated soils



# HCD Delivers Value Solutions Across the Oil & Gas Value Chain

## PHASESHIFT™ TECHNOLOGY PLATFORM SOLUTIONS



1. Wellhead – HCD Multi-Flow 2. Wellbore – Tri-Phase Squeeze 3. Oil Sands/SAGD – Bit-Flow 4. Pipelines – Assur-Flow 5. Tanks/Vessels – Kleen-Flow

# Delivering Value Across Oil & Gas Market Segments



## Production

Primary focus

Remediation & Inhibition

Continuous Operations

North America & Global

Viscous Oil



## Transmission

Major Focus Flow Assurance

currently targeting Gulf of

Mexico, North Sea,

Canadian Oil Sands & India

Viscous Oil



## Storage

Secondary Focus

Large individual prospects

Global

# Summary of Distributors and Agents

Distributor  
& agent  
progress  
aligned  
with our  
strategy

Signed agent agreement with OOSITA, the business arm of the 'Fort Chipewyan Métis Nation' in April 2023 for Canada.

Negotiating an agreement with a key distributor in the Gulf of Mexico. Negotiating agreement with an Agent in the North Sea.

10 distributors in North America (3 in Canada)  
6 International distributors and agents: India; ME; APAC; Egypt; Africa

# Strategic Imperatives

Right Regions → Right Prospects → Right Sales Network → Right Support Structure

1

Align with the 'Right' distributors and agents and properly motivate them

2

Increase emphasis on direct sales efforts

3

Focus on landing trials and leveraging wins

4

The 'Right' testing for our chemistry, and the necessary chemical registrations & approvals

# The Technology is Working – Field Success Examples

PROJECT	PURPOSE	DOSAGE RATE IN FIELD	RESULTS/STATUS
<b>Alberta Canada</b>	Paraffin remediation and inhibition	250 ppm HCD Multi-Flow	Successful trial for \$5bn producer in the Cardium formation results lead to award of chemical treatment business in 2023.
<b>Santos</b>	Paraffin remediation and inhibition	250 ppm HCD Multi-Flow	Awarded treatment business in 2022 after successful trial. PO received for 2023 season.
<b>Gulf of Mexico</b>	Paraffin remediation and inhibition; reduce the need for paraffin cutting	250 ppm HCD Multi-Flow injected downhole on gas lift wells	Mid-size G of M producer. Success to date remediating wax deposition; the customer is reducing the cutting frequency; stated that chemical has freed up a lot of production time
<b>Oil India (India)</b>	Increase Well Production Rates (Tri-Phase Squeeze)	10 drums MF/1 drums SR/10lbs MicroPhase per Well	64% Increase in oil production before Pump Failed for 11-week shutdown (retrial requested)
<b>Petronas Platform</b>	Restore production to 9,000 bopd	250 ppm HCD Multi-Flow	Pdn resumed for 5 years after 2 yr shut-in with PP reduction and emulsions broken
<b>Petralis (Texas)</b>	Increase Production in 3 wells	5 drums of MF/1 drums SR 7lbs MicroPhase per Well	5-month avg oil production increase 186% /Gas increase of 316%
<b>China CNPC</b>	Diluent Reduction in 1 well	38,000 bopd field @ 2,000ppm	Diluent may be reduced by 40%, viscosity by 65%, production increased 22%.
<b>California 1 &amp; 2</b>		1,000 bopd field @ 2,000ppm	Diluent requirement reduced by 40% and organic deposition successfully removed from water pipe
<b>Canada - CNRL</b>	Improve Production of waxy oil	<200ppm continuous feed	4 wells treated. Production increase @ 150% over 6 months
<b>Utah 1 &amp; 2 (Newfield)</b>	Pour Point Reduction	23,000 bopd @ 1,000ppm	Pour Point reduced by 14°C (25F). Company taken over

# Executing on our strategy: 'Ongoing Business'



## Cooper Basin Australia

- Purchase order received for 2023 winter season starting in May.
- Opportunity to expand into additional newly drilled wells, should they experience paraffin related issues.
- **Strategy:** exploit success to expand to other producers operating in the basin as well as with this producer.



Before HCD Multi-Flow

After HCD Multi-Flow

## Western Canada

- Successful Cardium formation trial converted to ongoing business for HCD's distributor in Grande Prairie, Alberta.
- Treatment expanded to 15 wells in May. Potential for 100 wells in this field.
- Signed agreement with OOSITA, Fort Chipewyan Métis Nation business arm in April 2023 to be an Agent for HCD in Canada.
- **Strategy:** exploit success to expand to distributor's other customers and prospects and into **Heavy Oil** and the same with 2<sup>nd</sup> Canadian distributor.

# Executing on our strategy: 'Current Trial Applications'



## Two offshore platforms in the Gulf of Mexico

- 1<sup>st</sup> platform – 3-month trial to eliminate the need for quarterly wax cutting.
- 2<sup>nd</sup> platform – trial to reduce need for daily wax cutting has been very successful.
- Pipeline spur opportunity – a result of positive trials.
- **Strategy:** *work directly and with a new distributor to target other opportunities in the Gulf resulting from successful trials here.*



## North Dakota Bakken Formation

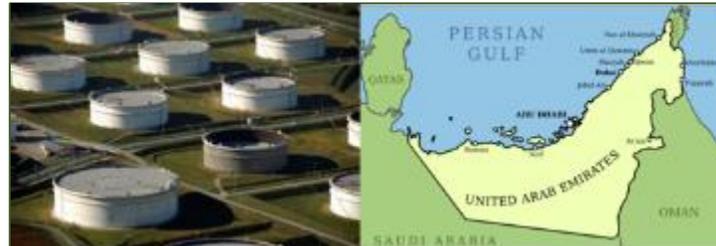
- Very waxy well where incumbent chemistry has limited effect.
- Additional opportunity wells in this field ~100.
- **Strategy:** *success expected to result in expansion with this distributor throughout the region.*

# Executing on our strategy: 'Pending Trials'



## North Sea Platform

- Waxy crude, severe impacts on production and operations
- Chemical paid for and delivered
- Work on Cefas trial approval
- **Strategy:** use success to expand business with this producer. Use an Agent and Distributor to access similar opportunities in the N. Sea



## UAE Tank Cleaning

- Large NOC operating in the UAE
- Chemical paid for and delivered
- Organizational changes causing delays
- **Strategy:** distributor to utilize success to grow in the ME. Same with 2<sup>nd</sup> distributor



## India Tri-Phase Squeeze

- Production enhancement opportunities
- Two Purchase Orders received
- **Strategy:** use success to springboard prospects with many independents in India

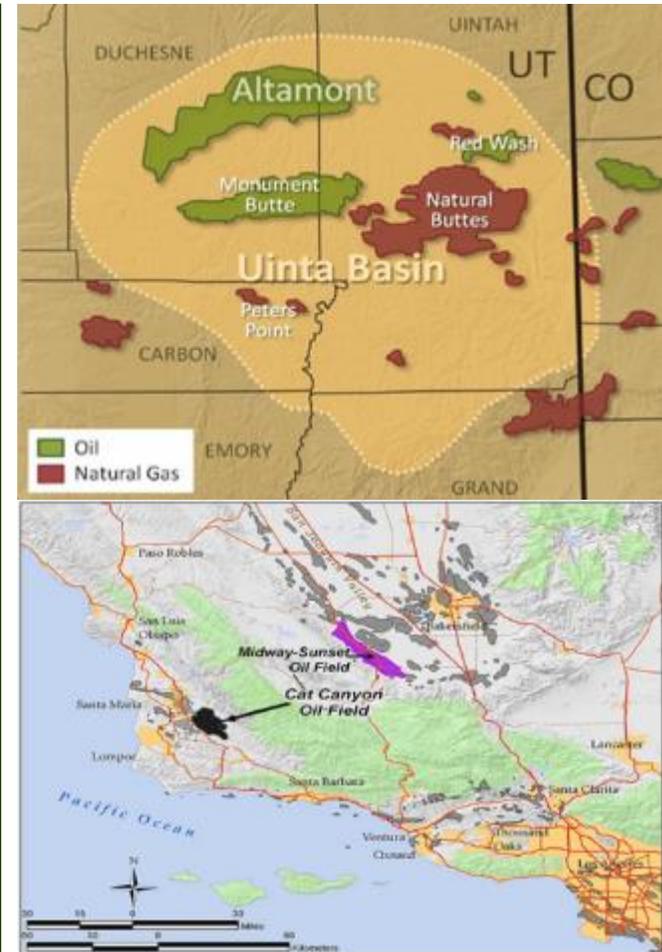
# Executing on our strategy: 'Current Priorities & Activities'

## Utah's Uinta Basin

- Multiple opportunities in the Uinta Basin for paraffin remediation and control.
- HCD received a **Purchase Order** from a Texas based distributor to trial HCD Multi-Flow in several applications in the Uinta formation.
- **Strategy:** after validating its efficacy through positive field trials, our distributor will market HCD technology to other clients in Utah, the Delaware & Permian basin, and Oklahoma.

## Bakersfield, California

- Paraffin remediation/inhibition and production enhancement prospects in Bakersfield.
- A PO for a single well trial is expected soon in a field with ~70 similarly distressed wells.
- **Strategy:** distributor to market our technology to California, Rockies, Oklahoma, and Wyoming markets once they validate its effectiveness.



# Executing on our strategy: 'Current Priorities & Activities'

## Australia Pour Point Opportunity

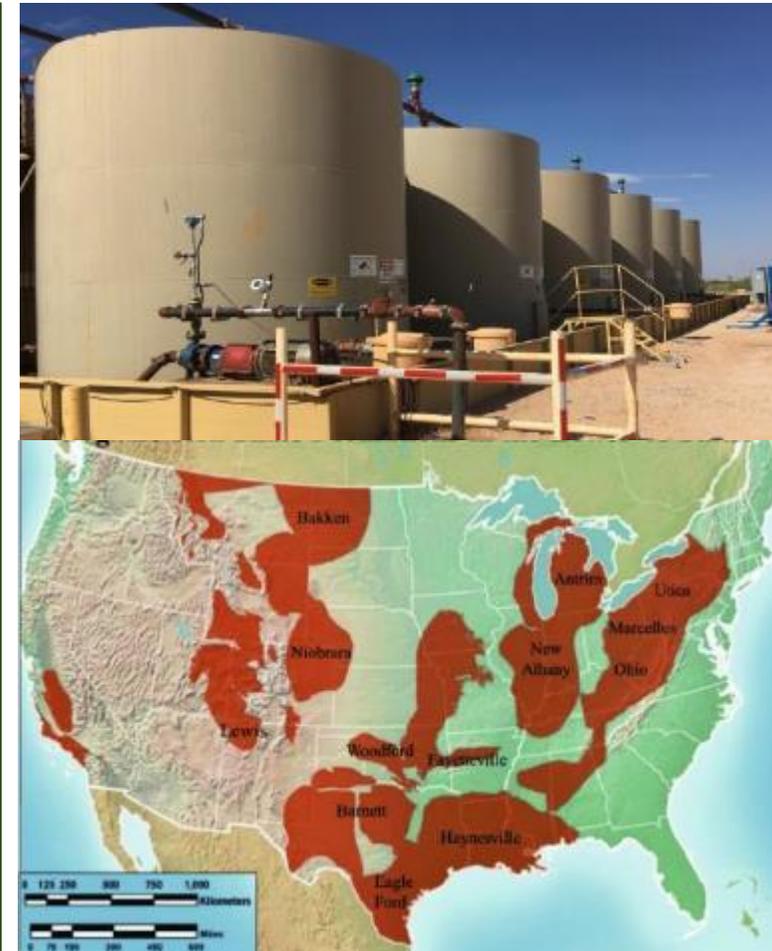
- Direct result of our success in the Cooper Basin
- Potential trial to discover if HCD Multi-Flow is a commercially viable option for lowering pour point

## US Supermajor Oil & Gas Co. Permian Basin

- Positive in-house paraffin control testing led to initial talks with Permian operations and technical group

## South Texas, Eagle Ford Shale

- HCD's strategy includes targeting the very waxy crude oil in the Eagle Ford shale using multiple Texas based distributors
- Progress is being made with a large national oil company there
- **Strategy:** distributor and direct sales to exploit trial success



# The Past Year

## Key Takeaways

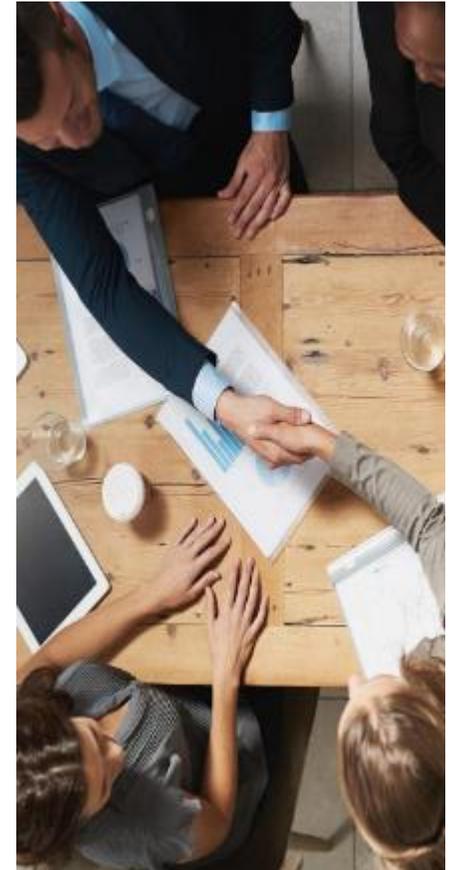
- The long process of finding the right distributors and agents and maturing the relationships is starting to pay off. The number of trials is growing, and new ongoing business is starting to rise.
- HCD has found a credible test procedure, Wax Flow Loop testing, that can be used to screen our chemistry and provide the end users with viable data on the efficacy of HCD chemistry on their specific crude oil.
- Regional focus is imperative.



# The Year Ahead

## 2023 Focus and Path Forward

- Distributor base – drive & strengthen distributor base focusing on *The Right* distributors
- Product screening – utilise wax flow loop testing as the go-to screening for HCD technology for paraffin control.
- Trials and treatment – focus on winning trials and leveraging the successes with the goal of converting to ongoing business and feeding expansion into key regions.
- HCD must remain flexible in adapting to the industry and investment climate it finds itself in and will always look for opportunities to enhance shareholder value



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Advancing Crude Oil Mobility



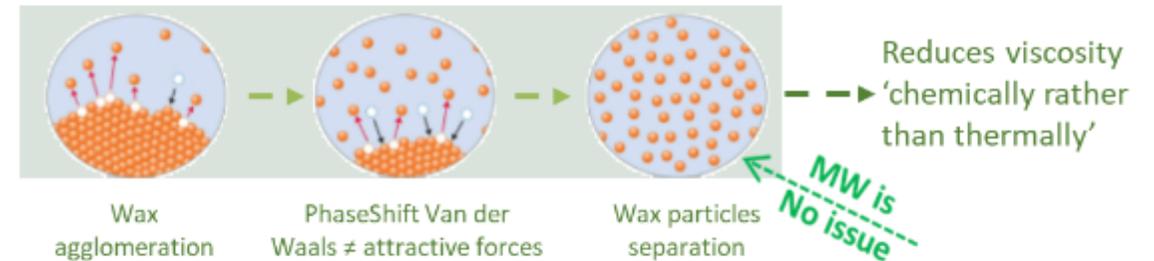
## Appendix

# Differentiated Technology To Move Oil

## Viscosity Reduction

- The mechanism utilised is entirely different to conventional PPD's in that **PhaseShift** technology works by electron sharing with like molecules (wax, asphaltene etc) through molecular repulsion between the aggregated hydrocarbons in long chain molecules
- This reduces the *Van der Waals attractive forces* between the waxes responsible for corresponding molecular attraction
- Pour Point Depressants (PPD's) utilise the polymer-wax interface to halt or hinder wax crystallization -> typically very narrow in their applicability, and challenged by High MW n-paraffins
- **HCD PhaseShift** technology can therefore be used to remediate (liquefy) existing deposits as well as prevent (inhibit) the formation of new deposits.
- This technology will also reduce crude viscosity chemically and can increase API Gravity.

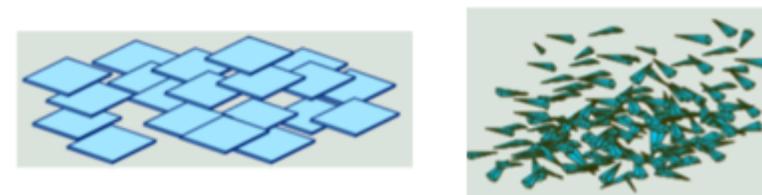
## PhaseShift - Molecular repulsion



\*Carbon distribution of waxy crude can be unfavourable (high MW n-paraffins), negating wax molecule growth through crystal modification



Crystal Modification



Traditional PPDs

MW is a Big challenge\*

# Production Facilities- Phoenix, Arizona



- Production & storage facilities in Phoenix Arizona. Also storage facilities in Malaysia
- Current capacity is 10,000 drums/year. Could be lifted to 20,000 with additional staff
- Simple automation of facility could swiftly bring capacity to 130,000 drums/year (24 hours/day)
- Existing stock of ~ 266 drums of HCD Multi-Flow®

# Testing Implications on Dosage Rates

- Tests and trials indicate dosage rates of HCD products for use in pipelines and continuous down-hole applications on viscous crudes are typically between 250 - 750 ppm
- Tests and trials indicate dosage rates of HCD products for use in heavy, extra heavy and viscous crudes are in the 1,000 – 2,000 ppm range
- Dosage rates will always vary considerably depending on individual applications and oil composition
- New product range and pricing to be confirmed before June 30th but indicative cost to producers for baseline product follows:

Multi-Flow Dosage Rates (ppm)	250	500	750	1000	2000
End User Cost/bbl of oil treated (US\$)*	\$0.36	\$0.72	\$1.08	\$1.45	\$2.90

\* Based on the North American recommended retail price of HCD standard Multi-Flow. Other MF based products will have different pricing