

Hydrocarbon Dynamics

Advancing Crude Oil Mobility



AGM Presentation

May 2022

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:	\$2.6m (31 Mar 2022)
Share Price:	\$0.024
Issued Capital:	587.1m Shares
Market Capital:	\$14 Million
Options on Issue:	46.3m (expiry 31/10/2022 @ \$0.03)

Shareholder Summary

S Mitchell	13.1%
S McGregor Super Fund	8.8%
Lowell Resources Fund	4.0%
Chag Pty Ltd	3.1%
Wheelbarrow Investments	2.5%
Top 20 Holders	47.7%

HCD Share Price



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

HCD Technology

HCD PhaseShift suite of chemistries utilise small, specially engineered carbon-based molecules that reduce the Van der Waals attractive forces between like molecules in order to reliquefy large agglomerations of wax and asphaltene deposits naturally occurring in heavy crude oils.

Liquefies and inhibits hydrocarbon deposits

- **PhaseShift** chemistries liquifies paraffin and asphaltene deposits by applying the principal of the sharing of electrons in the outer orbitals causing a molecular repulsion between like molecules, thus reducing the Van der Waals attractive forces that naturally occur.



Reduces viscosity of heavy oil

- Technology Demonstration: **PhaseShift** effectively reduces heavy crude oil viscosity.

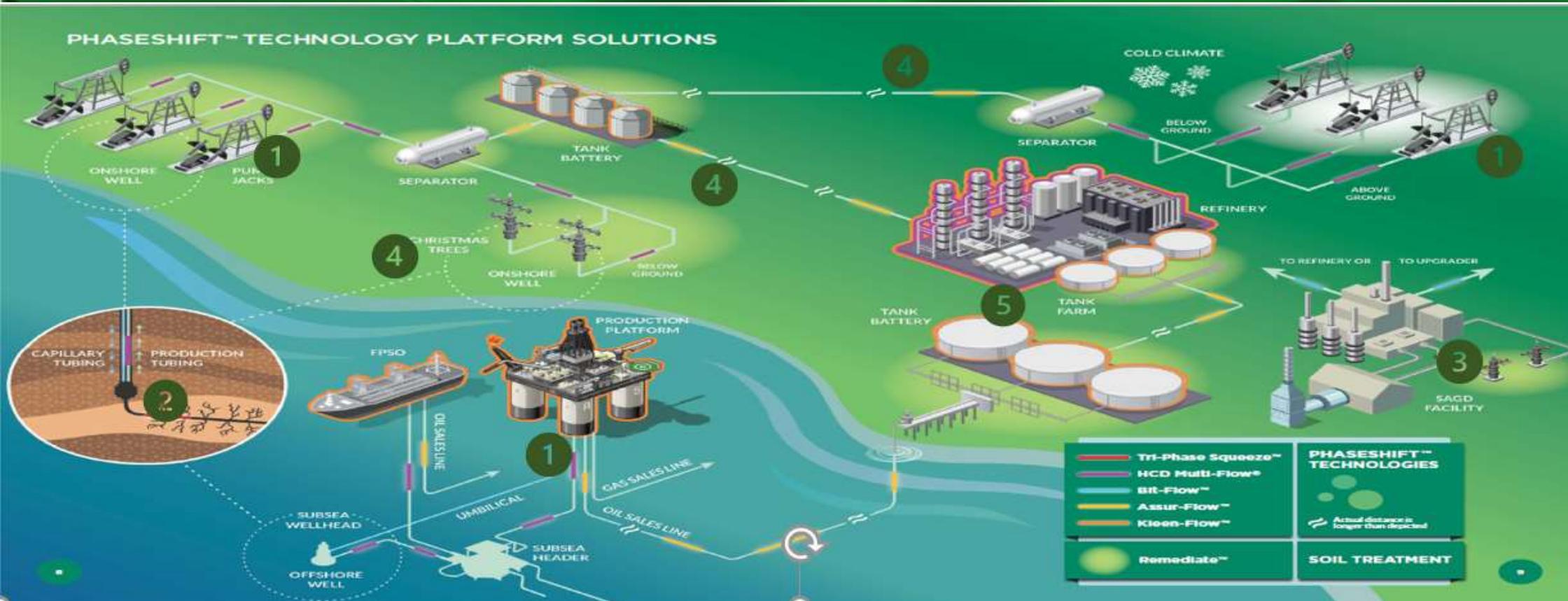


Breaks oil/water emulsions

- **PhaseShift** efficiently breaks oil/water emulsions that cause higher viscosity and larger pressure drop.



HCD Technology Delivers Solutions Across the Oil & Gas Value Chain

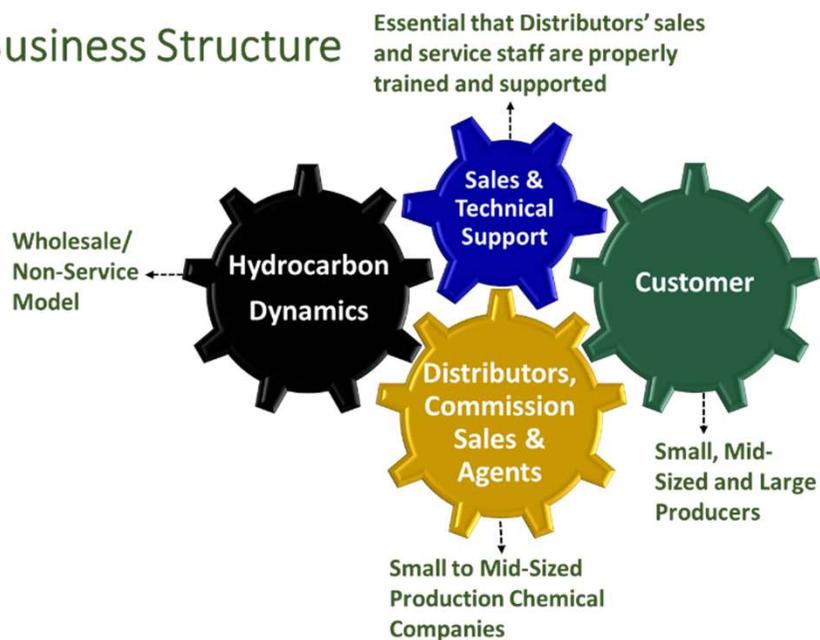


1. Wellhead – HCD Multi-Flow 2. Wellbore – Tri-Phase Squeeze 3. Oil Sands/SAGD – Bit-Flow 4. Pipelines – Assur-Flow 5. Tanks/Vessels – Kleen-Flow

How is HCD Structured?

Hydrocarbon Dynamics is a non-service, wholesale manufacturer of oilfield chemicals focused on crude oil mobility marketing its technologies through small to mid-sized oilfield chemical service providers and seasoned commissioned sales personnel.

Business Structure



➤ Distributors

- small to mid-sized, aggressive oil field chemical service providers
- geographically/regionally based
- technically competent
- have strong, existing customer relationships

➤ Commission Sales Personnel/ Agents

- well connected in the oil & gas industry with strong decision maker contacts and production chemical background

➤ Sales & Technical Support

- HCD provides essential technical and marketing support to help our distributors meet their goals

HCD Strategic Priorities – Progress in 2021, Continued Focus in 2022



Add New and Strengthen Existing Distributors and Agents



Increase Focus on Direct Sales Efforts



Accelerate Trials and Leverage Wins



Wax Flow Loop Screening to Drive Critical Opportunities



Complete Necessary Chemical Registrations and Approvals

Summary of Distributors and Agents

Summary of Distributors & Agents in 2022		
10 North American (3 New in 2022)	2 India 2 ME (1 New in ME)	2 APAC Agents
<ul style="list-style-type: none">➤ 6 USA distributors➤ 1 USA agent➤ 3 Canadian distributors	<ul style="list-style-type: none">➤ 1 global, India based dist. focused on India and S. America➤ 1 India agent➤ 1 Middle East agent➤ 1 Middle East distributor	<ul style="list-style-type: none">➤ 1 Malaysia based agent dedicated to Malaysia and Indonesia➤ 1 agent dedicated to the China and the ME



HCD Awarded Paraffin Control Business Following Successful Cooper Basin Trial

Hydrocarbon Dynamics Limited has been awarded the paraffin control chemical treatment business for 30 wells with receipt of a follow-up order from Santos in the Cooper Basin. The order follows a successful trial on 3 wells during the 2021 winter season.

Highlights

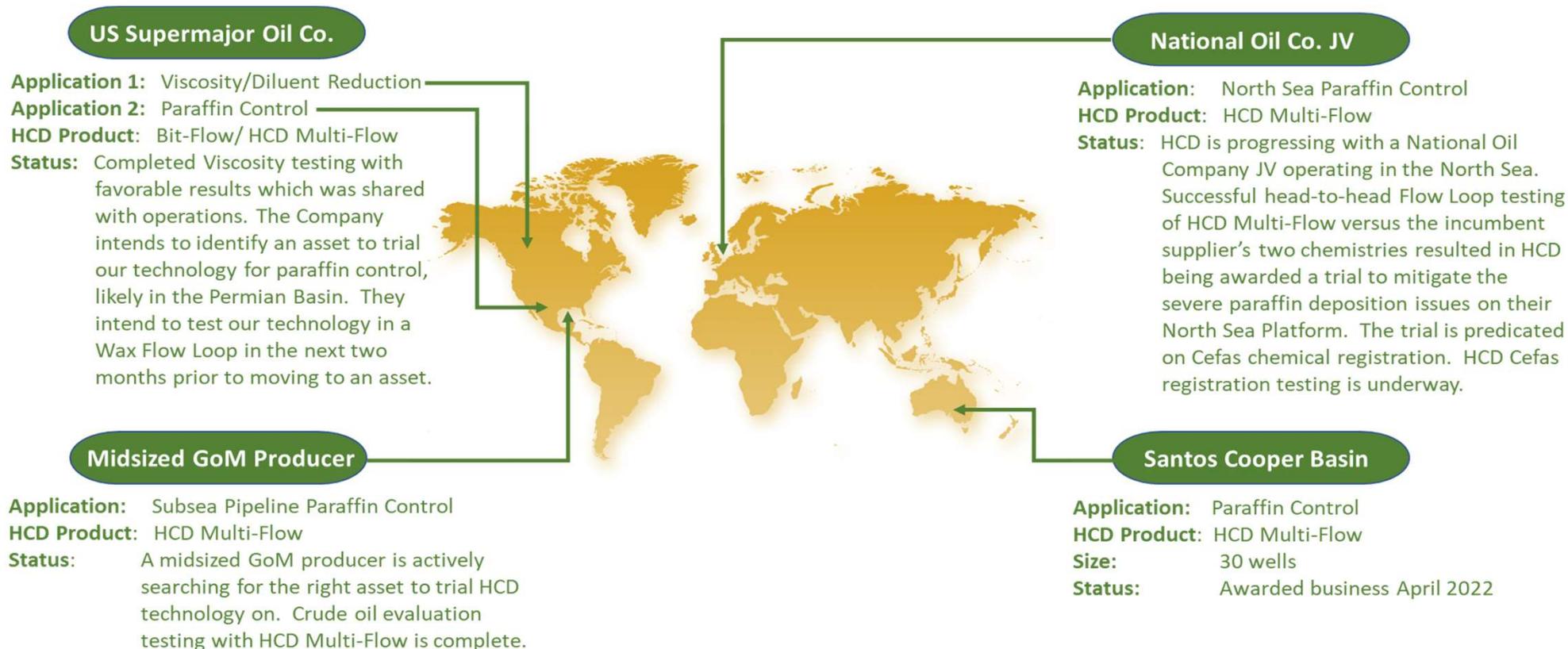
- With superior technology and performance, HCD has supplanted the incumbent chemical supplier, one of the world's largest oilfield chemical companies.
- HCD concluded a successful 6-month paraffin control trial on 3 of Santos' most challenging wells in the Cooper Basin.
- 250 ppm of HCD Multi-Flow achieved the key objectives of mitigating down time and production loss issues stemming from paraffin build-up and subsequent high-pressure trips.
- HCD to capitalize on this win with other producers in the region.

Results of 6-month Trial on 3 Production Wells			
Year	Chemical	Downtime (days)	Oil Loss (bbl)
2019	Competitor	76.5	4681
2020	Competitor	49	2656
2021	HCD Multi-Flow	2.8	88

- Downtime was reduced by 94%.
- Oil production losses were decreased by 97%.
- Increased revenue from reduction in lost production
- Lowered operating costs.
- Improved operational efficiency and safety by reducing the complexity of the paraffin control program by eliminating the struggle to restore production.

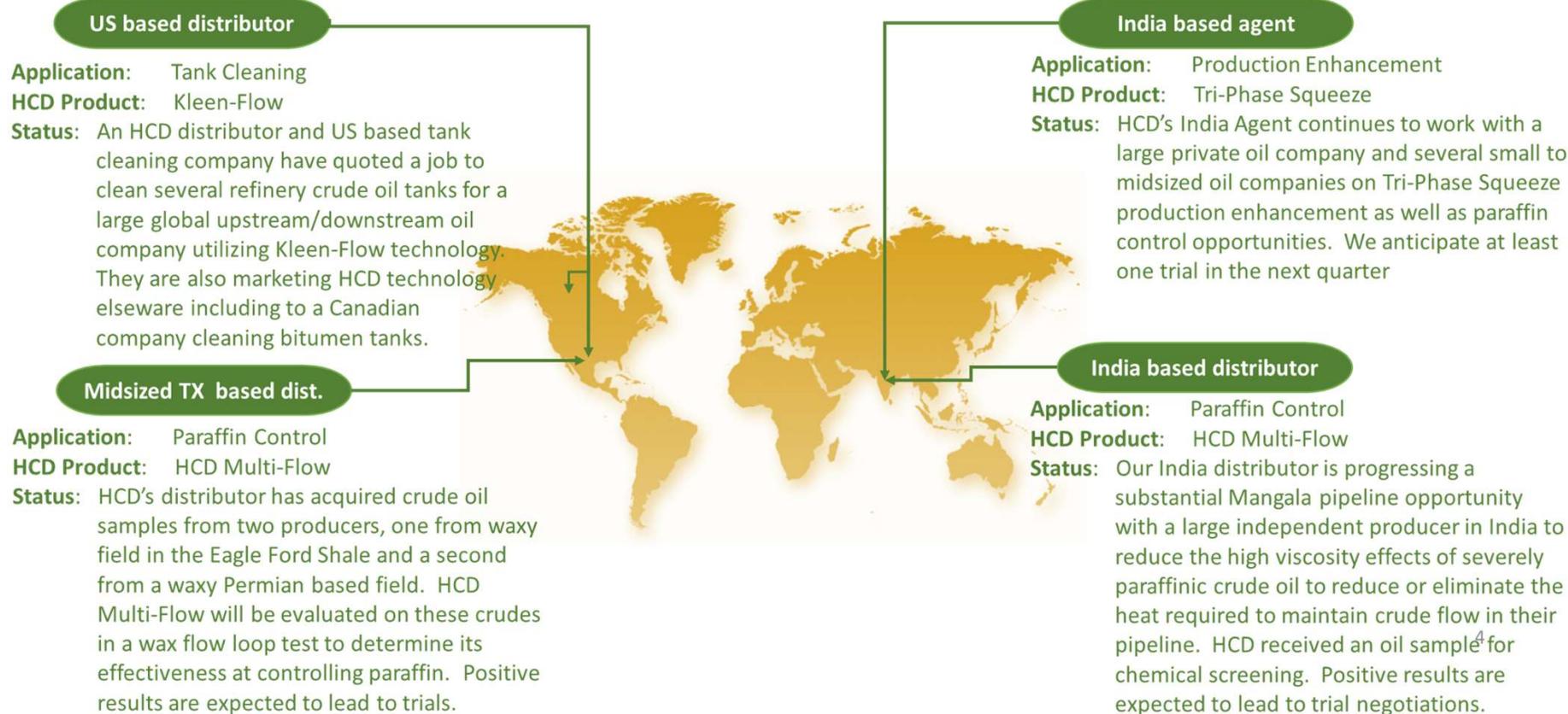
Direct Sales Highlights and Current Priorities

HCD are ramping up its direct sales efforts while continuing to drive our distributor strategy to accelerate closing trial opportunities and transforming those into ongoing business.



Distributor Highlights and Current Priorities

HCD remains dedicated to driving its distributor strategy by pushing & strengthen the existing distributor base while adding new ones that are critical to growth.



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UK based agent

Application: Soil Reclamation

HCD Product: HCD MF/Salt Reducer/MiroPhase

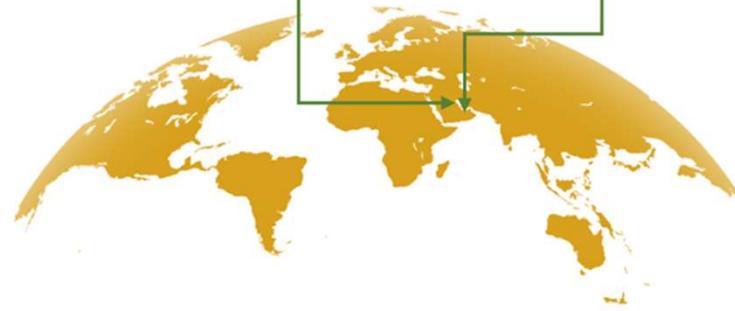
Status: An HCD Agent is proposing HCD chemicals in a substantial soil remediation tender for a large national oil company in the Middle East. HCD technology can reduce cleanup time and increase recoverable crude oil with no impacts on downstream operations.

Dubai based distributor

Application: Tank Cleaning

HCD Product: Kleen-Flow

Status: HCD's Dubai based distributor is targeting tank cleaning opportunities in the Middle East and Algeria. They are in the process of quoting a tank cleaning job in the UAE for a large national oil company utilizing Kleen-Flow technology to reduce downtime and maximize efficiency. They are also making progress on a similar application in Algeria.



Summary of Testing Milestones

Laboratory testing remains a crucial part of HCD's product development and marketing. The company must comply with applicable regional chemical regulations and meet regulated treatment application approvals to be permitted to market and apply its chemistries in these circumstances.

HCD has achieved the following critical approvals, certifications, and registrations:

- **Gas-Lift Certification** – this certification is required in order to inject chemical into a gas-lift well. NVR Thermal Stability Test is utilized to simulate elevated temperature conditions in solvent stripping environments while evaluating the mobility and thermal stability of the product for gas lift applications and qualification for chemical injection via capillary string.
- **Capillary String Qualified** – required to inject chemical down a Capillary String. The NVR Thermal Stability Test is utilized.
- **REACH Registered** – is a regulation of the European Union, adopted to improve the protection of human health and the environment from the risks that can be posed by chemicals. All chemicals entering the EU must be REACH registered. HCD chemistry is REACH registered.
- **UK REACH Registered** – is a REACH regulation for the UK. HCD chemistry is UK REACH registered.
- **Umbilical Approved** – required to inject a chemical down an offshore umbilical. To achieve approval, a chemical must meet pass the tests prescribed by Operator for their specific umbilical conditions and includes tests such as cleanliness, stability, viscosity, and cold centrifuge. HCD Multi-Flow has been umbilical approved for our North Sea offshore trial opportunity.
- **Wax Flow Loop Testing** – Wax Flow loop testing has been utilized and shown to be the best indicator of HCD chemistry capabilities in laboratory testing as it best simulates field conditions. HCD LTD will be focusing on this lab testing procedure moving forward.

As a final step to trialing our HCD is currently working towards Cefas registration which is required to be able to inject chemicals in North Sea offshore assets. The testing includes partitioning testing and toxicity testing.

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Thank You

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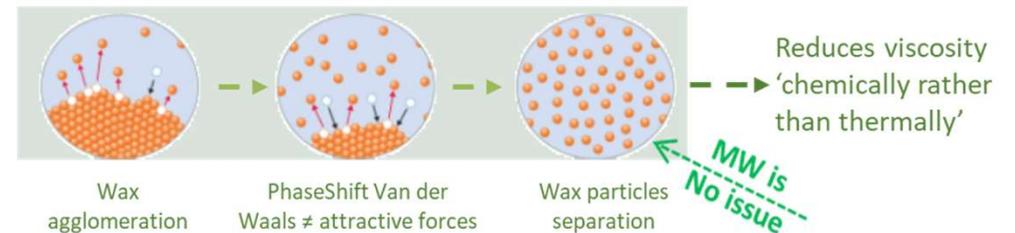
Appendix

Differentiated Technology To Move Oil

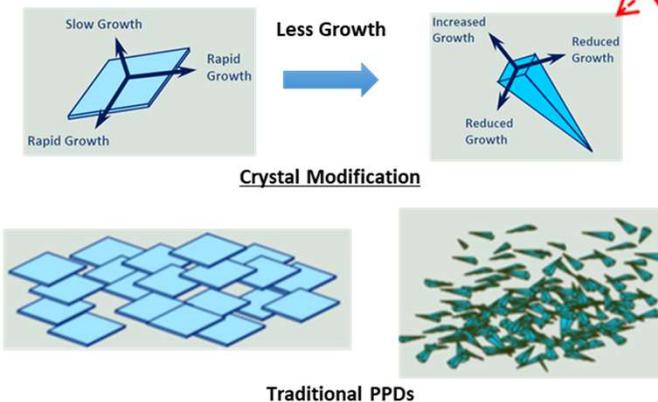
Viscosity Reduction

- 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



MW is a Big challenge*

Production Facilities- Phoenix



- 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 ~ 380 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

Field Trials

PROJECT	PURPOSE	DOSAGE RATE IN FIELD	RESULTS/STATUS
Santos	Paraffin control in flowlines after three (3) wells to mitigate lost production.	250ppm to three wells based on oil	The wells' treatment started on June 6, 2021. The result was a 96.7% reduction lost production. HCD was awarded the paraffin control business starting in the 2022 winter season on 30 wells. The trial started on 23 December 21 on a dirty system. The distributor was unaware that two other wells were tied into the flowline downstream of the well being trialed. These wells were untreated. They decided to end the trial and look for a field where they could trial an isolated well. The wellhead and flowline were subsequently opened where it had previously plugged with paraffin and found to be clean with just 1/8' layer of soft, easily removed paraffin. This is a sign that the product did exactly as predicted.
Imervative Chemical Partners	Paraffin control trial in a North Central Texas oil field.	250ppm based on oil	Fusselman formation of the Permian Basin Two wells treated with 250ppm HCD MF down the annulus and each was cleaned with 1 drum of HCD MF circulated for 1 day. The rods, pump and production tubing were pulled on one of the wells and found to be completely clean.
Smart Chemical Services	Paraffin control two wells in the Fusselman formation of the Permian Basin.	250ppm and 1 drum recirculation	Multi-Flow at 300 ppm was unable to prevent paraffin buildup and the need for hot oiling. It requires a higher rate of chemical which is not economically viable for this small production.
Pro-Ject Chemicals	Paraffin control one well in Central Texas that they have been unable to treat.	300ppm of HCD MF to one well	Increased oil production by an average of ~12% across all wells; Decreased OPEX costs projected to be >\$0.50/ BOE (not including the production increase); Significantly reduced the quantity of chemical needed (250 ppm vs. 1,250 ppm); Ended the need for demulsifier chemical treatment; Eliminated the need for hot oiling; eliminated need for solvent soaks.
Whitecap (Western Canada)	Paraffin remediation and inhibition	250 ppm HCD Multi-Flow	Treating two well that the distributor has been unsuccessful on to date. Paraffin coupons significantly cleaner with HCD Multi-Flow treatment and the wax is much softer. One well pulled and the pump, rods and tubulars are clean!
Smart Chemical Two well trial (West Texas)	Paraffin remediation and inhibition	250 ppm HCD Multi-Flow	Trialing on a well Pro-Ject has failed on and therefore must be routinely hot oiled. Injecting HCD Multi-Flow for 6 weeks and have yet to require hot oiling.
Pro-Ject One well trial	Paraffin remediation and inhibition	250 ppm HCD Multi-Flow	5-month avg oil production increase 186% /Gas increase of 316%
Petralis(Texas)	Increase Production in 3 wells	5 drums of MF/1 drums SR 7 lbs MicroPhase per Well	64% Increase in oil production before Pump Failed for 11-week shutdown (retrial requested)
Oil India (India)	Increase Well Production Rates (Tri-Phase Squeeze)	10 drums MF/1 drums SR/10lbs MicroPhase per Well	Modest decrease in pour point due to wrong equipment and sludge filled holding tank utilized in trial (retrial requested)
Cairn Energy (India)	Reduce Pour Point of oil in 105,000bopd pipeline	500– 5000 ppm MF	Pdn resumed for 5 years after 2 yr shut-in with PP reduction and emulsions broken
Petronas Platform	Restore production to 9,000 bopd	250 ppm HCD Multi-Flow	Results Pending – Greater Burgan Field
Kuwait	Viscosity Reduction in 1 well	20 drums used	Diluent may be reduced by 40%, viscosity by 65%, production increased 22%.
China CNPC	Diluent Reduction in 1 well	38,000 bopd field @ 2,000ppm	Diluent requirement reduced by 40% and organic deposition successfully removed from water pipe
California 1 & 2	1.Diluent Reduction; 2.Clean-up of waterline 2.Clean-up of waterline	1,000 bopd field @ 2,000ppm	4 wells treated. Pdn increase @ 150% over 6 months
Canada - Alberta	Improve Production of waxy oil	<200ppm continuous feed	Pour Point reduced by 14°C (25F). Company taken over
Utah 1 & 2 (Newfield)	Pour Point Reduction	23,000 bopd @ 1,000ppm	

Lab & Bench-Top Success- Seeking Field Trials

PROJECT	LAB RESULT	STATUS
Gulf of Mexico USA # 1	Oils showed large reduction in viscosity and API increase	Postponed offshore trial in 3 undersea flowline wells (1300BOPD) at MF feed rate of 250-2000 ppm (40 drum trial)
Gulf of Mexico USA # 2	As above	Trial postponed until field success elsewhere demonstrated
CNRL (Diluent) (Canada)	Viscosity Reduction 90% @40C	Awaiting a trial (COVID DELAY)
Petro China (Diluent reduction Canada)	Well AD05 Viscosity Reduction 90% and API increase 7.01-8.98 Tested at 15C/40C	Awaiting approval for trial (COVID DELAY)
Nexen SAGD Crude (Diluent Canada) (72,000 BOPD)	API increase 5.5 to 19.3 with 50/50 Blend of Diluent/crude & 1000 PPM MF	Will pursue after industry conditions improve
Valkor (Trinidad)	Results on other Valkor oils sufficient	Well cleaning for 5 wells. Potential for hundreds of wells (1-2 drums/well. Goal is to replace "Hot Oiling"
Valkor (Unita Basin)	Success in liquifying yellow & black waxes	Expecting ~6 drum order for trial. Potential for 250 drums/month
Valkor (Ukraine)	Results on other Valkor oils sufficient	
Colombia (SELVA)– oil from 10 wells tested & 1 tank tested	Many tests on many fields/wells and tanks API increase in all at least at least 1.2 API units	Awaiting Colombian distributor
ADOC 45,000 bopd pipeline, Abu Dhabi	Liquefied paraffin-rich sludge with slight agitation	Proposal Submitted
NESL (Belarus tank cleaning) (8-350,000-barrel tanks on site all require cleaning)	Distributor reports successful testing on sludge reliquification (Bench Test)	Distributor made inquiry for 182 drums in mid- May. Proposal submitted (PO PENDING)
Colombia well 713 (CRC Montalvo/Grubb)	Lab reports MF inhibits deposition of asphaltenes and paraffin.	Awaiting Colombian Distributor
Quifa Field (Colombia)	API increase 13.4-14.7 . Viscosity drop 50%, BS&W drop 50%	Awaiting Colombian distributor for next step

Distributors and Agents

Company Name	Region	Country / Area
Imperative Chemical Partners	North America	North America
Platinum Chemical Services	North America	Western Canada
OG Chemical	North America	Colorado
New Agent	North America	Houston, Texas
Perfex Chemical Solutions	North America	Oklahoma & Wyoming
Striker Hydralink	North America	US & Europe
AZT Glogal LLC	North America	Western Canada
Chemics	North America	Western Canada
Iron Horse Group	North America	Western Canada
Smart Chemical Services	North America	Texas
Deepwater Technical Services	North America	Gulf of Mexico
Creedance Energy Services	North America	North Dakota
United Hydrocarbon Solutions (Formerly Trimor)	North America	Southern Texas
Element & Sharp International Svcs	North America	Houston, Texas
Dorf Ketal	India/ South Africa	India / Brazil
Miridual Pathak	India	India
Ciel Energy FZCO	Dubai	Middle East / Africa / Iraq
New Dubai Based Distributor	Dubai	Middle East / Africa / Egypt
GGCD	Middle East	Middle East
Qinghua	China	China