

# 2021: Full scale silica plant commissioned, 100% throughput



Sustainable low-carbon colloidal silica from geothermal fluid; a genuine world first

# 2022: Global expansion study with geothermal major

July completed FEL1 Study for EDC Philippines of 15,000tpa silica plant in license-partnership model

# 2022: First global silica-lithium partnership

Signed collaboration agreement with Enel Green Power on three-site project evaluation programme

Unique technology and IP developed in New Zealand now ready for global rollout



#### The Year in review



## **Building our silica franchise**

- Getting the Northern Plant to 100% fluid throughput
- Advancing the franchise designing a plant for EDC (our first potential license-partnership?)
- Selling silica well

## **Advancing in lithium**

- Writing up the core chemistry
- Understanding the resource landscape
- Designing a pilot plant

#### We are generally tracking to programme in all areas.



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# 2021 AGM: The c12 months ahead – maturing the silica business

- Ramp the world-first Northern Plant to 100% nameplate throughput ✓
- Recommission Ngawha Plant in profitable, automated configuration ✓
- Implement robust solutions for variations in silica concentration in brine ✓
- Continue to develop customised silica products for premium markets ✓
- Seek third-party validation that Geo40's technology prevents scaling of pipes and reinjection wells and enables industrial use of waste heat and CO₂ sequestration. ✓

We will quantify the value our technology can bring to global geothermal power generators. ✓

This will position Geo40 for structured discussions around technology leverage, whether through further own-builds, a licensing model or both. ✓



2021 AGM 9 Sept 2021

# 2021 AGM: The c12 months ahead – advancing lithium



We have a comprehensive development programme underway, enabled by funding from Pacific Channel, including:

- Development of end-to-end chemistry ✓
- Materials handling study (dewatering of sorbent etc)
- Desktop study of global lithium resource opportunities
- Scoping study of relevant project(s) (later in 2022)
- Pilot Plant build and processing of global brines (in progress)
- Peer review of technology and project economics (2023)
- Independent validation of where our technology will be relevant (on what types of global brines). (in progress)
- Advancement of potential resource-partnership discussions (in progress)



#### **Environmental headwinds**



#### The Ohaaki Environment

- Silica concentration remains low often as low as 600ppm
- We struggled through much of the year to make 14nm product constrained us to run at 50%

#### The Global Environment

- Huge increases in shipping costs, and vastly reduced shipping capacity
- Some markets stalled entirely
- We were unable to travel to customers

# These factors have meant that the Northern Plant financial performance has been well below our expectations.



# **Our structured response**



### Our silica assets (Northern and Ngawha):

- Holding Contact Energy to promised 700ppm new-normal (alongside other measures) at both plants
- Tracking losses and improving recovery
- Potential reconfiguration of front end to process 20% more fluid at higher grade
- Ngawha Plant now running in profitable configuration

#### **The Global Environment**

- Have tracked ahead of weighted average price up 15% on business case
- Low-carbon and ESG collateral means that we are forecasting that we will continue to increase price received
- Expecting shipping constraints and pricing to ease resulting in more margin for us

# These measures will the improve the profitability of the Company's silica assets and help ensure that the bulk of new capital is available for growth.



#### **GeoSilica**



## We supply customised low-carbon silica solutions

We sell to both established and new innovative silica markets. This is a US\$1b market, growing at 6% CAGR.



Coatings and Adhesives
- Resene Paints, Connell Bros



Earth and Mineral Industries

- Normet, Fuji



Foundry and Precision Investment Casting
- GMG Hitchener



**Pulp and Paper**in development with Solenis



**Rubber and Latex**- in development with Texmo



**Waste Management**in development with WMNZ



**Building and Construction**– Master Builders, GCP, Sika



Chemical Manufacturing

- Nissan Chemical, Sumitomo



Civil Development

- RST/Goodman, HEB

#### The conventional alternative; silica-by-blast-furnace:



- Quartz-rich sands mined then melted at 1600°C in a blast furnace
- Chemical extraction back-end processing to strip gangue minerals
- Furnaces typically coal powered
- Silicas produced typically have very high carbon footprint

# **Beyond silica: Lithium**



Lithium

## Developing direct lithium extraction technology to address a wide range of lithium resources.

Five <u>diverse</u> brine types (including very low grade fluids) processed in the lab since 2021:

- New Zealand, 10ppm Li
- Europe x 2, 45ppm & 120ppm
- Argentina, 700pm-1200ppm, salar and tail brines
- USA, 320ppm, oilfield

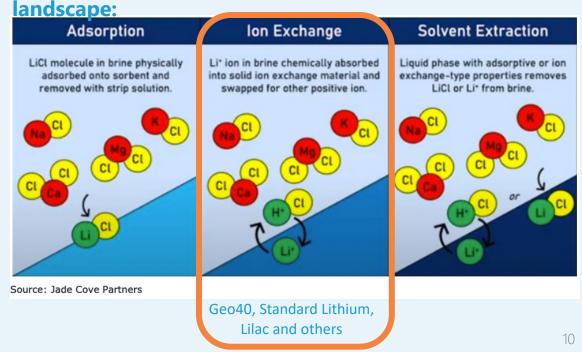
# Over 90% Li recovery achieved, opening up low grade brine resources where others can't succeed.

Our lithium recovery technology:

- Is highly selective, working as low as 30ppm Li
- Produces a very pure lithium concentrate

Our tech uses similar basic chemistry to Lilac Technologies and Standard Lithium but with a differing physical approach.

The Direct Lithium Extraction technology



# **Geo40 DLE Technology Global Addressability Hypothesis**



## Simplified matrix of principal global brine chemistry families (outliers excluded):

Brine Chemistry Family	Continental			Oilfield	Geothermal		
Chemistry sub-category	Low Mg/Li ratio	High Mg/Li ratio	High Calcium	All	Low pH	Si + Li	Li only
Geography	Argentina, Chile, USA	Argentina	Argentina, Chile	Canada, USA	Salton Sea, Djibouti	NZ, Mexico, USA	Europe, UK, Chile
Geo40 technology relevance	•	<b>Ø</b>	•	•	X	<b>Ø</b>	<b>Ø</b>
Key competing technologies	Dow, Tenova, Lilac, Livent (excl. evap)	Lilac, Tenova (both yet to be proven)	Dow, Lilac(?)	E3Metals, Prairie Lithium, Standard Li	EnergySource Minerals	None	Dow(?), EnergySource Minerals

Geo40 believes its tech can work on 90% of global brines but evaporation remains very prevalent and cost competitive in the low Mg/Li ratio category. As such, we believe our DLE tech is commercially relevant across c42% of the balance of global brines.

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# Pilot Plant







# Pilot Plant

# **Next steps**



#### The new Pilot Plant

- Getting up to 100 cycles (proving the process)
- Processing offshore brines via our Transitional Facility first one arrives this week
- Informing a peer review of our process

#### **Getting offshore**

- Have done fieldwork on two different brines from Argentina
- Have done fieldwork on an oilfield brine from the USA
- This work paves the way to get real assets on site

The current lithium carbonate price is cUS\$60,000/t. Analysts are forecasting huge supply deficits out to 2030 at least, such that pricing bears no relationship to supply cost. When we made a strategic call to pursue lithium in 2020, pricing was US12,000/t.



#### **Partners in Lithium**



## Those we're working closely with:















Lithium de France













# Next steps: Deploying a 1000tpd to 2000tpd lithium plant offshore



## Or, how fast can we get the tech operating in the field? Creating the future, faster.

#### The concept:

- 2,000tpd throughput on a 300ppm resource is around 1000tpa lithium carbonate – market relevant
- Front-end build in-market, high-tech back-end NZ build, all skid mounted, semi mobile
- 9 months design and build programme
- 3 months wet commissioning in NZ
- c3 months to ship and site commission

This means we could feasibly have a credible DLE plant operating on a lithium resource in late 2023/2024.

The task now is to identify a preferred partner and to do detailed work on the specific brine chemistry and site constraints.

We see real potential here to catch-up and potentially pass other technology developers.



Pictured above is our 800tpd silica plant that we designed and built in 9 months; the challenge here is near-identical, but in lithium





# **ESG Sustainability Performance Report**

Geo40's first ESG Baseline Report, including highlights, for the year ending 31 March 2022.

Socialsuite

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# GEO40 ESG FOCUS AREAS FOR THE YEAR ENDING 31 MARCH 2022

Geo40 has identified initial key-focus metrics for measurement in the financial year to 31 March 2022. Importantly the suite of metrics selected provides good coverage across the four World Economic Forum pillars of Governance, People, Prosperity, and Planet.

The seven metrics chosen and how they fit into the WEF Framework is illustrated in Figure 1 below.



Figure 1; Geo40 Focus areas for the year to 31 March 2022

#### **Conclusion and thanks**



The last two years has been tough, but we have put many of the essential building blocks in place to make Geo40 successful. Our assets are tracking towards profitability, and our silica franchise is attracting genuine interest. We have proven we can sell silica well.

Our strategic call on lithium around three years ago appears to have been the right one. Demand seems insatiable, and we see that direct lithium extraction from brines is compelling to many. We need to remain resolutely focused on being credible in this space, and the months ahead will be exciting.

A little over two years ago we were a c\$40m business without a scale asset. We're now a \$100m company with some incredible talent in house working resolutely on the things that will drive value for shareholders.

We know that our shareholders are anxious to see value growth and improved liquidity. As we grow and become relevant in our sector we know we can get there.

As always, I sincerely thank all shareholders for their ongoing support.

# Unique technology with global reach





