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CleanTech Lithium PLC
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CleanTech Lithium PLC ("CleanTech Lithium", "CTL" or the "Company")
DLE Pilot Plant Produces High Quality Eluate

CleanTech Lithium PLC (AIM:CTL, Frankfurt:T2N, OTCQX:CTLHF) an exploration and development company advancing sustainable lithium projects in Chile, announces highly encouraging results from the processing of brine from Laguna Verde at the Company´s Direct Lithium Extraction (DLE) pilot plant in Copiapó, Chile.

Highlights:

- The DLE pilot plant has produced high quality eluate with low impurities
- The performance of the DLE process is based on the composition of the eluate achieving key metrics of:
  - A lithium grade in feed brine of 196mg/L was concentrated to 710mg/L in the eluate, or a 3.6X concentration factor
  - Lithium adsorption recovery rate of 94%
  - Rejection rates over 99% for key contaminants calcium, magnesium, potassium, sodium and sulphate
- A reverse osmosis unit at the DLE pilot plant is used to concentrate the eluate prior to shipment, concentrating the test batch from a lithium grade of 710mg/L in the eluate to 2,194mg/L in the concentrated eluate
- An initial 200L of concentrated eluate has been sent to a third-party processor in North America for test work to set up the process plant for conversion of eluate into battery grade lithium carbonate
- CTL will ship batches of 24m^3 of the concentrated eluate for conversion with the first batch scheduled for later this month
- The pilot plant in Copiapó has demonstrated that it can operate at the designed capacity of concentrated eluate production sufficient for conversion to 1 tonne per month of battery grade lithium carbonate
- This places CleanTech Lithium at the forefront of exploration companies in Chile and the wider sector, in its ability to make available large samples of lithium carbonate product to potential strategic and offtake partners seeking to start product qualification

Steve Kesler, Executive Chairman, of CleanTech Lithium PLC, said:

"The analysis of the eluate shows the DLE performance has exceeded our expectations, concentrating the lithium grade of the feed brine by 3.6X while achieving high recovery rates and low impurities. The first full batch of 24m^3 of concentrated eluate is scheduled to be shipped in the coming weeks. The pilot plant has met its design capacity capable of producing 1 tonne of LCE per month, positioning CleanTech Lithium to produce significant quantities of lithium product samples for

potential strategic partners. We are edging closer to be one of the first DLE based companies in Chile to produce battery-grade lithium carbonate."

Further Information

The Company´s DLE pilot plant is in Copiapó, Chile, approximately 250km from Laguna Verde, and finished commissioning in late March. At the R&D centre where the pilot plant is located, brine from the Laguna Verde project is stored in a large 243,000 litre vessel outside the pilot plant and then fed into an indoor tank having passed through filtration to remove suspended solids. It is then fed into the DLE columns shown in Figure 1, which are filled with adsorbent designed to be selective for lithium molecules. Lithium, as lithium chloride, is adsorbed from the brine, before desorption with water to create a purified lithium chloride eluate.

A reverse osmosis (RO) unit at the DLE pilot plant, as shown in Figure 2, then concentrates the eluate by extracting approximately 75% of the water before this concentrated eluate is shipped to the facilities of Conductive Energy in Chicago, USA for conversion into battery grade lithium carbonate. A 200L batch of concentrated eluate was recently air freighted to Conductive Energy for test-work to optimise the planned conversion process before larger volumes of concentrated eluate, which will be shipped in 24m^3 containers, are dispatched with the first such shipment scheduled for later this month.



Fig. 1: Pilot Plant Multi-Valve Feeding Brine to DLE Columns (approx. 2.5 metres high)



Fig. 2: Reverse Osmosis Unit Used to Concentrate Eluate at the Pilot Plant

Brine is processed at the DLE pilot plant in cycles where each cycle represents the 30-hour sequence of adsorption, displacement wash and desorption using all 30 of the DLE columns to process the feed brine into eluate. The 200L test batch provides a representative sample taken from the first two DLE cycles completed at the pilot plant. Analysis of the feed brine, eluate and concentrated eluate is provided in Table 1 below.

Element (ions)	Unit	Feed Brine	Eluate	Concentrated Eluate
Boron (B)	mg/L	451	279	411
Calcium (Ca)	mg/L	640	2	7
Chloride (Cl)	mg/L	70,893	3,429	11,039
Lithium (Li)	mg/L	197	710	2,194
Magnesium (Mg)	mg/L	2,293	4	14
Potassium (K)	mg/L	4,533	0	0
Sodium (Na)	mg/L	48,776	20	134
Sulphate (SO4)	mg/L	7,768	91	103
Total Dissolve Solids (TDS)	mg/L	142,432	4,837	19,260

Table 1: Composition of Feed Brine, Eluate and Concentrated Eluate (Major Ions)

The concentration of lithium from 197mg/L in the feed brine to 710mg/L in the eluate is 3.6X, which is considered to be a very positive result. DLE primarily acts as a purification stage, recovering lithium chloride from the brine whilst rejecting other impurities. For all the major ions in the brine, apart from boron, the rejection rate was 99% or higher and almost 100% for the largest impurity in the brine which is sodium, as shown in Table 2 below. The adsorbent shows very good selectivity for these ions with extremely high selectivity for lithium to sodium.

The low selectivity for boron is expected with the Company´s process flow sheet, as described in the completed Laguna Verde scoping study, which includes a boron removal stage using ion exchange. The current process flow sheet also includes a nano-filtration stage for magnesium and calcium as a high-level purification of these two elements is required before conversion to battery grade lithium carbonate. The very low levels of these two elements in the eluate indicates nanofiltration may not be required. CleanTech Lithium´s process team is also working on solutions that would reduce or eliminate the requirement for the Boron removal stage to further simplify the process.

Element (ion)	Rejection in Eluate
Boron (B)	38.1%
Calcium (Ca)	99.7%
Magnesium (Mg)	99.8%
Potassium (K)	100.0%
Sodium (Na)	100.0%
Sulphate (SO4)	98.8%

Table 2: DLE Performance - Rejection of Major Impurities

The recovery rate in Cycle 2 was 94% in adsorption with an overall recovery after desorption of 89%. The desorption recovery rate is expected to be further optimised as the pilot plant stabilises over more operational cycles. The production rate achieved was 2.57 kg LCE/hr which meets or exceeds the design capacity of the plant.

Downstream Processing into Battery Grade Lithium Carbonate

For the conversion of the concentrated lithium chloride eluate into battery grade lithium carbonate, CleanTech Lithium has engaged a leading lithium concentration and refining company, Conductive Energy, based in Alberta, Canada, which has a conversion facility in Chicago, USA (see Figure 3). Concentrated eluate will be shipped in batches of 24m^3, which corresponds to a shipping container, to the port of Los Angeles before transiting to Chicago.



Figure 3: Conductive Energy - Milling and Refining Equipment, Continuously Stirred Tank Reactor, and Lithium Carbonate product (pictures left to right)

The first step will be to further concentrate the eluate using Forward Osmosis (FO), with the FO unit provided by Forward Water Technology, another Canadian company based in Ontario. FO achieves a high concentration factor

with low energy use. Following FO, the conversion process stages undertaken by Conductive Energy, involve polishing by ion exchange to remove trace impurities, carbonation to precipitate lithium carbonate, solid/liquid separation and drying. These standard industry processes for lithium carbonate production are reflective of the conversion process CleanTech Lithium plans to use at a commercial scale for the Laguna Verde project.

Samples of the lithium carbonate product will be analysed by Conductive Energy and a third-party independent laboratory to confirm the benchmark of 99.5% Li_2CO_3 is achieved for battery grade lithium carbonate. The product will be packaged for shipping to potential strategic partners and off-takers for product verification in the coming months.

Competent Persons

The following professional acts as qualified person, as defined in the AIM Note for Mining, Oil and Gas Companies (June 2009) and JORC Code (2012):

Marcelo Bravo: Chemical Engineer (Universidad Católica del Norte), has a Master's Degree in Engineering Sciences major in Mineral Processing, Universidad de Antofagasta. He currently works as a Senior Process Consulting Engineer at the Ad-Infinitum company. Mr Bravo has relevant experience in researching and developing potassium, lithium carbonate, and solar evapo-concentration design processes in Chile, Argentina, and Bolivia. Mr Bravo, who has reviewed and approved the information contained in the chapters relevant to his expertise contained in this announcement, is registered with No. 412 in the public registry of Competent Persons in Mining Resources and Reserves per the Law of Persons Competent and its Regulations in force in Chile. Mr Bravo has sufficient experience relevant to the metallurgical tests and the type of subsequent processing of the extracted brines under consideration and to the activity being carried out to qualify as a competent person, as defined in the JORC Code. Mr Bravo consents to the inclusion in the press release of the matters based on his information in the form and context in which it appears.

The information communicated within this announcement is deemed to constitute inside information as stipulated under the Market Abuse Regulations (EU) No 596/2014 which is part of UK law by virtue of the European Union (Withdrawal) Act 2018. Upon publication of this announcement, this inside information is now considered to be in the public domain. The person who arranged for the release of this announcement on behalf of the Company was Gordon Stein, Director and CFO.

For further information contact:

CleanTech Lithium PLC	
Steve Kesler/Gordon Stein/Nick Baxter	Jersey office: +44 (0) 1534 668 321 Chile office: +562-32239222 Or via Celicourt
Celicourt Communications	+44 (0) 20 7770 6424
Felicity Winkles/Philip Dennis/Ali AlQahtani	cleantech@celicourt.uk
Beaumont Cornish Limited (Nominated Adviser)	+44 (0) 20 7628 3396
Roland Cornish/Asia Szusciak	
Canaccord Genuity (Joint Broker)	+44 (0) 20 7523 4680
James Asensio	
Fox-Davies Capital Limited (Joint Broker)	+44 (0) 20 3884 8450
Daniel Fox-Davies	daniel@fox-davies.com

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Notes

CleanTech Lithium (AIM:CTL, Frankfurt:T2N, OTCQX:CTLHF) is an exploration and development company advancing sustainable lithium projects in Chile for the clean energy transition. Committed to net-zero, CleanTech Lithium's mission is to produce material quantities of sustainable battery grade lithium products using Direct Lithium Extraction technology powered by renewable energy. The Company plans to be a leading supplier of 'green' lithium to the EV and battery manufacturing market.

CleanTech Lithium has two key lithium projects in Chile, Laguna Verde and Francisco Basin, and hold licences in Llamara and Salar de Atacama, located in the lithium triangle, a leading centre for battery grade lithium production. The two major projects: Laguna Verde and Francisco Basin are situated within basins controlled by the Company, which affords significant potential development and operational advantages. All four projects have direct access to existing infrastructure and renewable power.

CleanTech Lithium is committed to using renewable power for processing and reducing the environmental impact of its lithium production by utilising Direct Lithium Extraction with reinjection of spent brine. Direct Lithium Extraction is a transformative technology which removes lithium from brine, with higher recoveries than conventional extraction processes. The method offers short development lead times with no extensive site construction or evaporation pond development so there is minimal water depletion from the aquifer. www.ctlithium.com

****ENDS****

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