



Silex
Systems Limited

Operational Update – 1H FY2021

25 February 2021

Highlights of the first half and key subsequent events:

- Completed the restructure of SILEX technology licensee Global Laser Enrichment LLC (GLE) on 31 January 2021, resulting in Silex acquiring a 51% majority interest in GLE, and Canada's Cameco Corporation increasing its interest from 24% to 49%;
- GLE's path to market is underpinned by the Paducah commercial opportunity which is akin to owning a 'Tier 1' uranium resource capable of producing around 5 million pounds of uranium per year for several decades, which would rank in the top ten of current uranium mines by production volume;
- Acquiring 51% interest in GLE gives Silex greater control over the commercialisation of the SILEX uranium enrichment technology and a direct share in any future profits, in addition to royalties payable under the existing license and US\$20 million in commercialisation milestone payments;
- Successfully completed a key milestone to validate commercial synthesis of feed material for the Zero-Spin Silicon (ZS-Si) laser enrichment process, representing an important step in the second stage of the project involving design, construction and operation of scaled-up prototype equipment for ZS-Si production;
- IQE announced the achievement of a key demonstration milestone for its new high frequency (RF) filter for 5G devices (called IQepiMo™) which is built on the cREO™ technology platform. Trials of IQE's new RF filter device completed to date with customers and partners have indicated significant device performance improvement.

Silex CEO and Managing Director, Dr Michael Goldsworthy, said: "We have announced some very significant achievements for our three technologies since our last update, including the completion of the GLE acquisition. This not only gives us greater control over the commercialisation of the SILEX uranium enrichment technology, but provides Silex with a second potential revenue stream from GLE in addition to the royalties due under the existing license agreement.

"The new JV partnership with Cameco represents the start of an important era for GLE and the SILEX technology, at a time when nuclear power is coming back into focus as a key source of zero-emissions base load electricity in an emissions constrained world. Our path to market with GLE is firmly established with the Paducah commercial opportunity which, based on economic modelling, may be equivalent to a 'Tier 1' uranium resource capable of producing around 5 million pounds of uranium per year for several decades", he added.

SILEX Uranium Enrichment Technology

The SILEX technology, which is the only third-generation laser-based uranium enrichment technology under commercial development today, could become a major contributor to nuclear fuel production for the world's current and future nuclear reactor fleet, through the production of uranium in three different forms:

- **natural grade uranium (U_{nat}):** via enrichment of DOE inventories of depleted tails through the Paducah Laser Enrichment Facility (PLEF) project - producing uranium at natural U^{235} assay of ~ 0.7%;
- **low enriched uranium (LEU):** for use as fuel in today's conventional nuclear power reactors – which require fuel with U^{235} assays of between 3% and 5%; and
- **high assay LEU (HALEU):** a customised fuel for next generation Small Modular Reactors (SMRs) currently under development – several of which require fuel with U^{235} assays of up to 19.9%.

Uranium production and enrichment are the two largest value drivers of the current nuclear fuel cycle, accounting for up to 70% of the value of a fuel bundle. Importantly, commercialisation of the SILEX uranium enrichment technology through licensee GLE could enable the SILEX technology to become a unique, multi-purpose nuclear fuel production platform for existing and emerging nuclear power generation systems.

i) The GLE Restructure:

Successful completion of the GLE restructure occurred on 31 January 2021, following conclusion of the US Government approval process. The transaction involved the joint purchase of GE-Hitachi's (GEH) 76% interest in GLE by Silex and Cameco. Closing of the Agreement resulted in Silex acquiring a 51% interest in GLE and Cameco increasing its interest from 24% to 49%.

The transaction included a site lease between GLE and GEH which will enable GLE to complete the SILEX technology commercialisation program at the Test Loop facility in Wilmington, North Carolina. This program will culminate with the full-scale demonstration of the SILEX uranium enrichment technology with a pilot plant facility, currently being built at the Wilmington site.

Silex and Cameco have also negotiated terms for an option for Cameco to purchase from Silex at fair market value, an additional 26% interest in GLE, potentially increasing their interest to 75% (subject to USG approvals). This option underscores the support and strength that Cameco, as one of the world's leading uranium and nuclear fuel suppliers, brings to GLE and the commercialisation program.

Key commercial terms under the existing SILEX uranium enrichment technology license agreement between Silex and GLE remain in place. This includes a perpetual royalty of at least 7% on revenues generated by GLE from any future use of the SILEX technology for uranium enrichment, including in the Paducah commercial opportunity, and US\$20 million in commercialisation milestone payments.

A new Governing Board has been established for the restructured GLE, which will comprise two members each from Silex and Cameco. The Silex members will be Silex CEO, Dr Michael Goldsworthy, and Silex Board Chair Mr Craig Roy. In view of the extra work load associated with Mr Roy's role as Chair of the new Governing Board, Mr Roy's compensation will be increased by an additional \$40k per year, with \$20k payable by the issue of Silex equity at the 10-day VWAP preceding the Company's 17 December 2020 Board Meeting (subject to shareholder approval at the 2021 AGM).

ii) The Paducah 'Tier 1' Uranium Production Project:

The Paducah commercial project opportunity is an ideal path to market for the SILEX technology. Underpinning this opportunity is the Sales Agreement between GLE and the US Department of Energy (DOE) which provides GLE access to large stockpiles of depleted uranium tails inventories owned by the DOE.

The Paducah commercial project opportunity will involve GLE constructing the proposed 'Paducah Laser Enrichment Facility' (PLEF) utilising the SILEX technology to enrich the DOE tails inventories which have been stored in the form of depleted uranium hexafluoride (UF₆ - containing U²³⁵ assays of between 0.25% to 0.4%). Subject to completion of the technology commercialisation project, regulatory approvals and prevailing market conditions, it is anticipated the PLEF will commence commercial operations to produce natural grade uranium from the late 2020's.

Tails enrichment at the PLEF would continue over several decades, resulting in the production of natural grade uranium which could then be sold into the global uranium market at a production rate equivalent to a uranium mine producing an annual output of around 5 million pounds of uranium oxide, which would rank in the top ten of today's uranium mines by production volume. Preliminary analysis by Silex of the PLEF project indicates it could rank as a 'Tier 1' uranium resource based on estimates of the long-life and low cost of production.

iii) Nuclear Power Outlook:

Over the past year, the signs of recovery in the markets for nuclear fuel have strengthened, including for uranium, conversion and enrichment. While the short-term demand for uranium remains soft, market prices for nuclear fuel continue to trend upwards, supporting our view that the long-term value proposition for clean nuclear energy and the related nuclear fuel markets is positive with significant growth forecasted in nuclear power generation around the world.

Zero-Spin Silicon for Quantum Computing Processor Chips

In December 2019 Silex launched a new R&D project in conjunction with project partners Silicon Quantum Computing Pty Ltd (SQC) and UNSW Sydney (UNSW), to develop a process for the commercial production of high-purity 'Zero-Spin Silicon' (ZS-Si) using a variant of the SILEX laser isotope separation (LIS) technology. ZS-Si is a unique form of isotopically enriched silicon required for the fabrication of next generation processor chips which will power silicon-based quantum computers.

In January 2021, Silex announced the successful completion of another key milestone in the project involving the technical validation of a process to commercially synthesize the feed material required for the ZS-Si production process. This is an important milestone in the second stage of the project which involves the demonstration of scaled-up prototype equipment for ZS-Si production.

Silex's LIS technology has the potential to efficiently produce ZS-Si and provide a secure supply for project partner and initial customer SQC, in support of its world-leading efforts to commercialise silicon-based quantum computing technology in conjunction with UNSW.

Quantum computers are expected to be thousands of times more powerful than the most advanced of today's conventional computers, opening new frontiers and opportunities in many industries, including medicine, artificial intelligence, cybersecurity and global financial systems. Many countries around the world are investing heavily in the development of quantum computing technology, with governments and key corporates (such as Intel, IBM, Google, Microsoft and others) vying for leadership in this emerging strategic industry.

The three-year ZS-Si project, which was awarded a \$3 million Federal Government funding grant from the CRC-P in February 2020, is due for completion at the end of CY2022. The first stage of the three-stage project was successfully completed in June 2020, establishing 'proof-of-concept' for the silicon LIS process. The second stage of the project involves the design, construction and operation of scaled-up prototype equipment with the objective of verifying the scalability and preliminary economics of the LIS technology. The third stage will culminate with the planned production of initial commercial quantities of ZS-Si from a SILEX pilot production facility, leading to a full economic assessment of the ZS-Si business case. The first commercial quantities of ZS-Si produced from the pilot facility will be purchased by SQC under an Offtake Agreement executed in December 2019. Silex will retain ownership of the ZS-Si production technology and related Intellectual Property developed through the project.

Current methods for production of enriched silicon are very limited and costly (even for lower purity material) with only a few kilograms produced annually, mostly using gas centrifuge technology. Should the ZS-Si project be successful, it would enable Australia to establish itself as a world-leader in ZS-Si production, potentially creating a new value-added export market. As the ZS-Si project progresses, Silex will engage with other potential customers, including several of the world's largest computer chip manufacturers who are also developing quantum computing technology.

cREO™ Semiconductor Technology

Silex subsidiary Translucent's cREO™ technology was purchased by UK-based IQE in 2018. IQE is the global leader in the design and manufacture of advanced semiconductor wafer products used in many of today's advanced semiconductor devices and is a key player in the emerging 5G wireless technologies market.

During the half-year, IQE announced the successful development of a new high frequency (RF) filter product (called IQepiMo™) which is built on the cREO™ technology platform. Following several months of customer and partner device trials, IQE announced on 17 February 2021 the achievement of a key demonstration milestone for IQepiMo™. IQE announced that data from the device trials indicated significant improvement in the performance of its 5G filter device, compared to incumbent technology, when tested at the top end of the frequency range used in current 5G applications. This represents encouraging progress towards managing high frequency signals in 5G devices such as mobile handsets.

Financial Overview

As at 31 December 2020, the Company's balance sheet had total assets of \$29.1m and net assets of \$27.3m, which included \$15.1m in cash and term deposits, and IQE shares of \$12.2m.

Authorised for release by the Silex Board of Directors.

Further information on the Company's activities can be found on the Silex website: www.silex.com.au or by contacting:

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Forward Looking Statements and Risk Factors:

About Silex Systems Limited (ASX: SLX) (OTCQX: SILXY)

Silex Systems Limited ABN 69 003 372 067 (Silex) is a research and development company whose primary asset is the SILEX laser enrichment technology, originally developed at the Company's technology facility in Sydney, Australia.

The SILEX technology has been under development for uranium enrichment jointly with US-based exclusive licensee Global Laser Enrichment LLC (GLE) for a number of years. Success of the SILEX uranium enrichment technology and the proposed Paducah commercial project remain subject to a number of factors including the satisfactory completion of the engineering scale-up program and uranium market conditions and therefore remains subject to associated risks.

Silex is also in the early stages of pursuing additional commercial applications of the SILEX technology, including the production of 'Zero-Spin Silicon' for the emerging technology of silicon-based quantum computing. The 'Zero-Spin Silicon' project remains dependent on the outcomes of the project and the viability of silicon quantum computing and is therefore at risk. The future of the SILEX technology is therefore uncertain and any plans for commercial deployment are speculative.

Additionally, Silex has an interest in a unique semiconductor technology known as 'cREO™' through its ownership of subsidiary Translucent Inc. The cREO™ technology developed by Translucent has been acquired by IQE Plc based in the UK. IQE is progressing the cREO™ technology towards commercial deployment for 5G mobile handset filter applications. The outcome of IQE's commercialisation program is also uncertain and remains subject to various technology and market risks.

Forward Looking Statements

The commercial potential of these technologies is currently unknown. Accordingly, no guarantees as to the future performance of these technologies can be made. The nature of the statements in this Announcement regarding the future of the SILEX technology, the cREO™ technology and any associated commercial prospects are forward-looking and are subject to a number of variables, including but not limited to, unknown risks, contingencies and assumptions which may be beyond the control of Silex, its directors and management. You should not place reliance on any forward-looking statements as actual results could be materially different from those expressed or implied by such forward looking statements as a result of various risk factors. Further, the forward-looking statements contained in this Announcement involve subjective judgement and analysis and are subject to change due to management's analysis of Silex's business, changes in industry patterns, and any new or unforeseen circumstances. The Company's management believes that there are reasonable grounds to make such statements as at the date of this Announcement. Silex does not intend, and is not obligated, to update the forward-looking statements except to the extent required by law or the ASX Listing Rules.

Risk Factors

Risk factors that could affect future results and commercial prospects of Silex include, but are not limited to: ongoing economic uncertainty including the impacts of the COVID-19 pandemic; the results of the SILEX uranium enrichment engineering development program; the market demand for natural uranium and enriched uranium; the outcome of the project for the production of 'Zero-Spin Silicon' for the emerging technology of silicon-based quantum computing; the potential development of, or competition from alternative technologies; the potential for third party claims against the Company's ownership of Intellectual Property; the potential impact of prevailing laws or government regulations or policies in the USA, Australia or elsewhere; results from IQE's commercialisation program and the market demand for cREO™ products; and the outcomes of various strategies and projects undertaken by the Company.