Half Year Operational Update

22 February 2024

Silex Systems Limited | ABN 69 003 372 067
LHSTC, New Illawarra Road, Lucas Heights NSW 2234
Telephone: +61 2 9704 8888 | Facsimile: +61 2 9704 8851 | Website: www.silex.com.au

Recent Highlights and Progress

- The Company continues to make significant progress in the execution of its technology commercialisation projects, with a key focus on supporting the acceleration of the commercialisation program for the SILEX laser-based uranium enrichment technology;
- Global Laser Enrichment LLC (GLE) – the jointly-controlled venture between Silex and Cameco Corporation, is uniquely positioned to address the 'Triple Opportunity' that has emerged in the global nuclear fuel supply chain, being driven by global climate change and geopolitical issues:
    1) Production of natural grade uranium in the form of converted UF_6;
    2) Production of low enriched uranium (LEU) for existing nuclear power plants; and
    3) Production of high assay LEU (HALEU) for next-generation advanced reactors, including SMRs[1];
- With the aim of leveraging this Triple Opportunity, GLE's owners agreed to a plan and budget for CY2024 that continues to support acceleration of activities in the technology demonstration project for the SILEX uranium enrichment technology;
- Acceleration of GLE's commercialisation program preserves the option of commencing commercial operations at the planned Paducah Laser Enrichment Facility (PLEF) as early as 2028;
- Silex and GLE continue to finalise construction, integration and commissioning of full-scale laser, separator and gas handling equipment being deployed in GLE's Test Loop pilot facility in Wilmington, NC, with the aim of completing technology demonstration (TRL-6)[2] of the SILEX technology in 2024;
- Successful technology demonstration includes completion of a favourable independent assessment of the TRL-6 pilot demonstration project and submission of a report to Silex and Cameco;
- Work is progressing on other key commercialisation activities, including completion of GLE's new facility in Wilmington, providing significant additional space for growth of the GLE team and the construction of in-house manufacturing capability to support GLE's engineering operations, Paducah, KY site acquisition activities, and preparations for NRC commercial plant licensing;
- GLE is currently evaluating the HALEU Enrichment Acquisition Request for Proposal issued by the US Department of Energy in January 2024;
- In August 2023, Silex announced, in collaboration with Silicon Quantum Computing (SQC) and UNSW Sydney (UNSW), the award of $5.1m in funding from the Federal Government's Defence Trailblazer Program for the design and construction of the first full-scale Quantum Silicon commercial production plant;

[1] Small Modular Reactors (SMRs) produce up to 300MWe power

[2] Technology Readiness Level 6 (TRL-6), as defined by DOE Technology Readiness Assessment Guide (G 413.3-4A)

- In January 2024, Silex and SQC agreed to expanded commercial arrangements for Quantum Silicon production, including an increase to SQC's Quantum Silicon product offtake commitment to $2.25m and an agreement for SQC to acquire up to 493,827 fully paid ordinary shares in the capital of Silex for $2m;
- In December 2023, the Company announced successful completion of a proof-of-concept project for its medical isotope separation technology (MIST Project), identifying a process to produce enriched Ytterbium (Yb-176), which is the precursor isotope required for Lutetium (Lu-177), a breakthrough development for the diagnosis and treatment of aggressive metastatic cancers;
- The Company held cash and cash equivalents at 31 December 2023 of ~$126.7m, with no corporate debt.

Our Strategy

We are committed to the commercialisation of our innovative SILEX laser enrichment technology across multiple markets, with a priority focus on contributing to the reliable and sustainable supply of nuclear fuel for the world's clean energy needs and the production of quantum materials for next generation quantum computing technology.

The execution of our strategy is being pursued through the following activities:

- Pursuit of the 'Triple Opportunity' that has emerged in the global nuclear fuel supply chain for the SILEX uranium enrichment technology through our ownership of a 51% interest in exclusive uranium technology licensee, GLE;
- Developing the SILEX technology for the production of Quantum Silicon products based on Zero-Spin Silicon (ZS-Si) – a key enabling material required for silicon quantum computer chip fabrication; and
- Further diversifying the business case for the SILEX technology through potential production of medical isotopes, initially focusing on enrichment of Ytterbium-176 – a key enabling material for a breakthrough nuclear medicine cancer treatment.

The ‘Triple Opportunity’ for GLE and SILEX Technology

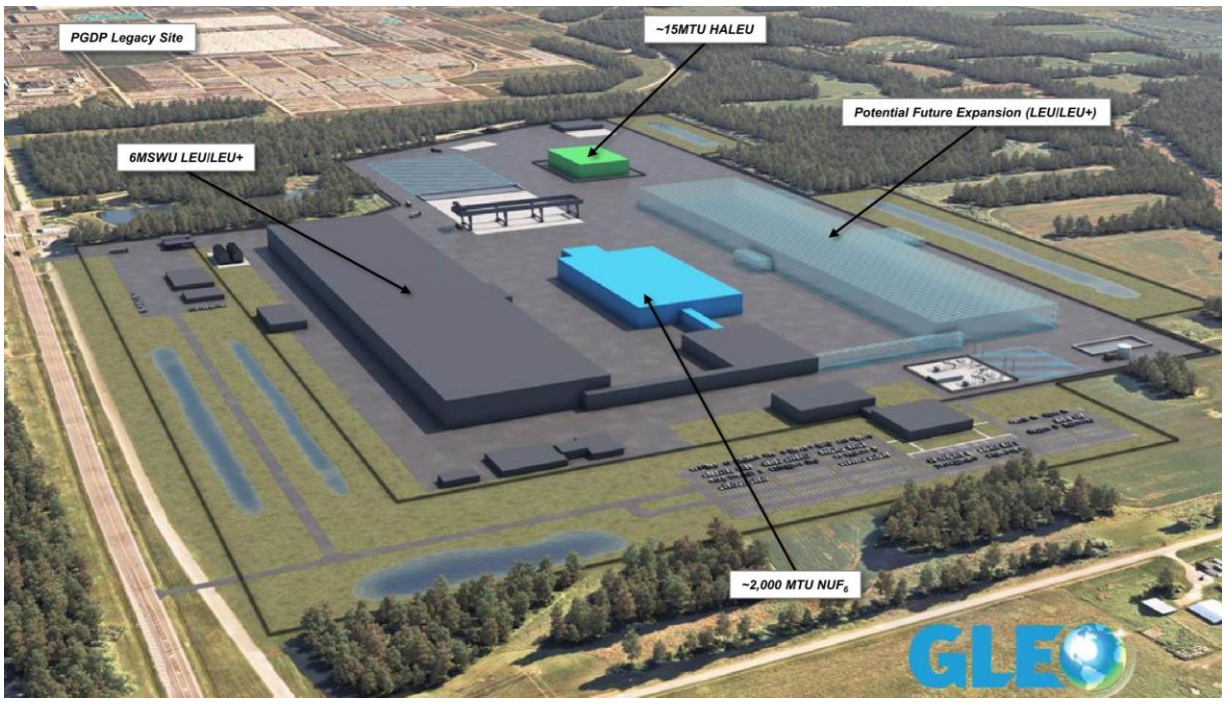
The SILEX technology is the only third-generation laser-based uranium enrichment technology at the advanced stage of pilot-scale demonstration today. GLE could become a major contributor to nuclear fuel production for the world’s current and future nuclear reactor fleet with a ‘Triple Opportunity’ to produce three different grades of nuclear fuel – all via the deployment of SILEX laser-based uranium enrichment technology at the proposed PLEF Multi-purpose Production Plant:

1) **PLEF UF_6 Production:** Production of natural grade UF_6 (with U-235 assay of 0.7%) via processing of depleted tails (U-235 assays of 0.25% to 0.5%) with the SILEX technology, which would come in the form of already converted uranium, thereby also helping to alleviate UF_6 conversion supply pressure;

2) **PLEF LEU Production:** Production of LEU (U-235 assays up to 5%) and LEU+ (assays from 5% to 10%) from natural grade UF_6 with additional SILEX enrichment capacity – to supply fuel for existing reactors;

3) **PLEF HALEU Production:** Production of HALEU (U-235 assays up to ~20%) via enrichment with the SILEX technology to supply fuel for next generation advanced reactors, including SMRs.

PLEF Multi-purpose Production Plant (conceptual)



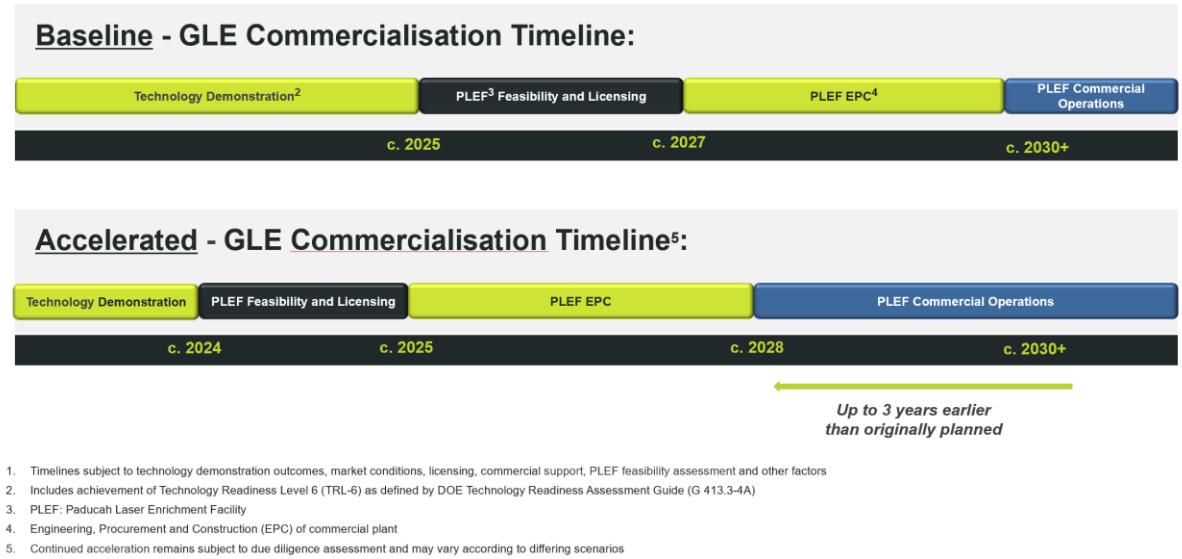
Source: GLE, Multi-purpose PLEF (conceptual)

The PLEF project opportunities are underpinned by the 2016 agreement between GLE and the DOE, which, through the acquisition of over 200,000 metric tonnes of depleted tails owned by the DOE, provides the feedstock for the production of natural grade uranium hexafluoride (UF_6) over three decades. The output of the proposed plant would be sold into the global uranium market at an expected production rate equivalent to a uranium mine with an annual output of up to 5 million pounds of uranium oxide, which would rank in the top 10 of today's uranium mines by production volume. Preliminary analysis by Silex of PLEF UF_6 production indicates it could rank equal to a 'Tier 1' uranium project based on current estimates of longevity and the low cost of production.

Subject to the successful completion of the pilot demonstration project, industry and government support, suitable market conditions, a feasibility assessment for the PLEF and other factors, the SILEX technology could enable GLE to develop the planned PLEF project and become a key supplier of natural UF_6, LEU and HALEU.

Commercialisation Timeline[1]:

The accelerated timeline currently anticipates completion of the technology demonstration project during 2024 (including the completion of an independent assessment and report to GLE's owners), which preserves the option of commencing commercial operations as early as 2028. The diagram below shows the original baseline and accelerated timelines for the commercialisation program activities:



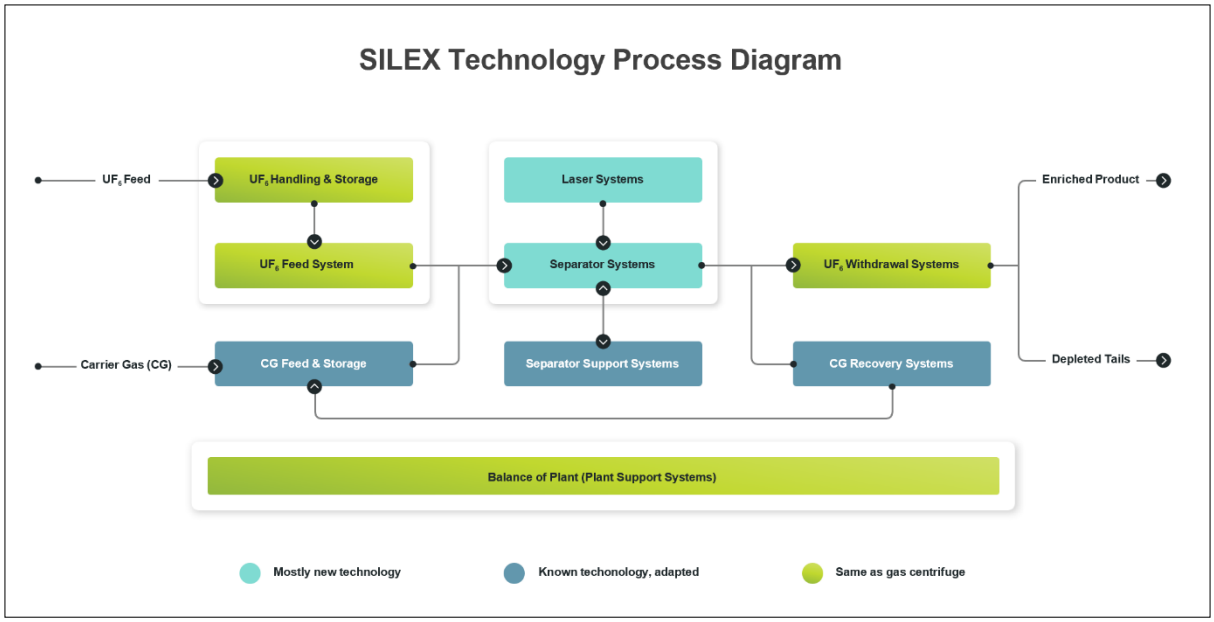
1. Timelines subject to technology demonstration outcomes, market conditions, licensing, commercial support, PLEF feasibility assessment and other factors
2. Includes achievement of Technology Readiness Level 6 (TRL-6) as defined by DOE Technology Readiness Assessment Guide (G 413.3-4A)
3. PLEF: Paducah Laser Enrichment Facility
4. Engineering, Procurement and Construction (EPC) of commercial plant
5. Continued acceleration remains subject to due diligence assessment and may vary according to differing scenarios

GLE remains focused on the completion of the technology demonstration project, the continued pursuit of government and industry support and funding opportunities, site acquisition activities related to the planned PLEF, preparation of the PLEF NRC license application, completion and commissioning of GLE's new facility in Wilmington, NC, and activities to support manufacturing readiness and supply chain development. These activities provide the potential for GLE to deploy the SILEX uranium enrichment technology in a timely manner to help address the forecast supply gap in nuclear fuel markets in the coming years.

Technology Pilot Demonstration Project Update:

The primary focus of the technology demonstration project being conducted jointly by Silex and GLE is the construction and testing of pilot-scale laser systems, separator systems, and associated gas handling equipment. Construction of sub-systems is almost complete, with the current focus largely on integration and commissioning of pilot facility equipment.

At the core of the SILEX technology are the laser systems and separator systems that form the vast majority of the classified intellectual property licensed to GLE, as depicted below:



Laser Systems: The two full-scale pilot laser system modules, designed and built at Silex's Lucas Heights facility, have been installed and commissioned in GLE's Test Loop facility in Wilmington and are being prepared for TRL-6 enrichment testing.

Separator and Gas Handling Systems: Construction of the enrichment separator and gas handling systems required for the pilot demonstration program is nearing completion, with integration of these systems well advanced. An Operational Readiness Review, to be conducted by the NRC, is currently scheduled for late February, and, if all is in order, UF_6 feed gas will be able to be loaded into the Test Loop in preparation for the commencement of enrichment testing.

Industry and Government Support:

GLE's business strategy includes active engagement with industry and government organisations, aimed at developing areas of collaboration and support to expedite and de-risk GLE's commercialisation program for the SILEX uranium enrichment technology.

US Nuclear Utility Support

GLE continues to receive support from leading US nuclear generators, with Letters of Intent (LOIs) in place between GLE and Constellation Energy Generation, Duke Energy, and Dominion Energy Services Inc. The LOIs reflect the broader support of the US nuclear industry to establish greater diversification in the supply of nuclear fuel.

GLE is deeply engaged in the US nuclear industry and proactively explores opportunities to partner with stakeholders to obtain support for its commercialisation strategy and the planned PLEF Multi-purpose Production Plant.

US Government Initiatives

In response to the continuing geopolitical developments, energy security concerns, and the need for carbon-free electricity generation, the US Congress has moved to enact clear bipartisan legislation to support the establishment of new nuclear fuel production capacity in the US, as well as to reassert America's global nuclear industry leadership.

GLE is currently evaluating the HALEU Enrichment Acquisition Request for Proposal, issued by the US Department of Energy in January 2024 as part of the HALEU Availability Program. Additionally, GLE is awaiting details regarding a potential US$100 million funding opportunity announcement to support novel fuel technology, which is expected to be published sometime this year.

During December 2023, there were also several key US legislative developments:

- The US House of Representatives passed the *Prohibiting Russian Uranium Imports Act*, which proposes to prohibit the import of Russian uranium products into the US. The bill is currently awaiting passage through the US Senate;
- The *Nuclear Fuel Security Act (NFSA)*, which authorises significant funding for the US nuclear industry, was signed into law by President Biden as part of the *National Defense Authorization Act* for Fiscal Year 2024. The NFSA directs the DOE to strengthen the US nuclear fuel supply chain and create a Nuclear Fuel Security Program which would include new US LEU and HALEU production capacity. Funding for the NFSA is pending for appropriation; and
- A supplemental funding bill which is currently before Congress, includes a provision of US$2.7bn for a new American Energy Independence Fund, which would support acquisition of non-Russian LEU and HALEU, including through establishing new US production capacity.

GLE continues to explore opportunities to participate in the various US government programs as they unfold.

Fuel Market Update and Nuclear Power Outlook

Nuclear Power Outlook:

Many countries' policies are shifting in favour of nuclear energy, with recognition of the role that nuclear power can play in the supply of carbon-free, base load electricity. Nuclear energy is anticipated to play a much greater role in the energy mix as countries around the world adopt energy policies to meet net-zero emissions targets. Importantly, 25 countries have now signed on to the declaration at the United Nations 28th annual Conference of Parties (COP28) in Dubai, in December 2023, to triple nuclear energy capacity by 2050.

According to the World Nuclear Association (WNA), there are currently 436 operable nuclear reactors globally, with significant growth in nuclear power expected from the additional 62 reactors under construction and with hundreds more planned. Notwithstanding bold nuclear construction programs in China, India and the Middle East, the US remains the world's largest producer of nuclear power with 93 operable reactors. The US currently accounts for more than 30% of worldwide nuclear generation of electricity and is expected to remain the largest nuclear power generator for years to come. Growth in demand for nuclear power is also being evidenced in life extensions for existing reactors. In the US, nearly all of the operable reactors have been granted operating licence extensions from 40 to 60 years, with some potentially planning to operate for 80 years or more.

In addition, there is growing interest and international investment being made into the development of next generation advanced reactor technologies, including SMRs. Many advanced reactors are being designed to operate with HALEU fuel, while others will use conventional LEU fuel or, in some cases, LEU+ fuel.

With significant growth forecast in nuclear power generation and recent policy developments, we see valuable commercial opportunities emerging for the SILEX uranium enrichment technology and GLE in the global nuclear industry.

Fuel Market Update:

Given ongoing geopolitical issues, energy security concerns, and the need for carbon-free, base load electricity to address climate change, we expect to see nuclear power form a more meaningful portion of the energy mix of many countries around the world. There also remains the potential for ongoing disruptions in the Western nuclear fuel supply chain precipitated by the Russian invasion of Ukraine, which may be exacerbated should the US bill – *Prohibiting Russian Uranium Imports Act*, be passed by the US Congress, with sanctions imposed on Russian-sourced uranium and enriched nuclear fuel.

With Russia currently providing the global nuclear industry with ~14% of its uranium requirements, ~27% of its conversion services and ~45% of enrichment capacity, Western governments and utilities are seeking to establish secure nuclear fuel production capabilities free of Russian (and Chinese) influence. As a consequence, the global nuclear fuel markets for uranium, conversion services, and uranium enrichment services have continued to tighten, with price increases being witnessed across all components of the fuel cycle. From the Russian invasion of Ukraine in February 2022 to January 2024, the term markets for uranium, conversion and enrichment have increased by ~70%, ~90% and ~135% respectively.

Quantum Silicon for Quantum Computing Processor Chips

The Quantum Silicon Production Project was announced on 17 August 2023, and is being undertaken in conjunction with partners SQC and UNSW. The Project's objective is to establish the first Quantum Silicon Production Plant and to develop the skills and capability to manufacture commercial 'Quantum Silicon' (Q-Si) products, produced from ZS-Si Halosilane, in multiple product forms at commercial scale.

In January 2024, Silex announced an expansion of the commercial arrangements with SQC in support of the Q-Si Production Project. This included an amendment to the 2019 Offtake Agreement increasing SQC's product offtake commitment for Q-Si products from $0.9m to $2.25m. A Subscription Agreement was also executed with SQC, which will result in SQC acquiring up to 493,827 fully paid ordinary shares in Silex for $2m. The subscription shares are anticipated to be issued on 29 February 2024. The 3.5-year Project is also supported by $5.1m in funding from the Defence Trailblazer for Concept to Sovereign Capability Program, a strategic partnership between The University of Adelaide and UNSW, via the Department of Education through the Trailblazer Universities Program.

If successful, the Project will establish an end-to-end manufacturing facility at the Company's Lucas Heights facility. It is anticipated that the Plant will produce up to 20kg annually of ZS-Si, which will be converted to the Q-Si product forms required by potential customers in the global silicon-based quantum computing industry:

1) **Quantum Silane gas** – used in chemical vapour deposition (CVD) based processes utilised for quantum chip fabrication
2) **Quantum Silicon solid** – used in molecular beam epitaxy (MBE) based processes utilised for quantum chip fabrication.

A key benefit of the SILEX laser isotope separation technology is its modular nature, allowing for the Production Plant to be scaled-up with additional modules, based on market demand and other factors. Silex also continues to engage with silicon quantum computing developers to develop a customer base for global sales of Q-Si. Silex will retain ownership of the Q-Si production technology and related IP developed through the Project.

Quantum Computing and Q-Si Outlook:

Australia is at the forefront of global efforts to develop and commercialise quantum computing and associated quantum technologies, which have the potential to underpin transformational technological advancements in many fields, including artificial intelligence, robotics, advanced communications, and sensing, and in complex global industries, such as defence and aerospace, finance, biomedical science, chemicals, and logistics. UNSW and its commercial spin out, SQC, are world leaders in developing silicon-based quantum computing technology, which, if successful, will allow Australia to establish sovereign capability in a key strategic technology that will advance the country's future defence, national security, and economic competitiveness in the emerging quantum technology era.

Silicon-based quantum computing technology is reliant on the production of enriched silicon. Current methods for production of enriched silicon are limited and costly, with only small quantities produced annually, mostly using gas centrifuge technology in Russia. Due to the Russian-Ukrainian conflict, this fragile supply chain has been disrupted, threatening the viability of silicon quantum computing.

Medical Isotope Separation Technology (MIST) Project

In February 2023, the Company commenced the MIST Project, initially focused on identifying a process to economically produce enriched Ytterbium-176 (Yb-176), which is the precursor isotope required for Lutetium-177 (Lu-177) production. The Lu-177 radioisotope has enabled a breakthrough development, called targeted beta therapy, for the diagnosis and treatment of aggressive metastatic cancers and is currently facing supply disruption due to the supply of enriched Yb-176 previously being almost entirely sourced from Russia.

In December 2023, Stage 1 of the Project – proof-of-concept – was successfully completed. Proof-of-concept was achieved with a Silex custom-built test system in our Lucas Heights facility. The Stage 1 results involved the demonstration of an isotopic enrichment effect for the Yb-176 isotope, and clear the way to proceed to Stage 2, which aims to validate the process at prototype scale, including the first level of scale-up.

The proof-of-concept results are preliminary by nature and follow-up testing will continue through the first part of 2024 to build accuracy in test measurements and improve initial process efficiency. The focus for the remainder of CY2024 will then turn to the design and construction of a prototype demonstration system, followed by enrichment testing.

The MIST Project has the potential to provide a technology platform for application to other high value medical isotopes. Assuming viable economic enrichment of Yb-176 can be demonstrated in the MIST Project, the potential to partner with the global pharmaceutical industry will be explored. The technology and all associated IP is wholly owned by Silex.

Financial Overview

As at 31 December 2023, the Company's balance sheet had net assets of ~$139.9m, which included ~$126.7m in cash and term deposits. The Company has no corporate debt.

Workplace Health and Safety

The health, safety and well-being of our people is paramount. We have a constant focus on the health, safety and well-being of our team members across all sites and we reported no lost time injuries or reportable incidents on our project sites during the last year.

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:

Michael Goldsworthy
CEO/Managing Director
T +61 2 9704 8888
E investor.relations@silex.com.au

Julie Russell
CFO/Company Secretary
T +61 2 9704 8888
E investor.relations@silex.com.au

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 technology commercialisation 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 development program and the proposed Paducah commercial project remain subject to a number of factors including the satisfactory completion of the engineering scale-up program and nuclear fuel market conditions and therefore remains subject to associated risks.

Silex is also at various stages of development of additional commercial applications of the SILEX technology, including the production of 'Zero-Spin Silicon' for the emerging technology of silicon-based quantum computing. The 'Quantum Silicon' project remains dependent on the outcomes of the project and the viability of silicon quantum computing and is therefore subject to various risks. Silex is also conducting research activities in its Medical Isotope Separation Technology (MIST) Project, which is early-stage and subject to numerous risks. The commercial future of the SILEX technology in application to uranium, silicon, medical and other isotopes 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 100% ownership of subsidiary Translucent Inc. The cREO® technology developed by Translucent has been acquired by IQE Plc based in the UK. IQE has paused the development of the cREO® technology until a commercial opportunity arises. The future of IQE's development program for cREO® is very 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 as applied to uranium enrichment, Zero-Spin Silicon production, medical and other isotope separation projects, 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 trends, government policies 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 and social uncertainty, including in relation to the impacts of the COVID-19 pandemic; geopolitical risks, in particular relating to Russia's invasion of Ukraine and tensions between China and Taiwan which may impact global supply chains, among other risks; uncertainties related to the effects of climate change and mitigation efforts; the results of the GLE/SILEX uranium enrichment pilot demonstration 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 outcome of the MIST program; 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; whether IQE's commercialisation program for cREO® is resumed, the results from the program and the market opportunities for cREO® products; actions taken by the Company's commercialisation partners and other stakeholders that could adversely affect the technology development programs and commercialisation strategies; and the outcomes of various strategies and projects undertaken by the Company.