



# Silex Systems Limited Operational Update

22 February 2016

(ASX: SLX) (OTCQX: SILXY)

# Forward Looking Statements



Silex Systems is a research and development Company whose primary asset is the SILEX laser enrichment technology, originally developed in the Company's technology facility in Sydney, Australia. The SILEX technology, licensed exclusively to GE-Hitachi Global Laser Enrichment LLC (GLE) in the USA, is currently in the engineering development stage and plans for commercial deployment remain distant and high risk. The commercial potential of this technology is therefore unknown. Accordingly, the statements in this announcement regarding the future of the SILEX technology and any commercial prospects are forward looking and actual results could be materially different from those expressed or implied by such forward looking statements as a result of various risk factors.

Some risk factors that could affect future results and commercial prospects include, but are not limited to: results from the SILEX uranium enrichment engineering development program being conducted jointly by the Company and GLE; the demand for natural uranium and enriched uranium; the time taken to develop the SILEX technology; the potential development of competing technologies; the potential for third party claims against the Company's ownership of Intellectual Property; the potential impact of government regulations or policies in the USA, Australia or elsewhere; and the outcomes of various commercialisation strategies undertaken by the Company and/or its Licensee GLE.

The forward looking statements included in this presentation may involve subjective judgment and analysis and are subject to significant business, economic and competitive uncertainties, risks and contingencies, many of which are outside the control of, and are unknown to Silex. Given these uncertainties, you are cautioned to not place undue reliance on such forward looking statements.

# The Company

Silex Systems is an advanced technology company focused on the development and commercialisation of its innovative and potentially disruptive laser-based 'SILEX' uranium enrichment technology

# Key Activities and Status of Silex



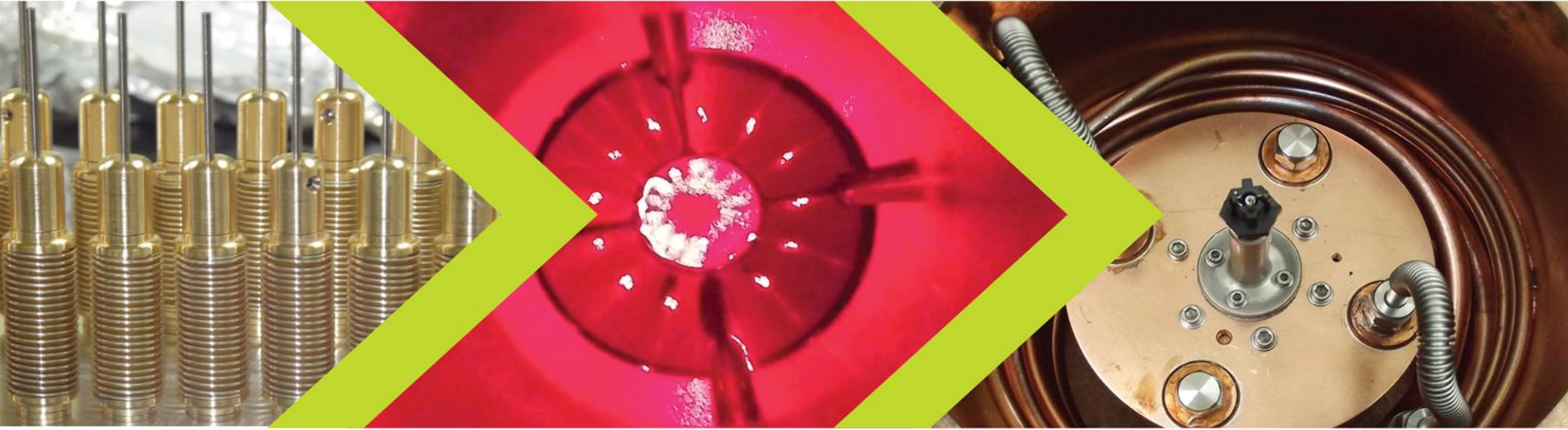
- Company restructure announced in June 2014 now complete
- Key decision was to return the focus of the company to the development and commercialisation of our foundation technology, the SILEX laser-based uranium enrichment technology
- The corporate restructure has resulted in the following outcomes during 2015:
  - i) Solar Systems** – Mildura and Bridgewater properties sold for \$1.7 million, assets sales net \$0.6 million to date, negotiations with third parties continue regarding the sale of IP and remaining assets;
  - ii) Translucent** – exclusive License and Assignment Agreement signed with UK-based IQE Plc in September 2015. Technology transfer to IQE advancing rapidly. (Refer to following slide); and
  - iii) Corporate** – 50% reduction in headcount, 50% reduction of leased space for our corporate office.
- Silex is in a sound financial position - current cash reserves approximately \$55 million or \$0.32 per share (at time of writing our share price was ~\$0.32)
- Focussing on the commercialisation of the SILEX Technology is considered the best path forward to create value for shareholders with nuclear fuel markets returning to positive growth

# The Translucent – IQE Agreement

- Translucent's innovative 'Rare Earth Oxide' (REO™) technology has potential application to high volume semiconductor sectors such as power electronics and wireless communications chips
- September 2015 - Translucent signed an exclusive license agreement with IQE - the world's leading semiconductor epiwafer supplier
- The agreement provides a 30-month license (with payment of US\$1.4 million due 15 March) for IQE to develop and commercialise initial products incorporating the REO™ materials
- IQE can elect to purchase the REO™ technology (with payment of a further US\$5 million) within the 30-month license period
- A royalty of up to 6% of IQE's revenues derived from the technology is payable to Translucent – potentially significant in high volume semiconductor sectors such as wireless chips and power devices







# SILEX Laser Uranium Enrichment Technology



Silex

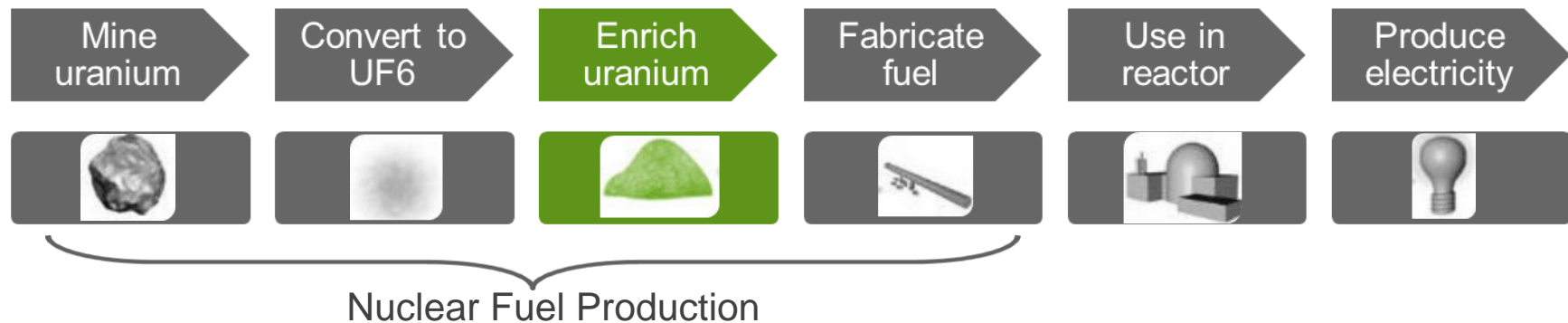
# SILEX Technology Development Status



- GE-Hitachi Global Laser Enrichment (GLE) and Silex continue to advance the development and commercialisation of the SILEX Technology at a measured pace
- The team in Wilmington, North Carolina continues to make significant progress with process and engineering improvements, potentially improving process efficiency and economics
- The Silex team in Lucas Heights, Sydney is also making significant progress with development and demonstration tests for a prototype plant-scale laser system
- GLE continues to pursue the tails reprocessing plant opportunity in Paducah, Kentucky – an outcome to the negotiations with the US Department of Energy expected in the next few months
- Silex is increasing involvement in commercialisation and business development activities, currently assessing with other stakeholders options to increase project funding

# Advantages of the SILEX Technology

- Enrichment is the most difficult and costly step in making nuclear fuel for power reactors – around 35% to 40% of total fuel cost based on current market prices
- All enrichment today performed by gas centrifuge technology developed initially in the 1940's
- SILEX is a breakthrough in efficiency – most cost effective enrichment method
- Anticipated to have the lowest capital costs of all enrichment technologies
- The only 3rd generation laser-based enrichment technology being commercially deployed
- Classified technology - protected by the strictest security measures





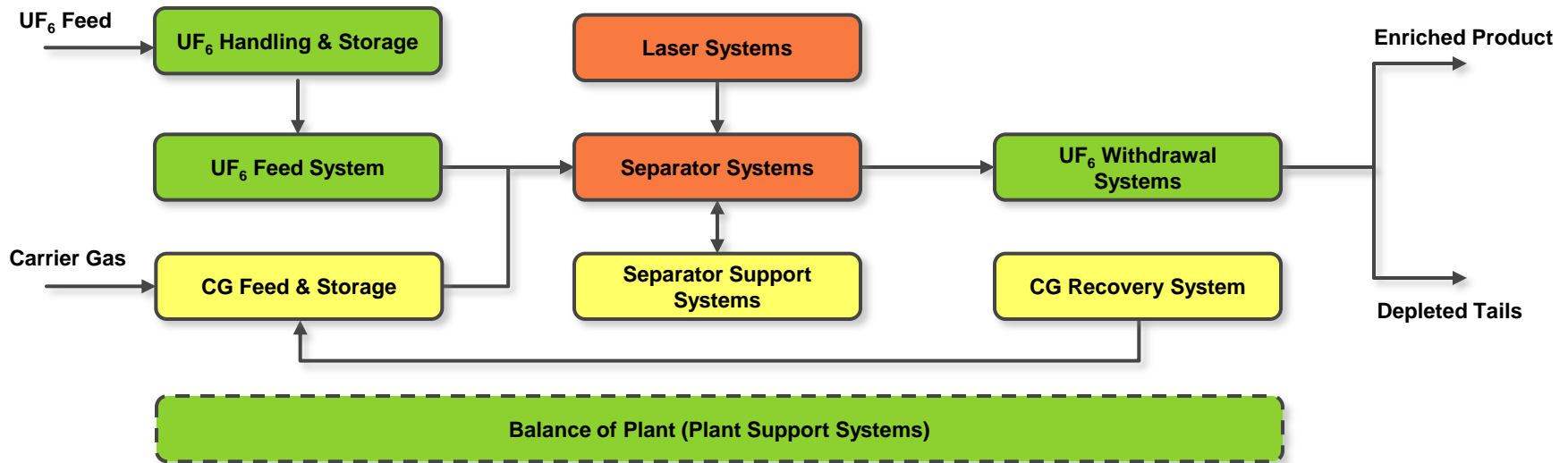
# Comparison of Enrichment Technologies




	Gas Diffusion	Gas Centrifuge	SILEX Laser
<b>Developed</b>	1940's	1940's	2000's
<b>Process</b>	Mechanical (high pressure diffusion)	Mechanical (centrifugal force)	Laser Excitation (molecular or atomic precision)
<b>Enrichment Efficiency</b>	1.004	1.3 to 1.5	2 to 20 <sup>(1)</sup>
<b>Cost Comparison</b>	Cost prohibitive	Capital intensive	Potentially attractive
<b>% of Existing Market <sup>(2)</sup></b>	0%	86%	0%
<b>Status</b>	Obsolete 1 <sup>st</sup> Generation	Operational 2 <sup>nd</sup> Generation	Under development 3 <sup>rd</sup> Generation

(1) This number is Classified – the range indicated is dictated by the technology Classification Guide

(2) Approximately 14% supplied from GDP inventory, RepU/MOX and other sources (UxC Enrichment Market Outlook Q3, 2015)

# SILEX Process Flow Diagram

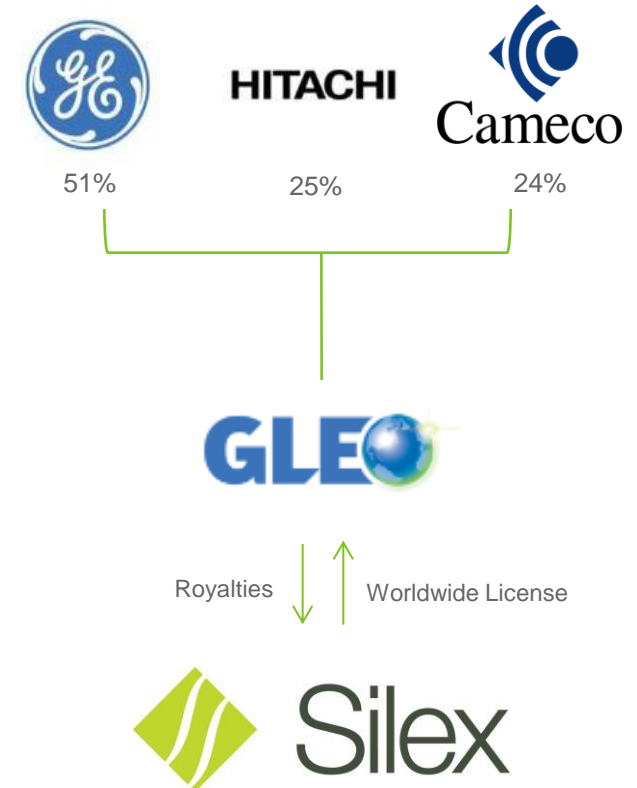


-  Mostly new technology
-  Known technology adapted
-  Same as gas centrifuge

# Commercialisation and License Agreement

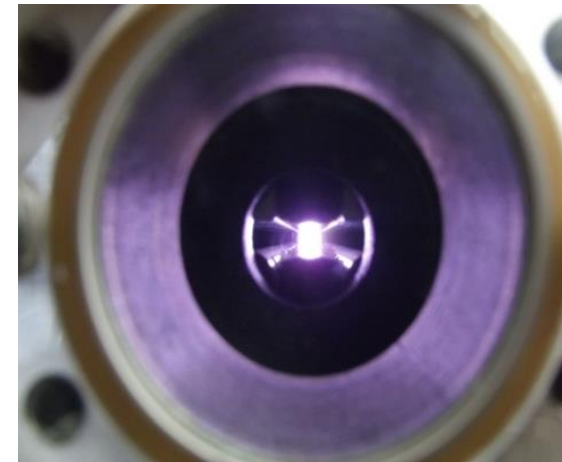
## Perpetual Royalty Agreement with GLE

- Exclusive worldwide commercialisation and license agreement for the SILEX Technology – signed in 2006
- Phase I milestone completed in May 2013 – triggered US\$15 million payment to Silex
- Next milestone payment triggered by start of construction of initial commercial plant: US\$5 million
- Final milestone payment – US Nuclear Regulatory Commission (NRC) verification of construction compliance of initial commercial plant: US\$15 million
- **Perpetual royalty range of 7% to 12% of future GLE revenues from commercial operations**  
(based on calculation of cost per unit production installed)



# GLE's Phased Approach to Commercialisation

- Phase I – ‘Technology Validation’ successfully completed in 2013
- Phase II – ‘Economic Validation’ is the focus for the next few years, including demonstration of full scale commercial production equipment
- Plans include possible enrichment plant of up to 6MSWU in Wilmington, NC (US NRC Construction & Operating License received in 2012)
- Additional opportunity for a commercial plant in Paducah, KY – subject to negotiations with US Department of Energy (refer slide 13)
- Commercial plant decisions by GLE are dependent on market conditions



Phase	Objectives	Status
Phase I	Test Loop technology demonstration and NRC commercial plant license approval	Completed
Phase II	Economic and engineering validation for the initial commercial production module	Commenced in 2012
Phase III	Construction of the first full-scale commercial production facility	To be confirmed

# Paducah Enrichment Plant Opportunity

- Closure of last 1<sup>st</sup> generation gaseous diffusion plant in May 2013 – led to US Department of Energy (DOE) bid process for future operations
- GLE submitted a proposal to the DOE in August 2013 involving construction of a SILEX-based laser enrichment plant at the Paducah site
- DOE selected the GLE proposal exclusively in November 2013 for possible future commercial operations at Paducah
- Enrichment of DOE tails stockpiles potentially equivalent to one of the largest uranium mines in the world operating for around 40 years
- Plans will ultimately depend on a recovery in uranium market pricing from currently depressed levels
- Outcome of negotiations between the GLE and DOE expected in the next few months



Paducah Enrichment Plant Site



# Nuclear Power Market Outlook

- Potential for significant increase in nuclear power capacity over the next two decades
- Energy security and climate change are two key drivers for nuclear power deployment

## Nuclear plant forecasts to 2030\*

Country	2016	2030
<b>TOTAL – all Countries</b>	439	603
US	99	109
China	30	94
India	21	51
Japan**	43	45

\* Approximate only - excludes 330 proposed plants, and includes ~ 60 older units shutdown

\*\* Currently 40 operable reactors offline, 2030 assumes 10 units shutdown

Source: World Nuclear Association (WNA) – January 2016

## Key Statistics

- ✓ 11 percent of global electricity
- ✓ 439 operable reactors currently
- ✓ 66 new plants under construction
- ✓ 158 plants planned
- ✓ 330 plants proposed

# Potential Market Recovery Drivers



## Economics

- Nuclear power continues to prove economically competitive - costs of electricity from nuclear generation comparable to coal and gas in most countries and less than (subsidised) renewables

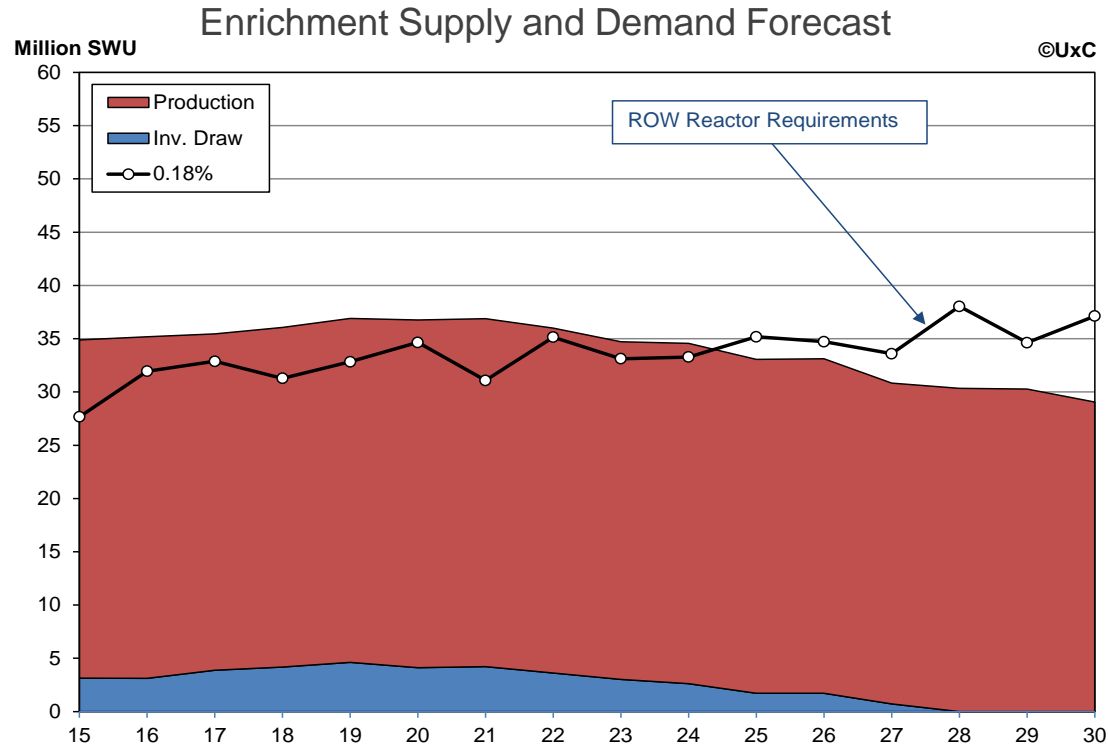
## Energy Security

- Nuclear power will remain a key component of global electrical generation capacity - electricity demand is expected to increase by around 80% by 2040 compared to 2012 demand<sup>(\*)</sup> with the majority of growth in nuclear power in Asia (China, India, Korea) and Russia
- Global growth in nuclear power capacity will underpin growing demand for uranium and enriched uranium (positive for the Paducah and Wilmington opportunities respectively)

## Clean Energy and Low Carbon Emissions

- Climate change policies around the world are making fossil fuels less attractive – Paris 2015 Climate Conference achieved the first universal binding agreement on emissions

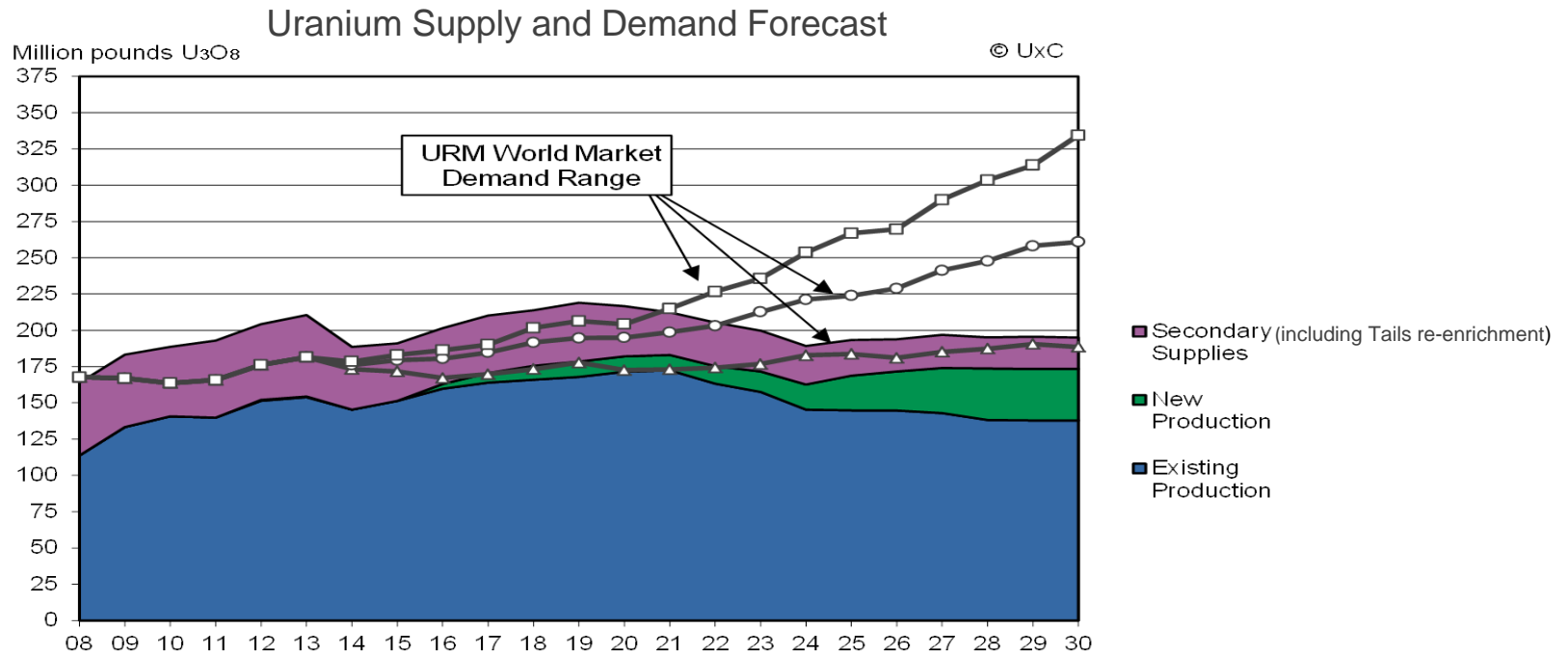
# Enrichment Market Outlook



Source: UxC Enrichment Market Outlook, Q4 2015

- ROW forecast shows market back in balance ~2022 and then going into supply shortage ~2025
- SWU/Enriched Uranium inventories also begin to phase out by 2025/2026 and are consumed by 2028
- By mid-2020s, additional SWU supply will be needed to meet forecast market demand

# Uranium Market Outlook



Source: UxC Uranium Market Outlook, Q4 2015

- Uranium supplies remain excess to market demand, under the mid case demand scenario, until 2022
- Secondary supplies include uranium being produced by enrichers with excess SWU capacity through underfeeding and tails re-enrichment

# Summary



- Silex has completed a major restructure, returning its focus solely back on commercialisation of the SILEX laser enrichment technology
- SILEX Technology remains under exclusive licence to Global Laser Enrichment (GLE) - a business venture of GE (51%), Hitachi (25%) and Cameco (24%)
- GLE and Silex continue to advance the SILEX Technology commercialisation program, albeit at a reduced pace in line with adverse short term market conditions
- The SILEX commercialisation program is believed to be the only significant development effort for 3<sup>rd</sup> generation laser-based enrichment technology in the world today
- Timing for the commencement of commercial production remains uncertain, dependent primarily on the outcome of Phase II work (economic validation) and prevailing market conditions
- The Paducah plant (to enrich depleted tails stock piles back to natural grade uranium) is the nearest term commercial opportunity for the initial deployment of the SILEX Technology
- Silex believes the long-term fundamentals for nuclear are positive, with significant global growth of nuclear power capacity forecast



# Disclaimer



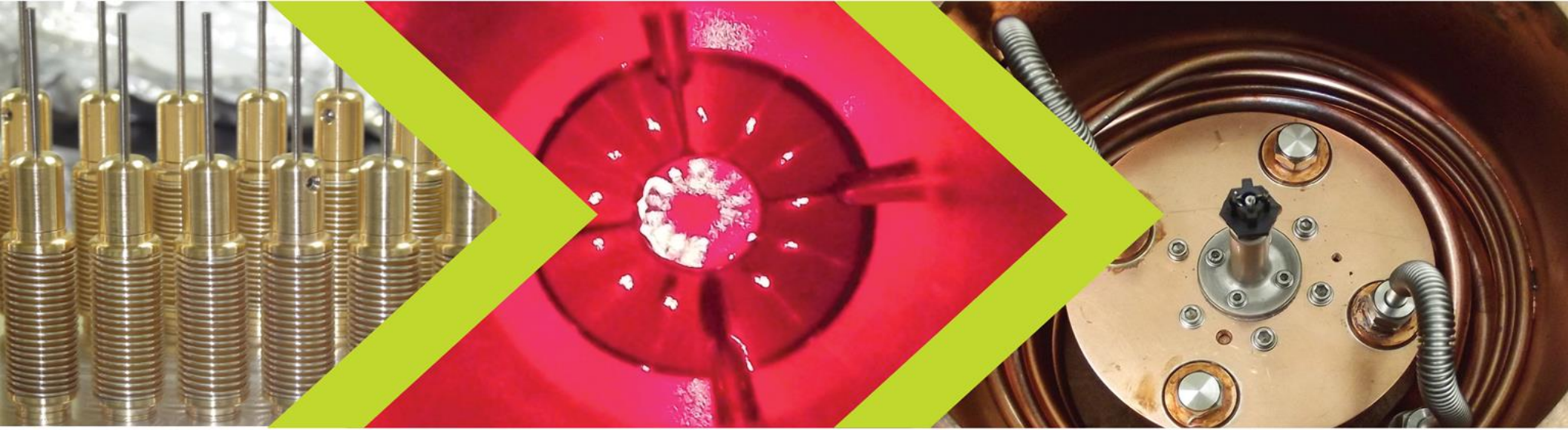
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Thank you

