Silex

SYSTEMS LIMITED

Presentation to House of Representatives Standing Committee on Industry and Resources

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Inquiry into Developing Australia's Non-fossil Fuel Energy

Case Study: The Strategic Importance of Australia's Uranium Resources

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Silex Systems Limited

Forward looking statements

Silex is a research and development company whose assets are its proprietary rights in technologies, including, but not limited to, the SILEX technology, Translucent technology and Fiberbyte technology. The company's technologies are in the development stage and have not been commercially deployed. Accordingly, the statements in this presentation regarding the future of the company's technologies and 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 factors. Some factors that could affect future results and prospects include, but are not limited to, results from the uranium enrichment development program and the stable isotopes program, the demand for enriched materials including uranium, silicon, oxygen, carbon and others, the outcomes of the company's interests in various semiconductor and photonics technologies, the time taken to develop various technologies and the development of alternative technologies.

MISSION

OUR MISSION **:**

to become a world leader in -

- Isotopically Enriched Materials
  - Uranium
  - Silicon
- Advanced Semiconductor Materials
  - Optical Silicon Interconnects
  - SOI and ‘High-k’ substrates

About Silex Systems ….

- Australian listed technology company (SLX:ASX), est. 1988.
- Market Cap ~ $400M Shareholders ~5000.
- Historical background – refer to website (www.silex.com.au).
- Employees ~ 40, including 12 PhD's, 11 Engineers
- Several technologies nearing commercialisation
- Seeking Uranium Enrichment partner for scale-up and commercialisation

Current Operations and Target Markets

1) SILEX TECHNOLOGY DIVISION (Sydney)	Estimated Total Market Size US$
Uranium Enrichment (Nuclear Fuel Industry)	~ $5,000M
Silicon Enrichment (Semiconductor Wafer Industry)	> $1,000M
Carbon and Oxygen Enrichment (Medical Diagnostic Isotopes)	> $100M

2) SEMICONDUCTOR TECHNOLOGY DIVISION	US$
Optical Silicon (Translucent – Palo Alto, USA)	> $3,000M
Advanced Electronic Materials (Translucent – Palo Alto, USA)	>$1,000M
Fiberbyte (USB InSync & DAQ) (Adelaide & USA)	~ $400M

The World Today…..

- **Global electricity demand to double by 2030**
  - Driven by industrial modernisation of China and India
- **The vast majority of this growth will be supplied by COAL**
- **COAL is driving up atmospheric CO_2 levels:**
  - 280ppm (pre-industrial 1850) → 370ppm (2000)
- **CO_2 is driving Global Climate Change: the greenhouse effect.**
- **Global Climate Change is already embedded - will only get worse.**
- **World oil and gas reserves are depleting → fossil fuel costs rising.**

Conclusions **- Our energy consumption habits are unsustainable**
- We must develop alternatives immediately

Potential Solutions

- Decrease Fossil Fuel consumption and CO_2 levels
- Increase reliance on Nuclear Power
- Increase reliance on Renewable Energies (Wind, Solar etc).
- Accelerate the Hydrogen Economy (via nuclear power).
- Improve Energy Efficiency
- An ***integrated mix*** of nuclear, renewables, hydrogen and energy efficiency measures is required, and inevitable.

The Australian Perspective

- **Vast coal reserves** → major global polluter
  → need 'clean coal' technologies
- **Vast uranium reserves** → withheld by political interference
  → need to accelerate resource development
- **Renewables and hydrogen** → minimal political response
  → need to accelerate development

Conclusions:

- **Australian has a 'golden' economic opportunity**
- **A bi-partisan energy strategy is urgently needed**
- **A unique opportunity for political leadership exists**

Nuclear Power

A Global Nuclear Power Renaissance is Underway:

- Currently 17% of world's electricity supplied by nuclear power
- 440+ reactors currently operating
- 70+ being built / planned + accelerated development in Asia
- No greenhouse gas emissions → will not impact global climate
- Governments and Utilities around the world are re-assessing the nuclear power option.
- Public opinion is changing!

The Nuclear Issues

1. **Uranium Enrichment and Non-Proliferation**

2. **Nuclear Power Reactor Safety**
   - Highest priority – world's Best Practice
   - Reactor Technology has matured
   - 3rd and 4th generation reactors – failsafe and human-proof

3. **Nuclear Waste Remediation**
   - Technology has matured – borosilicate glass and Synroc
   - Permanent immobilisation in solid matrix and deep geological disposal.
   - Successful demonstrations (eg Sweden) and developments (eg US-Yucca Mtn).
   - Political issue (NIMBY) – not a technical issue

Uranium Enrichment and Non-Proliferation

International:

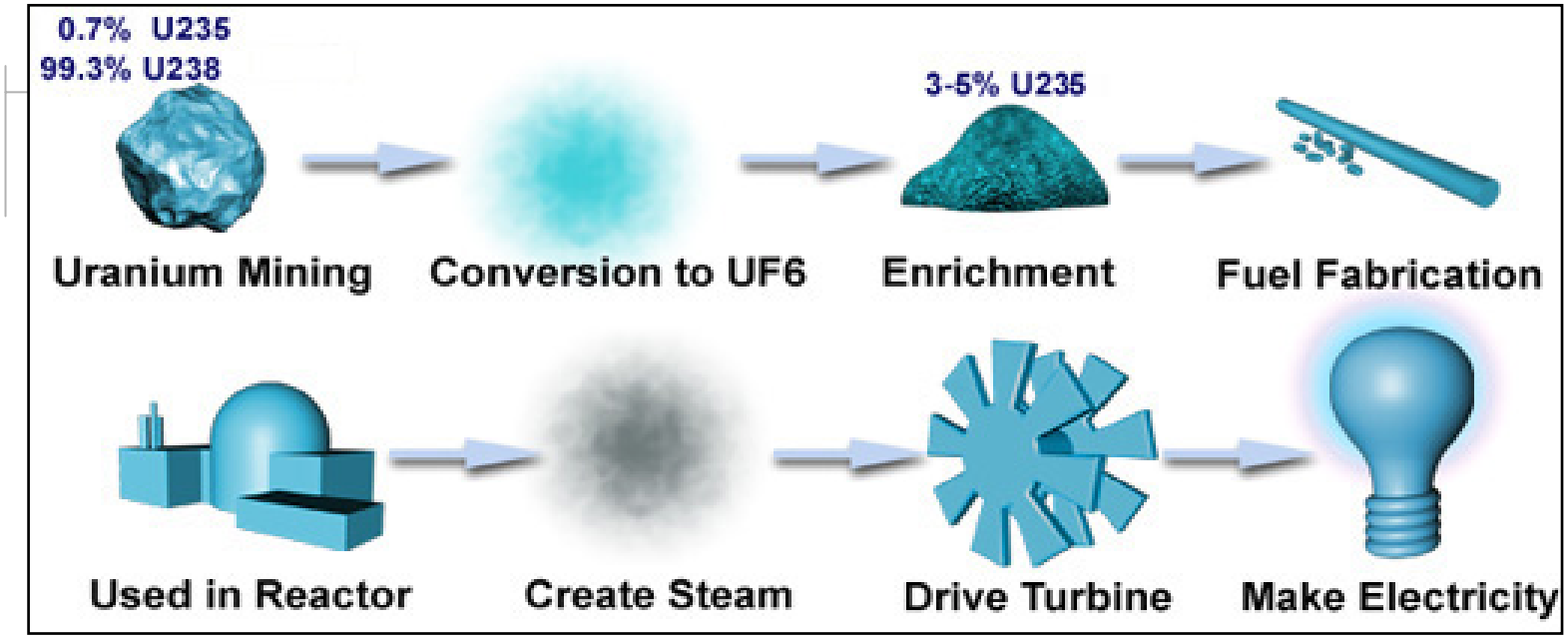
- **Significant international security issue (Iran, Nth Korea)**
- **Question of access to uranium enrichment technology**
  – US Government Proliferation Security Initiative (PSI).

SILEX:

- **Laser technology far more complex and sophisticated than centrifuge.**
- **Australia and US - best equipped to safeguard SILEX Technology.**
- **Australia has track record for strongest non-proliferation policies.**
- **Signatory to IAEA NPT and a strict bi-lateral treaty regime.**
- **Special Aus-US Co-operation Agreement to safeguard SILEX.**
- **Silex is the most heavily regulated company in Australia**
- **SILEX Technology - very effectively safeguarded for 15 years.**

SILEX Uranium Enrichment

The Nuclear Fuel Industry:



The Nuclear Fuel Industry

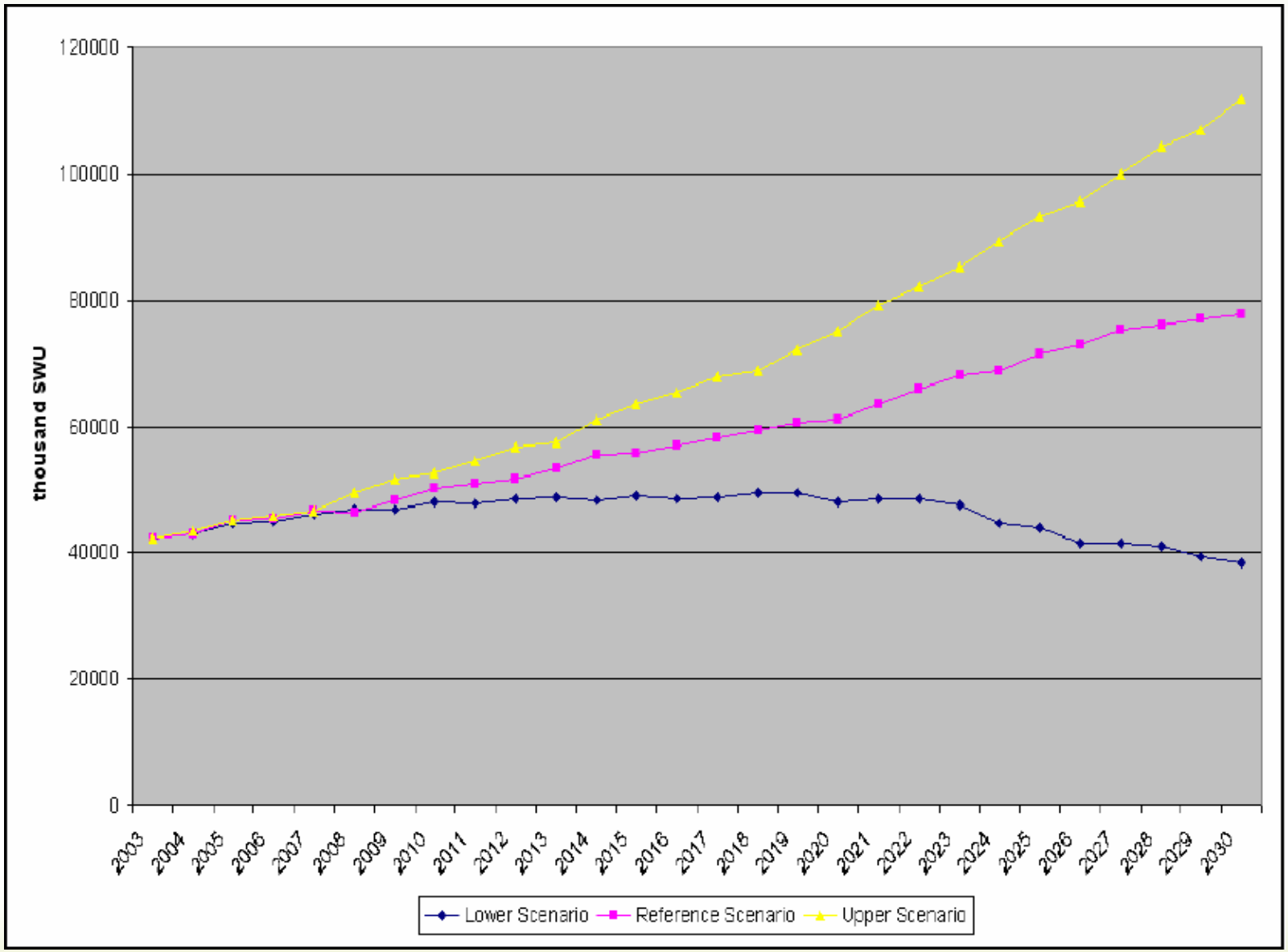
Nuclear Fuel Economics:

- Nuclear fuel costs are ~30% of total costs of nuclear power.
- Nuclear fuel costs - approximate breakdown:

Uranium Ore	~ 35%
UF_6 Conversion	~ 5%
Enrichment	~ 40%
Fuel Fabrication	~ 20%

- As uranium prices go up – demand on enrichment increases (i.e. increasing the level of enrichment to produce lower tails assays decreases the amount of ore consumed).
- Uranium enrichment is key to nuclear fuel economics!

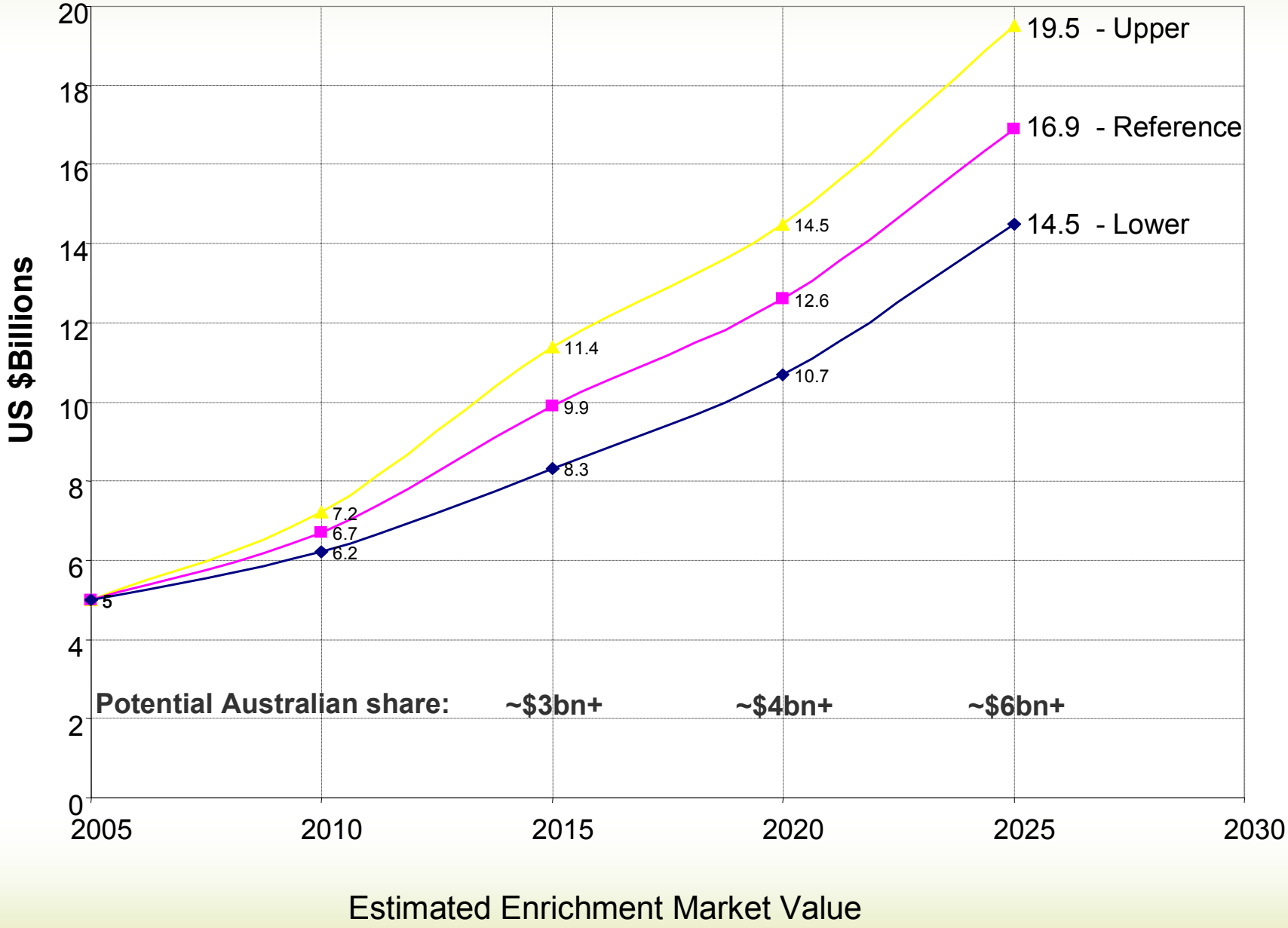
Uranium Enrichment Market Outlook



Enrichment Demand Scenarios

Source: The Global Nuclear Fuel Market, WNA, 2005

Uranium Enrichment Market Outlook



Uranium Enrichment Market Outlook

Supply & Demand Forecasts

	2005		2010		2015	
	MSWU	%	MSWU	%	MSWU	%
AREVA (GD)	9	20%	?	-	0	-
USEC (GD)	7	16%	?	-	0	-
USEC (HEU)	6	13%	6	12%	0	-
URENCO (C)	7.5	17%	9	18%	10	18%
TENEX (C)	12	26%	12	24%	12	22%
AREVA (C)	0	-	2	4%	7.5	13%
USEC (C)	0	-	2	4%	3.5	6%
NEF (C)	0	-	2	4%	3	5%
OTHER (C)	3.5	8%	4	8%	5	9%
SUPPLY	45	100%	37	74%	41	73%
DEMAND	45		50		56	
DEFICIT	0	0%	13	26%	15	27%

GD - Gas Diffusion
HEU - Highly Enriched Uranium
C - Centrifuge

(Estimates extracted from: WNA/NEI Fuel Cycle Conference & Market Survey Sources)

SILEX v Existing Technologies

	SILEX	CENTRIFUGE	GAS DIFFUSION
DEVELOPED	2000's	1940's	1940's
PROCESS	Laser Excitation	Mechanical ('centrifugal force')	Mechanical ('brute force')
ENRICHMENT EFFICIENCY	2 to 20(1)	1.25	1.004
ESTIMATED COST PER UNIT (US$)	$30~$40(2)	$60~$80	~$100
% OF EXISTING MARKET(3)	0%	40%	45%
STATUS	**Under Development 3rd Generation**	**Proven 2nd Generation**	**Obsolete 1st Generation**

(1) Classified – more detailed information not available

(2) Indicative estimate only – needs to be verified in Pilot Program.

(3) Approximately 15% supplied via Russian HEU material

Outline of SILEX Technology

- **Key features of the SILEX Technology**
  - very low energy requirements and low capital costs.
  - UF_6 process – no materials engineering issues.
  - viable engineering concepts
  - laser technology can be industrialised

- **SILEX Technology potentially has a clear commercial advantage over centrifuge**
  - The only 3rd generation laser technology under development today.

History of the SILEX Uranium Enrichment Technology

1988	• Concept, Theory, Initial Experimental activities
1992	• Proof of Concept demonstration with stable isotopes (Mo, Cl, C etc)
1994	• Proof of Concept demonstration with Uranium (lab scale)
1996	• USEC Agreement signed – uranium project development partner.
2000	• Uranium Project Milestone I – macroscopic process physics demonstration. • US – Australia Bi-Lateral Agreement for SILEX Technology signed
2001	• SILEX Technology officially Classified by the US and Australian Governments.
2002	• Full Uranium Enrichment demonstration via 'direct measurement' (gram scale with product extraction & independent assay analysis).
2003	• USEC withdraws from project after 6½ yrs & ~US$40M expenditure. • Silex continues to progress the technology solo.
2004	• Silex – USEC Termination Agreement. Facilities/team intact, project continues.
2005	• Direct Measurement Program (SWU/economics) successfully completed. • Seeking an industry partner to fund Pilot Demonstration and Commercialisation.

SILEX Uranium Enrichment

Status of the Uranium Project:

- 'Direct Measurement' Enrichment Program successfully completed mid - 2005.
- Classified Due Diligence by US companies delayed 6 months by US Gov't.
- Classified Due Diligence evaluations completed in January.
- Several companies (US and non-US) now in negotiations with Silex.
- Decision on commercialisation partner expected Q1, 2006.
- Silex remains quietly confident of commercialisation prospects.

SILEX Technology Development Plan

STEP	2006	2007	2008	2009	2010	2011	2012	2013
Scale-up & Optimisation / Test Loop								
Pilot Plant Design & Licence								
Pilot Plant Construction								
Pilot Plant Testing								
Commercial Plant Design & Licence								
Commercial Plant Construction 3MSWU								
Commercial Plant Start Up								

Lucas Heights Laboratories

DM Test Facility

Lucas Heights Laboratories

DM Laboratory

Lucas Heights Laboratories

DM Laser Facility

Silex Systems Ltd

A unique Australian company developing technology and advanced materials for the 21st Century

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