



ASX Markets Announcements Office  
via electronic lodgement

## PFS Results for PhosEnergy Process

*Strong economics indicated with low OPEX*

### Highlights

- Independent, PFS-level engineering study completed on PhosEnergy Process.
- Estimated cash operating cost of less than US\$18 per pound of U<sub>3</sub>O<sub>8</sub>.
- Estimated capital cost for base-case commercial production facility of US\$156 million for production of 880,000 pounds of U<sub>3</sub>O<sub>8</sub> per annum.
- UEQ believes further opportunities exist for improvements in both capital and operating costs.
- Cameco re-affirms support with commitment of US\$4 million investment tranche for next phase of development.

Uranium Equities (ASX: UEQ) is pleased to announce that, utilising design data gathered during successful Demonstration Plant operations carried out in 2012, an independent Pre-Feasibility Study (PFS) level Engineering Study (the Study) of the **PhosEnergy Process** has supported the **viability and low-cost nature of the Process for extracting uranium** as a by-product from phosphate fertiliser production.

The Study, which UEQ and Cameco commissioned through a global engineering and professional services consultancy, estimated a capital cost of **US\$156 million** for a base case PhosEnergy plant located at the site of a 1Mtpa P<sub>2</sub>O<sub>5</sub> phosphate facility in the south east United States capable of producing approximately **880,000 pounds of uranium** per annum at an estimated cash operating cost of less than **US\$18 per pound**.

In UEQ's opinion, even at current spot uranium prices, a facility of this nature would be capable of generating strong cash operating margins – highlighting the robust economics of the PhosEnergy Process and its potential to underpin an exciting business opportunity for UEQ and its partner, **Cameco Corporation**.

Following receipt of the PFS Cameco has committed to pursuing the next key phase of development of the jointly owned **PhosEnergy Process** by committing a further US\$4 million to the project. This investment finalises Cameco's earn into 73 per cent of the technology with UEQ retaining a 27 per cent interest.

"This is a great result which follows a highly successful Demonstration Plant test program in the United States last year," said UEQ's Managing Director, Bryn Jones.

### Our Strengths

- Breakthrough PhosEnergy Process
- Nabarlek – rare near mine exploration portfolio
- Multiple near term growth opportunities

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"This clearly indicates the robust nature of the process and its ability to produce uranium at a cash operating cost which would be well within the lowest cost quartile for uranium producers globally," Mr Jones said.

"The next phase of commercialisation is expected to comprise an on-site demonstration of the PhosEnergy Process at the site of an existing phosphate producer in North America, and this phase will underpin a Definitive Feasibility Study and enable us to address full scale commercialisation from the PhosEnergy Process," Mr Jones noted.

"The continued financial support of Cameco is indicative of not only the robustness of the PhosEnergy Process the engineering completed to date but also the commercial opportunities represented by the PhosEnergy Process," He added.

## **PFS Level Engineering Study**

Utilising information gathered during the technical development of the PhosEnergy Process – in particular the successful Demonstration Plant operations announced on 19<sup>th</sup> September 2012 – the Study has defined capital and operating cost estimates for a PhosEnergy plant located at the site of a nominal 1M short tonne P<sub>2</sub>O<sub>5</sub> phosphate facility in the south east United States producing approximately 880,000 pounds of uranium per annum (Base Case).

Using the outputs of the PFS, estimated project costs are as follows:

- Estimated cash operating costs of less than US\$18 per pound of U<sub>3</sub>O<sub>8</sub>; and
- Estimated capital cost of US\$156 million for the Base Case PhosEnergy plant.

Depending on the (normally) available infrastructure at the development site, additional capital may be required (estimated up to US\$9 million for a plant in south east USA).

In UEQs opinion the results of the PFS put the PhosEnergy Process in the bottom quartile for operating costs of all uranium production worldwide and at a considerable cost advantage over the bulk of new projects likely to come online over the next 5 to 10 years.

## **Cash Operating Cost Estimate**

Cash operating costs were derived using a methodology consistent with achieving an accuracy of +50%/-30% and an AACE Class IV estimate.

The Study estimated operating costs to produce an intermediate product which can be toll-milled through any one of a number of facilities in the United States, for which quotes have been received.

The estimated cash operating cost including toll milling and product transport is estimated at less than US\$18 per pound of U<sub>3</sub>O<sub>8</sub> including contingency.

Intermediate product transport for toll-milling accounts for a substantial portion of the total cash operating costs. This represents a significant opportunity for cost-structure improvements both through improved contractual transport arrangements and contained uranium concentration of the intermediate product.

Other opportunities exist in the refinement of reagent usage and power consumption as the development progresses. Estimated operating costs do not include corporate office, marketing and downstream phosphate processing costs which may be incurred. The estimated operating costs will form the basis of commercial negotiations with potential phosphate partners.

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## Capital Cost Estimate

The capital cost estimate was derived from Process Flow Diagrams (PFDs), site plans, General Arrangements (GAs) and a detailed mechanical equipment list. A site layout of the PhosEnergy Processing plant as designed is shown below in Figure 1:



**Figure 1 – PhosEnergy Processing Plant Site Layout**

Table 1, below, shows the breakdown in capital cost estimate incorporating significant contingency and EPCM components:

Description	Total Cost (US\$)
Direct Costs	\$87,714,000
Indirect Costs	\$43,122,000
<b>Total Direct &amp; Indirect Costs</b>	<b>\$130,836,000</b>
Contingency	\$25,385,000
<b>Total Direct &amp; Indirect Cost + Contingency</b>	<b>\$156,221,000</b>

**Table 1 – Base Case Capital Cost Breakdown**

Depending on the phosphate facility targeted for commercialisation, there may be additional capital required for infrastructure such as electrical sub-stations and reagent storage. It is estimated that these additional capital items may cost up to US\$9 million for a facility in the south east USA.

Several opportunities for further optimising equipment, structural and civil capital components are under review and will be incorporated into subsequent studies.

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## Next Steps in Commercialisation

Discussions are continuing with phosphate producers to allow on-site demonstration of the PhosEnergy Process using the existing containerised Demonstration Plant (Figure 2).



**Figure 2 – The PhosEnergy Demonstration Plant**

This Demonstration Plant operation will allow for further refinement of capital and operating cost numbers and provide sufficient inputs to enable a Definitive Feasibility Study (DFS) to be completed.

Commercial discussions around the split in revenue on a commercial application of the PhosEnergy Process on an operating phosphate facility will be required to allow an investment decision to progress the project further.

These commercial negotiations will consider the capital risk taken by both parties, the phosphate producer's appetite for exposure to the uranium market and the long mine life of phosphate projects – generally over 20 years.

The initial focus for commercialisation is expected to be the phosphate fertiliser industry in the USA, where UEQ estimates there is an opportunity to recover approximately 6 million pounds of uranium per annum. Operating in the USA also has several potential synergies with Cameco's existing US operations.

The worldwide PhosEnergy production opportunity is in the region of 20 million pounds of uranium per annum.



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## **Cameco commits further US\$4 million for further development**

Cameco Corporation, which is a leading uranium producer and supplier of nuclear fuel services, has completed its earn-in of 73 per cent of the PhosEnergy Process by committing to a further investment of US\$4 million. These funds will be used for further development of the PhosEnergy Process and should be sufficient to carry the project through completion of a Definitive Feasibility Study.

Cameco has also agreed to fund at least 50 per cent of UEQ's proportionate share of first facility capital requirements on terms to be agreed.

## **The Process**

The PhosEnergy Process is a technology for the extraction of uranium from phosphate streams produced in the production of phosphate-based fertilisers.

Yours faithfully,

A handwritten signature in black ink, appearing to read "B. Jones".

Bryn Jones  
Managing Director

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## **Forward Looking Statements**

This announcement may include statements that could be deemed "forward-looking statements". Although the Company believes the expectations expressed in such forward-looking statements are based on reasonable assumptions, such statements are not guarantees of future performance and actual results or developments may differ materially from those expected in the forward-looking statements or not take place at all.

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## About Uranium Equities

Uranium Equities Limited (UEQ) is positioned for growth in the uranium sector through its three pronged approach: The development of the PhosEnergy Process; A shareholding in Energia Minerals Limited in the Carnarvon Basin; and Exploration activities directed at high quality exploration assets in Australia's premier uranium districts.

The PhosEnergy Process is an innovative patented process for the extraction of uranium as a by-product from phosphate in the production of phosphate-based fertilisers.

The global annual production potential of uranium from the phosphate industry is in the order of 20 Mlbs  $U_3O_8$ . This quantity of uranium is mined in phosphate ores but not recovered annually on a worldwide basis. The major phosphate based fertiliser producers are located in Northern Africa, North America and Asia.

The PhosEnergy Process has been proven to demonstration plant scale with results establishing a robust process capable of achieving high levels of uranium recovery at the lower end of the cost curve. An independent PFS level engineering study has estimated cash operating costs of less than US\$18 per pound of uranium, putting it in the lowest quartile for operating costs of worldwide uranium production expected to come on line in the next 5 to 10 years.

The Nabarlek Project provides a rare near mine exploration opportunity surrounding the historic Nabarlek Uranium Deposit (previous production: 24 Mlbs @ 1.84%  $U_3O_8$ ). The deposit lies within an extensive uranium mineral system which extends over more than 50 square kilometres within the Mineral Lease and the surrounding tenements. The mineral system which contains widespread anomalous uranium geochemistry and ore grade mineralisation at several locations remains largely untested.

Energia Minerals are developing the Carley Bore Deposit in Western Australia's Carnarvon Basin. UEQ believes that the Carnarvon Basin will be Australia's next ISR production centre. UEQ currently holds 21.15% of Energia's issued capital.