

Montreal, Quebec, Canada / TheNewswire / March 15, 2016 - Uragold (TSX Venture: UBR) is pleased to announce the results of a carbon footprint analysis evaluating the environmental impact of its PUREVAP(TM) QVR process versus the conventional Siemens<sup>1</sup> process to make polycrystalline solar-grade (Sg) Silicon Metal.

The study was conducted by PyroGenesis Canada Inc. ("PCI"), a clean-Tech company that designs, develops, manufacture and commercializes plasma waste-to-energy systems, plasma torch products and the PUREVAP(TM) Quartz Vaporization Reactor (QVR).

### GREENHOUSE GAS EMISSIONS LOWERED BY 75% - SIGNIFICANT ADVANTAGES

The analysis<sup>2</sup> shows that the PUREVAP(TM) QVR process would generate 14.1 kg CO<sub>2</sub> eq/Kg SG Si, while the Siemens process normally generates 54.0 kg CO<sub>2</sub> eq/Kg SG Si of emissions. This represents 3.8 times, or 75% fewer greenhouse gas emissions, which is justified by elimination of the emissions emanating from the use of chemicals, as well as, energy consumption from the additional purification step. (See Figure 1)

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Figure 1 Carbon footprint comparison (1: PCI process, 2: Siemens process)

Bernard Tourillon, Chairman and CEO of Uragold Stated: "Reducing the carbon footprint of manufacturing Sg Si by 75% opens up Uragold to Green and Cleantech investment funds. Furthermore, eliminating approximately 40,000 Ton of CO<sub>2</sub> eq/per Ton SG Si produced could represent an opportunity for Uragold to benefit from carbon tax credits and incentive funding for green technologies."

Tourillon further stated: "In addition to the Carbon footprint reduction, Uragold is going to replace the traditional toxic process with a one step direct transformation of Quartz into Sg Si using the PyroGenesis PUREVAP(TM) QVR process, thereby providing a green manufacturing process for the Solar industry. This is important because - In addition to be energy heavy process - it is a well-kept secret that the traditional manufacturing process to make Sg Si is not a very environmentally friendly process. Specifically, three to four tons of silicon tetrachloride (a very toxic compound) is generated for every ton of polysilicon produced.

### Study Methodology

The environmental advantages of the PUREVAP(TM) QVR are demonstrated by comparing its theoretical carbon footprint with the baseline process.

### Key Hypothesis

Table 1 Explanation of carbon footprint study boundaries

	Description	Reference - PyroGenesis
Procurement	Operations for extracting the quartz and the reducing agents.	Analysis in FerroQuebec's report on carbon footprint
Quartz reduction	Reduction of quartz to metallurgical-grade silicon.	From theoretical mass balance.
Electricity	Electricity required for production.	From theoretical heat balance and estimated furnace
Purification	Refining from metallurgical-grade to solar-grade silicon.	None, since it's a one-step process.

Carbon footprint Calculations are summarized in Table 2

Table 2 Carbon footprint study results

	PCI PUREVAP <sup>TM</sup> process	Baseline process	Unit
Procurement	10.6	10.6	kg CO <sub>2</sub> eq/kg SG Si

Quartz reduction	3.54	3.68	kg CO2 eq/kg SG Si
Electricity	0.00080	0.00078	kg CO2 eq/kg SG Si
Purification	-	39.8	kg CO2 eq/kg SG Si
Total	14.1	54.0	kg CO2 eq/kg SG Si

The data and results are taken from several reference articles that had done the research and calculations.

#### References:

1. B.S. Xakalashé. M. Tangstad. Silicon processing: from quartz to crystalline silicon solar cells. Southern African Pyrometallurgy 2011, Edited by R.T. Jones & P. den Hoed, Southern African Institute of Mining and Metallurgy, Johannesburg, 6-9 March 2011.
2. R. Glockner. M. de Wild-Scholten. Energy payback time and carbon footprint of Elkem Solar silicon. 27th European Photovoltaic Solar Energy Conference and Exhibition.
3. Rapport d'empreinte carbone du silicium métal. FerroQuebec, Usine de Port-Cartier, 25 mars 2015. [http://www.bape.gouv.qc.ca/sections/mandats/usine\\_silicium\\_port-cartier/documents/PR8.1.pdf](http://www.bape.gouv.qc.ca/sections/mandats/usine_silicium_port-cartier/documents/PR8.1.pdf)
4. Carbon emissions for hydropower : <http://hydroquebec.com/sustainable-development/pdf/energy-supplies-and-air-emissions-2014.pdf>
5. Carbon emissions for natural gas combustion (CHP): [https://www.eia.gov/environment/emissions/co2\\_vol\\_mass.cfm](https://www.eia.gov/environment/emissions/co2_vol_mass.cfm)
6. <http://www.hydroquebec.com/generation/>

#### About Uragold

Uragold, with its worldwide exclusive usage of PyroGenesis' PUREVAP(TM) QVR, is endeavouring to become a vertically integrated High Purity Silicon Metal (99.99% Si), Solar Grade Silicon Metal (6N Purity / 99.9999% Si) and/or Higher (9N Purity / 99.9999999% Si) producer.

The PUREVAP(TM) QVR process's big advantage is its one step direct transformation of Quartz into High Purity Silicon Metal (99.99% Si), Solar Grade Silicon Metal (6N Purity / 99.9999% Si) and/or Higher (9N Purity / 99.9999999% Si) producer, thereby potentially allowing Uragold to manufacture high value material for the same operating cost presently being paid by traditional producers to make Metallurgical Grade Si (98.5% Si) using the traditional arc furnace approach.

The science behind PyroGenesis PUREVAP(TM) QVR process is solid:

- Plasma arc based process can and has transformed High Purity Quartz into Mg Si.
- Plasma arc based process can and is being used to purify Mg Si into higher value materials such as Si.
- Finally, refining Mg Si using an electron-beam furnace in a high vacuum-processing environment has proven the concept of the elimination of elements whose vapor pressures are higher than that of silicon.

What is unique and ground breaking is the combination of these three proven processes into one step.

Uragold is also the largest holder of High Purity Quartz properties in Quebec, with over 3,500 Ha under claims. Despite the abundance of quartz, very few deposits are suitable for high purity applications. High Purity Quartz supplies are tightening, prices are rising, and exponential growth is forecast. Quartz from the Roncevaux property successfully passed rigorous testing protocols of a major silicon metal producer confirming that our material is highly suited for their silicon metal production.

This press release contains certain forward-looking statements, including, without limitation, statements containing the words "may", "plan", "will", "estimate", "continue", "anticipate", "intend", "expect", "in the process" and other similar expressions which constitute "forward-looking information" within the meaning of applicable securities laws. Forward-looking statements reflect the Company's current expectation and assumptions, and are subject to a number of risks and uncertainties that could cause actual results to differ materially from those anticipated. These forward-looking statements involve risks and uncertainties including, but not limited to, our expectations regarding the acceptance of our products by the market, our strategy to develop new products and enhance the capabilities of existing products, our strategy with respect to research and development, the impact of competitive products and pricing, new product development, and uncertainties related to the regulatory approval process. Such

statements reflect the current views of the Company with respect to future events and are subject to certain risks and uncertainties and other risks detailed from time-to-time in the Company's on-going filings with the securities regulatory authorities, which filings can be found at [www.sedar.com](http://www.sedar.com). Actual results, events, and performance may differ materially. Readers are cautioned not to place undue reliance on these forward-looking statements. The Company undertakes no obligation to publicly update or revise any forward-looking statements either as a result of new information, future events or otherwise, except as required by applicable securities laws.

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The conventional process considers the procurement (the extraction of quartz and reducing agents), the quartz reduction in an atmospheric electric furnace followed by the chemical purification and deposition using a Siemens process deposition reactor.

2 The analysis considered the target production rate of 2,000 ton/year of SG Si as the basis for material and energy balance calculations.

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