



The Timminco Revolution

By Jack Lifton
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DETROIT (ResourceInvestor.com) -- There has recently been a flap on the Toronto Stock Exchange over allegations of insider trading in and allegedly related complex ownership changes in a company called Timminco [TSX: [TIM](#)]. The stock's soaring price was widely reported by the Canadian print media last month, and that story was [carried](#) on *RI*. Last week, the company announced that a new refining process it had developed would be disclosed publicly this week. That story was also [carried](#) on *RI*.

Yesterday, Wednesday, May 14, Timminco held a [webcast](#) after the Toronto Exchange had closed where the leader of the third party team from PHOTON, a solar industry information and technology consultancy, which had done the study of the company's new process and of the impact of that process on the company's financial dynamics, disclosed the content of PHOTON's report to Timminco.

I listened to the webcast live, although I did not actively participate. Two days ago I interviewed Mr. René Boisvert, CEO of Bécancour Silicon Inc., the wholly owned Timminco subsidiary, which has been producing metallurgical grade silicon metal for more than 30 years. My conclusions, the reasons for which I will spell out in a moment are, first and foremost, that I have just become aware of a brilliant and innovative change, [patent](#) applied for and pending, in the upgrading of metallurgical grade silicon. The upgraded metallurgical grade silicon (UMGSI) is of a purity level that can be directly used to manufacture photovoltaic (PV) solar cells with efficiencies and lifetimes equal to those currently mass manufactured from solar grade silicon that has been prepared by the much more complex, and more expensive, processes in use today to upgrade metallurgical grade silicon to solar grade silicon.

The most startling fact I learned, as least to me it was startling, was that the new Bécancour-Timminco process can be carried out on 5-to-10 tonne batches of molten silicon. I am the kind of (once-upon-a-time) high temperature metallurgist who though very familiar with the ultra purification of silicon (for use in making integrated circuit base wafers) always expects to see large single crystals of silicon being grown in multiple vacuum chambers slowly and laboriously as mass production.

Mr. Boisvert literally had me speechless when he described his company's process for mass producing solar grade silicon in multiton 'melts'. I have to also tell you that although Mr. Boisvert is very close to the vest about the details of the new process, I completely understood from his description exactly what his company had done and why they had done it that way. The Bécancour developed process has realized, in my opinion, the finding of the Holy Grail (no, editor, I am not being too dramatic) of a practical process for the large scale ultra purification of a material for electronic use.

(Last week, I wrote [an article](#) which I ended with an admonition to purchasing executives who ignore crises of supply restriction by simply stating that such restrictions do not exist. I now issue a warning to purchasing executives that they also ignore sea changes in the increased supply of critical raw materials at the risk of bankrupting their employers.)

Bécancour has developed a low cost high volume method for creating solar cell grade silicon directly from metallurgical grade silicon. On a practical level this will mean, as the PHOTON speaker 'gushed' enormous profits for Timminco in the near term and will provide it with a steady stream of substantial licensing fees for its patent applied for (and 20 of 23 claims approved) process from all of the rest of the UMGSI industry as it ultimately switches over to the Timminco process.

I don't know and don't care if some insiders at Timminco saw last year what I saw in the last couple of days, and decided to make a killing. If they did they will be dealt with by the OSC, the Ontario Securities Commission.

The real story here is that Timminco's subsidiary, Bécancour has been producing metallurgical grade silicon 'metal' for more than 30 years; this is because Bécancour has, as any and all successful companies in its business must have, access to the four factors necessary to be able to produce metallurgical grade silicon metal economically:

1. High quality, relatively pure, quartzite minerals (i.e., silicon dioxide called beach 'sand'). Natural forces, usually over vast periods of geological time, have caused it to become finely divided, and called quartz or 'rock crystal' when it is found in massive form on or near the earth's surface as a result of the melting of oxidized silicon and, due to its relatively light weight, it's 'floating to the surface of the earth's crust where it has solidified to form the largest part of the earth's crust. In fact, silicon dioxide, as sand and quartz, forms 60% of the earth's crust.
2. Metallurgical coal, which is coal that is mostly carbon, and can be processed, i.e., cooked or 'coked' to form an even purer carbon.
3. Low cost high volume electricity. In the case of Bécancour, which is situated between Montreal and Québec City, this is courtesy of HydroQuébec, which produces far more power than Québec uses, so that even New Yorkers read their newspapers by light generated using water falling in Québec's mountains, and, last and most importantly.
4. Skilled workman, process engineers and research scientists produced by Québec's, Canada's, and the world's great Universities and, because of the company's longevity, also the benefit of evolved engineering skills and a concomitant continuity of those skills accumulated for more than a generation.

Number 4 is the reason for Bécancour-Timminco's technological success, and that success is in no way to be diminished if any insider trading or manipulation charges are brought and even proved.

Technological revolutions, like political revolutions do not happen spontaneously; they are both phases in the life of broader movements, social movements in the case of political revolutions and the influence of the progressive advance of science and engineering in the case of technological revolutions.

For those of you who want to understand the manufacturing of silicon for solar cells and to understand where metallurgical grade silicon fits into the equation and where the impetus to develop their process was coming from for Bécancour read, "[Silicon Solar Cells: Physical Metallurgy Principles](#)," an overview article that appeared in the *Journal of Metals* in May 2003.

The main issue in PV solar cell production today is assured access to volume raw material, whether we are speaking of polycrystalline silicon wafer based or thin film silicon or selenium or tellurium based cells. The new Timminco process will allow Timminco to quickly ramp up to produce high volumes of solar grade silicon.

There is little incentive now to cut price because the market is explosively growing, and so it is not a matter of getting someone else's share, it is a matter of availability and delivery on time of a critical raw material. It is a classical seller's market. Timminco's timing couldn't have been better.