

Ecclestone on Alix Resources and the value-added chain of lithium

Christopher Ecclestone in an interview with InvestorIntel Corp. Sr. Editor Fred Cowans discuss his recent appointment CEO and Director for Alix Resources Corp. (TSXV: AIX). Discussing the ongoing mandate of Alix as a project generator and developing a presence in the value-added chain of lithium, he comments: "...people think of that as being involved in the process of making the batteries. In fact, we want to go beyond that. We want to get involved in the space after the batteries are exhausted and start working with the recycling of lithium batteries because it's not just the lithium itself that's in these batteries."

Fred Cowans: Christopher Ecclestone is the Chief Executive Officer of Alix Resources Corp. Christopher you don't need any real introduction to the InvestorIntel audience. You are very well known. Welcome via Skype to the InvestorIntel studio.

Christopher Ecclestone: Good. Thank you very much.

Fred Cowans: You've recently been appointed the Chief Executive Officer of Alix. I think you were on the advisory board for some time so you know the story well. What's going to be your focus coming into the CEO chair?

Christopher Ecclestone: As a project generator we can run far and wide in looking for projects to develop and that's what we're doing. We've got some projects already, some more advanced than others. We're going to be looking to add some more on and then thinking about the ways that we can generate some value from them in the future.

Fred Cowans: With the portfolio approach, what's in the portfolio now or why were the different properties chosen?

Christopher Ecclestone: Well, our first property of note is the Mexican property, which joins both the north and the south ends, the Sonora Project of Bacanora, which has attracted a lot of interest because they announced that they had a deal potentially for the offtake from that to Tesla. That's made the area a bit hot. We've got fortunately the extensions, both the north and the south of that. We're developing that with an ASX listed company called Lithium Australia, which is also known to the InvestorIntel audience. They are paying to earn in on that property. That's our main prospect at the moment. Our wholly owned properties consist of several in Quebec, one in Ontario and then there's another property farther west that we haven't done any work on at the moment. It's interesting because it's not just lithium, but it's a number of other minerals as well that we picked up from— that had previously worked on by TANCO, which is a well-known company in the tantalum space.

Fred Cowans: Beyond exploration, does the company have plans to do other things with lithium?

Christopher Ecclestone: We would wish to develop a presence in the value-added chain of lithium. Interesting, people think of that as being involved in the process of making the batteries. In fact, we want to go beyond that. We want to get involved in the space after the batteries are exhausted and start working with the recycling of lithium batteries because it's not just the lithium itself that's in these batteries, but we also have that other obscure object of desire of the recent times, cobalt, which as a conflict mineral— In fact, one of the few non-conflict sources of cobalt will actually be recycling batteries.

Fred Cowans: That's very exciting. What should investors be looking for in the way of news flow on that subject?

Christopher Ecclestone: Well, we're going to be announcing that we're moving into this space with a very well-known operator in the specialty metals area. They will be helping us in moving forward and really move to a demonstration plant in the short-term because we do not want to spend a long time on this because I believe in many of these specialty metals the advantage goes to the first mover. We want to be a first mover in lithium recycling...to access the complete interview, click [here](#)

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Thompson on the impact of Talga's graphite and graphene results on their lithium-ion battery program

Mark Thompson, Managing Director of Talga Resources Ltd. (ASX: TLG) in an interview with InvestorIntel Corp. CEO Tracy Weslosky discuss Talga's "ultimate goal of becoming a global scale producer of graphite and graphene" and how their recently announced positive results will boost Talga's lithium ion battery program. They also explore how Talga is targeting the \$11 billion plus corrosion protection sector, and the numerous competitive advantages therein. With an update on the Phase 2 graphene pilot test plant and the high quality graphene output that has been confirmed, Tracy asks Mark for his insight on the overall global graphite and graphene market and how the electric vehicle market will drive demand.

Tracy Weslosky: Mark the reason why I'm so excited about talking to you is, and I don't say this very often to the InvestorIntel audience, but I do believe we have one of the most undervalued stocks currently on the market. We have a lot of questions to talk to you about with both graphite and graphene today. Are you ready?

Mark Thompson: Go for it.

Tracy Weslosky: Okay. First of all I'd like to start by doing something I never do, which is to actually read a quote that I read in your shareholders letter from your Chairman, Keith Coughlan. He wrote in a recently published letter, "The Company has made great strides toward our ultimate goal of becoming a global scale producer of graphite and graphene. As a result we are strategically placed to play a growing role in the emerging trend towards low-emission energy production and storage via devices such as batteries and fuel cells, conductive coatings and a host of technology applications that require advanced materials". I would love it if you would just start by reintroducing Talga to our audience and understand why that's not just a visionary statement, but that's really what Talga is trying and is achieving.

Mark Thompson: Yeah. At the root of that is that the world has a lot of problems. It's got a lot of resource pressure and a lot of pollution pressure and it's trying to fix those problems. One of the ways around that is to positively change energy storage and energy mobility and energy generation. Graphite being a crystalline form of carbon is at the heart of a lot of those technologies and we own the world's highest grade resource of graphite under (inaudible) and NI 43 conditions. We're taking advantage of that and we're trying to work out strategically how to use that resource to the betterment of all these sorts of products that people read about in the media, but then don't enter into their lives for a little while, but similar to plastics and carbon fiber before it some of these companies go on to become global

leaders. That's where Talga is heading.

Tracy Weslosky: I think something that I would love for you to explain to our audience is how you really differentiate yourself. Your competitive advantage is you're going after some very unique niches – for instance an \$11 billion dollar plus corrosion protection sector...can you talk about these different sectors that you're targeting please?

Mark Thompson: So we were quite an early mover into the graphite space and what we found is that there's an industry that's 40 times bigger than the entire global graphite market and that's the total volume of material used for paints and coatings. Graphene, one of the largest volume applications with really good margins and really good speed to market in its development is in the coating sector. We've got a Chief Technology Officer, Dr. Siva Bohm who has over 25 patents and over 100 technical papers in his 25-year career. He's a coating specialist. He's now, as our CTO, basically constructing products made of our graphene to license and look for revenues from royalties and production obviously that feeds into our raw materials. We see the coating as a, I guess, a media darling compared to a roll up TV screens and things like electric planes, but it's actually a very good solid move because it only involves replacing encumbered materials like zinc and zircon rather than creating entirely new technologies. That's just one part of the four main sectors we focus on.

Tracy Weslosky: And of course, something that is sizzling to our audience is the battery storage market. Can you tell us what your involvement is in that particular sector?

Mark Thompson: Yeah, we've got a two-pronged approach to that...to access the complete interview, [click here](#)

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Lifton prepares for the Mines and Money Show in Toronto

September 16, 2016 – Jack Lifton in an interview with InvestorIntel Sr. Editor Fred Cowans discusses recycling automotive components, particularly batteries. Jack will be representing InvestorIntel in the Toronto Mines and Money show and speaking at 3:20 PM Monday, September 26th on energy storage presentation.

In this interview, Jack explains that it is very important to recycle electric vehicle battery materials as we do not produce enough lithium, cobalt and spherical graphite to make even a fraction of the vehicles that Elon Musk's Tesla plans to manufacture in the year 2018 alone.

Fred Cowans: Jack Lifton is the senior editor at InvestorIntel. Jack you certainly don't need any introduction to our audience. Welcome via Skype to the InvestorIntel studios here. You're going to be in Toronto soon for the Mines and Money show.

Jack Lifton: Yes.

Fred Cowans: It's September the 28th. The exact dates are the 26th to the 28th. What are you going to be talking about?

Jack Lifton: I'm going to be talking about recycling automotive components, particularly batteries, but also anything that can be recycled containing technology metals and materials.

Fred Cowans: That's stuff you've been writing about for some time.

Jack Lifton: Yes.

Fred Cowans: Do you want to give us some themes that you're going to be talking about within that?

Jack Lifton: Yes. I'm very surprised that there's been so little talk and action in North America about recycling lithium-ion batteries for vehicle use, very large batteries, when in fact the governments of both Canada and the U.S. mandate... to access the complete interview, [click here](#)

Guy Bourassa of Nemaska on the “very, very big shortage” of Lithium

The real driver for the intense global demand and price increase on lithium

February 5, 2016 – In a special InvestorIntel interview, Publisher Tracy Weslosky speaks with Guy Bourassa, President, CEO and Director for Nemaska Lithium Inc. (TSXV:NMX | OTCQX:NMKEF) on the overall global lithium market and how the real source for the increasing demand for lithium is energy storage. While commenting on the distinct benefits of the electric vehicle market interest, Guy addresses the global supply shortage and how this may translate to the marketplace.

Tracy Weslosky: I'm delighted to have this opportunity to talk to you about the overall lithium market. Jack Lifton is telling me that we have a bull lithium market. In fact all my editors are, John Petersen, Christopher Ecclestone, they're all saying we've got another 5 years of intense demand and

rising prices for lithium. Do you agree with this?

Guy Bourassa: Absolutely, I do agree with this. As a matter of fact, I'm sure that they also noted that the only commodity in the mining sector in the past 4-5 years that I've been seeing an increase in demand and an increase in sales price is lithium and the different lithium compounds. What I hear from the Chinese market and the producers around the world and the market analysts is that effectively there's a very, very big shortage actually that is reflected by the spot price that we see in China that we've seen for the past 3-4 months. Some people are talking about even \$15,000.00 U.S. for lithium carbonate on the spot price. Of course, the spot price does not represent the real contracts, long-term contracts, but it definitely shows that somebody is looking desperately for lithium carbonate at this time and that there is none.

Tracy Weslosky: Obviously that is a lot of exciting news for us at InvestorIntel and our audience. Of course, Jack Lifton is telling me the real driver for the battery market is actually China. Of course, Nemaska Lithium has made a one of a kind deal with Johnson Matthey. And as an expert in understanding the demand for batteries, can you talk to us a little about what that demand really is or help enlighten us a little bit more on what the status is at this time?

Guy Bourassa: I don't quite agree with Jack about the fact that the market is in China. Production increases in China, but their batteries and cathode material is going outside in other markets so they're producing these batteries, but the end-users are not, absolutely not presently in China. That's maybe going to be growing there, but it's already growing in Europe. It's already growing in the United States, the electric vehicle. What's even more interesting, because people don't believe of the rapid growth and the adoption of the electric vehicles, they have to take into consideration that on a tonnage-wise energy storage is much more important than the electric vehicle adoption. You're going to see at least

two times the number of tons of lithium compounds required for the energy storage sector. It's less sexy I suppose than the electric vehicles, but as a manufacturer I'm absolutely delighted with the rise in the demand for energy storage...to access the full interview, [click here](#)

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The cleantech disconnect between rising demand and the global technology metal supply

✘ **InvestorIntel** is hosting the Cleantech & Technology Metals Summit in Toronto on May 10-11th, 2016 with the materials and technologies of Cleantech as its theme. It will be a survey of those sectors and an introduction to some of the key players for Investors.

Over the next three months I will introduce the conference themes and give you details of who will speak about which topics. Each full session of the conference will be concluded with a panel of experts who will be questioned by sector specialists such as , John Petersen on battery storage, Professor Dudley Kingsnorth on the global technology metals market, and, of course, me. As a finale the sector specialists themselves will be put to the question on a panel chaired by InvestorIntel's publisher, Tracy Weslosky, with no holds barred. No one will be allowed to leave the conference without a clear understanding of Cleantech and the issues and

opportunities it raises for Investors.

Cleantech is an agenda for giving mass produced technologies a direction. The idea is to choose and utilize them with minimal, and ultimately, no net environmental impact. Ideally Clean technologies will additionally reduce existing pollution. The economics of Cleantech are not straightforward, because although a Cleantech agenda must include the capitalization of the direct costs of health and safety it must also include as a setoff the value brought by the Cleantech methodology by the elimination of the long term costs of the risks to health and safety ameliorated by the implementation of the Cleantech agenda. The measurement of these "savings" is often very subjective, and politicians and bureaucrats tend simply to "adjust" them to fit whatever model they are using to justify the expenditure of public funds to subsidize the Cleantech Agenda. Ultimately though an objective measurement will be needed.

Cleantech however in any case should not and most often does not countenance or condone hidden agendas such as, for example, the obvious fact that a great deal of fossil fuel must be consumed today to produce an electrified vehicle. Necessity requires that such procedures, at least today, must be used. I personally for example know of no factory for manufacturing traction batteries that uses solar energy or wind generated energy exclusively for its total manufacturing needs. Since the overwhelming majority of global "base load," the electricity generation that is available around the clock, is produced by burning fossil fuels this means that the direct manufacturing of batteries, wind generators, and solar cells consumes fossil fuels.

Achieving and sustaining the Cleantech agenda is a goal. And in order to achieve this goal we must deconstruct the total manufacturing supply chain and reconstruct it to minimize and ultimately eliminate pollution while minimizing costs of all kinds.

To begin this series of articles I'm going to focus on my area of expertise, materials and their sources, in this case I'd like to begin with the materials necessary (and therefore critical) for the construction of the energy storage devices known as batteries. There are two categories of these materials: 1. The finished (chemical) forms of them that go into the final end-product, the battery, and 2. The raw materials that are needed to produce the finished chemical forms. I will also address the processes by which the raw materials become finished (chemical) forms, because this is an area all too often overlooked, ignored, or assumed to be easy by naïve investors. Let's first look at the raw materials and their sources in nature. This is the very beginning of where the deconstruction of the total supply chain leads us.

One last note: I'm going to save for later in this series discussions of the fuel, construction, and process raw materials for nuclear reactors, because it is a complex subject best left until we have more background.

The replacement of fossil fuels COMPLETELY by nuclear fuels for generating base load is possible, and this has generated a great deal of controversy unrelated to whether or not nuclear generation of electricity is economically superior to fossil fuel generated electricity from both an environmental and a health and safety aspect. The non-technical, non-objective issues characterized in our polity as the "anti-nuclear forces" form a complex subject and it needs quite a bit of explanation and explication both of which will be easier to follow after we have a grounding in some more easily understood aspects of the direction of and impediments to the Cleantech Agenda.

Today I going to discuss the material basis of the storage of artificially produced electricity by batteries. I say "artificial, because the basis of our contemporary technologically themed civilization is our ability to produce, transmit, and convert into various forms of work electricity

at will and to deliver that electricity to any location we choose.

The battery economics data I am going to use comes from the research and work of my InvestorIntel colleague, John Petersen, who is a leading expert on the economics of energy storage for all uses by rechargeable batteries.

Putting aside for the moment the Cleantech aspects of the lead-acid and lead-carbon batteries that have been in wide use in the automotive industry as well as the power storage industry for at least a century it cannot be overlooked that the economics of scale have driven the manufacturing costs of these devices probably as low as they can go. **In some ways then the cost bar for batteries has been set, and for lead/carbon acid I think we are at rock bottom; it won't go lower.** Keep in mind that lead from storage batteries constitutes 85% of the lead recycled annually in the USA, and that the impact of recycling on the lead "cycle" has reduced the need for new lead production in this country dramatically. I would go so far as to say that the widespread adoption and use of lithium-ion battery chemistry for vehicle powertrain electrification along with the current capacity for the recycling of lead could eliminate the need to mine new lead in the USA in the near future.

In any case the electrification of vehicle power trains cannot be accomplished by the use of lead-acid or lead-carbon batteries. Why? Because such battery chemistries cannot store enough energy to move a one to two ton vehicle more than 60-70 miles at highway speeds to which we have become accustomed before needing to be recharged.

In fact this limitation has until recently been the main impediment to the electrification of vehicle powertrains for consumer use. And this impediment has stood for nearly a century.

However, change is upon us and the impediment is rapidly disappearing at least from a purely technological viewpoint. The rechargeable lithium-ion battery originally introduced for personal consumer products by Japan's Sony Corporation in the early 1980s has undergone massive and sustained development in the last 35 years, and the result has been an improvement in power storage and operational capacity (cycle life). The key metric for consumer applications of vehicle electrification is cost per kilowatt hour. This is a measure of the cost of the battery to manufacture and assumes that the particular chemistry chosen exhibits the necessary cycle life, ease of charging, and ability to discharge at any and all rates encountered in vehicle operation without a catastrophic (irreversible) failure.

Although actual manufacturing costs are proprietary several major battery manufacturers and vehicle manufacturers with electrified vehicle products are moving production forward rapidly, and this indicates that those who have the data are satisfied that a manufacturing cost of \$200/kWh, or less, has been achieved. Those who understand the costing of motor vehicle production, for example, are certain that the battery of forthcoming (Fall 2016) Chevrolet Bolt with an advertised range under ordinary conditions of 200 miles and a selling base price of \$30,000 after government tax credits, has met the magic \$200/kWh standard. GM itself has publicly stated that the cost of its Bolt battery is today \$145/kWh and that by 2020-22 it expects that cost to reduce to \$100/kWh. If this last figure is accurate and if the batteries perform as advertised between now and then the age of vehicle electrification will have arrived.

The global OEM automotive industry is traditional and conservative when it comes to engineering and planning. GM, for example, has chosen what it calls a "nickel rich" lithium-ion battery chemistry from Korea's LG.

Therefore orders have been issued and parts delivered already

for the first 3-6 month of planned Bolt production. And even though GM continues to life test (reliability, durability, cycle life, performance to specification, etc.) batteries the manufacturing of the batteries in Michigan from cells built in Korea by LG is well under way.

So, what's the problem?

The problems that I see arise from the disconnect between the demands for the critical natural resources and processing capacity needed to produce finished chemicals for lithium-ion batteries and the supplies of the raw materials from which these finished chemicals are made.

It goes without saying that the recycling of lithium-ion batteries is a business that will boom if vehicle electrification takes off.

But we also need to ask whether or not there is enough lithium, cobalt, manganese, nickel, and graphite available, and this means not only is there sufficient current production, but also whether new capacity if needed can be brought on line at the same speed as the ramp up of demand. To answer these questions requires a look not just at the financial but also at the geopolitical issues involved.

It's easy to get complacent by just talking about a Global Lithium Economy, but this is very misleading. The production of lithium from mines and of the capability and capacity to refine it into finished chemical forms for use in batteries is NOT uniformly distributed over the planet giving no one nation any advantages. Just as with rare earths producing lithium resources are concentrated in just a few places, and unlike rare earths lithium processing for use in batteries is not concentrated in the countries where it is produced and neither at the moment is the demand.

The new Chinese 5-year plan calls for a Cleantech agenda for the electrification of motor vehicles. It calls for 5,000,000

EVs by 2020. China does not now have the capacity to build that many EVs or their batteries, so a plea for subsidies has gone out inside of China from the battery industry. Simultaneously Chinese mining companies are acquiring and seeking out non-Chinese deposits from which lithium can be produced **for the Chinese domestic market's EVs**. This will not increase the amount of lithium **available** in the global marketplace.

Is there a mismatch between lithium supply and demand? If not how soon might there be one? And is there a mismatch between demand and processing capacity for any or all of the raw materials needed to make lithium ion batteries, not only lithium but also graphite, cobalt, nickel, and manganese, for example?

InvestorIntel's Cleantech and Technology Metals' Conference in May will address those questions and many more and show you how to keep informed about the issues important to investors.

In the meantime, I'm going to get you ready to ask questions in May by discussing the raw material and processing issues arising from

1. Vehicle electrification and alternate energy storage
2. The production of energy by means alternate to fossil fuels
 1. Wind,
 2. Solar,
 3. Nuclear, and
3. The determination where recycling is necessary not just nice

Coming on Monday, Feb 1: The situation with the materials for the storage of energy in batteries.

Northern Graphite's Greg Bowes on opening a battery research and testing facility

✘ “Northern has a big advantage in the battery market due to proprietary purification and coating technologies and the highest percentage of battery grade production. ” – Greg Bowes, B.Sc., MBA, CEO & Director – **Northern Graphite Corp.**

November 19, 2014 – In a special **InvestorIntel** interview, Tracy Weslosky, Editor-in-Chief and Publisher for InvestorIntel interviews Greg Bowes of **Northern Graphite Corp.** (TSXV: NGC | OTCQX: NGPHF) on their recent news surrounding Northern Graphite opening a source battery research and testing facility.

Tracy Weslosky: You just recently announced some very exciting news about a new battery testing and research facility. Can you please tell me more about this announcement?

Greg Bowes: Yes. We're quite excited about it. I mean, the ultimate goal I think for all graphite companies is we want to see electric vehicles succeed and part of that is we need better batteries. We need lower cost batteries. We need more environmentally friendly processing techniques and that is what this facility is designed to achieve.

Tracy Weslosky: So correct me if I'm wrong Greg, your facility is going to be in Tennessee, is that correct?

Greg Bowes: That is correct.

Tracy Weslosky: So perhaps I'm projecting here, but there's

numerous advantages to being located in Tennessee, is there not? I mean, wasn't the Saturn GM factory built in Tennessee?

Greg Bowes: Well, that may be true, but unfortunately it's probably more of a coincidence. The main reason it's in Tennessee is Dr. Edward Buiel who is leading our research and managing this facility, he already has a setup there. We have—He's recently added a lot of equipment to that facility. Part of that is the result of work that he's doing for us. There is other equipment that we are going to be adding. He already had all the infrastructure, the people, everything there and so that is one of the reasons we partnered with him. That is why it is in Tennessee.

Tracy Weslosky: Today I went onto Dr. Buiel's website to do some research. I see he's got over 30 year's professional experience specifically in the lithium-ion and battery storage area. Can you give us more background?

Greg Bowes: Yes. If we go back a couple of years, obviously the graphite companies were a new story and the lithium-ion batteries and all that good stuff. We wanted to demonstrate that our graphite would make a good quality anode material for batteries. There are no impurities. There are no fatal flaws in the material. We can produce it in a cost competitive manner. What we found out when we tried to go through that process is there is no one stop shop where you can just go and have all of that work done. We had it done by a patchwork of different consultants, manufacturers in Canada, the U.S., Japan, China and it was a very slow complicated expensive process, but we ultimately did get to the end where we have produced spherical graphite, which is the product that is used to make the anodes and lithium-ion batteries. We've actually tested it in cells and it works very, very well. We just thought we've already been through all this process. We are very comfortable with the quality of our graphite, the quality of our product and the results we are getting. We decided we would make our experience, our experience, our knowledge, our

expertise available to everybody else in the industry because, again, we want better batteries. We want lower cost batteries. We want higher growth rates in the use of lithium-ion batteries and ultimately electric vehicles and that benefits everybody.

To hear the rest of the interview, [click here](#)

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