

The Karbon-X Advantage in the Fight Against Climate Change

written by InvestorNews | August 8, 2023

InvestorIntel's Tracy Weslosky recently interviewed Chad Clovis, the CEO of Karbon-X Corp. (OTC: KARX), a trailblazing carbon marketing and project development firm that is at the vanguard of North America's ESG conversation.

Net Zero Carbon and other "planning dilemmas" Part 2

written by Steve Mackowski | August 8, 2023

In [Part 1 of this series](#), I introduced the concept of going to the plan's end result and working backwards through the planning process. I recommend this for some of the more difficult planning tasks, as it eases the mental burden. By that I mean, when faced with the challenge of planning for the world to meet a net zero carbon by 2050, the mental challenge is enormous. So, let's break it down.

A world that is meeting a net zero carbon target by 2050 will have to have achieved many linked but somewhat individual tasks and schedules. There are simply too many individual tasks to list, so I'm going to try and sub-group so that we can at least get a conceptualized overview of the challenges ahead.

1. Physical Resources.

2. Technology.
3. ESG Concerns.
4. Power Requirements.
5. Human Resources.

I'll try and cover each sub-group and provide linkages as we develop our thoughts. FYI. I have heeded my own advice here and started the process from the end and worked backwards. What you'll see are my thoughts and impressions formulated over many years in Critical Materials, ESG management, and planning, coming together hopefully with each article to get us all on board and with a clearer, more transparent, an honest view of the Net Zero Carbon issue, a Net Zero future and its requirements.

OK. Let's start with Physical Resources. You will have all been made aware by various reports that the amount of Physical Resources required for electric cars, wind turbines, solar power farms etc. is enormous. If not gigantic. It is certainly numbers of orders of magnitude bigger than current production levels. It is staggering to try to imagine 10 times (for example) the production of lithium, copper, chromium, rare earths, etc not to mention the steel and aluminum required for associated infrastructure. But let's put the issue of scale aside for the moment. I want to first dispel the notion that recycling will be the answer. I am not going to say that recycling is not important and should not be avidly pursued, but what I am saying is that recycling is not the "big-ticket" answer to the Physical Resources requirements. I'll demonstrate with a mathematical exercise.

Let's look at the current level of batteries (as an example). We need an assumptions list. We need a current output level, let's use a starting point of 100 units. Each battery will last 10 years. The growth in the need for batteries is positive 10% per

year. These absolute numbers are not really important in this discussion. It is the understanding of where they take us that's important. OK. Question one – how much recycling can you do in year 1? Answer – None. There are no batteries to be recycled. They last for ten years! So not until year 11 are batteries available for recycle and these are the now “dead” year 1 units. 100 of them only. Then 110 in year 12. 121 in year 13.

I know I have simplified the situation but as I will repeat throughout this series of articles, it's the overall impact that needs to be understood, not the detail as such. Look at the following table of units needed to meet demand, the resources needed versus the effectiveness of recycling capacity.

Year	Batteries Demand	Additional Capacity to supply	Recycle Available	Cumulative Additional Capacity	Utilize Recycle to get new Capacity
1	100	0	0	0	0
2	110	10	0	10	10
3	121	21	0	31	31
4	133	33	0	64	64
5	146	46	0	110	110
6	161	61	0	171	171
7	177	77	0	248	248
8	194	94	0	352	352
9	213	113	0	465	465
10	234	134	0	599	599
11	258	158	10	757	747

So, it's not until year 11 that recycled batteries have any effect. The battery demand and the resources required will have increased between 6 and 8 times by then. In fact, it won't be

until at least year 15 that any noticeable effect of recycling will be noticed. So, recycling may be a small part of an eventual solution, but it is not the saviour. Only increased output is. And increases in mining, processing, refining and manufacturing of this scale is to say the least challenging. And to meet the time challenge of 2050?

Well, let's muddy the waters of our planning process a little more and introduce the complication of co-dependence. And by that I want you to think about the example of making electric cars. To make one car you need enough of the various components to do that. Obviously! But what happens if you do not have any of component X? (Think of the current microchips issue for example). The whole schedule stalls until the production level of component X meets the needs for that volume of production. Now think back over the last ten years at the junior rare earths space. Why haven't they developed the capacity to meet the predicted needs? Well, the end user, the car companies in this example, didn't expand as fast as first thought (or is that hoped?) and the explorer couldn't get market contracts to justify getting the development capital. So, the co-dependence of the car company and the junior explorer, stalled the junior's development. In fact, it shut down many of the juniors. Those that managed to stay alive are now facing more years to get back up and the co-dependence will again surface as the slow ramp up of rare earths output will directly impact the growth of the output of electric cars! What is the impact of this co-dependence of mining development for the rare earths in the magnets needed for electric car output requirements in 2050? It will take some planning. Especially when you throw in the mix the co-dependence of all the other resources required, particularly those critical materials with a long timeline to development.

Another term I use is cross-dependence. Again, in the electric

car example, the vertical supply chain for each element or assembly, or whatever, can be influenced by a separate although essential vertical supply chain. Let me explain. If you need as an example to create a vertical supply chain for each of three new components, say, the magnets (from rare earths), the batteries (from lithium) and microchips (from silica), will the planning process allow for the indefinite delay in one or more of the components? That is to say, can the rare earths development timeline needed for the magnets be affected by an extensive delay in the creation of a process, or development of the resource, for say, lithium? Or silica? Of course, it can. The justification for the planned development of one is impacted by the achieved development timeline of the others. The car needs a number of successful developments in critical minerals in separate supply chains (and other components) to reach the final stage, producing the required number of vehicles by the timeline stated. And they have to have matching timelines otherwise the imbalance will cause a market condition where the component being developed the fastest may be stalled by the delay in the component being developed the slowest. Although co-dependence is taught in most Economics courses, as it is standard supply chain logic, cross-dependence has become much more odious today as the need for new components comes to light. And this is only the Physical Resources. Can you see this isn't a simple "Supply Chain" issue. It's not one component we are looking at here. It's many. It's a "Supply Array" issue!

Now we are getting started! Now consider the implications of the Republicans' defeat at the last USA elections. Did that have implications for the 2050 target? You betcha! As will the EU response to the looming energy crisis across Europe this winter. I'll call this dependence Geopolitical or GP-Dependence. So, we now have added another dimension to the planning process. The planning dilemma has to deal with a "Supply Matrix"! Wasn't in

my Economics 101.

Now, that's just for electric cars! You now have to throw in co-dependence, cross-dependence and GP-dependence with all those other required developments that together meet the 2050 target, some of which it has been stated that the technology does not yet exist! And remember, all of these developments are competing for the same resources! The Critical Minerals at least. This "Planning Dilemma" is on a scale probably never seen in the Western World. Well, not since World War II.

I think that's enough on the Physical Resources issue. There have been many articles, reports etc on this topic from others, but don't forget the reasoning behind the issues of recycling, co-dependence, cross-dependence and GP-dependence. It will come back later.

I'm looking forward to reviewing the Battle of the ESG Titans online debate as ESG is a passion of mine. Since the Battle was live at 3am Thursday morning 15th December in my part of Australia, I will change the order of the 5 sub-groups listed above for discussion. I'll discuss ESG concerns next (article 3), to incorporate thoughts from The Battle, and discuss Technology in article 4.

I'm thinking: have a great time over the holidays, stay safe and see you next time.

dynaCERT puts its carbon emission reduction technology to the test

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Getting companies to adopt climate change initiatives is no easy task. Many economists believe that carbon pricing – either through carbon taxes or cap-and-trade programs – is the most efficient way to reduce greenhouse gas emissions. Carbon taxes provide a financial incentive for businesses and households to reduce their energy use and switch to cleaner fuels.

Carbon pricing provides across-the-board incentives to reduce energy use and shift to cleaner fuels and is an essential price signal for redirecting new investment to clean technologies. The carbon emissions and credit game is tricky, but pricing carbon is critical in deterring fossil fuel use and reducing greenhouse gas emissions.

Technology is going to play a vital role in the facilitation of climate change initiatives. There is an enormous opportunity for companies with climate change and carbon credit technologies. [McKinsey](#) reported that the carbon credit market could be worth \$50 billion by 2050.

One company that has been involved in carbon credits and carbon reduction is [dynaCERT Inc.](#) (TSX: DYA | OTCQX: DYFSF). dynaCERT was one of the first companies to focus on carbon credits, and they have been working with [Verra](#), the largest governing body for carbon credits, for over two years. dynaCERT's Carbon Emission Reduction Technology (CERT) creates hydrogen and oxygen on-demand through a unique electrolysis system and supplies these gases to engines to enhance combustion, resulting in lower

carbon emissions and greater fuel efficiency.

Verra “[announced](#) to dynaCERT that it’s Methodology in respect of its Carbon Credit Certification has reached a new important stage.” This technology can be a significant benefit for companies looking to offset their carbon emissions, and dynaCERT is at the forefront of this rapidly growing industry.

[InvestorIntel interviewed](#) dynaCERT’s President, CEO, and Director Jim Payne about its recent efforts and technology to reduce carbon emissions and generate carbon credits. Payne is excited about the commercial prospects for his company’s innovative technology. He noted that several large corporations have expressed interest in using dynaCERT’s products to reduce their emissions. These companies are attracted by the potential for significant reductions in emissions – up to 50 percent – as well as the carbon credits that will be generated.

On [August 22nd](#), dynaCERT announced a new customer as both a showcase of their technology and one that could further their long-term prospects. The city of Timmins in Ontario, Canada, is committed to conducting a comprehensive pilot program to determine the city’s economic, social, and governance (ESG) objectives. As part of this program, the city has installed ten of dynaCERT’s HydraGEN™ units on various diesel-powered city vehicles. The units are expected to reduce fuel consumption, greenhouse gas emissions footprint, and carbon and NOx emission. Significantly, the pilot project will run and test the technology well into the Canadian winter months.

The program is planned to begin in September 2022, where equipped municipal vehicles will be analyzed to determine the impact of dynaCERT’s technology on emission reductions and fuel savings. The city expects to install HydraGEN™ Technology on buses, landfill equipment, garbage trucks, and other diesel-

powered equipment. The results of the pilot program will be closely monitored to assess the potential benefits of dynaCERT's technology for the City of Timmins, as well as a test case for other municipalities and potential commercial customers, which will be closely monitoring the results of the program in Timmins, which is considered a hub of the progressive mining and forestry community.

Although dynaCERT also recently announced the departure of two directors and a change of auditors, at publication date the company's stock has seen a steady increase over the past two weeks from \$0.10 to about \$0.22. There is clearly a growing appetite at many levels for carbon emission reduction technologies.

Jon Gluckman of Sixth Wave Innovations on the increased profitability and decreased carbon emissions from gold mines using its IXOS® product line

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In a recent InvestorIntel interview, Tracy Weslosky spoke with Dr. Jon Gluckman, President and CEO of [Sixth Wave Innovations Inc.](#) (CSE: SIXW | OTCQB: SIXWF) about how Sixth Wave's IXOS®

gold adsorption and recovery technology can help reduce costs and increase yield for gold mines resulting in as much as US\$100/Troy Oz savings.

In this InvestorIntel interview, which may also be viewed on YouTube ([click here to subscribe to the InvestorIntel Channel](#)), Dr. Gluckman said that Sixth Wave's IXOS® purification polymer is eco-friendly and is a superior replacement for the activated carbon used today in the gold mining industry. He went on to explain how IXOS® can provide additional carbon credits for reducing carbon dioxide emissions and help enhance a gold mine's ESG posture. Currently working with some of the major gold mining companies, Dr. Gluckman said that Sixth Wave's IXOS® technology can also be used in silver mining and in that of other high value metals.

To watch the full interview, [click here](#)

About Sixth Wave Innovations Inc.

Sixth Wave is a development stage nanotechnology company with patented technologies that focus on extraction, purification, and detection of target substances at the molecular level using highly specialized Molecularly Imprinted Polymers (MIPs). The Company is in the process of commercializing its, IXOS®, a line of extraction polymers for the gold mining industry.

Sixth Wave can design, develop, and commercialize MIP solutions across a broad spectrum of industries. The company is focused on nanotechnology architectures that are highly relevant for detection, purification, and separation of viruses, biogenic amines and other pathogens, and nutraceuticals for which the Company has products at various stages of development.

To learn more about Sixth Wave Innovations Inc., [click here](#)

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If you have any questions surrounding the content of this interview, please contact us at +1 416 792 8228 and/or email us

direct at info@investorintel.com.

ESG Alert: No matter how you slice it, the carbon credit world is big now and destined to get a lot bigger...

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With the current focus on climate change and the need to reduce our global carbon footprint it would probably make sense to have an economic way for nations and companies to commoditize carbon in order to better track and deal with this problem. Well there is and it may come as a surprise to learn that there has been a fungible carbon emissions trading market since 2005 – the EU Emissions Trading System. Also known as EUAs (European Union Allowance), similar to other commodities, EUAs trade on the Intercontinental Exchange (ICE). The carbon emission contract trades in Euro on a per tonne of CO₂ equivalent basis, with yesterday's closing price at just over €52 and a 52 week range of €23 to just under €57.

There are many companies around the world, including financial institutions, utilities, fossil fuel companies, and others, that actually have dedicated carbon emission trading desks transacting things like EUAs and have done so for a long time. However, today we are going to look at a different perspective on this market, one would suggest a natural evolution for a commodity, a streaming company that gives investors exposure to

the world of EUAs. [Carbon Streaming Corp.](#) (OTC: MXVDF) is a unique ESG principled investment vehicle offering investors exposure to carbon credits, a key instrument used by both governments and corporations to achieve their carbon neutral and net-zero climate goals. The Company intends to invest capital through carbon credit streaming arrangements with project developers and owners to accelerate the creation of carbon offset projects by bringing capital to projects that might not otherwise be developed.

You may have heard several companies around the world talking about setting net-zero emissions goals, in fact over 1,500 companies have announced plans to be net-zero by 2050 or sooner. Obviously, that is going to prove to be very difficult for those involved in resource extraction, manufacturing and even bitcoin mining that require more energy than is presently available on a renewable basis. But how will they get to net-zero? In the interim the plan is to offset the carbon they put into the atmosphere by buying offsets like EUAs. This can become a pretty complex circle of (carbon) life so we'll try to keep it simple here. You can break down carbon markets into two basic categories: compliance or regulated, where markets for carbon credits are created by the need to comply with a regulatory act; and voluntary, where corporations, governments and even individuals volunteer to offset their emissions by purchasing carbon credits.

No matter how you slice it, the carbon credit world is big now and destined to get a lot bigger. The estimated size for the compliance/regulated market was US\$261 billion in 2020, a five-fold increase from 2017. The voluntary carbon market was a much more modest \$320 million in 2019, although UN Special Envoy for Climate Action Mark Carney has said the voluntary market "needs to be a \$50-100 billion per annum." And that's why Carbon Streaming has been raising capital and signing up projects to

build up an inventory of carbon credits.

Since the start of 2021, Carbon Streaming has raised \$46 million including [\\$32.5 million in March](#) and another [\\$11.6 million in May](#). But the Company is not just sitting on that cash having recently announced commitments to invest in the [MarVivo Blue Carbon Conservation Project](#) in Magdalena Bay in Baja California Sur, Mexico, an exclusive term sheet to develop [two carbon credit projects](#) within the Bonobo Peace Forest located in the Democratic Republic of Congo and a strategic [joint-venture partnership](#) with an established First Nations business in British Columbia to source and finance investment opportunities in collaboration with First Nations and develop projects within their territories to combat climate change through the reduction of greenhouse gas emissions. In all, Carbon Streaming has sourced a potential deal pipeline of over US\$500 million with its near-term pipeline valued at approximately US\$170 million at target IRRs of 15%+.



Source: [Corporate Presentation](#)

So unless you happen to have a working model of a cold fusion generator that you've been keeping from the world, carbon credits are going to be with us for a while and likely to become even more commoditized than they already are. Carbon Streaming represents one of the few opportunities to participate in this space in today's market without having to set up your futures trading account and transacting EUAs.