BUSINESSEDGE

NEWS MAGAZINE

Mining & Resources Special Edition

Kodiak Copper CEO sees bright future for women in mining

PAGE 8

Canada could play a starring role in the future of critical minerals

BRAD HAYES

The energy transition of the 21st century – the transformation of energy sources from primarily fossil fuels to a more diverse and resilient set of energy generators – is profoundly changing humanity's demands on the earth's resources.

Many of today's key resources will continue to be important in the coming decades, including iron ore, sand and gravel, lime (for cement), coal, oil, natural gas, wood and other forest products. But there are a number of critical minerals that are gaining attention as technologies evolve. We are already mining or otherwise extracting all of these today, but new applications, many linked to more diverse energy generation, are profoundly upsetting traditional supply-demand relationships. Some examples:

- Lithium – lithium-ion batteries are key components of energy storage in an increasingly electrified world. Electric vehicle batteries and short-term electricity storage to support electrical grids drive skyrocketing demand.
- Copper – copper has been a critical metal in our electrified societies for more than a century, but demand is growing rapidly as more things are electrified. An electric vehicle (EV) requires about three times as much copper as a typical internal combustion engine (ICE) vehicle.
- Nickel – nickel's versatility includes use in stainless steel, solar panels, batteries, aerospace, and defence applications. With Russia ranking third among nickel-producing countries, the supply structure is facing disruption.
- Helium – helium cannot be substituted in rapidly growing applications such as medical MRI machines and high-tech semiconductor and fibre-optic manufacturing, while geopolitical factors threaten some of the major sources.
- Rare earth elements – elements that are important components of renewable energy tech such as wind turbines are rapidly achieving critical status, but current production and processing is focused in China.
- Cobalt – one of a number of metals important in battery technologies, but supply comes primarily from the Democratic Republic of the Congo, which has major human rights issues.
- Uranium – as nuclear energy grows rapidly in many nations, uranium demand is leaping ahead.

The International Energy Agency recognized the importance of critical minerals in energy transition in a key 2021 report.

Canada has designated 31 elements as critical minerals (Figure 1 on page 5), and other countries have similar lists. The federal government recently announced a Critical Minerals Strategy, and maintains a Critical Minerals Centre of Excellence, where one can find an interactive map of critical mineral mines, processing facilities, and new projects (Figure 2 on page 6).

There are numerous government incentives for starting up new critical minerals projects, but details are still being ironed out. Helium explorers, for example, do not receive favourable tax treatments, despite having to develop new exploration strategies and processing technologies in a market in which shortages loom.

(STORY CONTINUED ON PAGE 5)

Prairie Lithium positioned to capitalize on rising demand

By now, most investors are aware that lithium is a critical ingredient in our energy future.

Many are also aware that lithium is the lightest of all solid metals, and that lithium demand is rising sharply because of its essential role in lithium-ion batteries (LIBs) that power portable electronics, electric vehicles (EVs), and energy storage systems (ESS).

You may know that lithium has various industrial applications – including in manufacturing of multipurpose greases, medications, glass, and ceramics – and that the leading regions for lithium production are Australia, South America, and China.

But did you know that there are vast lithium resources in North America, and that there is a Canadian company that is well positioned to be a leader in lithium production in the years to come?

Prairie Lithium, headquartered in Emerald Park, Sask., holds the highest-quality inferred lithium brine resource in Canada discovered to date. Operating in Saskatchewan's resource-rich and mining-friendly Williston Basin, Prairie Lithium's projects have easy access to key infrastructure including electricity, natural gas, fresh water, paved highways, and railroads.

Proprietary technology will enable the company to utilize direct lithium extraction (DLE) from brine (mineral-rich, subsurface water deposits). Prairie Lithium has acquired petroleum wells scheduled for abandonment that can be used to streamline the process of penetrating the brine reservoirs.

It is a win-win scenario for Prairie Lithium – which obtains properties with built-in infrastructure and straightforward drilling access to lithium-rich deposits.

The environment is also a winner, since Prairie Lithium will be using best practices to extract resources that help fuel low-emission products such as EVs.

Soaring demand for lithium, combined with inadequate investment in lithium supply development, has driven prices to lofty levels. With the price of lithium increasing more than 500% from early 2021 to the end of 2022, new resources become more attractive and economically feasible to extract.

Meanwhile, Prairie Lithium's geoscientists understand how to analyze lithium in brines, map the hydrochemistry, delineate reservoir quality, model deliverability of the resource, and bring the resource to surface through drilling deep wells.

"We are a lithium resource company, and we are developing a direct lithium extraction technology to help unlock our resource that could also unlock other lithium brine resources," says Prairie Lithium CEO Zach Mauer. "With an exceptional business model and an amazing team of geologists and engineers who will help make the most of our assets, we are very excited about the company's future, as well as what these projects could do for investors."

Prairie Lithium Corporation recently entered into a pre-acquisition agreement with Arizona Lithium Limited (ASX: AZL, AZLO, OTC: AZLAF), a company focused on the sustainable development of the Big Sandy Lithium Project in Arizona.

For more information, including how to invest in Prairie Lithium, email info@prairielithium.ca or visit *prairielithium.ca*. For insightful explanations of lithium and direct lithium extraction, see the "Videos & Interviews" section under "News & Media" on the website's main menu.

IN THIS ISSUE

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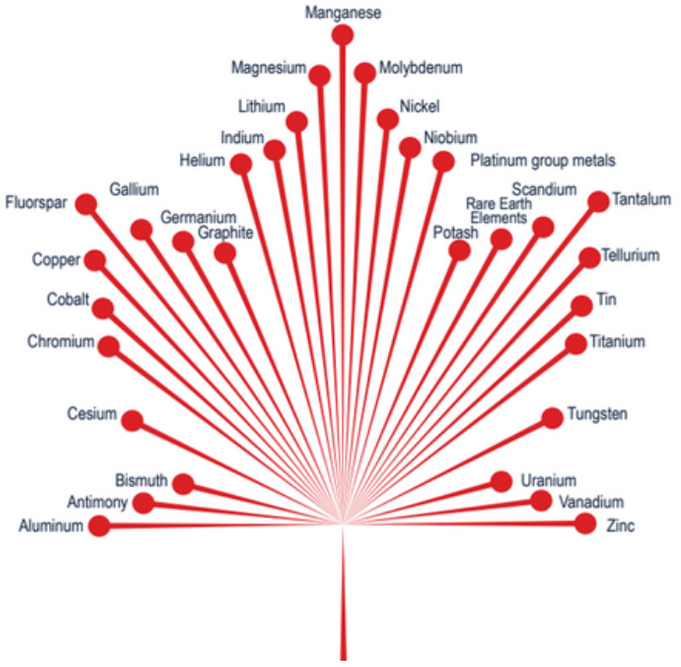
FROM PAGE 2

Figure 1: Canada's Critical Minerals List 2021



Source: Government of Canada

Provincial governments, regulators and technical organizations are stepping up as well. Geoscience BC supports research into critical minerals production in British Columbia, the Saskatchewan government is promoting uranium and potash as critical minerals, and Ontario is promoting development of critical minerals from planned new mines in the “Ring of Fire” northern frontier.

Policy experts are reinforcing the need for Canada to move aggressively on critical minerals development. See, for example, “*The Coming Energy Transition: Industry’s Opportunities are not just in Canada*” from Bazel and Mintz at the University of Calgary School of Public Policy.

This all sounds great – governments, academia, and industry are all on board to promote critical minerals development in Canada. Canada can lean on its traditional strength as a mining powerhouse, and many of the nascent players in international helium, lithium, and other critical mineral ventures are based in Canada.

Canadian resource entrepreneurs have in fact been pursuing critical minerals opportunities for several years now, seeing the emerging needs long before the current public focus.

But not all is rosy. Strategic disconnects such as those that have hindered oil and gas development globally over the past decade threaten to disrupt orderly evolution of critical minerals markets, too. Another recent IEA report – " Renewables 2002" – forecasts rapidly accelerating growth of renewable energy technologies, particularly wind and solar, in the immediate future.

While critical minerals supply chains are mentioned in passing, the report does not run any sensitivities to test alternative growth models should critical mineral supplies not be available in ever-increasing quantities at ever-decreasing prices.

Yet the same explosive demand growth that drives new critical mineral ventures is already creating serious shortages and rapidly rising prices.

Canadian helium explorers are routinely running economics on prices of $600 per thousand cubic feet – more than double the figure used just a few years ago. Lithium is attracting up to 10 times the price it did a couple of years ago, and most other critical minerals prices are jumping as well. Meanwhile, substantial new supplies – enough to change market dynamics – are years away, and in some cases cannot possibly meet forecast demand.

Even where global resources are adequate, geopolitical risks threaten efficient development. It took decades for non-OPEC oil and gas supply growth to limit the influence of OPEC on markets, and it will take comparable lengths of time to address similar problems with the supply of cobalt, rare earths, lithium, helium, and many other critical minerals.

As a result, big market distortions are clearly ahead. Emissions-driven policies set unrealistic goals for energy production that rely on explosive growth of renewable energy to have any chance of success. Canada’s Minister of Natural Resources Jonathan Wilkinson asserts that “Canada’s Critical Minerals Strategy will enable the country to seize the generational economic opportunity presented by critical minerals, creating sustainable, well-paying jobs while growing our economy.”

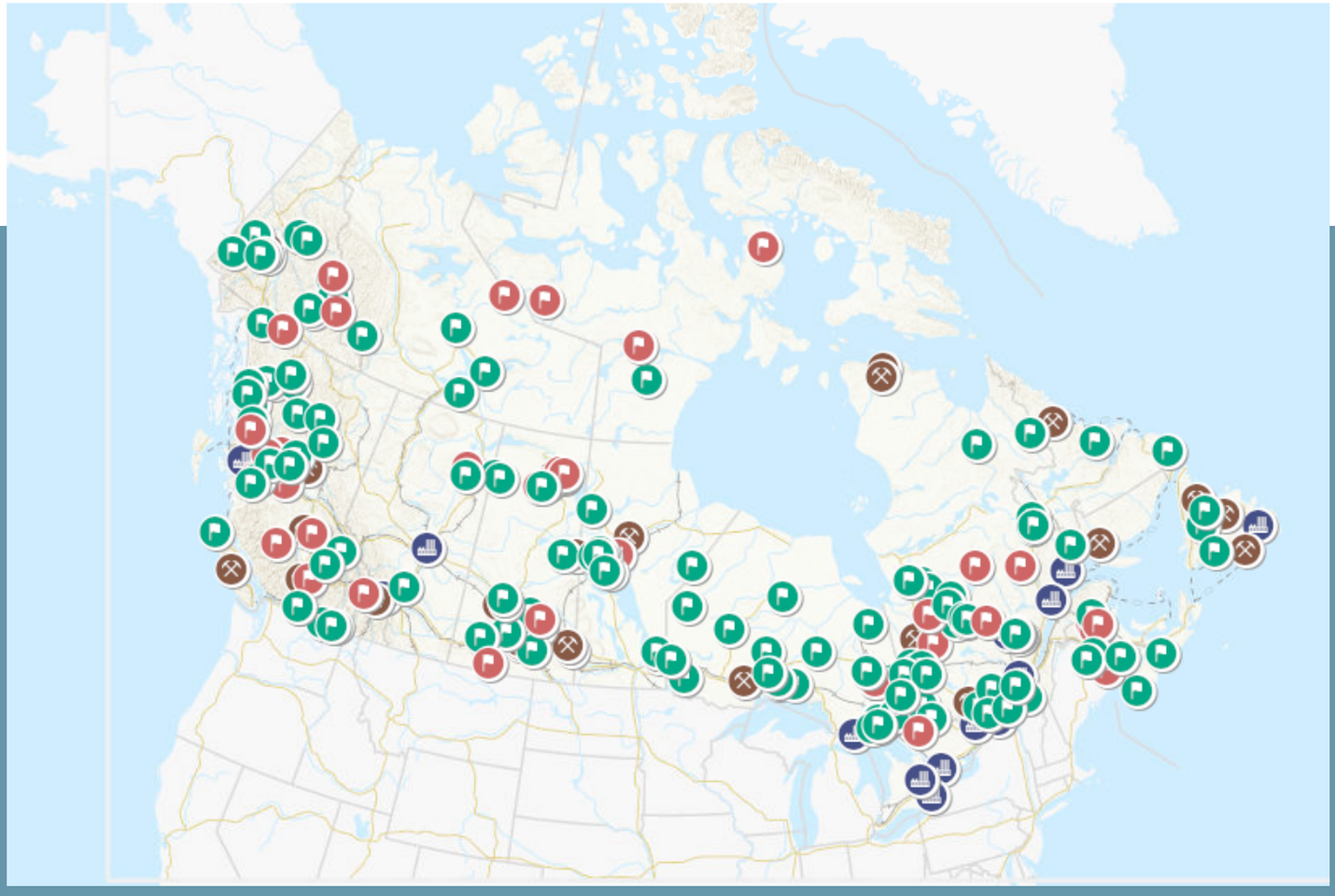
(STORY CONTINUED ON PAGE 6)

But in the world where things actually happen, policy statements and sunny outlooks are not enough. Financial, regulatory, technological, and engineering/supply chain factors guarantee that new copper mines, commercial lithium extraction from saline brines, and other substantial supply growth are years away.

So while fossil fuel supply growth (or even maintenance) is actively discouraged by Canadian, U.S., and European government policies, critical mineral supply realities will constrain renewable energy (and other technological) growth. New policy and ongoing research are responding to this immense strategic disconnect, but there is a bumpy ride ahead for energy supplies and prices. Let's hope Canada succeeds in expediting new domestic critical minerals supply growth in order to smooth out the road.

Figure 2: Critical minerals map of Canada

This view shows mines, processing facilities, and new projects in an advanced stage of development.



Source: Government of Canada

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KELLY RYAN

Polo-playing engineer excels in holding reins of mining junior

The subject of our 20 Questions feature this month is an anomaly.

Claudia Tornquist is one of a tiny handful of female CEOs in Canada's mining industry. According to the latest breakdown, only 19% of executives at publicly traded mining companies in this country are women. (2022 Diversity Disclosure Practices: Diversity and Leadership at Canadian Public Companies: Osler) A fraction of those are chief executives.

But sitting in the offices of Kodiak Copper Corp. (KDK.V) high above the streets of downtown Vancouver, Tornquist does not see any glass ceiling; only opportunity for those who put in the work.

She spoke with Business Edge News Magazine's Rob Driscoll and Kelly Ryan about going from the second-largest mining company in the world to a junior startup, copper in the Green Revolution, and bringing polo (yes, the kind you play on the back of a horse) to Vancouver.

1. You went from Germany to London to Vancouver. What took you to those different places?
Well, I grew up in Germany, and my training is as an engineer – mechanical engineer – and I then started my professional career in the automotive industry. After a couple of years, I did an MBA in France, and then worked after that in London in finance for a little bit because I wanted to apply what I had learned in the MBA. And just as I was planning to go back into the automotive industry, I had a headhunter approach me with a job at Rio Tinto. Until then, I had no intention of going into the resource industry. I had no touch points with the resource industry. In fact, I googled Rio Tinto because I didn't even know what Rio Tinto was at the time. They were specifically looking for people from outside the mining industry, and I ended up joining Rio Tinto. That was now more than 20 years ago. I've been in the resource industry ever since. With Rio Tinto, I had a fantastic time, and then made the switch to the junior sector. Moved with my family to Vancouver and have been in the junior mining industry ever since.

2. What is the biggest difference between Rio Tinto and the junior mining industry?
There's a very big difference. I would say Rio Tinto is a very large company, obviously much more slow moving and bureaucratic, much bigger projects, bigger sums of money, etc., involved. It's a great company to work for because things are done properly in a big company, and you really learn things properly. So I'm very grateful for my time at Rio Tinto, because it taught me a lot. The junior sector is much more entrepreneurial. You see much more the impact you make yourself. It's much more up and down because it's a very cyclical industry, and in the downturn, life's tough as a junior.

Claudia Tornquist
CEO Kodiak Copper Corp.

(STORY CONTINUED ON PAGE 10)

Award-winning broker Uthe is your trusted expert in mortgage matters and more

KEITH UTHE

Keith Uthe is not your average mortgage broker.

Besides being an award-winning Independent Mortgage Broker with Enrich Mortgage Group, Keith is a Licensed Realtor, Certified Real Estate Investment Advisor, Smith Manoeuvre Certified Professional, and Real Estate Investor.

While mortgage holders often work with brokers who simply take the commission from the deal and disappear, Uthe looks at his role as an industry-leading coach who can provide valuable guidance to clients on an ongoing basis.

"Maybe you can foresee a move in the future – perhaps for a new job or lifestyle change – three, five, or 10 years from now. When it comes to these large investments, it makes sense to have a prudent plan with contingencies in mind – and it is critical that you have access to the most important information.

"That is what I am here for; I am constantly educating myself so that I can be a valuable resource to my clients."

Recently, the Bank of Canada released a document indicating that about 50% of variable-rate, fixed-payment mortgages have reached their trigger rate, the point at which the mortgage payment only covers interest and contributes nothing toward the principal. This affects about 13% of Canadian mortgages.

But that is not cause for panic, according to Uthe.

"Mortgages are usually the most significant financial transactions in our lives, so it is paramount that we understand what we are getting into, as well as how things may change down the road," Uthe explains. "When I meet with my clients – be it in person or virtual – we discuss not only where we are now and how we got there, but what the future may bring. There are all sorts of variables that should be considered when managing mortgages and other real estate investments.

"The last thing you want to do is make a rash decision that could put you in a difficult position," Uthe explains. "If you work with me, I can go over various options, including possibly increasing your mortgage payment by a sensible amount so that you keep pace with the mortgage term without putting too much pressure on your current situation."

A series of interest rate hikes is the latest sign of how the mortgage industry can undergo great change.

As a Smith Manoeuvre Certified Professional, Uthe can even show you how to make your mortgage payments tax deductible.

For a free, no-obligation discussion about your mortgage situation, contact Keith at keith@enrichmortgage.ca or toll-free 1-877-366-3487.

FROM PAGE 8

3. Tell me about working with Kodiak Copper in British Columbia. I have read somewhere that you appreciate that the general rule of law is followed here compared to in some regions. Is that something that draws you to work in Canada?
Yeah, it's a great place to work, and many of our investors really like Canada and B.C. because it's a safe jurisdiction, rule of law, you know what you get. And it's been fantastic working here. At our MPD project, we have a very good relationship with the Indigenous communities in the area. Sometimes, B.C. or Canada can be slow and bureaucratic when it comes to permitting and things like that, but, overall, you know that, and you plan with it. Overall, it's a fantastic place to work.

4. Let's talk about the whole safety issue because certainly if you are working in South America there are real risks. Do you come up against protests or people who don't like mining companies in their community? Because mining has a reputation of just going in and getting what they want, and then leaving when they're done.
We haven't had any opposition so far. I think what you just described, mining companies just going in and doing whatever they like, that's maybe what happened in the old days. But, really, those times are over. It's expected that companies are responsible for the environment and work together with the local communities – take their views, their input into consideration, and we certainly work very closely with all the local First Nations. And it's a very constructive working relationship. We keep them up to date, we meet with them, they give us their inputs. They work, for example, with us on our environmental work, on our heritage surveys, and it's very constructive.

5. How is it working with Kodiak? I've read there has been some positive news.
Well, we've just wrapped up a big year of exploration. We were able to execute a large exploration program. We drilled over 25,000 metres, have some results already, and have much more to come in terms of results. We just made a gold and silver discovery recently in trenching, which is a very exciting new development and are now busy planning an exciting and big program again for next year. We're hoping to conduct a similar size program to what we did this year. So lots more news to come from Kodiak.

> “...TO BE ABLE TO POINT TO A DISCOVERY THAT GETS EXCITEMENT, GETS INTEREST, AND WHETHER IT'S COPPER, WHETHER IT'S GOLD, IT JUST SHOWS THAT WE'VE BEEN SUCCESSFUL IN OUR APPROACH.”

6. The gold find – is that going to be a major part of your company going forward? How significant are the results?
Well, the recent biozone discovery is a bit out of the box, I would say, in that it was a gold, silver, precious metals discovery. And, in general, the main project is copper porphyry. That's what we've primarily drilled for so far. It's not uncommon in a large porphyry system like the one at MPD to also have precious metals zones. So it's an interesting addition and additional potential essentially for the project going forward. The main focus is copper porphyry exploration and certainly we have lots of targets for that next year to drill. This new discovery just adds another class of targets to our list. It helps to bring investors in when you say, oh, not only have we got copper, we've found gold, potentially, and silver.

7. In a market where everybody's worried about a potential recession, how do you make people spend their money and invest?
It certainly helps to make discoveries. I think that's what the excitement is in a junior mining company. And to be able to point to a discovery that gets excitement, gets interest, and whether it's copper, whether it's gold, it just shows that we've been successful in our approach. We have a very systematic exploration approach. And last year we came up with the Gate Zone copper discovery, which we've since successfully expanded. And now this gold discovery is a brand new addition and certainly an exciting one.

(STORY CONTINUED ON PAGE 12)

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FROM PAGE 10

8. Can you help readers understand why copper is so significant in terms of the direction of our economy and in different industries?
Well, copper and the demand for copper will be driven in large part by the whole energy transition, the green revolution. There's lots of demand already materializing, and there will be more materializing over the next years and decades. This whole energy transition is a real global mega-trend and all the industry or technologies that underpin the Green Revolution – electrical cars, solar, wind, etc., they are all very copper intensive and use much more copper than the industries they replace – say, an electric car takes 3, 4, 5 times as much (copper) as a conventional car, and so we know there will be strong demand.

9. How is the supply side looking?
The supply side of copper is very different in that there are just not many projects coming on. In the last 10 years, there have been very few copper discoveries, and no major discoveries. We know already – because it takes 10 to 20 years to build a copper mine from discovery to when it produces – there won't be much coming on in the next couple of years. On the other hand, we have, of course, a lot of demand.

10. Is there a plan to build up the drilling program and then merge or be bought out?
Well, our aim for the future is to add value at the drill bit. That is I think what we can do best as a junior. We certainly will execute big drill programs next year, the year after, to make more discoveries and add value that way for our shareholders. Now, in the long term, if you look around the world, the copper porphyry mines that are up and running, I don't think there is a single one that is run by the junior that originally made the discovery, because copper are big deposits. Big mines that cost many hundreds of millions, if not billions to build, and they're a big-company game. So for us, in the long term, the likely scenario is if we keep having success, that eventually a major company will become interested.

> “LOTS OF PEOPLE ARE LOOKING NOW SPECIFICALLY FOR WOMEN IN LEADERSHIP AND BOARD ROLES. SO, REALLY, THE TIDE IS CHANGING.”

11. How many female CEOs are there in the mining industry?
In Canada, I don't know the exact percentage, but it's a small minority. It's a very male-dominated industry. Almost all of the CEOs are male.

12. Do you find challenges with that?
Not really. At the end of the day, it's what you do and your work. If you are doing good work, then, yeah, that's what counts. There might have been, in the past, glass ceilings or opportunities that people just didn't think of (for) a woman. People would go to the people they knew, the other CEOs. And so the logical choice for many roles would have been men. But I think that's really changing – lots of people want now a more diverse leadership, more diverse companies. And I can certainly say from my experience over the last year or two or three, that I've had as many opportunities come to me, particularly board roles ... just lots of people are looking now specifically for women in leadership and board roles. So, really, the tide is changing. Yeah, I think more and more companies are realizing that having a woman at the helm or as part of the management group is actually really good for the success of a company.

13. I think that you naturally inspire young women just by doing what you're doing, by reaching the top level of management with a mining company. Do you find there is any extra pressure to be that inspirational leader?
I *can't say that I'm thinking much about it; being extra inspirational. It's great if girls or younger women get inspired by my work or other female CEOs' work. I think it would be great to have more women in the business. There's a lot of research that shows that diversity leads to better results, and diverse teams make better decisions.*

14. There are a lot more women geologists than there used to be, aren't there?
I don't know. I honestly don't know. When I was at university, I did not even know that you could study geology because, in Germany, geology is a non-event. And like I said before, I didn't even know Rio Tinto when they first approached me. I worked for Rio Tinto for almost 10 years, and I was in England, so very often I'd go back to Germany. And in those 10 years there were three people in Germany who knew what Rio Tinto was. That tells you how much mining is on people's mind. In Germany, it's just a non-event.

(STORY CONTINUED ON PAGE 14)

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FROM PAGE 12

15. There are lots of people who are going to say, 'Why would you stay in the resource industry?' It is so fickle. What is the draw for you?
I just like the entrepreneurial side of it and, yeah, it's a very exciting industry. Sometimes a very frustrating industry because, if you do explorations, sometimes you find nothing. It's a very cyclical industry, so sometimes there are downturns that can take long years, so there are certainly lots of ups and downs. But if you make a discovery, success at exploration is just very exciting, and that's really what I like about it.

16. Switching gears a little, you were instrumental in bringing polo back to Vancouver. Tell us about that.
(Laughing) Well, polo is one of my big hobbies. In fact, our family hobby. My husband plays, my children play – we are a polo-playing family. And when we moved to Vancouver from London, U.K., we planned to join the Vancouver Polo Club and arrived here and found out there was no polo club. So we founded one.

17. Were many people interested?
For the first couple of years, the Vancouver Polo Club was my husband and me - two members. But since then, it has grown and we are now the second-largest polo club in British Columbia, and a very active club. It's great fun to play and a really fantastic sport. So (the club has) gone from two people to 14 members. You have to keep in mind, polo is a very small, elite sport. I think the entire community of polo players in North America, is 5,000. So there are probably more people in Vancouver, many more people in Vancouver that play hockey than there are people who play polo in all of North America.

18. I've never played polo, and I don't know anything about it other than that horses are involved. Can you tell me the greatest things about polo?
It's a very exciting sport. It's a lot of adrenaline, and it's very hard in that you have to ride, of course, then you have to hit a ball from the back of a bouncing horse. A small ball. While going at a gallop and with a long mallet. So there's a lot of hand-eye coordination, and I think it's a bit like golf that many times you hit it and it just doesn't go anywhere. And then you hit this one shot, and it goes. And it's such a fantastic feeling. So that, and then it's also a lot of just strategy on where to go and how to go, and how to play the game. And you can imagine it's very fast. You are galloping on a horse. And so, yeah, there are many different angles to it. It's a very addictive and very fun sport.

Clauria Tornquist is all smiles when she speaks of her passion for playing polo.

19. And dangerous to some degree. There have been some high-profile injuries. Have you been able to avoid injury?
It is, I think, less dangerous than many might think. Obviously, whenever you ride on the horse, every once in a while, you hit the ground, and generally that's not so pleasant. But it's not more dangerous than many other equestrian sports or other sports. So, no, we haven't had any serious accidents, which is great.

20. One more question about Kodiak – why would somebody want to invest in Kodiak?
Well, with an exploration company, it's always the management. We have Chris Taylor, our founder, who's famous from his Great Bear success, one of the major gold discoveries in Canada in recent years, if not decades. And having him at the helm is obviously fantastic. We have made a discovery, and are fully funded, and have lots and lots of results coming, and much more thrilling ones to come. So it's a very exciting stage in the company's development.

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Mining and resource stocks regain their lustre

CONSTANTINE LYCOS

Mining and resource stocks have over the decades been a very important sector of the Canadian stock market. The inherent volatility, scandals, low overall sector rates of return, and the rise of the real estate sector and related industries as the primary sector of importance in Canada have meant that resource stocks declined in prominence in the last 15 years. However, a strong case can now be made in their favour.

The demand for metals is very strong.

1. The move toward clean energy initiatives is creating additional demand for metals and minerals. Wind, solar, electrified automobiles and their batteries are all adding significant demand for metals:

- Electric cars, for example, according to visualcapitalist.com contain on average 66 kg of graphite, 53 kg of copper (compared to only 22 kg in gas cars), 40 kg of nickel, 25 kg of manganese, 13 kg of cobalt, and 9 kg of lithium.
- Offshore wind-power plants, according to the International Energy Agency, require 13 times more mineral resources than a similarly sized gas-power plant.

2. Infrastructure spending is projected to be dramatically higher in the next 10-15 years compared to the previous 10-15 years in huge projects such as power plants, roads, telecom, water, rail, airports, and seaports. According to Russell Investments, the key reasons for this are aging infrastructure needing upkeep in the U.S. and Europe, and new infrastructure spending, primarily in Asia.

> “THE DEMAND FOR MINERALS AND METALS IS VERY STRONG... MEANWHILE, THE SUPPLY OF METALS AND MINERALS IS CONSTRAINED.”

(STORY CONTINUED ON PAGE 18)

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Supply of minerals and metals

Meanwhile, the supply of metals and minerals is constrained. There has generally been underinvestment in the sector since just before the financial crisis of 2008 as investors decreased their exposure to the sector (as well as the oil and gas sector) due to ESG (environmental, social, and governance) concerns, as well as due to the prevailing preference to invest more heavily in long-term-growth sectors such as technology.

Additionally, new mines require a long timeline to reach the point of production, often 10 years or more. In light of this, and with valuations being quite good for the mining sector as a whole, we believe that investors should have significant exposure. While the S&P500 Index has less than 3% exposure to the industry, a good allocation could be 6-10%, with a corresponding reduced allocation to technology and financials.

CONSTANTINE LYCOS IS THE CEO OF LYCOS ASSET MANAGEMENT INC., WHICH PROVIDES FINANCIAL ADVISORY SERVICES INCLUDING PORTFOLIO MANAGEMENT TO INDIVIDUALS AND CORPORATIONS. HE CAN BE REACHED AT CONSTANTINE@LYCOSASSET.COM OR 604-288-2083. VISIT LYCOSASSET.COM FOR MORE INFORMATION.

Attractive investment options include:

Cameco (TSX:CCO $30.58, don't pay over $33.00), the largest uranium producer in the world. With the world moving toward cleaner energy, nuclear power plants could become more important in the energy production mix.

Freeport-McMoran (NYSE:FCX $37.83, don't pay over $40.00), the largest copper producer in the world. Electrification of vehicles requires copper. Copper is economically sensitive, and therefore a volatile stock pick – and we may be in a recession in 2023.

Tech Resources (TSX:TECK.B $52.07 don't pay over $57.00), a diversified miner with copper and zinc (clean energy), as well as some coal and oil-sands production.

Silvercorp Metals (TSX:SVM $4.44, don't pay over $5.50) A smaller, mostly silver miner, $838-million market capitalization. Silver is used in electric cars, so with wide-scale electrification of vehicles under way, there should be a lot more demand for silver in the coming years. There are not many pure silver stocks to choose from, and this is one of the better ones.

Modest economic growth predicted for provinces

BY THE CONFERENCE BOARD OF CANDA

Canadian provinces will see limited growth throughout the remainder of 2023 and into 2024, according to new research from the Conference Board of Canada.

"Despite the signs pointing to slow economic performance this year, the worst-case scenarios of a deep recession or highly destabilized labour and capital markets are becoming less likely," said Ted Mallett, director, economic forecasting at the Conference Board of Canada. "We anticipate that the hospitality, transportation, arts and recreation sectors will be at the leading edge of growth through 2025."

The Conference Board of Canada estimates that Newfoundland and Labrador's GDP contracted 1.8% in 2022, but will rebound by 2.2% in 2023, and 2.1% in 2024, driven by a resumption of oil production from the Terra Nova platform. Employment in the province will remain relatively stable in 2023, as the economic slowdown continues to affect the services-producing industries.

High commodity prices are expected to continue supporting Alberta's GDP growth in 2023. The agricultural sector looks favourable in 2023, following a recovery from the drought in 2021. The biggest concerns for Albertan farmers involve uncertainty about demand concerns and input price uncertainty. The province's GDP is forecast to be 2.1% in 2023, before accelerating to 2.8% in 2024.

Saskatchewan's mining and agriculture sectors are expected to be strong drivers of growth again in 2023. Farm receipts are expected to post a bigger increase in Saskatchewan than in any other province in Canada, as the province continues its supply-driven recovery following the drought in 2021. The Conference Board of Canada forecasts Saskatchewan's GDP to expand 1.6% in 2023, followed by a 2% gain in 2024.

Manitoba's strong agriculture performance in 2022 is expected to continue in 2023. Despite the growing concern over rising input costs, crop-price volatility presents the biggest risk factor for the agriculture sector. However, the Conference Board of Canada expects that to ease in 2023. Real GDP for the province is projected to be 0.9% in 2023, followed by 2.2% in 2024.

With nearly all pandemic restrictions lifted in Prince Edward Island, the tourism sector and Canada Winter Games are expected to be major contributors to the Island's economy this year.

However, the agriculture and fishing sectors are still dealing with damages from Hurricane Fiona. The Conference Board of Canada forecasts the province's GDP to expand 0.9% in 2023 and 2.5% in 2024.

Ontario's high-skilled sectors such as professional, scientific, and technical services are expected to see output growth above the national rate this year and next, while the manufacturing sector will contract in 2023 due to slower global demand, particularly in the durables sector. The Conference Board of Canada forecasts Ontario's GDP to grow 0.5% in 2023, before rebounding to 2.5% in 2024.

Exposure to higher debt costs is a particular concern in British Columbia, where household indebtedness is among the highest in Canada. Supported by immigration and net positive interprovincial migration, the province's population is expected to expand at an average annual rate of 2%, exceeding the national growth rate of 1.8%. The province's GDP will expand 0.4% in 2023 before growing to 2.6% in 2024.

Despite the anticipated economic downturn for Canada's trading partners, demand for fishing and agriculture products will help exports keep expanding, acting as a bright spot for Nova Scotia's economy. Increases in shelter and energy costs were more pronounced in Nova Scotia than most provinces. As a result, real household consumption in the province is expected to decrease this year. The Conference Board of Canada projects GDP in the province to increase 0.3% in 2023.

Monetary policy is gradually filtering through to several areas of Quebec's economy, notably investment and consumption. Demand for housing in the province is waning in response to higher interest rates and will remain tepid in the coming years given relatively weak projected population growth. Quebec's GDP growth is forecast to be 0.2% in 2023, followed by 2% in 2024.

New Brunswick continues to see a growing population, which expanded 2.7% year over year in the third quarter of 2022, driving an increase in housing demand that is expected to continue in 2023 despite higher interest rates. The Conference Board of Canada forecasts New Brunswick's economy to expand just 0.1% in 2023 and 1.8% in 2024.

Canadian mining industry a story of abundance and opportunity

NORMAN LEACH

In Canada, the mining and oil and gas industries have gained reputations they do not deserve. Ask the average Canadian what they think of either sector, and the answer is often one of derision and hopes for banishment. Both face the same challenge – they create enormous wealth but are far from the end user. Few Canadians realize just how much of their daily life depends on the mining industry, so it is easy to criticize.

As far back as the 1670s, explorers and business people (it was sometimes hard to tell them apart) were trying to establish mining operations in a territory recognized for its wealth of mineral resources. Coal was discovered on Cape Breton Island, and copper in the Hudson's Bay region. However, it was not until 1783 that a commercially viable mine was built in Trois-Rivieres, Que. – extracting iron ore and then copper in Bruce Mines, Ont.

Through the end of the Second World War, the Canadian mining industry grew rapidly, serving the needs of an economically expanding Canada and the demands of the war.

Today, mining is still vitally important to Canada, and the folks at Canada Action (https://www.canadaaction.ca/mining_sector_canada_by_the_numbers) help us highlight a range of impressive facts.

More than 720,000 people work directly or indirectly in the industry. Economically, mining represented 5% of the country's GDP – over $105 billion – in 2019 alone. By value, Canada's top five mineral products are gold, coal, iron ore, potash, and copper, representing a collective revenue value of $31.6 billion in one year.

Canada is one of the world's most diversified mining countries, with almost 200 mines and another 6,500 quarries. Today, Canada is the largest producer of potash, uranium, and niobium, and the third-largest producer of aluminum, cobalt, nickel, gemstones, and platinum.

As for bringing investment to Canada, the mining industry plays a leading role. Fifty percent of the world's public mining companies are listed on the Toronto Stock Exchange (TSX) and the TSX-Venture Exchange, making Toronto the mining finance capital of the world. Mining companies and investors collectively pay an average of $2.4 billion in taxes and royalties annually.

In 2019, 14% of the world mining industry investment in non-ferrous exploration was spent in Canada.

(CONTINUED ON PAGE 22)

THANK YOU...

... for joining our celebration of the relaunch of Business Edge News Magazine and expansion to Eastern Canada!

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For workers, the news is also good. The average annual wage in Canada is $63,000; in mining, it is $126,000. In Ontario, on average, mine workers made 77% more than the industrial wage, earning $1,791 per week. In Saskatchewan, the industry paid $1.4 billion in wages in 2017.

Since 1974, the mining industry has signed 525 agreements with Indigenous people in Canada, covering more than 365 exploration and mining projects. Three hundred of those agreements have been signed since 2010, and, as of 2019, 430 of the 525 agreements were still in effect.

Add to the mix that 16,500 First Nations people are working in the mining industry – the highest number in any private sector industry in Canada. Today, Indigenous people represent 12% of those working in the mining industry – up from 8% in 2011, while Indigenous people account for approximately 3% of the Canadian population.

The mining industry is often called into question for its impact on the environment, and the positive side of the sector's efforts are often left out of news reports.

In 2004, the Mining Association of Canada (MAC) established the Towards Sustainable Mining (TSM) Initiative, well ahead of many industries. The TSM initiative has been recognized by many as a world-class initiative. Argentina has adopted it, as has Botswana, Finland, Spain, and the Philippines – with more countries actively considering using the Canadian standard.

Driven by the BC Health, Safety and Reclamation Code for Mines focused on "best practices in environmental stewardship and responsible development, mining companies in British Columbia are among the lowest GHG emission-intensive mining sites in the world.

The Canadian mining industry also supports the Green Mining Initiative, led by Natural Resources Canada, which aims to "improve the minerals sector's environmental performance and create green technology opportunities." It is easy to criticize an industry when you ignore the facts. In the case of the Canadian mining industry, the facts paint a mostly bright picture.

Mining industry women making big impact through Global Change for Children

KELLY RYAN

Every year at the Vancouver-based mining convention known as Roundup, there is a raucous party at downtown bar Moose's Down Under. Everyone from drillers, to geologists, to mining company presidents gather to support what has become known as just "the kids' party". People bid eagerly on silent-auction items, most having little idea of the international impact their spending will have.

The event was started 14 years ago by a small group of women working in the mining industry. Their travels brought them face to face with children struggling in impoverished communities.

"You know, we are so accustomed to seeing young children in school. And, there, you see the children selling wares – they are working. They are not getting educated," says Nancy Curry, one of the founding members. She admits it was daunting to think that they could make any real change, "but we thought, let's just throw a little party and bring a little money in."

That first party raised $4,600. Encouraged, the women formalized their approach and created the non-profit agency Global Change for Children (GC4C). Since that year, the event has raised over $450,000. It has paid for wells and water lines to a school in Laos, built the first primary school library in Bondeni, Kenya, created a transport system for child burn victims to get to a specialized clinic in Lima, Peru, and upgraded a counselling space for traumatized teens in Houston, B.C., among other projects.

"It's never enough," adds the CFO of the charity, Jessica Van Den Akker, "but it's enough to make a difference. To be honest, it's a bit heart-wrenching. And to look at all the proposals put before us, you see all the things people are trying to do for children. We have a lot to be grateful for."

Curry speaks enthusiastically about a trout farm GC4C helped build in Patacancha, Peru, in 2015. The goal was to eradicate chronic malnutrition among the 134 students at a primary school. The children, ages 3 to 13, regularly didn't have enough food. The GC4C trout farm changed that.

"It took two years to complete," says Curry. "The school now provides the students a protein-based meal three times a week, and then they sell the balance of the fish to help fund the school.

"That project is really dear to us because it's now self-sustaining." Follow-up study has shown an 84% improvement in children's health, along with increased attendance at school.

Both Curry and Van Den Akker credit the generosity of the mining industry – an attribute they know the public may not see.

"I think the perception is mining companies just want to take; take the resources and leave. I think that's incorrect," says Curry. "I think everyone is an eternal optimist. They are going for the dream, always looking forward. And they want to share."

The GC4C fundraiser brings in $40,000-$50,000 per year. With Moose's Down Under generously contributing the food for party patrons, every cent donated goes into the projects.

"We all donate 100% of our time," explains Van Den Akker, who is a CFO of a small renewable energy company. "The website (*https://gc4c.org*) is $400 every three years, and we have someone who does that for us. I think it's great that we are all volunteers. We are all just doing the best we can."

Among the many charitable initiatives carried out by Global Change for Children is a library for young students in Bondeni, Kenya.

Fracking 101: Just the fracts

LAURIE WESTON

When I graduated from university and started my job at Shell Canada as an interpreter, I was trained on the basics of the petroleum system. To clarify, an "interpreter" in this context does not mean that I was hired to translate Greek to English. I do speak Seismic quite fluently, though, and my role as an interpreter was to translate sounds of a different type – the mysterious sound waves contained in seismic data – to predictions of geological layers and properties, unseen in the subsurface. The integrity of the "petroleum system" was the objective of this translation, as it was vital to the success of the exploration and production activities of oil companies.

The petroleum system consists of five key components: source, migration, reservoir, trap, and seal. In plain language, has oil been generated naturally somewhere and travelled on its own to collect in a pool where it has been contained until the present day without leaking? The process of answering these questions is an attempt at reducing the considerable risk inherent in selecting a precise location to drill a 10-centimetre (4-inch) diameter hole in the ground, kilometers deep, costing millions of dollars, and strike it rich. "Oil, that is, black gold, Texas tea," in the eloquent words of Jed Clampett.[1]

There was, however, a potentially fatal flaw in the Beverly Hillbillies' depiction of Jed's discovery. In Jed's case, oil was at the surface, which meant the seal had failed and all the oil had quite likely already leaked out of the pool. A minor detail for a comedy show, but if any one of those components of the petroleum system is compromised, our expensive well will fail. Imagine the suspense and excitement when a well you proposed is drilling and nearing the predicted objective. Will you move to Beverly Hills, or remain a poor mountaineer?

Despite the best intentions and considerable scientific work done in advance, most of these attempts (typically 19 in 20 exploration wells) did, alas, end in failure – a "dry hole". There is a lot of uncertainty in these endeavours.

I was fortunate enough to be involved in a few successful discovery wells, and there is no feeling quite like it.

The process just described relates to conventional exploration. Conventional refers to the situation in which Mother Nature does the heavy lifting. We simply search for the convergence of all the right conditions at the conclusion of her work. What if we could shortcut nature's slow, methodical approach, while eliminating four of the five petroleum system components and drastically reducing the risks of the other one? Our chances of success would increase from 5% (1 in 20) to almost 100%.

This is not hypothetical; it is precisely the premise underlying "unconventional" production. It takes millions of years to form oil in compressed layers of ocean-bottom mud and silt, pressurized and heated to the conditions necessary to transform dead fish, shellfish, worms, and other sea creatures into hydrocarbon molecules. It takes millions more years for increasing pressure to squeeze those droplets out of the source rocks and start them on their journey to a secondary, trapped porous reservoir layer, where they collect into a commercially sized oil or gas pool. There are vast hydrocarbon source deposits all over the world already identified by geologists; instead of waiting for nature to move that oil from the source to the pool, and hope that it is contained there, why not drill directly into the source, removing the migration, reservoir, trap, and seal risks in the process? "Shale gas that is, tight oil, U.S. energy independence," a modern Jed (or Jen) might say.

That sounds pretty straightforward, but there are two significant technologies that had to be invented and perfected to enable our exploitation of source rock: hydraulic fracturing ("fracking"), and horizontal drilling. These two technologies overcame previously insurmountable problems: that source rock (shale) has very low porosity and, effectively, no permeability.

(CONTINUED ON PAGE 25)

If a conventional vertical well was drilled into source rock, even though it encountered oil or gas, only a thimble-full would collect in the well, just from the face of the rock exposed to the well bore, not beyond.

Horizontal drilling increases the surface area of source rock exposed to the well bore, and fracking creates permeable pathways for oil or gas to flow from some distance away from the well bore, increasing the production possible from one well by several orders of magnitude.

It is difficult to overstate the impact of these combined technological breakthroughs. The ingenuity, research, experimentation, resourcefulness, investment, and risk are on the scale of a moon landing, embodying remarkable ambition and accomplishment. There is a reason the technology was developed in North America; the race to unlock the prize contained in these rich conditions created the kind of incentive and competition that excite free enterprise.

Figure 1 (see *https://big-media.ca/fracking-101-just-the-fracts/* to view all figures) shows the effect of these breakthroughs in the U.S. production/consumption profiles from 1970 to 2021. Prior to 2020/21, energy independence was nearly in the bag.

So, what exactly does fracking entail? In order to break solid rock, an impressive amount of force is required. The force in this case is provided by pressurized fracking fluid (each company has its own secret recipe). This requires a substantial amount of water and equipment on the drilling site (Figure 2).

This equipment is there temporarily while the wells are completed. It is an orderly and efficient process, especially since multiple wells are drilled from the same surface location, directed in a horizontal pattern into the optimal layer (Figure 3).

The success of the operation depends on the quality of the rock, the hydrocarbon type (oil or gas) in the rock, and efficient engineering. Like a fine wine, there is a certain level of maturity, or ripeness to the source rock, the quality of which is determined through sampling and expert assessment.

This maturity can only be achieved in a high-pressure and temperature environment, so by their very nature these source rocks are deep – typically 3,000 to 4,000 metres (10 times deeper than the water table).

Depending on rock strength and fluid maturity, the completion program – the number of wells, their position, spacing, and length – is designed to access as much productive reservoir as efficiently as possible.

The frack program then kicks in. In a controlled and deliberate operation, engineers isolate a precise section of a horizontal well and pressure up only that zone, just enough to crack the rock. Then they will isolate the next section of the same horizontal well, and do the same again. There can be 100 or 200 of these “stages” in one well. These cracks open up pathways to get the juices flowing, but to keep them flowing, something needs to be pumped into the cracks to prevent them from closing under the pressure of 3 kilometres of rock above. This material is called, appropriately, proppant, and can be as simple as plain sand.

The benefits of fracking are obvious: increased domestic production, lower finding and development risk, and concentrated operations, minimizing land disturbance. There are some downsides, however. Opening a fracture by brute force can trigger a chain reaction in naturally stressed systems, causing an earthquake. This “induced seismicity” is monitored and regulated. Most of these induced earthquakes are too small to be felt at the surface – less than magnitude 2.0 on the Richter scale (microseismic). Tens of thousands of earthquakes this small occur naturally every day around the world. A small proportion of fracking-induced earthquakes are larger than 2, rarely getting over 4.0. For context, a 4.0 earthquake would feel like a large truck rumbling past your home.

Another downside – or maybe challenge is a better word – is the fact that production rates can decline quickly, so producing shale gas or tight oil fields require regular maintenance, which may mean infill drilling or re-fracking after a period of time. This and other factors make it difficult to start and stop production at will, in response to oil price volatility or political sentiment.

The risks and benefits of fracking are well known. As geopolitical events reinforce the enduring necessity of oil and gas, particularly the role of natural gas in the energy transition (see the BIG Media article Putting global emissions into perspective), in the context of responsibly managed and mitigated risks, the benefits cannot be ignored.

AI: Where are we and where are we going?

LAURIE WESTON

Artificial Intelligence has people fretting. High-profile disagreements among tech gurus make us wonder, anxiously, what the future will be like for ordinary people. If geniuses like Bill Gates, Elon Musk, and the late Stephen Hawking cannot agree on the usefulness and the relative benefits or dangers of AI, what hope is there for us to understand or even imagine how our lives will change? Will all of humanity live like kings and queens in a utopian world with robots providing for our every need? Or will those robots be in charge, banishing us to the wastelands? Is carbon-based life (that's us) compatible with silicon-based life (that's computers)? Are we heading for a power struggle? And, if that is our fate, who will win?

Let's start by taking stock of the present: how is AI already influencing our lives, for better or worse?

But wait. Before we even do that, we first need to take a step back and talk about data[1]. Data might possibly be the most boring subject on Earth. "Could there be anything more boring?" Remember Chandler Bing in the iconic American sitcom, Friends? None of the Friends could remember what he did, because they lost interest in the middle of his job title and stopped listening. Give up? Chandler's job was "Statistical Analysis and Data Reconfiguration". This was the most banal, unfulfilling career the writers could come up with – in 1994.

Now, Data Scientist (literally doing statistical analysis and data reconfiguration) is the sexiest job of the 21st century.

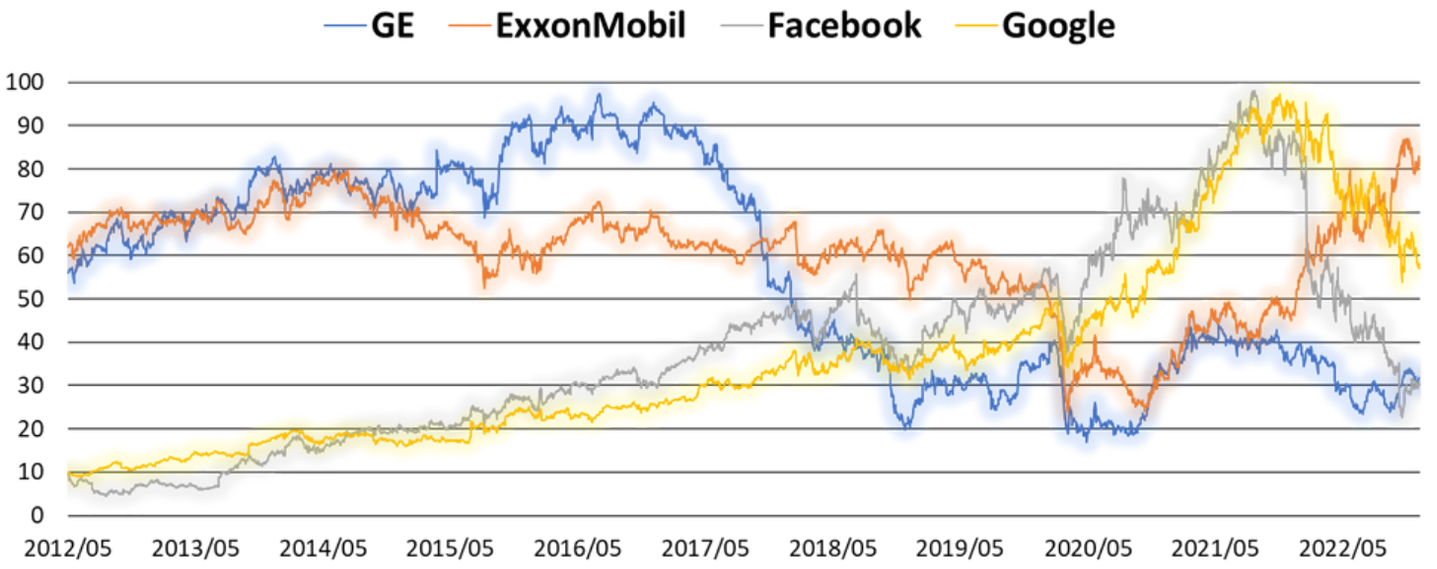
While the term "data scientist" appeared around 2010, the job search site Indeed.com reports that Data Science job postings increased 256% between 2013 and 2018, a pace faster than any other job category[2].

There is even a futuristic term for these modern cerebral sex symbols: "Quants" (short for Quantitative Analysts). Data could be more valuable than anything else on the planet. Witness the recent exponential rise in value of companies that deal in data, such as Google and Facebook, compared to companies in more traditional industries such as ExxonMobil and General Electric[3] (figure 1). The COVID-19 pandemic amplified tech stocks, while recent geopolitical events such as the war in Ukraine and energy supply issues have complicated these trends, but the value of data cannot be understated. Data can entertain and inform us; data can save our lives; data can generate billions in profits. Data can swing elections – allegedly[4].

There are multiple facets to Data. It may be a small word, but it carries big assumptions and connotations. One of which is a default assumption of truth. When most people see the word "data" in a news article ("the data shows", "data confirms", "the data is in and it's explosive!") they don't question the next sentence. This is potentially dangerous misplaced trust. Usually, when you see what is called data, it has already been "conditioned", meaning it has been filtered, interpolated, extrapolated, and interpreted, perhaps even manipulated. No one shows you the raw data, because it is ugly, and it is certainly not obvious (even to a Quant) that it means anything.

(CONTINUED ON PAGE 27)

Figure 1: Normalized share price history for GE, XOM, FB and GOOG, 2012 to 2022.



However, although truth is in the raw data, it (the data) may not be complete, impartial, or, more worryingly, correct. The act of collecting data is an art and a science in its own right. Consider the humble telephone survey: a pleasant person reading from a script provided in a call center, asks a series of questions which are designed to gather appropriate data for a predetermined objective. In many cases, the questions are ambiguous, leading, or misleading. The people reached by the phone call need to have a phone, answer it, and have the time and be willing to answer the questions, all of which impose sampling biases before the first data point is collected. Statisticians have long dealt with these shortcomings and have devised methods to identify biases and gaps in the data and extrapolate or filter to mitigate the effects. But some damage has been done – we have already introduced uncertainty.

We can even influence the data through the act of measuring. On the atomic scale, this is referred to as the Heisenberg Uncertainty Principle[5]. Since atomic particles are so small, the light waves/particles utilized for the observation affect the behaviour of the particles themselves, meaning that we can never accurately observe the unobserved particle action. Similarly, when studying gorillas in the wild, some researchers have facilitated observations by attracting gorillas to study sites with food, thereby introducing competition for the "free" bananas, changing normal gorilla behaviour in the process[6].

Quants are data tamers, assessing uncertainty, challenging methods, recognizing trends within trends, wrangling unruly outliers, muffling the noise, and revealing valuable insights. Kind of like gold prospectors of olden times, sifting through mountains of gravel to find nuggets they can take to the bank. The difference is, data is much richer, subtler, more mysterious, secretive, multi-dimensional, and, more often than not, misleading, than a pan full of grit with an obvious shiny flake in it.

Now, to get back to the AI story:

AI represents the computer methods and algorithms that Quants use to do their jobs (sometimes Quants are responsible for programming the algorithms in the first place). AI is all about empowering computers to rapidly consume petabytes[7] of data and reveal hidden meaning; the type of meaning that can be used to categorize groups or trends, predict causes and effects, or provide insights into future behaviour. The process of discovering meaning in groups of numbers or records encompasses three main steps: collect, process, and interpret. These steps sound straightforward, but, as we examine each stage in a little more detail, there are unexpected and potentially fatal – in the integrity sense – pitfalls lurking.

(CONTINUED ON PAGE 28)

As we have already seen in our telephone survey, the initial collection can be deficient, so data needs to be "cleaned", which usually means a person or algorithm looks at the data and ensures gaps are filled with reasonable interpolations, biases are recognized and suppressed, and that it fits some common-sense criteria, such as an age range between 18 and 99. Anything outside of that range might be considered bad data and deleted or flagged.

Next, computers process the data using various appropriately chosen mathematical algorithms with names like "generative adversarial networks (GANs)", relying heavily on "training" data. Training data is as critical to AI as reliable data collection and involves many, many examples of interpreted data identified and labelled (generally by human experts) to establish a database for the computer to reference. If the training data is not abundant enough, or is mis-labelled, the algorithm risks producing completely meaningless results. The danger is that the results appear meaningful and are bestowed with an undeserved confidence.

Finally, when the processing is complete, the next step is to interpret, or assign real-world significance to the result. This step is the reason for the whole process. If this is not done correctly or meaningfully, there was really no point to the first two steps. Once again, human subject-matter experts are necessary to fit the final interpretation options into realistic parameters.

Notice anything in common among these three steps? They all require, to some degree, judgement by a human or group of humans, or algorithms designed by humans, to assess quality and assign criteria. These human brains can therefore impose cognitive, cultural, or moral biases and preferences. This may seem like it defeats the purpose of the computer analysis. However, human involvement is an essential component that constrains the computer results to the realm of the realistic. AI experts refer to the process as "brittle" if the AI results are very different given slight changes to the human input or model constraints.

Keep in mind that although human judgement is important to the effective AI process, human brains are very good at some things and very bad at other things. Our human brains collect, process, and interpret considerable amounts of data every second. Consider facial recognition: while computers are gradually acquiring basic facial recognition ability, humans do not question their own capacity to recognize faces or categorize unrecognizable ones. Every person you see as you walk down the street, provides data to your brain which you are unconsciously comparing to your database and making instantaneous judgments (friend, lover, foe, good looking, trustworthy, interesting, smart, etc.). These new inputs are also adding to and strengthening your own personal database of experience, judgement, and categorization.

Computers may have trouble recognizing your face if you get new glasses or shave your mustache, but even if you have not seen your grandmother in many years, her hair is different, she is wearing different lipstick, new glasses, a hat you have never seen, and she has new teeth, you still recognize her instantly. This comes naturally to us but is currently a considerable challenge for a computer. I have noticed that even on my state-of-the-art new phone that uses facial recognition to unlock it, if I am laughing or yawning when I look at the phone, it is not sure it is me and asks me to type my password. We wouldn't have that problem with a face we knew.

However, human brains are easily distracted and fooled. They get tired and hungry. Our brains are influenced by emotion, cultural perspective, and unconscious bias at least as much, and perhaps more than, by rational analysis. Enter the eternally energetic, perpetually eager, cold, calculating computer. It is a perfect match. Carbon, meet Silicon. Just like any relationship, this partnership will have it's rough spots, but it can be a beautiful collaboration if we recognize and appreciate our strengths and differences.

Canadian securities regulators provide tips to avoid online investment scams

The Canadian Securities Administrators (CSA) is warning Canadians of potentially misleading advice and fraudulent online investment opportunities, and reminding them to research the claims before investing.

"Many Canadians today are being exposed to investment advice through popular social media platforms, apps, and websites," said Stan Magidson, CEO of the Alberta Securities Commission. "While some advice is credible, a lot can be inaccurate, misleading, speculative, or fraudulent.

"We strongly recommend Canadians research any investment opportunity they receive and its legitimacy before making an investment decision."

Some common examples of potentially misleading advice or fraudulent investments include influencers or celebrities sharing "secret" stock market hacks, and young "millionaires" advising people to invest in particular cryptocurrencies. The CSA reminds users that when they watch videos and other forms of unregistered financial advice, they should question the source and legitimacy of the advice.

The following tips can help investors avoid becoming victims of online investment fraud:

Do:

- Be wary. Scammers may show you false returns, fake account balances, or fake investment trading websites to create credibility or to have you "invest" more money.
- Check the National Registration Search to ensure the individual or firm is registered in your province or territory.
- Check Whois to ensure the website has not been recently created.

Do (continued):

- Check the CSA Investor Alerts, Disciplined List and Cease Trade Orders to ensure the individual or firm offering advice isn't considered an investor risk, or the subject of disciplinary or enforcement actions.
- Think critically about the offer, including the risks and returns being promoted, and compare it to similar opportunities to evaluate whether it might be too good to be true.

Do not:

- Give remote access to your device or computer. Fraudsters use this tactic to mine your computer for personal financial information such as passwords and logins.
- Take investment advice from celebrities, influencers, or anyone other than a registered investment professional. Think about what they have to gain by getting you to invest.
- Transfer funds to an unknown crypto wallet or give anyone access to your digital wallet. The amount of crypto fraud online is rising quickly – be particularly cautious about any crypto-related offers.
- Invest on any trading platform or with anyone not registered in your province or territory. Individuals and firms offering investments must be registered to do so.

This is not an exhaustive list of tips, nor a guaranteed strategy for avoiding a scam. For more information about fraud prevention and related resources, visit *https://www.securities-administrators.ca/investor-tools/avoiding-fraud/*.

The CSA, the council of securities regulators of Canada's provinces and territories, co-ordinates and harmonizes regulation for the Canadian capital markets.

Please forgive my 7 Deadly Journalistic Sins

ROB DRISCOLL

Bless me, readers, for I have sinned. My last confession was more than four decades ago.

It has indeed been a while since my parents hauled me off to the St. James Catholic Church confessional to be absolved of all sins. Back then, the most malicious misdeeds were riding my bicycle past dark and teasing my sister. I have upped my game considerably over the last four decades.

I find myself back in the confessional today for compelling reasons. Through the launch of BIG Media Ltd. (*BIG-Media.ca*), which produces much of the content in this magazine, I am attempting to introduce an extremely pure form of journalism. No advertising. No political affiliation. No spin. Our journalists are charged with finding the best data available on important matters and presenting it in a logical, open-source format.

As I pursue this heavenly objective, seeking absolution for my many media malefactions seems to be the righteous path to the journalistic Promised Land. It might also be my best chance to get past Peter Jennings at the press's Pearly Gates.

I therefore kneel before you today, divulging my 7 Deadly Journalistic Sins:

Lust – given four media passes to a wine-auction gala, I brought three lovely friends in body paint as my guests. I often find myself looking at the photos to remind myself to never do that again.

Gluttony – the times that I used media credentials to eat and drink to excess are far too many to count and, especially, to remember.

Greed – I won $2,000 and an all-expenses-paid trip to the awards event in Toronto for taking the adjacent photo of a young child getting hit in the face with a soccer ball … and did not share any of the cash with the kid.

Sloth – on the day of a nationally televised sports awards show, I used my investigative skills to find out who the two winners would be and interviewed them just before the live telecast. I used questions such as, "If you should be so lucky as to win tonight, what would it mean to you?" Every other journalist in attendance had to ask questions in a scrum as I filed my story (with much better quotes) to my impressed editor.

Wrath – in a softball tournament final, I caught the winning team cheating and was so annoyed that I provided full details in the newspaper the next day. It made for a very interesting phone-in radio show a few days later. Those players were furious, but I was able to write off the novel reaction as sour grapes of wrath.

Envy – I wanted to have the fat stacks of cash that the richest people in the world possess, so I came up with a business plan to make it happen. (*https://big-media.ca/big-media-labs-announces-latest-game-changing-invention/*)

Pride – I once had myself featured on the front page of my own magazine. I even asked myself some of the questions.

That is not all I can remember, but please forgive me for all of my sins. I now look to you, my faithful readers, to provide guidance regarding penance. Please be gentle.

Global Trade Credit offers risk mitigation, better access to capital – and a great sleep!

Graham Maclachlan, member of the board of directors of the Receivables Insurance Association of Canada

Despite being the main revenue driver for his company Global Trade Credit, Graham MacLachlan never feels like he's selling anything.

"I am just providing information to educate people, so they can make an informed business decision and they can decide what is best for them."

In the case of trade credit insurance, once a business operator understands how it works, the decision is usually pretty obvious.

Trade credit insurance, also known as accounts receivable insurance, is a product that can be used as a financial instrument to give businesses greater access to capital. It also manages threats that are beyond a company's control.

"It is truly remarkable how many businesses insure pretty much everything except their receivables – despite the fact that receivables are generally a company's #1 asset.

"Trade credit insurance is the best-kept secret in business," MacLachlan says. "It can be utilized purely to mitigate risk, or as a financial instrument that helps high-growth businesses expand with stability – or both!

> **"The cool thing is, you don't pay us a cent for all the work we do on your behalf"**

"A policy also expands the business's ability to grant credit – often dramatically, and grow sales – with one simple, affordable policy. Having a policy even helps you get better terms with the banks."

Diverse benefits to companies working domestically or in international markets have earned trade credit policies an interesting nickname.

"The benefits to the business are huge," says MacLachlan, who has been a leader in the international trade industry since representing the Manitoba Government in the early 1990s. "People call it 'sleep insurance' because the CEO, the shareholders, and all other stakeholders can sleep well at night, knowing that if something completely unforeseen occurs, the company is still safe. It even protects a business from the perils of non-payment."

MacLachlan's role as a broker is to ensure that Global Trade Credit customers have the policy with the best coverage for their unique needs – and at the best rates.

"Even for companies that already have a policy, a broker can be very beneficial," MacLachlan explains. "A trade credit insurance broker works much like a good lawyer, providing representation on a critical matter, and knowing what is best for you."

A good broker can save a business money in various ways, while helping access capital to facilitate high, sustainable growth.

"The cool thing is, you don't pay us a cent for all the work we do on your behalf," notes MacLachlan. "We are paid by the insurance companies once we have assisted you in finding the best fit for your business."

It's also important to note that there are cancellable and non-cancellable insurance carriers – and you likely won't know what you are working with unless you are represented by a broker.

Trade credit insurance also signals strong corporate governance; a business can use the policy to showcase professional protocols.

For more information, visit *GlobalTradeCredit.ca*, or contact Graham at gmaclachlan@globaltradecredit.ca or 403 454 9760.

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- An "ultra mafic" deposit with comparables at Lynn Lake (22m tons) and Voisey's Bay (50m tons), which sold for $4.5 billion.
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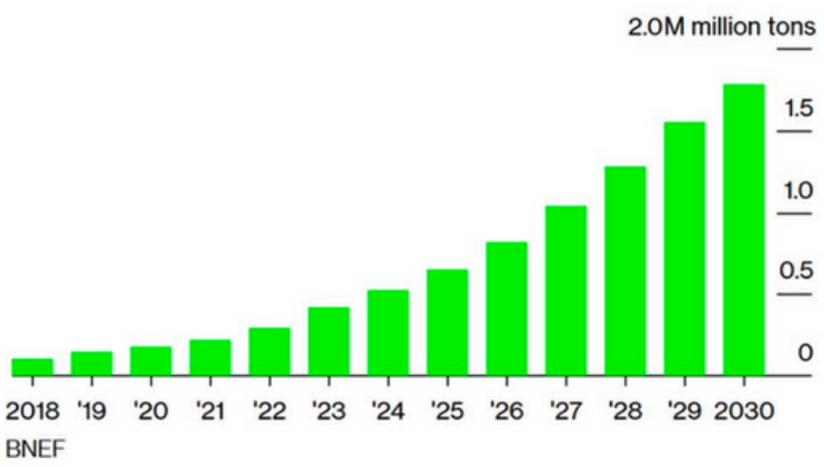

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