

BUSINESSEDGE

A man with a beard and mustache, wearing a blue suit, white shirt, and dark tie, is smiling broadly. He is the central focus of the cover, with his head and shoulders visible. The background is a light blue gradient.

NEWS MAGAZINE

November 2022

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Director claims TIFF prize with tale of Korean mother's challenging life in Vancouver

KELLY RYAN



Anthony Shim has a palpable presence as he stands outside the Vancouver Playhouse at the hometown premiere of his feature film *Riceboy Sleeps*.

The world premiere was on Sept. 11 at the Toronto International Film Festival. At that event, Shim was a relatively unknown, young filmmaker. What a change a few weeks can make. He stands in front of this crowd as winner of TIFF's prestigious Platform Prize – an award given for bold directorial vision. The choice was unanimous among jury members for the prize, saying in a news release "It balances social realism with pure poetry. Plus it's very funny."

In an interview with *Business Edge*, Shim shakes his head as he remembers getting a call from TIFF senior programmer Steve Gravestock near the end of the 11-day festival.

"I was in an Uber going to my hotel pretty late at night, and I'd been drinking some wine. And (Gravestock) said, 'Guess what? You won! You won the Platform prize!' It was so noisy. I was like, what? What did you say? It was so surreal to find out."

The Platform Prize comes with a \$20,000 cheque that will go toward living costs, Shim says with a laugh. He was up against another Canadian film (*Viking*, a comedy about a group of astronauts directed by Quebec's Stéphane Lafleur) and eight international nominees.

Shim's movie about a young Korean immigrant mother and her son living in 1990s Vancouver – and the struggles and triumphs they experience – stole the show.

Shim says the film is auto-biographical, with a touch of fiction thrown in to keep the story flowing. As a young Korean Canadian in a Vancouver suburb, he dealt with racism and cultural exclusion.

"I wanted to make something as personal and honest as possible without, you know, glorifying or embellishing anything, but just the most beautiful story I could about the sacrifices and the undying love of a parent towards the child."

Anthony Shim
Director and Writer
of *Riceboy Sleeps*



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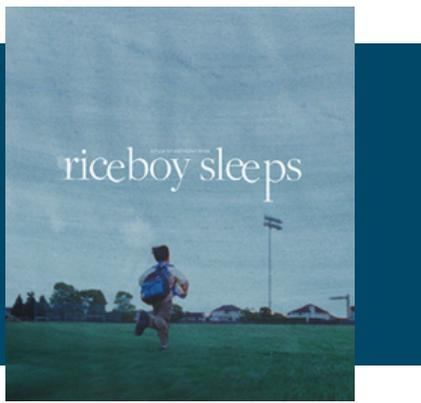
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Shim would not reveal the budget for Riceboy Sleeps, other than to say he thinks “Spielberg’s movies probably spend more on catering than what we had.” He acknowledges it is difficult raising money for a small, independent film with no major stars in the cast and an unknown director, adding that the struggle for funds creates a vicious cycle.

“You always have not enough money to execute your film well, and no one is getting paid what they should – like a living wage. And then a lot of times you’re just not well equipped to bounce back from mistakes and errors, and unforeseeable difficulties.

So, when you can’t bounce back from those, the film suffers and then you go ‘Oh, look how bad this movie is. Why should we support another movie like that?’ ”

He credits Telefilm Canada, CRAVE, CBC, a “chunk” of equity financing, and tax credits for getting his script off paper and onto the 16mm film on which it was shot.

He calls the creation of Riceboy Sleeps a combination of chance, luck, and good fortune.

He might want to add efficiency to that list. Shim worked as writer, producer, director, actor, editor, and fundraiser on the film, a career hangover from his early days in the theatre world.

“I just loved working on these stories and these productions with my friends. That slowly turned into me just acting in, and then directing them, you know, and I was also producing (the plays), and I was the lighting designer. I was the costume designer, the set designer, along with my friends who’d all chip in, but I didn’t know that there were titles for these things. Before I knew it, I was wearing all these hats without realizing I was. And so that approach just translated into filmmaking as well.”

Theatre also influences Shim’s directing style – long, uninterrupted shots that allow the action to transpire in real time.

“I wanted the audience to be able to experience this journey with these characters as though you’re there with them. There isn’t a separation. There isn’t a director manipulating the scenes between the characters and the audience. The director is out, and the audience is the one right there, moving with the people, experiencing, hearing, seeing, and what you see is what you get.”

Shim says he doesn’t know what impact winning the Platform Prize will have on his career, but he expects it will help with sales distribution of Riceboy Sleeps, which is scheduled to hit the theatres in 2023.

But the reviews will have to get the attention of investors. Critics fawn over the movie, calling it poignant, beautiful, a melancholy coming-of-age film directed by a “significant” new director.

Shim is already working on his next project, based on stories during the COVID-19 pandemic of crimes being committed against Asian Americans and Asian Canadians.

“It was very difficult to hear about it and read about these things, and not feel some kind of way about it. I feel a certain amount of responsibility to touch on current events

And this, I feel, I can’t really ignore it. It’s just a little too immediate for me. And so, I am working on a script on a film set in Chinatown during the pandemic era.”

Of course, he will be looking to the traditional film industry funding agencies along with angels. Angel donors are people who put their own money into something in the early stages of development. Shim has a message for anyone wondering if small Canadian films might just be part of their future investments.

“I’ve always felt like the theatre and cinema, while they are part of an entertainment business, are not too dissimilar from journalism – telling honest, true stories, and commentary about the society we live in today.

“In some ways, I feel like fictional storytelling allows for more truth than journalism at times. So, if anyone feels that there is a place and an importance for those type of stories in our society today, then I think it’s ‘Please!’ I mean, independent cinema needs it.”

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CEO has a sweet recipe for success – and peace

It happened in a second. One moment the Hadhad family was one of the most successful chocolate makers in Damascus. The next, their factory was destroyed by bombs from the Syrian war and the Hadhad family fled to the basement of their apartment building for shelter.

An escape to Lebanon and three years of refugee camps later, the family moved to the small town of Antigonish, Nova Scotia, where they worked from nothing to rebuild the business. They say their chocolate is a way of spreading joy in a world that could use more. The company name says it all – Peace by Chocolate is now the subject of a full-length feature film and a book.

Business Edge publisher Rob Driscoll and I sat down to ask CEO Tareq Hadhad 20 questions about the power of immigrants, the horrors of war, and, of course, the business of making chocolate.



Tareq Hadhad and his father Essam are the founders of Peace by Chocolate

1. I want to take you back a long ways because there will be a lot of people in our audience that haven't heard your story, which, of course, started in Syria. Was your family chocolate makers your whole life?

Tareq Hadhad: *They have been actually, yes. Our family comes from the heritage of making chocolate as a way to spread happiness into the world. As my dad said, 'Everyone (who) eats chocolate will be happy. No one who eats chocolate will be sad.' It started in 1986, started with my dad because all the other family members and the generations in the family were doctors, lawyers, judges. No one really wanted to take the risk of being an entrepreneur or starting an entrepreneurial path in life. So my father started this by himself. Then my mom joined him a year later after they fell in love, over two boxes of chocolate that my father gave to her. And that's how the story of my family began.*

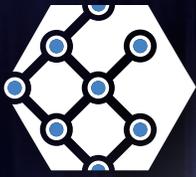
2. What is chocolate to you?

Chocolate is universal. Chocolate is like music. Everyone understands it, right? You don't have to know the lyrics of an Arabic song to really feel the emotions, even if you don't speak the language. The same thing for chocolate, because everyone really enjoys it the same way, but also it brings different memories. When you try a dark chocolate bar or a dark chocolate piece that reminds you of something, with a flavour that can take you, with an orange peel, to your first visit to the Middle East or to Spain, or somewhere. I think it brings back all this sweetness of memories and connections. And at the end of the day, I think the world can use more sweetness in the time of darkness and anxiety and hatred. And I think, you need the world to come back together. You need people to come back together.

3. How much does Peace by Chocolate build on the company your family had in Syria?

Actually it's the same flavours – but in Syria, we just didn't know that the world can lose peace. At the split of the moment ... we were living in a peaceful country. My father built that business. There were wars around us in Syria, for example, in Iraq, in Lebanon. Palestine ... all over. But we didn't know that we can lose the peace ourselves, and we took that for granted. So the business grew to become really the second largest chocolate manufacturing facility in the region at that time. In 2005 – between 2005-2008 – the company was exporting chocolate everywhere in Syria. So from Syria to even European countries like Belgium were importing chocolate from my father's company. And I'm like, 'They don't need more chocolate. They have enough already.'

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4. What was it like for you growing up in Damascus – as a child, it doesn't sound like you were concerned about wartime, but how do you compare that life to what life is like for children in Canada?

Growing up in Damascus, there was a big thing for us, which is family. We used to say, in times of tests, family's best. In times of anxiety, in times of unrest, in terms of conflict, you'd always go back to your family. You'd always really just try to seek peace and safety with them. And that's why we were growing up all in one building. My entire family, my father's side of the family – 60 members of my family were living in one building of 10 floors. My grandmother was on the first floor. We were on the second floor with my uncles and my aunts, and my cousins were all above us. And then every Saturday we used to have the supper together. Coming together as a family has meant the world to us. It meant that we have our family to protect us from any dangers. You never know what life is gonna throw at you. And we have learned actually in Syria, if life throws bricks at you, use those bricks to build a foundation, so it doesn't hurt you anymore.

5. Were you expected to take over the factory at some point?

When I was born, it was just fascinating how the culture there takes you in different directions towards a career in life. Ninety-nine percent of Syrian mothers, they want their kids to become doctors, and 1% of them, they want them to be engineers. So, I was from the 99%, and I grew up with the love of medicine as a passion for my life at that time. But at the same time, I think for me to grow up in one of the, if not the most ancient city in the world – Damascus is the oldest inhabited city around the globe. It goes back over 12,000 years. And as a child, I did not participate much in the social life as other children because I was too busy studying – because I had a goal in life to become a doctor. And that was always my vision. But at the same time, comparing it to the life of children in Canada ... it's very different in many ways. Canadians are very lucky. Canadian children are very lucky to know different cultures and different people, in their schools and their growing that they come from different backgrounds, and different ethnicities, and different countries. I love the quote that says, 'Canadians are born everywhere across the globe. It just takes them a little bit to get here.'

6. It took a war to get you here. What was it like going through war?

All my little cousins and my little siblings were crying, and they just didn't know what to do. They were just hearing the explosions around the building, hearing the helicopters that were hovering over us. And the soldiers were just shooting everywhere, on the streets. And I was looking at how scared they were, and it just hurt so much, at that time to really feel helpless, to feel useless, to feel that you cannot do anything to alleviate the stress and anxiety and the pain from those kids. And ... we ran to the basement at that time. We were stuck for five days as family members without food, without water, without electricity.

And, yeah, the only thing that we could hear at that time were kids screaming. And then they were scared to death, as they were saying. So, on the sixth day, we just rushed out of that basement and we headed out of the building. Then we became called refugees.

7. I find it incredible that you moved from being in a refugee camp in Lebanon, to Antigonish, which is tiny. It's a tiny little place dominated by a Catholic University and some small-town thinking. How did you make the transition? We've seen the movie, and it didn't look easy, but you seem so good with it now.

Absolutely. I was pretty skeptical. I was very hesitant about the idea of moving to a small town. That's why when I when I did the interview with the Canadian Council back in Lebanon, I told him, 'Can we go to a big city like Damascus?' And he said, 'Let me check.' And then he said, 'Actually, if you arrive in a small town, you're going find a sense of family. You're going to find people who are going to take care of you. You are not going become a number as if you land in Toronto, or in Vancouver, or anywhere across in Montreal, anywhere else across the country. And it's funny because I was always persistent on going to Toronto. I only knew from Toronto Bay Street. And it's funny because we are not living on Bay Street in Toronto. We're living on Bay Street in Antigonish.

8. How much do you still feel like an immigrant?

If we are not indigenous, then we came from somewhere. Our grandparents came from somewhere. Grand, great grandparents came from somewhere. So, I really believe in the power of immigration to transform communities. And that's what happened in the town of Antigonish. My family and I, we did not choose to go to Antigonish, Antigonish chose us, but if we have the choice right now, we choose it again and again. And I think the beauty of the town continues to shine as an example among other small towns in the retention of immigrants and newcomers, because whoever comes there, they just don't leave.

9. There must have been some pushback from people in the area. There is a phrase used in the Maritimes for people not born there – they're "come from aways." Did you encounter that attitude?

There was, I think, a story just in the beginning when I arrived in Canada, when I arrived in Antigonish, when someone just came to me who was skeptical about us being able to be self-employed as family. And he was saying, 'Tareq, why did you come to Canada to take our jobs?' And I actually went to him and I said, 'We did not come here to take jobs; we came here to create them.' I had no clue at that time what we were going to do. But I believe that we had brought our skills and our talents as people, who probably lost everything in the war, but we did not lose our skills and our talents. So we did not arrive here empty. We brought something with us. And yeah, we actually started hiring in the community within only eight to 12 weeks after arrival, getting help with people that were helping us making chocolate again, and selling it at the farmer's market.

10. So individuals welcomed you – how about the system?

How hard was it to get settled in that way?

When I landed in Canada, I had the same rights as every other Canadian, as if I was born here. With my permanent residency, I had every right, I had every responsibility. I was able to access everything else – my right to healthcare education. Even starting a business is not different if you are born here or born away, if you live here. Then you have access to the same resources like everyone else. And that's really why you find many immigrants, they're willing to take that risk to become entrepreneurs because they believe in it as a transformational tool to their communities. And for immigrants, when they arrive in these smaller towns, they scan the gaps and then they see what is missing. So when we arrived in town, we said I think what was missing at that time is a little bit of opportunities with jobs in the community. And that's why we just decided that entrepreneurship was the way to go in a time of uncertainty.

11. The movie that we watched indicated that you fought the chocolate idea and wanted to really focus on your medical plans. Is that an accurate representation? How is that for you in terms of going from the desire to become a medical doctor, to being the CEO you are now? And is the medical world in the future?

Yeah. The movie was not accurate, I think it was not a documentary. Almost 60% of the movie was correct. All the rest was a dramatic addition, I think, to just give a bigger picture of kind of the conflict within the immigrant community. Canada does not make it easy for newcomer doctors or medical students who need to get back to where they left back home. And I think that was the disadvantage, and the discouragement point for many newcomers. I reached out to many universities to get back to medicine, and they all said, 'Sorry, but you have to do high school again, and then do the undergraduate degree, and then do the MCAT, and then you can go back to med school.' I'm like, this is another 10 years of my life.... I think the frustration lasted for almost three months, and then I decided it is a time to make that the turning point in my life. After three months, I just decided that probably focusing on entrepreneurship, focusing on building the chocolate business for our family was the right thing to do. I decided to not give up entirely on my dream to become a doctor, but then I decided to just look at things differently, and say it's never too late. I think I can prioritize my life now in a different timeline than what the expectation was, because I think when we are born as human beings, we are put into this one mould of people, to go to school, graduate high school, go to university, undergraduate degree, then do something else, do masters or whatever, buy a house, get married, do all of this, do all of that. There was that clock that we all follow in life. And then I was like, but the clock broke. The cycle broke since I left Syria, since I left my homeland, since I left my med school.

Since I left that. So I think I need another clock. And then I started having my own clock, and then I realized certainly that entrepreneurship should be my full focus. I have to make sure that the company is growing, that the company is giving back to the community, that the company is doing the right partnerships. And I think it was the most rewarding decision that I've ever taken.

12: How successful is Peace by Chocolate? Will 2022 be profitable?

Just to give you a little bit of perspective, we started in 2016 with probably five employees spending the year. Now, we have around 78 employees. The company has grown significantly. The road was not easy for sure. We reached the peak of the growth in 2019. We had to scale back in 2020 after we shut down our factory for almost three to four months after the pandemic started, because we were changing our production stations and we had to rebuild our teams all over again. So that was a little bit of pain for sure. But the company in general has been growing steadily since we started from only two stores by the end of 2016, now our products are available in 1,500 stores across Canada. We have three major sales channels in the company. We have our robust e-commerce business. We have our own stores. And then the third part is our partnerships with national chains like Sobeys, Loblaws, and Hudson's Bay Company as well. And we are going to be hitting more shelves across the country very soon. We're working on major national partnerships as we speak. 2022? It'll be profitable, yes – in many ways. We look at profit in a different lens than just the net income at the end of the year, for sure. I think what matters to us is – is the company growing sustainably? Are we making enough money by the end of the year to refuel the growth so we can put it back? To buy new machinery, or to invest into a new department, or create a new product that is going to help us spread the message even further and further.

13. How would you describe yourself as a CEO?

We have been doing that with different approach – humans first. Once we put our team members as the top priority for us, that was the goal. But for me as a CEO, a lot of people really think about the CEO as the one person who has to take care of the customer, has to think of the customer first. But I think, that's not true because for me as a CEO, I don't talk to customers. I talk to my team. And I think my responsibility has always been to take care of the team members. I take care of my team members, who take care of team members, who take care of the customers.

14. What is it that sets Peace by Chocolate apart in terms of the product itself?

What we try to do differently is be unique and be remarkable in the fillings that we use in the chocolate, the taste. And certainly for our products, it starts with all the roasted ingredients that we use, like pistachios and hazelnuts, and all kinds of fillings that we use as well (what comes from) Nova Scotia, where we belong. Nova Scotia sea salt and dried blueberries, and using only the freshest ingredients, and honey, and the artisan line that we just created. And it's all handmade as well. You would feel the difference, and the customer feels the difference when they know there is a human being, a human touch, in something that they eat – or it's made entirely by machines, by a massive factory somewhere. And I think that's really what that difference is. We are growing; we are not that small, tiny business anymore, but we did not lose our originality. Every chocolate you would eat is made by hand, from people who are scraping those moulds, and putting these fillings into the chocolate, and freezing it, and cooling it down and then getting it out of the moulds, to the packaging where you would find people just wrapping these chocolate bars and getting them into cartons ready to ship out. And I feel that we kept that originality because who are we without the people? Who are we without that touch?

15. Why so many different products?

I think having a huge variety within the flavours is giving us an advantage point because we don't follow the 80/20 rule – we don't have that one top product that other companies do. You would find certain companies, mass producing certain products, and then they have that 20% when they just make the other products. We do not have that. We have a lot of products that they are popular, the same that they have, they have been part of our classic introductions as well that we have brought into our product mix since 2016 and '17. And they're still there until now. But at the same time, we are adding new products every time. And I think that's what we really expect from a company like ours, is how are we renewing ourselves. I think renewal is the key to set yourself as remarkable, and to set yourself up for success and significance.



16. Obviously, war is a big topic of discussion these days, and I think a lot of Canadians think it's still really far away ...

Absolutely, and that's why we call the company Peace. We settle with Peace. We do not call it Chocolate for Peace. We call it Peace by Chocolate for that reason. Peace is at the essence of everything. Without peace, you cannot go to work, you cannot build businesses, you cannot raise family, you cannot do anything. We cannot actually record this interview without peace. So I think celebrating peace as the forefront of our existence is very crucial. Now, many Canadians take this for granted. A lot of Canadians, they have never tried war. They don't know what it means. So many of them, they felt that the pandemic could be worse than war. But I said no, actually. Because in 2013 during the war that tore my immediate family apart, we lost everything. We were forced to leave our homes. We were forced to leave everything behind. During the pandemic in 2020, we were asked to stay in our homes, and we were asked to stay safe. I would take a million pandemics over one war, to be honest, because I think wars are the most atrocious cruel form of expression of conflict that any human could live in. There's nothing good in war except its ending.

I think Canadians have to understand that we need to work. We need to create that sense of harmony in our society, because without harmony war can start any moment. I became a Canadian citizen only a few years ago, and, I said, when I became a citizen, I did not just sign up to Canada's excellence. I also owned its mistakes and failures. So it starts right there. It starts when we all own its mistakes and failures, when we all realize that this country, it's a great country. It's a great place to call home. And we have a lot to celebrate. Armed conflicts are only one ways of wars. There are words and conflicts that just doesn't take mass killings or rockets or guns or shootings, to happen. There are wars that can happen, when we know that there are other community members who are suffering while we are living in our comfort zone, and we are enjoying all the privileges. Let's make sure that our society is harmonized. Let's make sure that we are all siblings under one family. We are part of a big Canadian family, so let's make sure that no one of this family is hurting. Let's make sure that everyone in this family is represented and has a voice at the table, and they are not getting decisions made on their behalf.

17. You have, as a company, made a commitment to hire and to mentor refugees. What is the scope of that program?

We made a commitment to hire refugees. So, I have 50 refugees in the company, mentor 10 businesses started by refugees and help poor businesses, started by refugees in distribution and marketing. We were just saying that whenever we have a resume from a refugee, they're not going to be discriminated against based on their experience, because they need a place to start. They're going to have a fair judgment based on their character, based on what they can offer, and based on where they can work. And we're going to support them, we're going to mentor them, we're going to train them. So that's really where the commitment came from.

18. We have trained people – immigrants – not being able to become doctors and scientists, even though we have so many brilliant minds that are ready to step in. What would your advice to the federal government be in terms of how can we streamline this to take advantage of the unused beautiful minds that are all over this country.

Remove the barriers. I think there are a lot of barriers, and I feel like everyone is throwing the responsibility on different levels of government. When you talk to mayors, they're like, 'Oh, this is a provincial government (matter).' You talk to provincial government – this is a federal government thing. It's not actually; it's a cross-governmental issue. Society needs doctors. You need healthcare workers, you need nurses. When I started the business, I called a friend of mine in Toronto, and he said, 'Tareq, what do you wanna do?' And I said, 'I wanna be a doctor. And I am trying to get back into medicine again.' And he said, 'Do you know that 60% of cab drivers in Toronto are immigrant physicians and nurses?' And I said, 'Actually, no, I didn't know that.' He was like, 'Those people, I think, are going to protect your life if you had a heart attack in their taxi.' But imagine that the government is not willing to give them a chance to be there in the emergency rooms where they belong. And it just, it broke my heart since then, because I know how severe the healthcare crisis is across the country. I remember one day, just this summer, my fiancé and I, we were driving in Cape Breton, and she had low blood sugar and she fainted. And then I drove to the emergency room at the hospital. The emergency department was closed for Thursdays, Fridays, and Saturdays. And I'm like, 'What's the hospital without doctors and without emergency room?' It's just a building. It's not that healthcare is a kind of privilege that some people might need. It's something that's at the soul of any society, at any community, at any government. I believe in Nova Scotia alone, there are like at least a thousand doctors that can step into the system right away.

19. Are you following what's going on in Syria? Would you go back?

Things got a little bit better between 2018 and 2019. And then when the pandemic started, and all the crisis that just happened recently, I think people there are just living because of the lack of death. It's like living in hell. A lot of people just cannot leave the country. The economy took a huge downturn since the war started, and now people just cannot find enough food to feed their families. I think it's a pretty dire situation in the country right now. And it's unfortunate because, the world is living through trendy news, and it's sad because Syria is not on the trends anymore. Like the refugee crisis – when was the last time you saw a story on the news about refugees living in refugee camps in Syria, Lebanon, Jordan, or Turkey? And I think that's really the reason why we have that apathy sometimes because people get their priorities on their news just from the trends. A lot of people ask me if I would go back to Syria ever. Canada is my home by choice. Syria is my home by birth. I would stay in Canada because Canada has given me the chance to be alive again. And I always say that Canada is not like a hotel or a hospital that I leave after I recover. It's my home.

20. You are a proud Canadian. You are a CEO. Are you a future politician?

You can't imagine how many times I get this question. It's really fascinating. I would do everything that Canada would ask me to do. Now, I feel that we are creating the difference, we are making change, we are spreading awareness, we are creating that power machine that is changing perspectives around immigrants. In general, the approval rate for immigration in our region was less than 30% when we arrived, and now it's over 80%. And working on changing mindsets – it's much more powerful than anything else. Yeah, if Canada needs me to be a politician, I would be a politician. If Canada needs me to be a soccer player, I will learn how to play soccer – although I hate it. But I will try to. I think there are ways for all human beings in this country to be who they want to be. But again, all the doors are open for me, for sure.



Essam Hadhad works his magic in the Peace by Chocolate kitchen

Will renewable energy costs continue to drop – and will this make electricity cheaper?

BRAD HAYES



I have read many articles claiming that costs of wind and solar generation are lower than alternatives, and that rapidly declining costs seen in the past will continue unabated in the future, reducing the cost of electricity for consumers.

Is that all true? Have the costs of generating electricity from wind and solar generation actually declined in recent years? Will they decline rapidly in the future? And will such reductions, if realized, make electricity cheaper for consumers?

First, let's understand the questions a bit better. What do we actually mean by the cost, and how do we calculate it? As is the case with most analysis, it depends on the conditions you lay out and the assumptions you make.

The cost of extracting any resource depends on the concentration or density of the resource. There is gold everywhere in the world, including dissolved in seawater, but we mine/extract it only where there is a sufficient concentration. Two grams per tonne of ore is good for gold because of its very high intrinsic value. Two grams of iron per tonne of ore doesn't cut it, because there is not sufficient value in iron at that level.

The resource-density principle applies to wind and solar resources – you cannot extract their energy if the resource is not present in sufficient quantities to pay the bills.

Figure 1 below shows the resource density of solar energy across Earth's surface, also called the global horizontal irradiance (GHI), measured in watts per square metre.

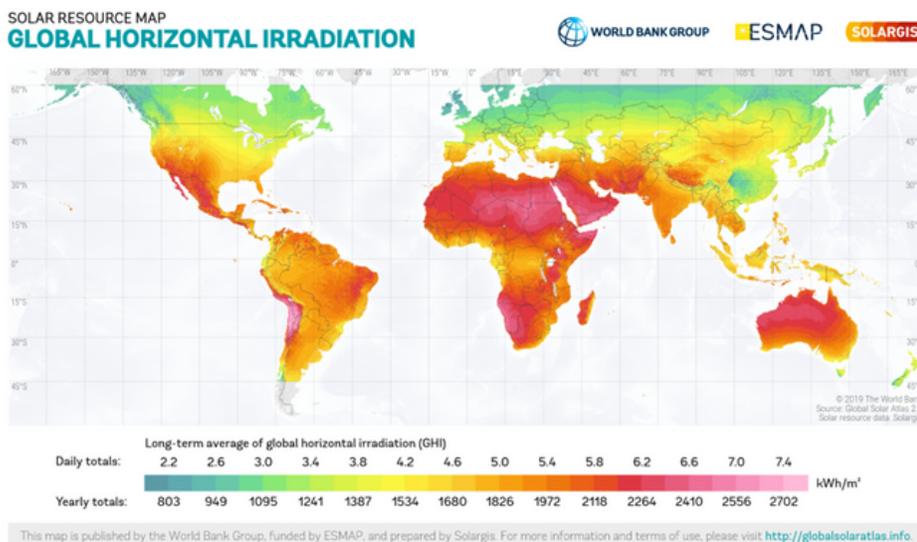


Figure 1: Global solar resource density

Source: [World Bank Group](#)

In Figure 1, the southwestern U.S. and Mexico, northern Africa and the Middle East, parts of southeastern Asia, and Australia all have good resource density, and solar can often generate electricity at relatively low cost in these areas. Even southern Europe is prospective, because although the GHI values are lower, there are so many people living there that a lot of generation capacity can be built very close to market. The Gobi Desert and the High Andes have fantastic solar potential – but few people live there. For those of us living in most of Canada, northern Europe, or Russia, solar is a non-starter because the resource density is so low that you would build a lot of expensive infrastructure for little return.

The global wind speed map (Figure 2) tells a similar story for wind, but in different places.

Wind energy is abundant and can be relatively inexpensive in the middle of North America, around the North Sea, and on the western and eastern coasts of Africa.

Some spots might work well for cheap wind power in parts of Europe, South Africa, and Australia, but the huge wind resources in Greenland, southern Chile, and the Gobi Desert are not in position to power many lives.

We must realize that the costs of wind and solar energy vary widely across the globe because the resources are rich in some places, and poor in others.

So, when someone talks about wind or solar being “cheap”, they are assuming high resource density – meaning only in select places.

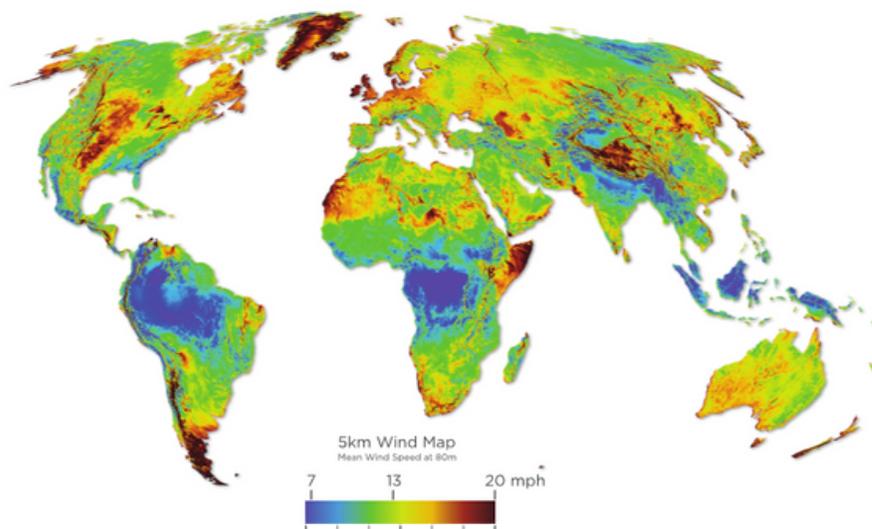
A second thing about measuring cost – what value do you place on availability? As we all know, you generate solar power only when the sun shines and wind power when the wind blows. Looking at Alberta’s electricity supply as I write (mid-afternoon, October 22), solar is generating 83 megawatts of electricity (from a total installed capacity of 1088 MW), and wind is generating 1171 MW (capacity 2780 MW). Checking five minutes later, the values are 70 MW and 1150 MW, respectively (http://ets.aeso.ca/ets_web/ip/Market/Reports/CSDReportServlet). While each megawatt-hour of solar and wind may be cheap compared to other sources (depending on the market mechanism), you can’t buy much of either at a time when people in the province are demanding 9677 MW. Fortunately, Alberta has abundant natural gas-fired capacity that can be varied quickly to compensate for the unpredictable wind and solar output.

So “cheap” wind and solar does not do us any good when it is not being utilized.

Let’s look at historical costs for generating electricity from wind and solar. There is little argument that capital costs over the past 12-15 years have fallen dramatically as technology has improved for all types of installations (Figure 3).

Figure 2: global wind resource density

Source: [Vaisala Inc., 2015](#)



Hit the gas on undervalued stocks before the Fed hits the brakes

INVESTING
EDGE

CONSTANTINE
LYCOS

As I write this on Oct. 15, 2022, it is common knowledge that we are looking at a potential recession for next year.

I would argue that we are already in recession in 2022, as defined by world negative output growth, measured in actual goods and services produced in 2022 vs 2021. Or measured in GDP in U.S. "constant" dollars, in other words, adjusted for inflation. The main reason for that is that:

$$\text{GDP} = c * E$$

GDP is the world gross domestic product measured in constant dollars,

E is the total world energy from primary sources (such as biomass, coal, oil, gas, hydro, wind, solar)

and

c is an energy conversion efficiency co-efficient that tends to go up a little every year due to human innovation.

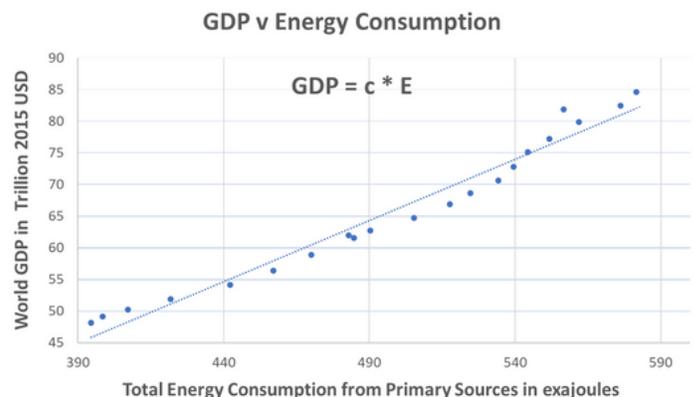
Simply put, it takes energy to make stuff. Work by hand requires food, factories need electricity or natural gas or some other source of energy, etc. The world in 2022 is already in an energy crisis of sorts, self-inflicted for the most part.

Investment in fossil fuel exploration dropped, as did oil and gas production, while simultaneously Germany and others shut down their nuclear power plants.

Meanwhile, Russia and Ukraine through war are taking out most of Ukraine's grain production and reducing Russia's exports of raw materials that can be converted to useful things outside of Russia.

Additionally, as the COVID lockdowns led to lower production of goods and services (less stuff) and central banks provided massive monetary stimulus (more money), high inflation ensued. So now, central banks are raising interest rates to fight the inflation they created. Under these conditions, the most important advice that I have had for people since the beginning of this rate-hike cycle has been: Don't fight the Fed!

We will continue with that theme.





THE BIGGEST OPPORTUNITY 99% OF CANADIANS MISS OUT ON: DOUBLING INVESTOR CAPITAL WITH U.S. REAL ESTATE

SUBMITTED BY KELSEY WOODS PHOTO BY RENTVISION



Madi and Patrick Gergen, owners of AmeriCan Multifamily Alliance Group, are here to remind Canadian investors of the huge opportunity to invest in American real estate. As an American-Canadian, husband-wife team, they have over 50 years of combined experience in the real estate industry. We recently interviewed the duo to learn lesser-known industry secrets, and specifically how Canadians can take advantage of this opportunity.

SO WHERE ARE YOU BOTH ORIGINALLY FROM?

"I lived in Pincher Creek until I was 10, then moved to the big city of Calgary and have lived here ever since. Patrick grew up in Seattle, Washington," said Madi. "We split our time between Calgary and Dallas, Texas because we love living here and love the advantages of investing in Texas."

WHY DID YOU CHOOSE TO INVEST IN TEXAS SPECIFICALLY?

"We like to remind everyone that all 50 states compete against each other and some states, like Texas, do substantially better than others," Patrick explained. "Dallas is extremely landlord- and business-friendly — not to mention its strong net in-migration," continued Madi. "Many businesses are moving to Dallas because the cost of living is more affordable than other states, which creates a huge demand for workforce housing."

SO INVESTING IN REAL ESTATE THERE SEEMS LIKE A NO-BRAINER FOR CANADIANS?

"In an inflationary economy, a good investment is one that's real," explained Patrick. "And one of the best real assets to be in is multifamily," Madi added.

INTERESTING! WHY IS MULTIFAMILY THE WAY TO GO?

"We've found it's the best investment class and market to invest in, and they tend to be less risky as everyone needs a place to live," explained Madi. "Traditionally, multifamily has proven itself to do extremely well in an inflationary market — you can leverage these properties with loans up to 75% and Canadians can take advantage of tax benefits through depreciation," Patrick added.

WHAT WOULD YOU SAY TO SOMEONE WHO IS INTIMIDATED BY MULTIFAMILY PROPERTIES?

"Great question! We're all aware that real estate has made more millionaires than any other investment type, but why do some folks do so well, while others have disappointing results? Well, it's because most people treat real estate like a 'stock investment' instead of a business," Madi explained. "In order to obtain great results consistently, you need to treat your real estate like a business. This means diligently working on the property to create value through models like our 'Forced Value Business Model,'" she went on.

"One of the biggest multifamily expenses is when people move out. Over the years, we've realized we have two products," Patrick explained. "We purchase B & C class apartment buildings in Dallas neighbourhoods, and a byproduct of that is ensuring our financial returns are consistently higher, with less risk."

"Our mission is to create a social impact in our residents' lives," continued Madi. "And people generally want to stay because of our community programs — from monthly resident events and after school programs, to free tutoring and more. We have an extensive calendar and are vertically aligned."

WHAT DO YOU MEAN BY "VERTICALLY ALIGNED?"

"We self-manage our properties," Madi explained. "So not only are we the owners and the investment managers, but we are the property managers as well — because nobody cares like an owner."

YOU CURRENTLY OPERATE A REAL ESTATE FUND. CAN YOU TELL ME MORE ABOUT THIS?

"Yes, The AMAG Opportunity Fund is a \$25M fund with a five- to seven-year plan," smiled Madi. "We plan to purchase three properties over the next year." Patrick added, "We will be seeding it with Bella Vista Pointe Apartments in Dallas, which we have owned and operated for 11 years now." Built in 1985, the Bella Vista Pointe Apartments has 188 units, listed under \$91,000 per door — there is still plenty of room for growth.

HOW CAN YOU HELP CANADIANS?

"We're here to help you invest," explained Madi. "We have had Canadian investors invest with us in American projects dozens of times over the past 12 years and we have a strong track record of doubling our investors' capital every five to seven years." Patrick continued, "This is our business, not a form of passive income — our current projections are to double your money in five to seven years with an ROI above 16%.

Instead of waiting for the market to turn upwards, get in touch with Multifamily Alliance Group today.

Disclosure: The information contained herein is not guaranteed as to its accuracy or completeness. This is not, under no circumstances, to be construed as a public offering to sell or solicit to buy the securities referred to herein in any jurisdiction.



FROM PAGE 16

My sense is that we are getting close to the end of this period of rate hikes as asset prices such as stocks and real estate have fallen off, as have commodity prices. Inflation has not dropped, due to the more sticky aspect of things including rent, wages, and homeowners' equivalent rent. Such items take more time to react to market changes.

With that in mind, we are going to stick to high-quality, recession-resistant businesses with decent dividend yield, and throw in a stock to take advantage of the time when central banks pause with their rate raises. At that point, the stocks that have performed well as borrowing rates increased should stop performing as well, and stocks that have been beaten down will perform better.

This month's top 3 stock picks:

1. Imperial Brands PLC

(OTC: IMBBY \$22.76 – don't pay over \$24)

Imperial Brands is the world's fourth-largest tobacco company. It is no secret that their business has been in decline. This has been the case for the last two decades, but the numbers are fairly stable now. The valuation is very good. They pay a decent dividend. And this sort of business is less affected by economic cycles. So it's a good one to hold while waiting for conditions to improve.

2. Merck & Co., Inc.

(NYSE: MRK \$92.18 – don't pay over \$96)

Merck is another recession-resistant type of stock – a pharmaceutical company. Again, people don't cut down on their prescription medications, regardless of the economic cycle. So these sorts of businesses tend to be less affected by economic cycles. The large-cap pharmaceuticals that pay a decent dividend are attractive in the current investment environment. Valuations in this sector are never particularly good, so not ideal from that perspective. We do not expect to make a huge return, but they could be a nice stabilizer in a well-diversified portfolio. Merck (NYSE: MRK) is my top pick among pharmaceutical firms because of the solid dividend yield, and I believe their products are comparatively stable.

3. Barrick Gold (TSE: ABX \$19.66 – don't pay over \$22)

We do not know when the Fed (Federal Reserve Board) will pause – it could be in three months time, six months time – and it could be earlier. Regardless, when it happens, the path to investment profits could be lined with gold. Barrick Gold is the second largest gold miner in the world after Newmont. Gold miners are producing these days at an approximate cost of \$1,000 per ounce or a little bit over. They have essentially a licence to print money because with world gold prices around \$1,650 per ounce at the time I wrote this, Barrick is already reaping large profits.

Now, of course, while the Fed is raising rates, the U.S. dollar is strengthening, and people have an incentive to hold short-term

Treasury instruments, money-market funds, and vehicles that pay decent interest – as opposed to gold, which pays no interest. So we don't expect the price of gold to go up until the Fed hints at pausing interest rate hikes.

The U.S. dollar, on the other hand, is expected to keep rising until that pause happens. At some point, that trend will reverse. Because you can't know when that will be, it is important to have a diversified approach and be there ahead of time. Barrick is a good pick for having an offensive position when the Fed pauses.

Disclaimer: Performance of stocks is, of course, never guaranteed. Consult a professional financial adviser before investing in these or other businesses.

(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.)

INVESTING
EDGE

FROM PAGE 15

Solar and wind facility operators have been able to bid lower and lower prices to build new capacity, in some cases lower prices than alternative forms of electricity generation. But the rate of cost reduction has obviously levelled off in recent years as procedures and processes are optimized, and as physical limits for efficiency of energy capture are reached.

What does that mean for future costs? There are two really important factors to consider – storage/intermittency and supply chains.

I addressed intermittency with an example above – the 16% drop in solar generation in a five-minute period. That is tolerable for an electrical grid dominated by gas generation, where intermittency of a small component is readily compensated. But what if solar were a large part of the Alberta grid – say, 40-50%? Rapid fluctuations during the day, and zero output at night would need a lot of expensive energy storage, or reliable backup in the form of gas-fired generation, to meet demand every minute of the day – which is the standard electrical grids must deliver. Even if solar can sell to the grid at a cheap price – say \$0.03/kW-h – we must add in the price of building and maintaining storage and backup to actually have a functional electrical system.

Therefore, if we are going to have electrical grids powered largely by intermittent renewables in the future, we have to factor in these large additional costs on top of the actual price of electrical generation by wind or solar. That adds up to far higher prices for the consumer than the price the grid operator pays to the solar or wind generator.

Supply chains – the second big factor in future energy costs – are already driving up the prices of solar panels and wind turbines, reversing long-term cost-reduction trends. The wind industry is facing big financial pressures as a result (<https://www.woodmac.com/news/opinion/wind-industry-faces-a-perfect-storm-of-profit-pressure/>).

On top of these short-term concerns, building the huge amount of new generation and energy storage infrastructure that would be required to shift the world significantly away from fossil fuels would require immense new mineral supplies. Figure 4 shows that wind generators require immense quantities of copper and zinc, but also far more rare earths than other energy sources.

Solar panels also require immense quantities of high-purity polysilicon. Prices of many of these commodities are skyrocketing because of supply constraints. Lithium prices, for example, are up by a factor of 10 in the past few years.

Figure 3: Historical costs of wind and solar generation

Source: [National Renewable Energy Laboratory, David Feldman and Ashwin Ramadas](#)

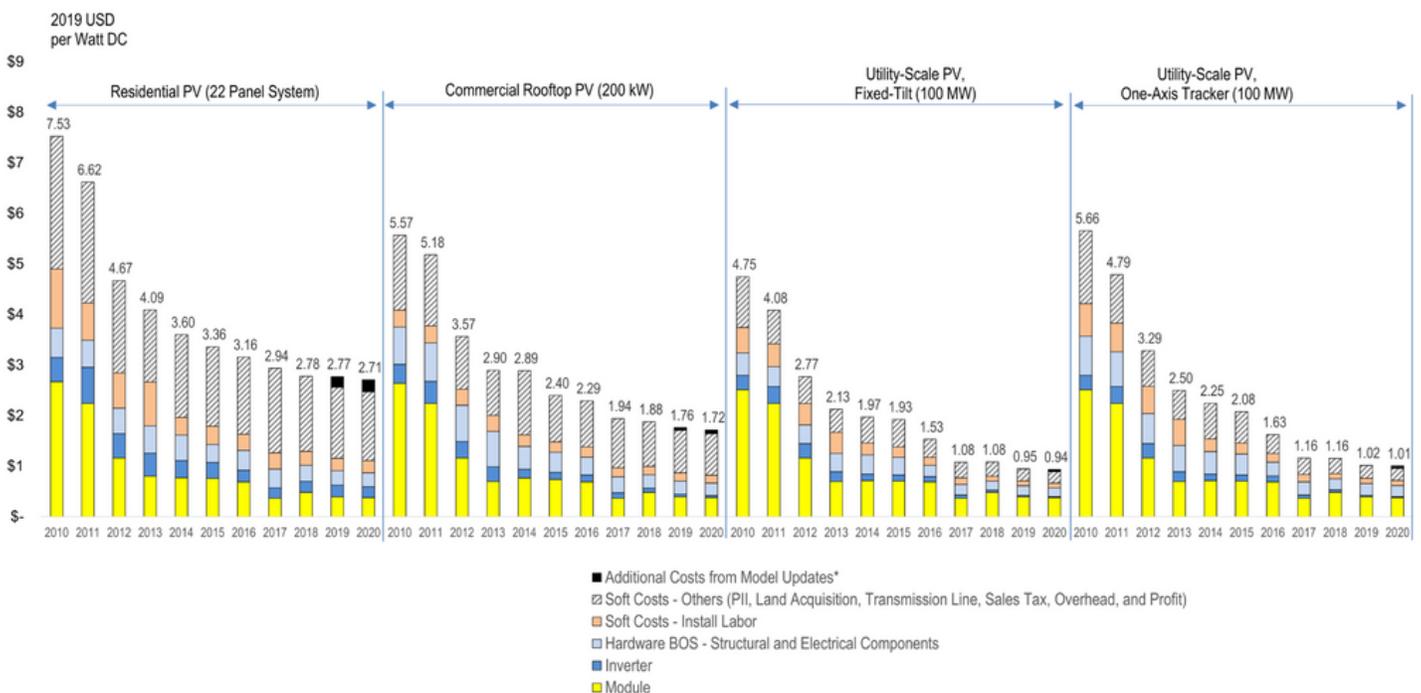
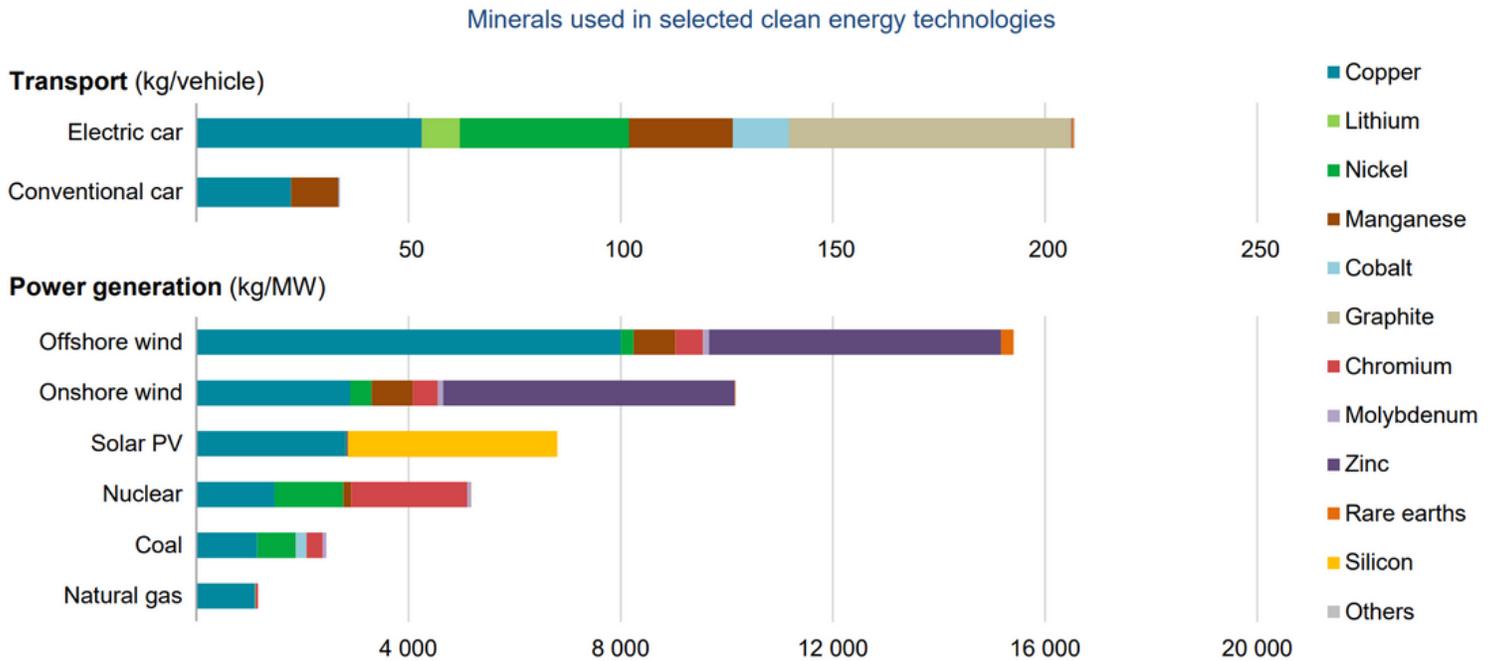


Figure 4: Breakdown of minerals used in various energy technologies

Source: [National Renewable Energy Laboratory](#), David Feldman and Ashwin Ramadas



For many critical minerals, it will take well over a decade to prospect for and develop new supply chains – a process that is energy-intensive and potentially environmentally damaging. There are serious doubts that we can ever develop quantities of some of these materials sufficient to meet projected needs.

Will we see a future with declining or at least stable electricity prices, led by declining costs of solar and wind generation? That is a difficult argument to make, because:

- We can access adequate solar and wind only in certain parts of the world
- Cost reductions from improving technologies have been very high in the past but are levelling off

- We face increasing costs for storage and backup of intermittent generation, particularly as solar and wind provide a higher proportion of electricity
- Supply chain issues are beginning to bite today, and will rapidly become more serious as demand for critical materials increases, increasing costs for solar and wind generation

A parting thought – Texas and California have made the news a lot in recent years because of electrical grid issues. Both have high renewables penetration, but California’s retail electricity is among the most expensive (18.0 cents/kW-h), while Texas boasts one of the lower rates (8.36 cents/kW-h) (<https://www.eia.gov/electricity/state/>). There is a lot to consider as we strive for sustainable and reliable energy development practices.

FOR SOURCES AND MORE, VISIT
BIG-MEDIA.CA FOR THE FULL PICTURE!

Putting global emissions in perspective

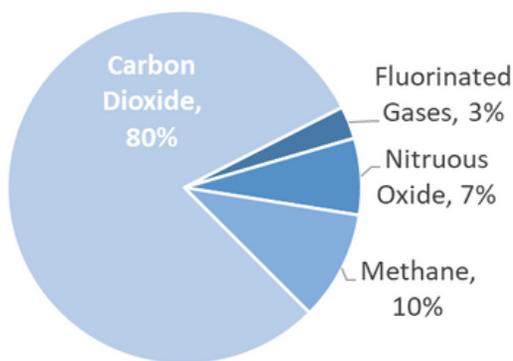
LAURIE WESTON



Every activity, natural or manmade, from breathing to driving, generates emissions of some kind. Certain emissions are worse than others, causing pollution or, in large quantities, affecting the composition of the atmosphere. Greenhouse gases (GHGs), in particular carbon dioxide (CO₂) and methane (CH₄), generated by modern industry, transportation, and agriculture, have been rising steadily since the industrial revolution. These emissions are implicated in manmade influence on climate. Figure 1 shows the relative proportion of GHG emissions in the US in 2019.[1]

Figure 1: Inventory of U.S. Greenhouse Gas Emissions and Sinks: 2019

Source: U.S. Environmental Protection Agency (2021).



Close to three-quarters of all manmade GHG emissions come from energy use in industry, transportation, and heating/cooling of buildings (Figure 2, [visit BIG-media to view](#)). The next largest source of emissions is the agriculture sector, accounting for a further 18%, with the remainder produced by waste, cement, and chemicals.[2]

The largest proportional component of greenhouse gases is CO₂, sometimes simply referred to as “carbon”. Although carbon and carbon dioxide are not the same, they have become synonymous in political and media discussion of climate change. Carbon dioxide gas (CO₂) is one of the places carbon resides, but carbon is a ubiquitous chemical in everything on earth, including living organisms. Carbon comprises 18% of our body weight and is literally part of our DNA.[3]

Just like other elements in the earth, carbon naturally cycles through the atmosphere, oceans, plants, animals, and soil in a complex interaction of chemical and physical processes. In part of that cycle, it can get sequestered for millions of years, as sediments and dead organisms sink to the bottom of oceans or lakes and are transformed by increasing pressures and temperatures into solid rock and fossil fuels. Carbon captured this way is normally gradually released back into the system through erosion and fluid maturation and migration, but humanity’s direct extraction of fossil fuels has accelerated part of this process, shortcutting the natural carbon cycle.

There is no doubt that the burning of fossil fuels is a significant source of GHGs, particularly CO₂. But in addition to the gradual natural processes just mentioned, there are catastrophic (in the geological sense) natural events that release massive amounts of gases and particulate matter into the atmosphere. Look at this spectacular picture of the Taal volcano in the Philippines erupting in 2020 (Figure 3).

One large volcanic eruption such as Taal can release millions of kilograms of GHGs into the atmosphere. Between May 3 and Aug. 5, 2018, the Kilauea volcano in Hawaii erupted. On one of those days, July 11, an estimated 77.1 kilotons (70,000 metric tonnes) of CO₂ were emitted.[5]

If that amount is assumed on every day of the eruption, this volcano was responsible for adding 6.57 million metric tonnes of CO₂ to the atmosphere. Remember this number when we get to the calculations of human contributions.

A recent BIG Media article, [Climate change and energy: context for the great debate](#), reported global energy use by source from 1965 to 2020 (Figure 5, [visit BIG-media.ca to view](#)).^[6] Each of these sources have associated GHG emissions according to the life-cycle estimates shown in Figure 4.^{[7][8][9]} Substituting the appropriate mean emissions intensity for each of the energy sources shows us the contribution of each of those energy sources to global emissions (Figure 5, [visit BIG-media.ca to view](#)).

Total emissions worldwide in 2019 were 37.5 billion tonnes. This is more than 4 million tonnes per hour. Recalling the number from the Kilauea volcanic eruption of 6.57 million tonnes, to put this in perspective, 94 days of eruption of a large volcano emits as much CO₂ as about 1.5 hours of human activity.

Figure 5 ([visit BIG-media.ca to view](#)) shows that fossil fuels are the largest emitters among the energy sources. But not all fossil fuels are created equal. Coal, for example, contributed 27% of the global energy mix in 2019, but its use was responsible for nearly 40% of emissions. Natural gas is the cleanest-burning fuel with emissions intensity approximately half that of coal for the same energy output. Replacing coal with natural gas reduces emissions.

Why is that relevant? The answer can be seen in the emissions charts (Figure 6, next page) divided between a selection of “first world” countries (U.S., U.K., Canada, Australia, Germany) and a selection of developing countries (China, India, Mexico, Africa).

It is apparent from these charts that emissions in the developing world are growing at an alarming rate, compared to recent decreases in the developed countries.

Coal use in particular has diminished in developed regions, replaced in large part by natural gas, but has been growing significantly in the developing world. This is illustrated in Figure 7 ([visit BIG-media.ca to view](#)), comparing CO₂ emissions by fuel type for the U.S. and China. In the year 2000, the U.S. and China were approximately equal in emissions from coal. Since then, the U.S. has decreased its emissions from coal by 50%, and China has increased by 300%.^[10]

Figure 3: Eruption of the Taal volcano in the Philippines

Dated January 12, 2020. The gas and ash plume reaches 17 kilometers high.



Modern society has been driven by fossil fuels, the availability of which directly powers standard of living. In recent years, gross domestic product (GDP), has become decoupled from energy use in the developed world.

This is not yet the case in developing countries. As they strive for the same standard of living as the first world, energy use follows (or leads). In general terms, the absence of accessible energy equates to poverty.

Efficient new technology takes decades to develop and scale up. Modern renewable technologies (solar and wind) have grown with concerted efforts over the last two decades.

Figure 6: Total GHG emissions by Source

Sources:
[BP statistical review of world energy](#)

[Comparison of Lifecycle Greenhouse Gas Emissions of Various Electricity Generation Sources](#),

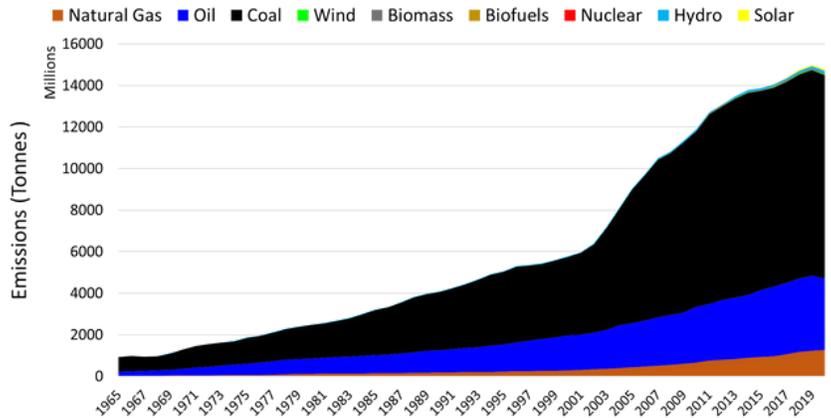
[2006 IPCC guidelines for national greenhouse gas inventories](#)

Despite this focus, its share is barely keeping pace with growth in energy demand. In 2019, solar and wind energy generation accounted for only 3.3% of global energy supply (Figure 5, [visit BIG-media.ca to view](#)).

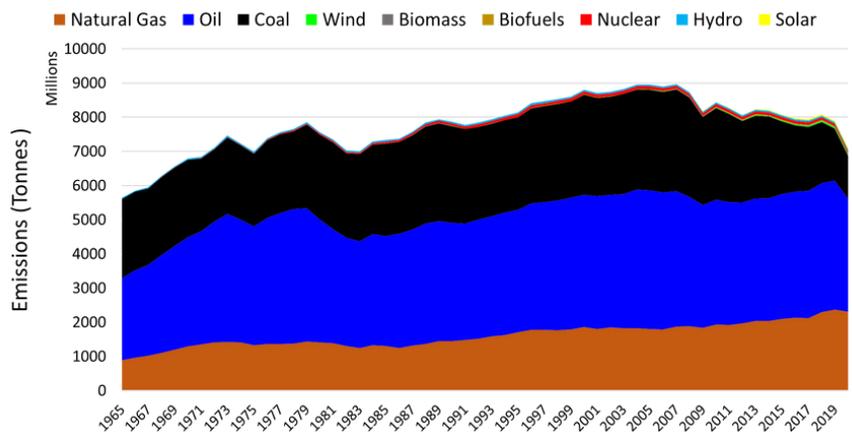
In practical terms, no energy source is intrinsically bad – it is the emissions that cause problems. If our objective is to reduce emissions, renewables are not the only way. Rapidly improving technologies are helping reduce GHGs from fossil fuels, and capturing carbon at the source and from the atmosphere (Figure 8, [visit BIG-media.ca to view](#)).^[11] Such technological advances are a critical factor in pursuing global emission reduction targets.

Since we cannot expect renewables to meet global energy demand for decades to come, fossil fuels will continue to provide the affordable energy the growing world population demands. Solutions to the “emissions crisis” will require co-operation between industry, academia, governments – and, perhaps most importantly, individual citizens – to consciously improve efficiency and establish an optimal, sustainable energy mix.

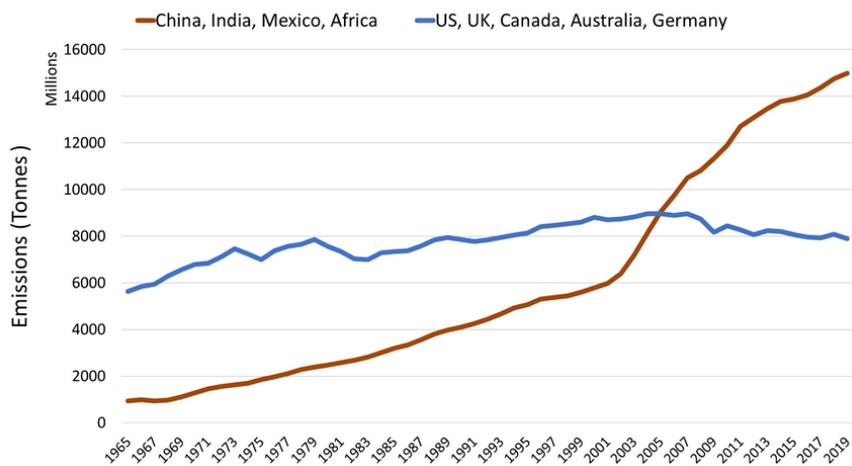
**TOTAL GHG EMISSIONS BY SOURCE
 CHINA, INDIA, MEXICO, AFRICA**



**TOTAL GHG EMISSIONS BY SOURCE
 US, UK, CANADA, AUSTRALIA, GERMANY**



TOTAL GHG EMISSIONS



**FOR SOURCES AND MORE, VISIT
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Return to sensible energy policy – a painful but necessary transition

BRAD
HAYES



Many would agree that the energy world has changed dramatically over the past couple of years. In early 2020, energy commodity prices, particularly oil, plummeted as response to COVID-19 devastated demand and producers could not sell their oil. Markets recovered slowly through 2021 as the world worked its way through the pandemic – then oil, gas, coal, and electricity prices exploded in 2022 as energy shortages became apparent, followed by Russia’s invasion of Ukraine that revved up geopolitical risks.

Nine months into the latest Russian conflict, people are starting to look harder at why Europe and many low-income nations are suffering energy supply crises, while even resource-rich Canadians and Americans experience high energy prices, along with supply-chain problems and industry slowdowns.

The answer is both very simple and immensely complex. The simple answer is – many countries have very poor energy policies, incapable of dealing with today’s energy situation, and now they’re seeing the results. Let’s not be smug in the United States and Canada – our energy policies are as bad as any, but we are so blessed with abundant energy resources that we have not seen a North American energy crisis just yet.

The more complex and realistic answer is that most high-income countries really do not have energy policies – they have emissions policies that assume sufficient energy will always be available. In Europe, and particularly in Germany, government policy in recent years focused on accelerating development of low-emission energy sources such as wind and solar (plus high-emission wood pellets, but that is a story for another day).

That is all fine, but policy decisions were also taken to shut down high-performing and low-emission nuclear power generation, and to actively discourage production and consumption of oil, gas, and coal.

We see similar policies emerging in other high-income nations, particularly in Canada and United States, where it is almost impossible to build a pipeline. Federal governments are making oil and gas development more difficult, and operating nuclear facilities face early shutdowns.

Back to Germany – it was assumed (apparently) that renewables could grow quickly enough to supply electricity needs, even while demand grew to electrify sectors such as transportation. Relatively cheap imported oil and gas would always be available to paper over the cracks – or so the thinking went. That idea worked OK from the economic downturn in 2008/2009 through 2020, but gas prices skyrocketed in 2021, well before the Russian invasion, and sit at astronomical levels today (Figure 1, visit [BIG-media.ca to view](https://big-media.ca)).

Consumers in Europe are facing devastating energy bills this coming winter – at least triple those in previous winters according to many media reports. The damage is not limited to the average consumer who cannot afford their heating bill, but has spread to many industries such as steel, cement, fertilizer, and others that rely directly on fossil fuels or abundant cheap electricity.

An interview in the New York Intelligencer with the commodities/industrial experts at Doomberg does not mince any words in laying out the situation in European energy markets (<https://nymag.com/intelligencer/2022/09/europe-energy-catastrophe.html>).

Here's what they say about today's energy situation:

"Look at what they're actually doing. They're burning coal like they never have in Germany. So – climate what? I mean, does Germany actually care about climate change? If it cared about climate change, I guess Germans would all shiver instead of burning coal. Climate change is going to happen over multiple decades in a century. The war is here. The war is before us. There's no such thing as the unicorn buffet where we have no trade-offs and every decision is a good one."

I am sure many people would object to the harshness of the language and the depiction of climate change effects. Nevertheless, Doomberg summarizes the situation accurately. Europe is paying unaffordable energy prices that are bringing economic disaster, and while the Russia/Ukraine conflict is exacerbating the situation, the origins of the problem lie in European emissions policy that did not ensure energy security and affordability for their citizens.

So, Europe is seeing the pain of uncertain and expensive energy supply, and the pain is spreading. What are the responses of governments committed to reducing greenhouse gas emissions? Germany is delaying the shutdown of nuclear power plants slated to close in late 2022. Germany and other European nations are burning a lot more coal. The entire continent is scrambling for natural gas supplies, either from non-Russian pipelines, or by building new LNG import facilities that will operate for decades

(<https://www.jwnenergy.com/article/2022/9/12/energy-crisis-pushes-germany-to-lock-in-lng-for-de/>).

The U.K. has rescinded the ban on onshore hydraulic fracturing, which may allow development of domestic onshore gas supply (<https://www.reuters.com/world/uk/new-uk-pm-truss-wants-more-oil-gas-extraction-north-sea-2022-09-07/>). Others may follow – Germany has squelched onshore gas development in recent years, but the resources are there for development.

As University of Colorado environmental studies professor Roger Pielke Jr. says in The Honest Broker Newsletter (https://rogerpielkejr.substack.com/p/energy-security-comes-first?utm_source=email):

"All of these actions related to energy indicate what should be completely uncontroversial – energy security comes first. And by security I mean security of supply and of cost. Externalities such as air pollution (both particulates and greenhouse gases), dodgy regimes as a source of supply and fears over technological risks can only be addressed in the context of security."

Of course, governments are also encouraging accelerated development of renewable energy sources, but are being forced to face realities that limit how much energy they can generate in time to address today's shortages. Rising costs, supplies of critical minerals, expansion of electrical grids, and inadequate energy storage all limit how much wind, solar, and geothermal can be built and how quickly.

One can argue that European policymakers are embracing energy policy more seriously and sensibly than they have over the past decade. Energy security, the lack of which threatens the life and livelihood of every citizen right now, has muscled its way to the front of the policy lineup. Today's "short-term" policy measures allowing more fossil fuels and nuclear will gradually become long-term policy as people are reminded daily that they need affordable energy on demand, every day. Renewable energy will continue to grow, but perhaps with a more realistic view of what it can deliver and how long that will take.

A final word from Pielke Jr.:

"Expressing virtue through energy technologies will always be much easier when there are multiple viable options on the shelf (so to speak) and ready to be deployed. In the absence of clear alternatives, or in the presence of promises of new alternatives soon to come, countries will overwhelmingly choose what is familiar or immediately deployable. There won't be much interest in political games through energy policies."

So – a lot of economic pain can produce more sensible energy policy. The big question for us in Canada and the United States is – do we need to experience as much pain as the Europeans have before our federal governments take to heart the lessons of national and global energy security?

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Capturing carbon

LAURIE
WESTON



Modern humans have, through their daily activities, been liberating carbon at a furious pace. By “carbon”, I specifically mean carbon dioxide, or CO₂, which is a naturally occurring gas molecule made up of one carbon atom and two oxygen atoms. Growing concentrations of CO₂ in the atmosphere accelerated due to human activities have been linked to unwelcome climate changes, and there have been considerable political and scientific efforts to reduce these concentrations.

The CO₂ molecule



As detailed in an article on Page 21 of this issue, CO₂ is only one of the group referred to as greenhouse gases, or GHGs. Reducing our emissions of all GHGs and improving environmentally sustainable practices are imperative and ongoing objectives. There has been significant focus on the development of renewable sources of energy such as wind and solar to offset fossil-fuel use with the associated reduction in GHG emissions. This is easier said than done, as described in the BIG Media article [Climate change and energy: context for the great debate](#) ([visit BIG-media.ca](#)).

This article will focus on the largest component by volume of anthropogenic (human-caused) emissions, CO₂. Carbon is a building block of all life, stored naturally in living organic matter (plants and animals), “fossilized” organic matter (rocks and hydrocarbons), air, and water.

The natural carbon cycle involves complex physical and chemical processes through which carbon moves, over the course of millions of years, from basic carbon dioxide gas to substantially more complicated molecules, and back again. As with all scientific endeavours, we try to understand these complex processes using simplified physical models and experimentation, incorporating as much theoretical and practical knowledge as possible, modifying the theories and models as more is learned.

The interruption and further complication of the natural carbon cycle happens when we burn hydrocarbons for energy, process certain types of rocks (carbonates) to make cement, disturb and modify the soil through agriculture, and disrupt land and water ecosystems with industrial and urban activity. Regardless of how it gets there, the end result is an increase of carbon dioxide gas in the atmosphere.

There are, however, many ways of reducing the amount of carbon dioxide in the atmosphere. In one of nature’s elegantly symbiotic relationships, we animals breathe oxygen (O₂) and exhale carbon dioxide (CO₂), while plants do the opposite. In the presence of high CO₂ concentrations, plants are known to thrive, absorbing and synthesizing CO₂ while they are alive.[1]

Plants also transfer carbon to the soil through their root systems, and when animals and plants die, they become part of the soil or marsh, sequestering the carbon in the process.[2] Oceans absorb a significant amount of CO₂ through multiple processes (Figure 1).[3] It finds its way into corals and sea life, which sink to the bottom when they die, their shells and skeletons eventually forming those carbonate rocks we use for cement. Their soft bodies become tiny droplets of oil that migrate through pores in the rock, and mingle under the right conditions into vast pools.

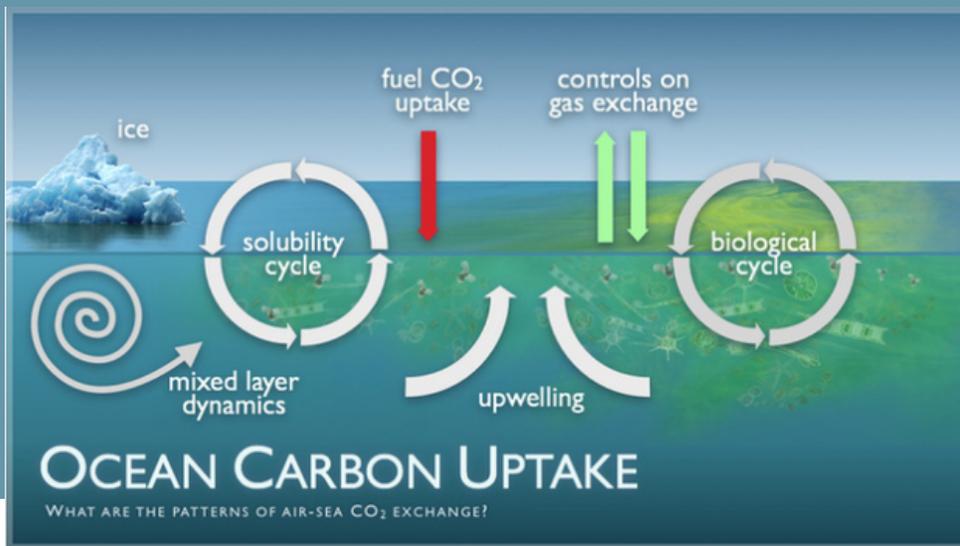


Figure 1: The ocean-atmospheric carbon exchange.

Source: U.S. National Oceanic and Atmospheric Administration, <https://www.pmel.noaa.gov/co2/story/Ocean+Carbon+Uptake>.

Although the science of all these interconnected processes is not well understood, recent studies suggest that about half of the CO₂ that we emit is absorbed by plants and soils, and that this proportion is keeping pace with increases in emissions (Figure 2, [visit BIG-media to view](#)).[4]

If half of the CO₂ emitted into the atmosphere is absorbed naturally, what do we do about the other half? There are two obvious options:

1) We can reduce the amount emitted in the first place, hence the “heated” debates on the energy transition. However, despite all the media attention and political efforts over the past few decades, renewable energy sources (which are not totally clean in any case) still contribute only 3-4% of the continually rising global energy demand.[5]

2) We can use artificial methods to capture and either use or lock away the carbon in a secure location. This approach is called “carbon capture, utilization, and storage”, or CCUS.

CCUS requires technology to capture, transport, and use or store carbon dioxide. We also need to be confident that the CO₂ is not leaking out of wherever we put it, which requires ongoing monitoring technology (Figure 3, [visit BIG-media.ca to view](#)).

All of this technology has been utilized for many years. In 2006, an Italian geologist friend called me unexpectedly, saying he was coming to my home city Calgary – not to visit me; he was only passing through. The Italian government sent him to a small town in southeast Saskatchewan to learn about a world-renowned project for the capture and storage of CO₂. [6]

Long before the word “carbon” carried such negative connotations, oil companies had been injecting the miscible gas, CO₂, for enhanced oil recovery (EOR), increasing secondary oil production from fields that had been depleted by conventional pumping (Figure 4, [visit BIG-media to view](#)). In Weyburn, Saskatchewan, this purpose was augmented with detailed CCUS scientific research for multiple objectives including:

- Geological site characterization of the geosphere and biosphere
- Prediction, measurement, monitoring, and verification of CO₂ movements
- CO₂ storage capacity and distribution predictions, and the application of economic limits
- Long-term risk assessment of the storage site

The Weyburn study provided significant scientific data and insights regarding the capture and storage of CO₂, as well as permanently sequestering 40 megatonnes of CO₂. However, the use of CO₂ for EOR is considered by many to be politically incorrect because of the commercial benefits it brings to oil and gas companies, prolonging the production and use of fossil fuels. Current Canadian policies offer incentives to specifically non-EOR CCUS. [7] BIG Media elaborates further on carbon economic incentives and opportunities in [Climate change – environmental emergency or economic opportunity?](#) ([see BIG-media.ca](#))

At Weyburn, the CO₂ is collected from an industrial plant in North Dakota, liquefied, and sent by pipeline across the border into Saskatchewan. This is an example of CO₂ captured at its source, which is a proven and commonly employed technology around the world. But it can also be extracted directly from the atmosphere (DAC) using experimental technology (Figure 5, [visit BIG-media.ca to view](#)). [8]

Whatever way CO₂ is gathered, in order to be stored permanently, it needs to be transported to an underground injection site, where it is pumped deep into a suitably secure geological formation.

Unless the captured carbon is used for a commercial purpose such as EOR, there is no revenue; just expense. Although costs are decreasing, capturing and storing carbon is expensive. Like all additional costs to a business, someone must pay, whether it is the government or the consumer.

Climeworks is a Swiss technology company that has two direct-air-capture sites, one near Zurich and one in Iceland (Figure 5, [visit BIG-media.ca to view](https://www.big-media.ca)).^[9] The site in Zurich sells carbon dioxide to local greenhouses to enhance plant growth, and to a local Coca-Cola factory to put the fizz in soda.^[10] Both of these are temporary uses for carbon.

According to its website, Climeworks appears to be monetizing its Icelandic operations with a subscription service for carbon dioxide removal; “We want to inspire a billion people to remove carbon dioxide from the air and reverse climate change.” At a quoted subscription cost of €15 – €50 (\$17 – \$57 USD) per month, they are not thinking small.

Microsoft, Spotify, and Audi, and more than 10,000 others have subscribed so far. With a few clicks and a credit card, you, too, can be a “climate pioneer” and place your order for carbon removal on your behalf.

There are obviously no easy answers to these problems. Our lives have evolved to be dependent upon increasing amounts of energy, which, so far, have been provided primarily by carbon-intensive fossil fuels. Changing will not be easy or fast, especially when our understanding of complex interconnected natural systems and their adaptability is so rudimentary. Solutions will come from an array of different technologies and systems, large and small, available now or yet to be invented, evolving as we learn.

This is an enormously entangled subject, scientifically, politically, socially, and emotionally. While we are figuring it out, we are going to try things that might not work, hopefully without inadvertently causing harm. In the meantime, we can all try to be aware of our own contributions and do simple things in our everyday life that have the cumulative potential to make a significant difference.

Figure 5: The Climeworks Orca direct-air-capture carbon-removal site in Iceland.



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About the speaker: Brad Hayes has a PhD in geology from the University of Alberta and is president of Petrel Robertson Consulting Ltd., a geoscience consulting firm addressing technical and strategic issues around oil and gas development, water resource management, helium exploration, geothermal energy, and carbon sequestration. He is an adjunct professor in the University of Alberta Department of Earth and Atmospheric Sciences.

Hey Doc - am I crazy?



ROB
DRISCOLL

With so many people saying that I am nuts to launch a magazine in print and digital formats, I decided to pay a visit to my clinical psychologist.

Now, my understanding of doctor-client privilege guidelines dictates that my psychologist, Dr. May Dupp of the Clinically Registered Association of Psychologists (CRAP), must keep our conversation confidential.

However, I can share the details of our conversation with whomever I choose... so here is a transcript of the conversation that I recorded on my smartphone:

Dr. Dupp: Wow - it's been several hours since you last met with me to discuss your mental issues. What brings you here this afternoon?

Me: A lot of people think I am nuts to launch a new-look magazine that includes a print version. Do you think I am crazy?

Dr. Dupp: Crazy is a strong term. Let's start with underlying issues. Why would you even consider the idea of launching a magazine, particularly a print version?

Me: My theory is that there are many people who love to read hard copy, and that by introducing a higher level of business journalism in reporting on critical issues such as global emissions, environmental sustainability, economics, and finance, more of us will be empowered with practical knowledge and fewer will engage in ill-informed arguments or support harmful policies. Of course, they also have the option of reading our great content at businessedgemediac.ca.

Dr. Dupp: That is an interesting theory, but why would someone read Business Edge when there are so many great publications out there already?

Me: Are you trying to trigger me? Coverage at most - if not all - of my competitors is sadly lacking in accuracy and critical context. There is also a dearth of viable advertising vehicles through which companies can boost business in the Canadian market. No one else is delivering a publication to 100,000+ Canadian businesses per issue.

Dr. Dupp: Okay, okay, I get it. Now, how are you doing with your habit of secretly recording conversations and trying to sneak promotional messages into conversations that you then publish under the guise of humour columns?

Me: Much better, thanks. I think that ever since I just launched Canada's #1 business magazine, I have felt a lot less pressure to engage in shameless self-promotion.

“
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ALL – OF MY COMPETITORS IS
SADLY LACKING IN ACCURACY
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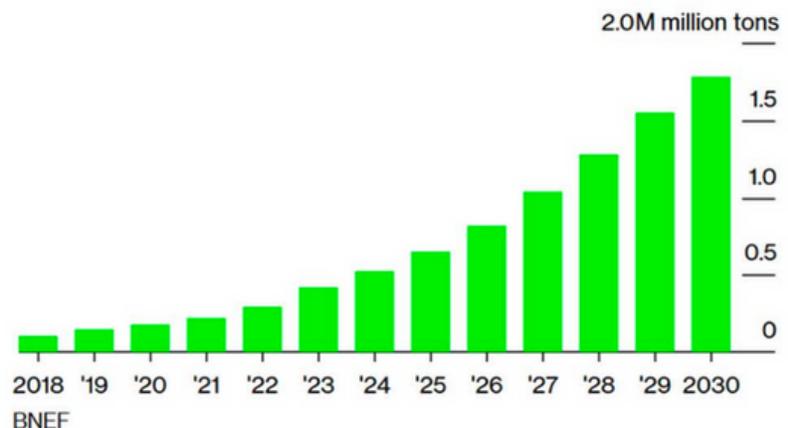
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