

Shorelines

NEWSLETTER OF THE PROBUS CLUB OF NORTH SHORE VANCOUVER

October 2021 www.probus-northshorevancouver.ca (Members Password: probusns2021) Vol.19 No.10

Management Committee

President:

Darryl Stodalka
604-925-2570

Vice President:

Gord Cook
604-921-7393

Secretary:

Keith Fenton
604-926-7586

Treasurer:

Gordon Adair
604-230-9122

Past President:

Ron Wood
604-922-7646

Communications:

Terry McLeod
604-926-0239

House:

Terry McLeod*
604-926-0239

Membership:

Dale Douglas
604-921-6888

Speakers:

John Elliott
604-925-3535

Special Events:

Doug Magoon
604-616-6761

*Interim

Monday, October 4th Zoom Meeting - 9:30AM

Dennis Molnar, Historian

*“Amazing People Stories of World War 2 (Part 3)
including the British Woman who sank 5 German U-Boats”.*



Dennis Molnar is returning for a sixth speaking engagement with our Club. This time he will entertain us with more “Amazing People stories of World War 2 (Part 3) including the Woman who sank 5 U-Boats in One Day.”

Why was it impossible to arrest the Best Double Agent in the History of Spying? How did the smallest handwriting in the world help WW 2? What was Coca Cola’s brilliant strategy in World War II and meet the woman who sank 5 U-Boats in one day!

Dennis Molnar worked for, and was a Director of, a high technology company that supplied satellite photo mapping systems for use by the Military. An Electronics Engineer by education, he visited Military Agencies on 5 continents, was in Iraq during the war with Iran, and in Libya during its 1980’s high tension with the USA. Having visited over 50 countries, he studied the role of maps in War History and decided to share his passion and knowledge as a Lecturer.

Dennis tells captivating and intriguing stories of people and events that have helped shape our history. What was the life of a World War II Spy really like? Who made the most obvious mistakes in the most critical sea chase of World War II (and why)? Who was disobeyed more by their subordinates: Churchill or Hitler? Why did so many husbands and wives, living behind the Berlin Wall, become informants for the secret police and spy on each other? And why are the History books so wrong about Cuba’s Revolution and Cold War Missile Crisis ?

Dennis received his MBA, became the Managing Director of a Technology Company, taught at the University of British Columbia, and has served on various Advisory and Director Boards. He is a past Director of the BC Winston Churchill Society and for over 20 years has presented World War II and Cold War History to Businesses, Professional Groups, Museums, and Societies. **PLEASE NOTE This presentation will NOT be recorded. Relax in your easy chair with a cup of coffee and log in to this presentation on Monday.**

Mark Your Calendars with These Important Dates



Monday, November 8th, 2021 Zoom Meeting - Maureen McGrath, Host of the Sunday Night Health Show on CKNW and author of *Sex and Health*. Her Ted X talk on YouTube gives a taste of what to expect.

November 8th Pre-Meeting Coffee Session - details to follow

President's Notes



Greetings members of our fine PROBUS Club. I am delighted that the members of our Management team encouraged me to take on the role of President. I have been a member since our first year. I have been active on the communications team for much of the time since. We have seen many changes to our technology for the better. 15 years ago, no one could have foreseen that we would or could meet monthly in a virtual manner.

The Zoom platform was evolving and was ready for us just when we needed it. We have conducted 16 Zoom webinar style monthly meetings so far. I agree that there is sadly lacking the personal face to face aspect to our meetings. We are working behind the scenes to secure a meeting venue for the time when the public health authority allows us to return to in person meetings. I think that I share the feeling with most of our members that keeping the club active through a robust speaker's program is important to maintain.

I wish to acknowledge the service of departing team members Herb Grubel, Tom Gunn and Jeremy Marr. I also welcome new team members Dale Douglas (membership) and Gord Cook (vice president). Returning are Ron Wood (past president), Gord Adair (treasurer), John Elliott (speakers), Keith Fenton (secretary), Terry Mcleod (move from house to communications), Doug Magoon (special events) and myself (president). The house chair position is vacant at the moment. I wish all of you a productive and healthy year and look forward to working with a great team.

Please note that management team members welcome help in their committees. If you wish to pitch in to assist in some way, please reach out to me so that I may elaborate on opportunities.

Darryl Stodalka

Contact: president@probus-northshorevancouver.ca



Special Events

The Special Events Committee was able to launch its first event in a year thanks to the kind offer by Alex Wood, member of our PROBUS club and of the Royal Vancouver Yacht Club, to take a group of our members on a cruise on September 24th up Indian Arm with a visit to the historic Wigwam Inn. Thank you Alex for making this opportunity possible.

A visit to Carbon Engineering in Squamish will occur once they complete the construction of a 1000 tonne per year atmospheric CO₂ capture pilot plant in the coming months. North Shore Rescue is happy to host another tour as soon as their COVID protocols permit.

The committee is pursuing followup discussions about another visit to the Pacific Science Enterprise Centre, whose history and endeavours were capably described to our club by Steve Macdonald at our June Zoom meeting.

Planning is also under way for this year's Christmas luncheon, hopefully in person this coming December, COVID circumstances permitting.

Doug Magoon, Special Events Chair

Membership Renewals Final Notice

2021-2022 Year Membership



If a member fails to pay the renewal fee of \$60 by **October 15th** their membership will lapse and their name will be removed from the mailing list.

Please mail your payment ASAP with your renewal form if you have yet to renew or you can pay by Interac.

Contact linda@probus-northshorevancouver.ca

October 4th Zoom Coffee Session



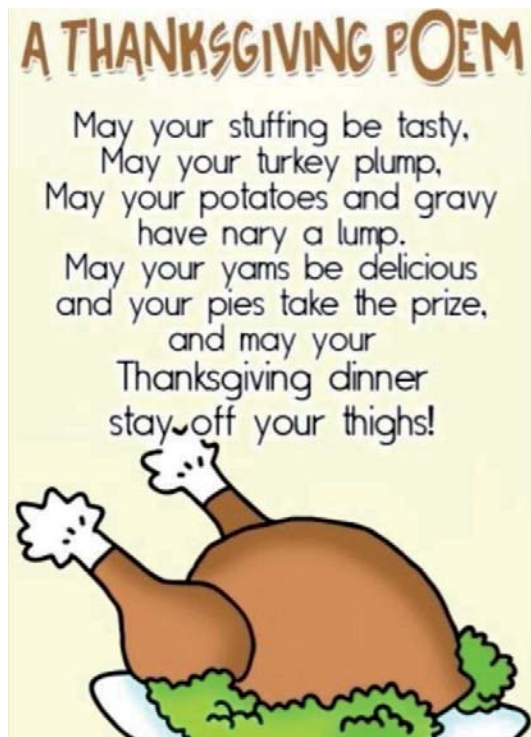
A new 'Coffee Session' prior to our monthly meeting, will take place on ZOOM.

Time schedule: 8:35 - 9:10am. This session will stop, regardless, at that end time.

A virtual background should appear with a table display ala our meeting room, previously. Three (3) rooms will appear once logged-in. One can move to different rooms to meet others and add to conversations.

Members will be sent log-in instructions for the Coffee Room and the regular Meeting Webinar -- end one and into the latter as though you were sitting down to an in-person session. Remember, your virtual presence will add to the enjoyment for each other.

Terry McLeod, Acting House Chair



Last Month Speaker - Anna Stukas

Anna Stukas, P. Eng, VP Business Development, at Carbon Engineering Ltd. In Squamish

“The Climate Revolution” and how direct air capture will enable clean infrastructure, mitigate risk, and provide affordable solutions for true net zero.

Carbon Engineering Ltd. was founded about 12 years ago with a mission of developing commercially scalable, cost effective technology to capture carbon dioxide from the atmosphere. Their vision is to lead the world in the large-scale removal of carbon dioxide from the air and advance the shift to a sustainable carbon-neutral society.

How it works can be described using the analogy of a bathtub filled with water and about to overflow, the first thing we would do is turn off the tap. However, the tap is sticky, and the bathtub continues to fill. Instead, we pull the plug, and that is the function of direct air capture in our atmosphere. It allows us to drain some of the water out of the bathtub to help to get the water level back in balance.

There is increasing global awareness and action where companies are declaring targets and moving toward net zero, operating with no net addition of CO₂ to the atmosphere ie. a zero carbon footprint. But true net zero means permanently removing the equivalent of remaining emissions, not just reducing emissions where possible, thus leaving the remaining unavoidable emissions. In other words, removing one ton of emissions and adding one ton of renewable energy, still means one ton of emissions. We need to balance that one ton of emissions with one ton of removal. The cost will be significant, and may impact companies future viability. Carbon removal solutions are scarce and expensive today.

It is not all negative! This offers an opportunity and experts believe that we are on the brink of a new revolution – the Net Zero Revolution. Preceding this we had the Agricultural Revolution, the Industrial Revolution and the Information Revolution.

An ideal climate solution would be: Affordable, Scalable, and Easy for governments, companies and individuals to purchase today and would: Enable safe, measurable, and permanent carbon removal, Have Global potential, and Allow the world's energy needs to be met. As of today, nothing has met all of these criteria. However, Carbon Engineering Ltd. Offers the missing technological piece – direct air capture from the atmosphere. They are commissioning their new innovation center in Squamish, and will be proud to do tours post-covid, and once they are fully commissioned.

The scale of the CO₂ problem is so large that we need an all-encompassing approach to address it, including emissions reduction strategies, biological carbon removal, and

technological carbon removal solutions.

Carbon Engineering Ltd. solutions include sequestering the captured CO₂ in the geosphere or durable carbon products, and/or synthesizing it into ultra-low carbon fuels. They have developed a closed-system technology (using pre-existing technologies combined with patented innovations and proprietary know-how) that allows the process to be used anywhere. The carbon dioxide is buried very deeply underground and overtime it degrades into calcium carbonate, the same thing that limestone and seashells are made of. All fuels begin with a common set of ingredients – air, sun and water. Using the same core ingredients, a technological solution to creating hydrocarbon fuels is applied that short circuits the biological or geological approaches. This means that bio-fuel is ready in weeks/months as opposed to fossil fuel which takes millions of years.

Why do we need to permanently remove carbon dioxide from the air? The atmosphere, the ocean and the land biosphere are all interconnected. The land biosphere in BC, as we have seen with the fires, is not permanent – there is too great a risk that the trees will burn down. We need trees! They can play a critical role in helping to buy us time to solve climate change, but we can't do it all with trees.

On March 9, 2021, Carbon Engineering Ltd. announced the launch of a new carbon dioxide removal service, with Shopify as its first customer, with a commitment of 10,000 tonnes of carbon renewal. This will be performed by the US plant development partner. Commitment reflects the growing awareness of the need to include permanent carbon dioxide removal in climate plans.

Questions

Q1 How unique is your approach to this issue?

A We are quite unique. The world needs more direct air capture. Other countries have developed direct air capture, but we need a lot more capacity for the world. We are different by the front end process that we use, which is a liquid solution. By contrast, another company uses a solid capture solution that acts like a sponge to absorb the carbon dioxide, and then removes it. This is more suited to small scale projects, unlike ours which is more suited to large scale projects.

Q2 Can your presentation be forwarded to interested parties?

A I'd be delighted to share a PDF.

Q3 Can you run over the costs one more time and how those costs compare to those of the other companies you mentioned.

A I can't publicly tell you exactly what our costs are. What I can tell you is that we've published a peer reviewed academic paper that shows that costs in early plants will be in the low 100's of dollars per ton and by the time we get to deploying multiple plants we will be looking at 100 – 150 dollars per tonne. Our permanent CO₂ removal offers prices in the low 100's of dollars. Compare that to Clime-works' subscription service in the range of 700 – 1000 dollars per tonne.

Q4 What does this mean for electrification of autos and other transportation?

A Electrification is fantastic. We need more of it. In provinces like BC where we have a grid that is 97% clean, we should be electrifying every single light duty vehicle. While we are electrifying those vehicles, we should be looking to low carbon fuels to help to lower the footprint of all of our legacy vehicles. We are looking at a 15- 20 year horizon where we will still need to burn liquid fuel in those vehicles until the last of those legacy vehicles are phased out. We need clean fuels today to help accelerate the decarbonization of light duty transportation while we shift toward electrification of light duty vehicles. Where we need this in the really long term, is in things like aviation. Harbour Air has had a lot of news coverage about their electric aircraft which is fantastic, but we are a very very long way from seeing long haul aviation go electrified.

Q5 What does it cost to operate a carbon removal plant and how much energy does it use?

A Cost is entirely dependent on the price of that energy you are using to operate your plant. The cost of your renewable electricity is the number one driving factor of your plant operations overall. From an energy perspective you need about 5 gigajoules of thermal energy to heat up those pellets and you need about 366 kilowatt hours per tonne of carbon dioxide that you capture. The best analogy that I can give is that a million ton per year plant needs an order of magnitude of about 100 megawatts, roughly, as a rule of thumb. It is not insignificant but also not insurmountable.

Q6 One of the Probus members sent an email on how whales are helping to remove carbon dioxide from the air. Can you comment on that and would banning whale fishing help the climate cause?

A Banning whale fishing is good for all sorts of reasons. They form a critical part of our ocean ecosystem, and I am sure they have temporary carbon dioxide capture capabilities just like our kelp forests do, and the forests surrounding us on the North Shore do. It is not a permanent, long-term solution, and I suspect it is hard to quantify. It is important as the need for re-wilding for building resil-

Last Month Speaker - Anna Stukas

ience into our local ecosystem. Attenborough has put out two excellent documentaries in the past year focusing on the need for re-wilding to gain resilience in the effects of climate change.

Q7 Given that the world's three biggest polluters are the US, China, and India, will this technology make a significant difference to the worldwide problem?

A I hope so. Our first plant is being deployed in the US. We've signed a multi-plant licensing deal with IPoint5, and if you listen to the CEO of Occidental Petroleum, she has publicly committed to move from being an energy company to being a carbon management company. Her goal is to get to a point where they are putting more carbon dioxide underground than is coming out in the oil that they extract. They are incredibly bullish on the technology and have a desire to scale very quickly. They've publicly said that they are looking to do over two dozen plants in the very near future and get to hundreds of plants by decades from now. China has announced their desire to get to net zero by 2060 and while they are the world's largest deployer of new coal plants, we have seen that when China commits to something they tend to do it. The adoption of EV's and hydrogen vehicles in China has risen exponentially – faster than in North America – driven primarily by local air quality issues and they have adjusted their licensing system for obtaining a vehicle to allow those wanting EV's/hydrogen vehicles to move further up the queue. India presents more challenges because they are still looking at how they pull the vast majority of their population out of poverty, and that comes to the environmental justice point of this where, as developed nations, we need to be taking a leadership role to allow still developing countries to catch up in a fair and equitable way.

Q8 You mentioned Shopify as an early stage investor. Does your company have plans to go public?

A This is a question that gets asked frequently. I don't have an answer to this. Right now we are lucky to have a very committed group of strategic investors ranging from Bill Gates who was a very early investor all the way to Occidental Petroleum, Chevron and BHP Billiton. We are not having to worry about where our next paycheck is coming from which is a luxury for any start-up company but as to where things go in the future all I can say is "stay tuned".

Q9 Given that the atmosphere is a shared resource, countries that don't choose to invest in this type of technology are basically getting a gift from those that are willing to underwrite the cost of it. Is that a disincentive for smaller countries that are still developing to embrace the technology as others are doing it on their behalf?

A I think we are seeing growing global momentum to require everyone to come to the table. We saw it this summer with 130 countries committing to a minimum corporate tax rate. I think we are going to see growing pressure on smaller countries to step up as well. We need early adopters – the costs are never going to come down if plant #1 doesn't get built. Some of those smaller countries can't afford a plant to be built. I think we have a responsibility as one of the more affluent countries to take that leadership role.

Q10 What is the difference in the energy created? For a barrel of oil, how much fuel equivalent (in electric energy etc.) is needed in order to produce that barrel?

A With fossil fuels, we feel that it is "free" as the earth invested millions of years in its creation. It is a new reality when we look at newly created energy to synthesize those fuels ourselves. We do get process efficiencies approaching 50% so you put energy in and get 50% of the energy out. That doesn't sound great until you consider what the efficiency ratio would have been to grow all of the plants and animals and have them decompose into fossil fuels over millions of years. In that context, it is a pretty good end to end efficiency. A clean electron in a car is more like 80% efficiency. If we can directly electrify, we should, but there are things that we can't, like long haul aviation. That is why we need a portfolio of solutions. If we don't permanently take that carbon dioxide out of the atmosphere, we aren't going to be able to restore the world we live in back into an equilibrium position, and we are going to continue to have to deal with the worst effects of climate change.

This summary was prepared by member Darlene Dean



"Shorelines" © a monthly publication of
The Probus Club of North Shore Vancouver

Editorial contributions and comments are welcomed
and may be sent by e-mail to :
linda@probus-northshorevancouver.ca