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[00:00:02] Santa Ono: You're listening to CITR 101.9. Broadcasting from UBC's Point Grey campus, located on the traditional, unseeded cosalish territory of the hən̓q̓əmiñəm-speaking Musqueam people.

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[00:00:30] Recording: Broadcasting from the University of British Columbia, where a piano plays itself in Alumni Hall. This is Blue and Goldcast.

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[00:00:56] Santa: I'm Santa Ono, the President and Vice-Chancellor of UBC. On this season of the Blue and Goldcast, I'm speaking with the people who are helping to shape UBC's next century. On each episode, I'll be joined by one of my senior faculty advisors. We'll hear how they're contributing to our strategic plan. Like all of us during this COVID-19 pandemic, we've had to adjust.

For the Blue and Goldcast, that means recording remotely. I've been recording from my home and my guests have been recording themselves at home as well. You might notice things sound a little different but that's just one of the ways that UBC has found to adapt.

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[00:01:55] Santa: Hello, everyone. Thank you very much for joining in on the Blue and Goldcast. We know that climate change is one of the largest issues facing our society and that it's a cause that our students and faculty are very passionate about. As you know, UBC is a very highly ranked institution just generally but also especially in the time higher education impact rankings.

We are ranked number one in the world in terms of taking urgent action to combat climate change and we're proud of that but we don't want to rest on our laurels. We want to continue our work and Professor Walter Merida is really one of our top experts in that area and he's also senior advisor on climate here on our Vancouver campus and is a globally recognized leader and he's also associate dean of research in his faculty.

Walter, welcome to the Blue and Goldcast show.

[00:02:51] Dr. Walter Merida: Thank you, Santa. Thank you for the invitation.

[00:02:53] Santa: Let's just start off, because not everyone knows you as well as I know you. Can you tell us a little bit about yourself and how you came to UBC? A little bit about your work?

[00:03:03] Dr. Walter Merida: I guess you could say that I am actually the product of international education. I think that's partly why I believe so strongly in the transformative power of what universities can do. I was born and raised in Guatemala. It has been a long journey since those days to where I am now. What we

do at UBC is, I work mostly on sustainable energy systems and the keyword there I think, is systems because we tend to look at pieces perhaps of the solutions.

My work tries to look at a system's architecture to design services. A lot of the discussion is something knowledge is on products but at the end of the day, what people want is services, transportation, healthcare, communications. I, of course, do some other work on more specific items like hydrogen technologies and that's to connect the vast availability of renewable electricity to services that cannot be provided with electricity.

I came to UBC in 2002. It's been quite a while. I must say, I'm very, very proud of what UBC has done in the area of sustainability and climate action in general.

[00:04:12] Santa: Now, many students are very up to date with greenhouse gas or GHG emissions. They are part of international courts, as you know, that have been signed by some nations and not others. Could you talk to those experts in our audience about what steps we have taken to reduce GHG? What numbers look like and whether it's possible for us to accelerate that work?

[00:04:39] Dr. Walter Merida: Certainly. I think UBC was the first university in Canada to have a sustainability policy and we have managed to, for example, in terms of specific measures, we have managed to reduce our greenhouse gas emissions on the Vancouver campus by approximately 38% compared to 2007 levels and that's quite significant in the sense that at the same time, we have grown about 26% in the student population and approximately, I would say 16% in the square footage of buildings, just construction.

In a way, UBC, if you look at the map, the picture I have in my Zoom background, for example, it's a picture of the peninsula and what you see there is that despite being next to one of Canada's largest cities, we are in many respects, a remote community. We are separated from the city by a park. We are at the end of the natural gas line, at the end of the electricity grid, and in many ways, we need to operate as a municipality.

In fact, UBC operates as a small city and that gives us the challenge but also the opportunity to show like we have done in terms of greenhouse gas emissions reductions, that is not a zero-sum. I think this is one of the most important messages I think in terms of climate action. Taking positive environmental and climate action is not a zero-sum.

We can actually grow as we have shown in our population and construction and at the same time, lower our impact on the environment on the potential for climate change. Some of the measures that we have adopted include things like building a biomass energy power plant right on the campus. This is an example of using our campus if you like, as a laboratory, as a testbed, to test and develop new concepts.

In this case, the demand if you like was very straightforward. We needed more power and heat on campus but rather than buying the off the shelf solution, we look for partners to develop the next generation of power plant that in this case was going to use biomass. There's a lot of forestry waste in British Columbia. We're a forest-rich province and that's an example of where UBC can become not only the source

of ideas and innovation and technologies but also a risk-tolerant early adopter of these solutions.

I think that can drastically accelerate the time to market on the development of some of these solutions.

[00:07:07] Santa: The campus as a living lab concept, UBC has really been a pioneer in that, everywhere I go, people recognize UBC as leadership in doing so and it's something that persists with the example that you gave us but you have been really the architect of a new effort that really thinks about the smart energy district.

I was at an announcement of some support from governments in that initiative and you even had a model of what that would look like. Can you tell us a little bit about that?

[00:07:40] Dr. Walter Merida: Absolutely. I have a 12-year-old daughter and we were looking at some archaeology textbooks recently and we came across the picture of the first dinosaur that had feathers and we started talking about evolution and so on but the interesting thing I told her is that the first feather was not meant for flight, it was meant for warmth. The first car was not a large and advanced telecommunications center on wheels with large batteries.

This is just a roundabout way of saying that a lot of innovation is going to happen at the interface of these new technologies and these new solutions as we develop them and as they are adapted to do something that they were perhaps not meant to do initially. The project that you're referring to Santa is a city-scale testbed at the corner of Westbrook mall on Thunderbird Boulevard, where we have one of the largest parking buildings on the campus. It's a four story parking building.

Unless UBC already has a large number of electric vehicle chargers around the campus. We are increasing the number of electric vehicles that come into the campus. As I mentioned, cars and parking garages are two of the most underutilized assets anywhere in the world. Cars parked from 9:00 AM on the State Park until 5:00 PM when everyone leaves and they sit there doing nothing and at the same time occupy these large buildings in the middle of our campus.

What if we could aggregate the storage capacity that electric vehicles have by virtue of carrying these large batteries and then make the recharging infrastructure reversible so that the cars can be charged during one part of the cycle and then when their system needs energy or electricity, they can send the electricity back to the grid. That's exactly what we're doing as part of this project.

Now, I mentioned hydrogen technologies at the beginning and the reason that hydrogen is important is that there are many things that we can do with clean electricity and solar electricity, in particular, is the cheapest electricity right now. The Metro services in Santiago in Chile signed a contract for under two cents a kilowatt-hour which is extremely low price for electricity.

The problem is that solar wind, most of the renewable energy sources are only available sporadically and intermittently. That's the first problem is the cyclical intermittent nature of renewable electricity. The second problem is that there are

services that simply cannot be provided by electricity. For example, flying a jet liner at the speeds and times that we are accustomed to is not really possible for propellers sort of electric drives.

You need a chemical fuel to do some things. The simplest possible chemical that you can imagine is hydrogen. This project will also incorporate an electrolyzer that will convert one megawatt solar array that we will install on the roof of this parking garage, and convert it into hydrogen. Of course, we can then refuel hydrogen vehicles on the UBC station. We will build a hydrogen refueling station there as well, will be a station capable of servicing heavy duty vehicles.

For British Columbia, almost half of the land transportation emissions come from heavy duty vehicles. That's an example of how an integrated energy system works. You use solar energy to charge the electric vehicles which then can send some power back to the grid. You use some of that power to make hydrogen, which then can be used to refuel hydrogen vehicles and the final piece and this is the one that's most important, perhaps for UBC targets as we continue to reduce our own emissions, is the de-carbonization of space heating.

As you know, the province of British Columbia with a clean VC document has some very aggressive targets for a 15% content of renewable natural gas into the natural gas grid. Natural gas use for heating buildings is one of the main sources of emissions of UBC. The last thing we can do is take some of that hydrogen and then inject it into the natural gas grid to dilute if you like the natural gas, thereby lowering its carbon content.

This entire city block has a substation, has the campus energy center and I think, will be the first place in the world where all these technologies will work harmoniously.

[00:11:57] Santa: A lot of the special advisors that I've worked with over the years are extraordinary group. I'm sure you met many of them, but I have to tell you that the work that you're doing is extraordinary and I'm very grateful for the energy, with which you've been a special advisor. What you just talked about is something that you've been working on for some time, but you've really stepped up your leadership. The other thing that really we're grateful for in terms of your leadership is stepping up as co-chair of the climate emergency task force.

As you know, this past year was a monumental year for the institution. We have been inspired by students who have really been through demonstrations and activism, clearly articulated their demand which I think is well-placed that we as an institution take a leadership role in everything from divestments to the kinds of projects that you have just spoken about and to do our best to integrate the understanding of threats that we face as a civilization in our curriculum and to provide additional opportunities for students to be part of the solution.

You have really done a remarkable job working with students, working with the other faculty members and deans and external organizations, governments, and industry, and we're all your debt of gratitude for your service as special advisor. I was wondering if you could just talk a little bit to your role as coach here of the climate emergency task force.

It's in my view a remarkable story that we in this year have gone from activism to dialogue to town hall meetings and an action step. Can you tell us a little bit about your view of this past year, especially the past several months of movement at UBC?

[00:13:56] Dr. Walter Merida: Thank you, Santa. First of all, I should say that a lot of the credit goes to our students because they really were the ones who inspired us and really motivated us to move. In September, there were demonstrations with large numbers of students participating. The leadership of youth has been remarkable in this last year. In December of last year, we UBC, with your support declared a climate emergency which was unanimously supported by the board of governors.

I think this is an important comment to make because a lot of other universities that I work with, they are trying to do this, take the same kind of action, but their processes have not been as unanimously supported if you like. I think this is an important advantage, competitive advantage that UBC has, that we seem to have a common mission from the students to the staff, to the faculty and to the administration.

Since then, we started in earnest in February, the end of February, we started with the engagement process. There were public booths in March, and then in March 11, we had a campus-wide forum which included participation from really thought leaders in many of the areas related to climate action. Of course, the COVID-19 outbreak really had an impact mid-March and we had to suspend unfortunately, all the in-person engagements, most of them were oversubscribed and there was a real desire to participate.

Nevertheless, we adopted and we changed the process to be online and we had lots and lots of participation. We had almost 2,000 participants. Then we started where we are now, I would say, which is a process of engagement that has been extended for the summer. What we're trying to do is to gather as much information and as many different participants as we can from all different parts of the university.

We submitted a preliminary report to their board of governors, which was basically a summary of what has happened since the beginning of the year. We are now really engaged in a more systematic and planned way to really engage with subject matter experts, to convert this engagement process into a set of recommendations from our procurement processes, research, teaching and learning engagement with communities and partners outside of the campus and so on.

We hope to have that report finalized when the next board meeting happens in December. I'm really hopeful that what emerges out of this process will continue to place UBC as a global leader in some of these initiatives.

[00:16:52] Santa: Well, thank you very much. Now, COVID-19 certainly was a surprise and the entire world, not just the UBC had to pivot, but if you actually look at the impact of COVID-19 on GHG emissions and on impact on climate change, it's been remarkable. You've seen all the data, you've seen all of the different kinds of assessments. As the world reopens, you can see that those positive steps from a climate action point of view are being reversed pretty rapidly.

The question I have for you is this, so what can we preserve in terms of what we've learned about the positive impact of how we work, how we commute. Is there a silver lining to COVID-19 with respect to climate change and action that we might want to consider in a new normal, in a different way of doing business? The best thing when we have these crisis is for us to learn from them.

[00:18:00] Dr. Walter Merida: Yes, absolutely. We have a similar situation with the financial crisis earlier in this decade, the initials dropped, then they bounced back with a vengeance. A couple of things, one of the first things I would say is back to the comment about this taking climate action, not being a zero sum game. For the very first time, even before the COVID-19 outbreak the global growth, if you like, as measured by GDP, have been decoupled from carbon emissions, which is remarkable in itself.

In the past, if you wanted economic growth measured by GDP, anyway, it was impossible to decouple that growth from growth in emissions, but we have shown globally in a few places in the world, more than others, that it is possible to decouple growth from emissions. That's the first thing is that we can actually grow economically and lower our impact. In terms of the COVID-19 outbreak, absolutely.

It was remarkable in Canada, in particular in other parts of the world, perhaps less so, but in Canada, it was a remarkable how on this one thing, we came together as a nation, and there was a clarity of mission that I think in most cases has enabled us to go through the crisis, to manage the crisis as best we could. The world has faced three crisis concurrently. There was a COVID-19 outbreak, the remarkable drop in the oil prices around the world, that, for the first time had negative pricing for oil, which is unheard loss.

And of course, the climate emergency. My hope is that the clarity of mission and the unity that we showed in trying to tackle the COVID-19 outbreak can be translated to a common mission in facing climate action. Absolutely, climate action can be a lens actually for economic development. Canada in particular is very well-positioned to use that lens to pivot its economy from our current state to a sustainable and low carbon economy state.

When I was in a climate change conference in Bonn, Governor Jerry Brown made a big case for some of the financial instruments that until recently have only been available to central governments to become available to municipal governments. As good as it is to have a Paris Accord with almost 200 nations signing it, it is really the municipal local governments that are going to deploy the solutions at that local level.

That is one idea, how can we use Canada's well-respected and robust banking system and financial system to become a global resource to channel some of these investments into climate solutions? I think UBC in this case, is very well-positioned because if you look at British, Columbia, Washington, Oregon and California, you all of a sudden are talking about the fourth or fifth largest economy in the world, same time zone, common Language, common codes and standards, common legislation in some cases.

The low carbon fuel standards that British Columbia has held since 2008 is in California as well. There is a lot of room for really good innovation. Other examples

include, the European Investment Bank has started the creation of what they're calling green mortgages. These are basically mortgages that are offered to people to buy housing, which complies with certain sustainability guidelines. They of course offered them I think it's at about 25% discount compared to the standard rate to get that mortgage.

That's a huge incentive to go to build your house in a sustainable way. These are some really interesting moves at the global scale. The other one, which you touched on a little bit is the whole divestment issue as sovereign wealth funds and institutional investors start to change their portfolios, very large amounts of capital are going to be available.

Again, the implementation of climate solutions, because this is a global problem, typically require large capital investments, and very large risk assessment if you like. The expertise required to channel some of those investments is something that I think universities could be part of because we do have the Vancouver School of Economics for example. We have a very thriving and leading science and applied science faculties.

The University of California is already doing some of these works. Stanford is doing some of these work. There's a real opportunity I think for universities, as sub-national actors if you like, and especially research universities to become effective agents of change.

[00:22:46] Santa: We had great news that a coalition of I think 22 of North America's leading universities that have very significant track records and accomplishments including the entire University of California system. We heard great news that UBC has been asked to lead the UC3 consortium, the University Climate Change Consortium.

It's a two year mandate for us and Walter I hope that you'll remain engaged during those two years but it gives us as you were talking about the Cascadia Corridor and California as one of the largest economies in the world with some of the most advanced thinking and research in this area.

What do you see as the opportunity not just for UBC, but for UC3 and also as you know, globally we are a key link in the U7+ climate change initiative as well, which is going to have a second meeting very soon in Chicago.

Tell us about how this leadership of UC3 may give us an opportunity over the next two years to really drive global change in climate action?

[00:24:00] Dr. Walter Merida: Yes, I think that was fantastic news and congratulations by the way for the role. I think we couldn't have chosen a better transition. What that gives UBC is not only a platform to start engaging globally, but also the mechanism to amplify the actions and activities of like-minded partners. Also, to share best practices and to avoid redundancy.

For example, one of the things that I certainly can be accused of taking for granted just because of the fantastic people that we have to work with is the way in which the research teams and the operations teams at UBC work so well together. The fact

that I can call John Metras, David Woodson and John Madden, and they won't run in the opposite direction when a professor approaches them with a project, I think is a great development.

Some of those engagement mechanisms and some of those best practices I think could be shared across this group to then amplify and accelerate the way that some of this innovation happens on campus. Back to your question, we need a global platform. I think UBC by virtue of its activities and the recognition that it has received recently, in the rankings for example can now engage at a much higher level.

Some of the changes, for example, just to be very concrete in terms of Canada, some of the changes to the Tri-Council funding mechanisms in Canada actually enable us to engage internationally at a much higher level. If you look at the UC3 mandate, they are very much aligned with this idea of our campus as a living lab and expanding the impact from the campus level to the community level and to the global level.

I am very excited actually, I'm very much looking forward to seeing how we can collaborate and lead some of these initiatives to connect to other parts of the world. Similar efforts are going on in Europe and in some parts of Asia so I think what this gives us, the 22 universities that are part of UC3 include Mexico, Canada and the US. I think now we can really start talking about the North American platform for this engagement.

[00:26:16] Santa: Walter, thank you so much for your time. You're incredibly busy and we're very grateful that you've agreed to be part of the Blue and Goldcast.

[00:26:23] Dr. Walter Merida: Thank you. Thank you for the opportunity.

[00:26:27] Santa: That's it for Blue and Goldcast today. Dr. Walter Merida is a senior advisor on climate at the University of British Columbia. You can find more about our climate emergency engagement at climateemergency.ubc.ca.

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