

METRO VANCOUVER FUTURE OF THE REGION SUSTAINABILITY DIALOGUES

DEMATERIALIZATION: TRANSITIONING TO AN ECONOMY WITHOUT WASTE March 27, 2012, CENTRAL NORTHEAST

The Future of the Region Sustainability Dialogues are a series of discussions intended to assist decision makers shape the future of the region by inviting a range of views that challenge conventional wisdom and stimulate fresh thought on regional issues. The sessions explore topics such as housing, industry, labour and immigration, drugs and crime, the regional economy, transportation, energy and agriculture. The “issues summary notes,” below, provide an overview of unique points raised in the March 27, 2012, dialogue on dematerialization. Summary notes from each regional dialogue and related board reports are available on the Metro Vancouver website www.metrovancouver.org.

Issues Summary Notes

ABOUT THE TOPIC:

DEMATERIALIZATION: TRANSITIONING TO AN ECONOMY WITHOUT WASTE

- This dialogue will explore what dematerialization means and what we can do to facilitate change in this emerging policy area.
- It builds on discussions at the Metro Vancouver 2011 Sustainability Congress, which explored five key sustainability themes, including dematerialization. At the congress there was a common interest among participants in exploring a number of questions related to this topic:
 - What is dematerialization?
 - What does it mean to me as a consumer, an elected official, a business owner, a communicator or a decision maker?
 - What can governments do?
 - What can the private sector and academia do?
 - What can we do together?
- We will explore how we can maximize the efficient use of resources and better manage materials through their life cycle, by transitioning to an economy without waste.
 - Economic growth brings challenges and we are attempting to reconcile the consumption of materials with the finite limits of resources extracted from the Earth.
 - When the economy is booming and people are making lots of money, sometimes they forget that we’re tapping out resources and not leaving anything behind.

THE DIALOGUE

1.0 Context

1.1 What is dematerialization?

- Dematerialization is reducing the amount of material input required to produce one unit of a good or service. Like all species, we extract materials, resources and natural assets, and we modify them to create value. We can measure this value as the



material value, with specific physical units like tonnes of stuff, or Joules or the area we have, or we can measure in monetary terms.

- Dematerialization is the wise use of natural resources through increasing resource productivity all along the value chain of the life cycle, from extraction to manufacturing, production, distribution, use and consumption, and recycling or disposal.
- Dematerialization is when we support our prosperity or quality of life by using less stuff. When we talk about stuff or materials, we can talk about four different types of materials: construction materials; ores and industrial minerals or metals; fossil fuels (when we save energy, we're saving materials); and biomass or food and feed, air, water, soil and ecosystems.

1.2 Dematerialization is important to conserve the Earth's resources

- Together we extract nearly 60 billion tonnes per year from the Earth. Since the 20th century, we've increased this by a factor of about 8. As we all know, we live on a finite planet and we've reached planetary boundaries on a lot of these resources. We need to think about how we can be more productive.

1.3 Dematerialization is an important part of addressing climate change

- In waste terms, the amount of CO₂ we put into the atmosphere as a society every year is about 10 times the weight of what we put into landfills. It's the single largest waste by weight.
- Climate change is the overarching challenge for our generation.

1.4 Dematerialization is an acupuncture point

- If we work on dematerialization, we create cascading changes that improve the health of our economy, our society and our personal well-being.
 - We enter the conversation through looking at resource efficiency but quickly move to find multiple benefits and many different actors involved.
 - We start conversations about our economic model and the way we think about our quality of life.
 - It's an acupuncture point that helps us implement what we want to do in moving towards a sustainable future.

1.5 Priority areas for action

- We need to change how we organize our economics so that we can support dematerialization.
- Redesign: How can we redesign our products, goods and services?
- Sharing: [Participation in collective activities] can apply at the industrial scale. We can share among businesses and industries so that the waste is reused. For example, water coming out of one industry can become the fuel for another. Sharing is possible at different scales.
- Sustainable purchasing: We have the BuySmart Network here in the region, and we can do much more. Thirty percent of the GDP of most countries is purchasing.
- We need to visualize what sustainable lifestyles and economies would look like. That will help us move toward dematerialization.
- Whenever I think about places to intervene in a system, there are some key aspects.
 - Look for places where your efforts can change the whole system. For example, if you change how national governments are measuring GDP, it trickles down and affects how businesses define the way they're contributing to society.

- If you want to get something to scale quickly, get inspirational examples that draw people forward.
- Look for places where there are large wins. We know that 70% of household footprints are in three sectors: mobility, housing or land use planning, and food and drink. We can place a lot of our efforts in those big clusters, because that's what's going to tip the balance.
- Compost is the new frontier. If you look at the breakdown of what goes into our landfills, a lot of the top categories accounting for a large chunk of the waste is compost.

1.6 The goal of dematerialization

- Where we want to go is to maintain a high standard of living with the stuff we have, but ultimately we want to decrease the throughput of materials.
- We want less stuff that's more efficiently produced, that lasts longer, and at the end of its life cycle we close the loop on it.

1.7 Wasting efficiency gains by spending savings on resource consumption

- Sometimes when we use a particular resource efficiently we take the savings—say from buying an energy-efficient appliance—and end up spending them on something like air travel that undoes the greenhouse-gas savings from our efficiency increase.

1.8 Time frame for dematerialization

- Whenever you think about environmental problems, one of the greatest challenges is to think about the time horizon.
 - With waste, energy and resource issues, you have to think long-term. If you look at solutions, you look at doing something now, politicians are thinking of the next election, businesses are thinking of the next annual report.
 - Many environmental visions require a long-term vision and a long-term commitment to make them happen. And that is a real challenge.
- Think about futuristic solutions.
 - When I was growing up I watched a lot of Star Trek. They never had any recycling or waste issues because dematerialization meant that things came out of a replicator and the waste went back into the same machine.
 - Where do you want to be 100 years from now? Is a world conceivable in which 100% of material is getting recycled and reused? If you think that vision is feasible then that's solving most of our problems because once we get that solution we don't have to worry about our resource footprint because we wouldn't be using new resources, we'd be reusing what we had.
- I'm concerned about the long-term view, like 2050, and I'm also concerned about actually doing something.
- I'm confident that we're going to see the kind of changes we're talking about today. My concern is that we won't see it any time soon enough.

1.9 There will always be some waste

- [Even though we] focus on redesign and how to keep materials as long as possible into the circular economy, we still have to recognize that there will be some stuff that we will need to dispose of.
- We need to decide how we will manage disposal over time, whether to incinerate it or landfill it. It's often a question that we don't fully address.

- Waste disposal will always be there until we get to the science fiction place where we have a 100% closed loop.

1.10 Many technologies for dematerialization are already available

- We don't need to reinvent the wheel. We need to focus and sometimes so do the politicians.

1.11 Some sustainable technologies have substantial social costs

- It's great to have people want to shift to electric cars. What I want to know is where the electricity is going to come from. We're going to flood the valley of the Site C dam. We're going to force the aboriginal people to give up their territory and the farmers to surrender their land. Is that fair? To benefit the Lower Mainland we cause economic and environmental hardship elsewhere in the province.

2.0 Global trends in resource use

2.1 Canada is a large producer of waste

- The Conference Board of Canada looked at how much waste is being generated in Canada compared to 17 other OECD countries last year. Guess which country came out worst? It was us.
 - We consume 894 kg of waste per person per year. That's still more by 17% than our neighbours south of the border. That's 50% more than in Germany, and twice as much as in Japan.

2.2 Looking to other countries for best practices

- It's very useful to look around the world and see what the best practices are. What can we learn from other jurisdictions? What do they do better than we do?
- I looked at Japan and Finland and saw that there is different thinking prevailing there.
- During the 1990s and the 2000s, Japan introduced a number of measures to reduce their resource use. In part it's cultural.
 - There's a Japanese word "mottainai," which means "it's a shame for something to go to waste without being used to its full potential." This thinking is at the heart not only of individuals; it's also what businesses do and governments are thinking of.
 - The first step to making things better is to change our thinking and attitude towards resource use and improving resource efficiency.
- Finland has a long history of promoting recycling going back six decades already. What they pioneered is very innovative solutions where businesses and government interact and find solutions together that work. They have a relatively centralized system for dealing with waste management and waste prevention that can inspire a lot of solutions elsewhere as well.
- I understand that Finland generates 47% of their local energy out of biomass.

2.3 The global population is growing

- If you look at the global picture there are a couple of problems that we have to worry about.
 - One is population growth and greater affluence in a lot of countries. China, India and other places are growing very rapidly.
 - They're demanding a larger resource footprint, and if you think of where this is going to go, it is going to make some resources more scarce and will eventually drive up prices.

- How do we sustain a population of nine billion in a dematerialized world?
- We wouldn't be talking about dematerialization if we didn't have as many people in the world. What's the place of limiting population? The core problem is the number of people we have.
- We would be much better off in 2050 if we had a world of 2 billion people than a world of 9 billion. It would sure ease a lot of the tensions, and it would allow us to raise the standards of everyone to a high level of sufficiency. But how do you get there?
 - In countries where the population growth is big, you do things like empower women and enable choices in birth control.
 - These things are beyond our control. There's no magic wand we can wave to [reduce population growth]. To the extent that we can encourage that in other countries, we should do that, but it is going to become thorny if we have nine billion people all striving to live at our standard in 2050.

2.4 Resource use around the world is very unequal

- The real problem is that there's a small proportion of the population at the very top that consumes vastly more than others, and we can't all consume at that level.
 - If you look at the ecological footprint that's developed by William Rees at UBC, people in the top 10% have footprints that are double those in the bottom 10%.
 - We talk about consumption as a problem as if we're all equal in the middle class, but that's not the case.

2.5 Global patterns of resource use are changing

- There's a greater turnover in goods. We have more rapid obsolescence, and the example of the iPhone was mentioned. This can aggravate the problem.
- You can argue that we are in the process of dematerializing in that our economy is now 75% services as opposed to goods. At the same time, because of higher incomes and growth in population, the sheer volume of materials has gone up.

2.6 We are not running out of major resources yet

- When it comes to resources, I'm optimistic. We're not running short on major resources quite yet. In the long run that will be a more pronounced problem, but what makes me hopeful is that the price mechanism will help us find the right solutions.

3.0 Designing to facilitate dematerialization

3.1 Using innovative design and new technology to reduce materials use

- One example comes from the aluminum industry. They're experimenting with Alulite, which is a strong and rigid foam that weighs one-fifth of what normal aluminum weighs and uses about a fifth the amount of aluminum in its production.
 - It has made a big difference in ease of transportation for construction as well as producing the product.

3.2 Designing for ease of disassembly and repair

- Consider an iPhone 3G. It's now probably doomed to go into a museum because we're up to the iPhone 4.
 - The prospects for disassembling it and making it back into a new iPhone technology down the road are pretty limited right now.
- In the latest iPhone, you can't even replace the battery.
- Things have to be designed for repair and disassembly and that's not happening.

- There are a lot of opportunities for taking existing materials that we've put in, and there's a lot of embodied energy in making [these products] in the first place.

3.3 Choosing materials that are less resource-intensive

- Plastics are so pervasive in our society and they have lots of impacts in landfills and health impacts, being derived from fossil fuels. All of these things pose real challenges to dematerialization.
- Can we make products out of materials that can be upcycled?
 - For example, with certain polymers you can reuse them to make almost the same products, whereas paper quickly loses its capacity to be turned into paper.
 - Can we create non-toxic products that we can return to living systems?

3.4 Extended producer responsibility

- Another solution is the extended product stewardship that businesses have to think of in designing their products.
- I'm on the New Westminster Environmental Partners and the city's environmental committee. I'd like to hear more about what's coming down the pipe [for EPR] in the near term, what's happening in the long term and where you'd like to see it go. What industries should be targeted for this and will it be voluntary or made into law?
- There are different levels where the action can take place.
 - At the top level the OECD is putting out an EPR program that's informing what's our best practice and best standard, and jurisdictions are copying and adopting it.
 - Here in Canada, we have the Canadian Council of Ministers of the Environment. They have an action plan for EPR that is being phased in by 2050 and includes packaging materials, electronics, mercury-containing products, household hazards and special wastes. And then it will be extended to other industries in future years.
 - The CCME has put together that program and the uptake is taking time.
 - It's a slow process. Negotiating with individual producers is not easy because many of them are outside Canada.
- The Recycling Council of B.C. is doing an enormous amount with EPR and is very informed about how to do this work.

4.0 Extending product lifespan

- [We need to consider] ways to re-design products to be more durable and last longer. We're getting out of the box of planned obsolescence.
- Can we find materials that can have a longer life? Once you've got that you've got to create durable products that will last a long time.

4.1 Repairing products

- In India, things like TVs, microwaves and other electronics are repaired within a couple of days, and very economically. I see that we do recycle here but how can we make the process of repair feasible and economical in terms of cost and time?
- There's an organization in the Downtown Eastside called Free Geek. They take computers and refurbish them and repurpose them for other people to reuse. That's an inspirational model.
- The problem generally is the discrepancy in labour costs here versus where products are originally manufactured in Asia. They're not comparable.
- For economic opportunities for repair and maintenance, we need to rethink these cycles. The challenge is that B.C. is one very small jurisdiction in a very large world.

4.2 Total resource footprint is more important than a long product lifespan

- People always put up a dichotomy between durability and sustainability in the sense that you have to have products that are more durable and last longer to be more sustainable. But there is a trade-off.
- If you look at the turnover between product generations, you get a benefit from having a newer model of whatever it is, an iPhone or iPad, or a new car. If you drive a Prius as opposed to a gas-guzzling car from 1970, nobody will say it's a bad thing to have a rapid turnover from one generation to another because there are clear environmental benefits.
- The problem is not so much that things are less durable, but what is done with those goods.
 - If they get junked, then we have a problem.
 - If they get brought back to the manufacturer, disassembled and recycled properly, then we can have an economy where durability isn't the measure of things. Instead, it's the resource footprint.
 - If there is value in innovation and having innovative goods, there may well be a shorter lifespan for those goods. Five years for a device where before it was 20 years may be workable if the environmental footprint hasn't changed.

5.0 Collaborative ownership

- My two friends are an example of a couple who are dematerializing by not owning things, but getting access to them by collaboratively consuming them with others.
 - Instead of buying tools, they go to the tool library in Vancouver.
 - They don't own a car; they're part of the Zip car system.
 - Recently one of them needed something fixed on his jacket. They don't have a sewing machine, but they went to [Spool of Thread], which is a collaborative where you can go and use sewing machines.
- Something like 90% of households in the United States have a power drill, but the lifetime use of that drill is about 30 minutes. All these millions of drills, and they're not being used. It's interesting to think about dematerialization as a collaborative process for repurposing resources.

5.1 Sharing resources across Metro Vancouver

- I sit on the environmental protection committee in Port Moody. We were recently talking about solid waste and promoting commercial recycling, and we came across a very real barrier which is that we don't have the resources that we need. We don't have the trucks to do any more recycling: they're at capacity. What's the best way to approach this while we develop the resources to the capacity that we'd like?
- In the short term I'd say, collaborate. If we can start finding resources across the region that we can share.
 - For example, the City of Vancouver used to spend \$800,000 buying aggregate for its roads and \$500,000 to break up old sidewalk and send it to the landfill. They bought a crusher and saved themselves \$1.3 million.
 - Now they're lending that crusher out to other regions.
 - We don't all have to own everything. Let's start looking at what the Metro Vancouver region's assets are.

6.0 Reusing packaging instead of recycling

- Think about all the beverage containers, whether they're aluminum, which is recyclable, or plastic, which [is sometimes recyclable].
 - Really the model is beer. You get your beer bottles, you drink the beer, you bring them back to the store and they get them refilled.
 - Reuse is a far better priority than smashing up the beer bottles and making them into new beer bottles. There's a huge amount of energy associated with that, so this is an example of moving up the pollution prevention hierarchy.
- Some of you here might remember when we had a uniform beer bottle, the "stubby." Then we changed it. Nobody knows why; I think it was called marketing. One wants to market in a tall slim bottle, the other one in a fat bottle. But there was some thought behind it. It worked for many, many years, and we let it go.
- Many public sector institutions are using toner and ink cartridges that are remanufactured, [instead of using] new ones every time.
 - That reduces the cost by 30–60%. Imagine the materials it's saving as well.
 - Not only that, you're creating jobs for repurposing those ink cartridges.

7.0 Dematerialization requires a shift in economic thinking

- Dematerialization is a fundamental challenge to the way we do economics.
 - The basic purpose of our economy is materialization. It is the production of stuff, so that we can have better quality lives.

7.1 Building a local economy

- Why is it that we can't assemble or manufacture what we can do more locally, and not only import the jobs here but also remove the logistics chain with the all the materials that are built in to that, whether it's building ships or containers or whatever?
- I agree that it would be nice to have a much more localized economy, and I struggle with the huge gap between where we are and that vision.
- We are a major extractor of resources for export markets, and then we import finished products, even though we know that if we were to add more value to the wood products, to oil and gas, to all of the other things that we do, and have more local processing and manufacturing capacity, we would create a lot more jobs.
- In fact, as an economy, we're moving in the opposite direction. We used to have whole towns that were supported by the forest industry, and now we're increasingly exporting raw logs to get processed in China.

7.2 We need to shift to a more circular model of resource use

- We [produce materials] in a way where we extract resources, process them, consume them, and then they go into waste.
 - It's very linear and we're at a stage right now where we can no longer do that. We're trying to shift towards more circular relationships.
- Materials that leave your household should be in two broad streams.
 - One is organics: compost or material that can go back and re-nourish the Earth.
 - The other is technological cycles: the various materials that get cycled back into the economy. Metals are the most obvious example in their ability to be recycled, but there's also wood products and paper.

7.3 Transitioning to an economy that doesn't depend on growth

- Is there an economic success model for what 2050 would look like if we dematerialize, GDP goes down, and earnings and wages come down because we're consuming less?
- Tim Jackson in the U.K. has written a book called *Prosperity Without Growth*, and Peter Victor has written a book called *Managing Without Growth*. They are considering what macroeconomic system can transition us from our current system, which is based on novelty, planned obsolescence and private holding. To expand that we hold onto some of those aspects but include more conservation and tradition: holding onto things longer and adding more of a public or community focus. There are three parts to their economic model:
 - Change what we're measuring on a macroeconomic scale. Right now we measure throughput: the amount of stuff moving to disposal. But in addition to measuring GDP, which is a measure of throughput, we need to measure other assets. Economics assets are one piece. What we need to add to the roster is natural capital assets—how our ecosystems are doing—our social assets—how we build community and support livelihoods, and how we measure human well-being and happiness. That's being discussed at Statistics Canada and around the globe.
 - Labour policies: If we reduce the workweek to four days, we can share a lot more jobs, generate more employment, and have more time for leisure and citizen engagement. [This will help because] we're going to have many more people.
 - Investments: To avoid the efficiency rebound effect, we shouldn't put savings into general revenue but instead should invest them in the transition toward sustainability. We invest time and money in education, health, transitioning technology, public buildings, open space and community.
 - Those are three aspects. They're now developing a macroeconomic model to be reflected at the regional scale, so we'll stay tuned to find out how they're going to try and make that transition.
- When Peter Victor was on the panel a few weeks ago, he pointed out that dematerialization is happening. It's just that GDP growth is much higher and the figures he gave was a GDP growth of 30x and a material growth of only 8x. That's only a third, and that shows an element of moving to the service industry etc. Taking place.
- That's from the International Resource Panel. Even though we are seeing decoupling happening in place like biomass and fossil fuels, we don't see it happening in the use of minerals, ores or constructing. We should be careful about what we're decoupling and what is still being tied to GDP.
- As people who have larger footprints one of the questions that is going to be part of our conversation about the economy and our quality of life is, what does it mean not only to be efficient, but sufficient?
- When I look at where the sustainability leadership trends are, I see a focus on questions of de-growth and dematerialization.

7.4 Focusing on durability rather than disposability and consumption

- How can we convince businesses to make things more durable? With iPhones or Gillette disposal razors, where's the incentive for them to sell fewer products?
- What would make us those of us in this room want to hold onto our products longer?
- I don't think the idea of the triple bottom line makes sense.
 - Businesses are good at understanding their bottom line in terms of making a profit.

- Part of the problem we face in environmental issues is what economists call “cost externalization.” That means that there are costs associated with production: for example impacts on labour, human health or ecosystems, that are not embodied in the price of the good being consumed.
- That’s the intuition behind the carbon tax. We see it a little bit with resource royalties, or material input taxes, that reflect the full cost of harvesting the resources and make sure they’re embodied in the price.
- We want an economy where prices tell the truth and businesses can act accordingly. We need to set rules, regulations and tax structures that penalize doing the wrong thing and then let business find ways of making money within that framework, which they will do in very creative ways.
- I don’t think we should pretend that we need businesses to embrace these environmental or social values. We need businesses to do what they are doing within a framework that makes sense and that has the rules and prices that are consistent with a sustainable economy.

8.0 Using price mechanisms to control resource use

- The price mechanism will help us find the right solutions.
- As resources get scarcer, they get more expensive. That will help us find solutions that are more efficient. Without prices that steer us in the right direction, it’s very difficult to achieve good solutions.
- How do we get the right prices? For many environmental problems, the problem is that there is no price; it’s a free good. In B.C. we’re lucky enough to have some measures in place [to limit] putting carbon dioxide into the environment, but in most jurisdictions in the world we don’t. Putting the right price on environmental problems and goods: that is the challenge.
- The same goes for resources and waste. If waste is free, we’ll produce too much of it. If waste has a price, then we’ll produce less. In Europe waste is more expensive because landfills are scarce and incinerators are expensive. You pay a lot more for putting things into the trash than you do here.
- Putting the right price on things is part of the solution.

8.1 Individual metering for waste production and utilities use reduces consumption

- Studies have found that when stratas adopt individual water metering, consumption goes down 15–25%. If you have individual pricing for waste, if you have individual detached homes compared to multi-dwelling units and you compare the per capita waste, you can see a clear difference.
- When you have direct responsibility for how much waste you generate and how much it’s going to cost you. We can improve if we consider models where strong incentives are passed on to the individual.
- Richmond and Vancouver are introducing individual metering for water and the evidence is that these programs reduce consumption because they give people the right price signals.
- There’s a cultural shift through individual accountability.

8.2 Price signals come from regulation

- To get the economics working, you have to have price signals. That is something that comes from regulation; that comes from the insight that if you want to get efficient

solutions you have to create a level playing field to get to those solutions by setting prices.

8.3 Product prices often don't reflect the true cost of the product

- [The discrepancy in labour cost between North America and Asia] constitutes another externalized cost.
 - We benefit tremendously from young women in particular in many countries in Asia who devalue their own human capital over time and do so for extremely low wages and in terrible working conditions.
 - Our trade relationships need to reflect that fact and we need to be more aggressive in pushing for better standards there.

9.0 Dematerialization in Metro Vancouver

- I'm proud to live in Port Moody. I'm proud to live in a city where we've been tipping our diversion rates into the almost 80% range. We're leading the region, the province and we think we're leading the country.
- Municipal government is the most attached level of government so we have to deal with our neighbours and we have to work in our communities.
- If we can make steps, let's make those steps. If natural gas is better than burning coal or gasoline, then let's go there and let's make perfection the next step.
- Let's keep moving forward and let's keep the conversations up with your neighbours and your friends. There are 60 people in this room; we need a lot more. There are 3 million people in the region; we need everybody working on these goals. If you guys are supporting us it makes it a lot easier for us to do what we want to do. What we want to do is leave a better planet for our kids and for everyone else.

10.0 Initiatives from the CCPA's Climate Justice Project

10.1 Transitioning to a zero-carbon economy

- [The CCPA] considers how B.C. can be a case study for transitioning to an effectively zero-carbon economy within a few decades, but thinking through some of the social transformation and equity and justice issues that come about in that.

10.2 Approaching dematerialization through zero waste

- One of the projects [the CCPA's Climate Justice Project has] been working on is zero waste.
 - That's almost coming to dematerialization from the opposite end. A lot of the focus around waste policies in B.C., municipally and regionally, tends to be at the end of the pipe, after consumers have done their consuming.
 - We have materials going to landfills and increasingly been successful in diverting it to recycling programs and composting.
 - We also have new EPR (extended producer responsibility) programs.
 - All of these are a fundamental challenge to landfills.
 - When you study zero waste, you come back to asking where all the waste is coming from in the first place. Kids learn about the three Rs in school, there's even a song about "reduce, reuse and recycle." It literally is that straightforward.
- To put it in more jargony terms, it's called moving up the pollution prevention hierarchy.
- When you think of waste, think waste prevention, not waste management. That means life cycle planning, extended product responsibility and product stewardship.

11.0 Strathcona Business Improvement Association's Green Zone Initiative

- The Strathcona BIA is coming into this dematerialization discussion as a practitioner. One of the core mandates of the Strathcona BIA is the Green Zone Initiative.
 - Strathcona is one of Vancouver's inner cities. Strathcona, as one of the founding neighbourhoods of Vancouver, has a history of light industry manufacturing as well as some retail, so there's quite an interesting mix of businesses there.
 - With our Green Zone Initiative, we're trying to work with our member businesses to integrate more sustainable practices into their operations.

11.1 Resource Exchange

- The Resource Exchange is an eco-industrial exchange network whereby businesses can trade materials that they want to dispose of to another business, organization, artist or resident in the area who is interested in incorporating those materials into their supply chain.
- Consequently, instead of these materials going to landfill they are repurposed within the community.

11.2 Piloting commercial composting and recycling

- Another program we recently started was initially to support Metro Vancouver's Zero Waste challenge with our businesses.
- It's an opportunity to pilot a commercial composting and recycling program for businesses to see how much waste could be diverted.
 - Over a six-week period with 15 businesses diverting primarily organic material, soft plastics and some other materials that aren't easily diverted through the recycling program, we were able to divert over four tonnes of materials.
 - If you consider this on a global scale: 15 businesses in a corner of Vancouver being able to divert four tonnes of materials over a six-week period, it starts to frame how much material we're dealing with.
- One of the good things about this type of program is that it does create collaborative processes where businesses, instead of looking at their own supply chain and their own practices, can start collaborating with their neighbours.

11.3 Scaling up the BIA's activities

- Clearly the [Strathcona BIA] is taking a lot of leadership in what I see as pilot projects. What would it take to get your work to a scale where it's starting to make a material difference?
- The reason the work we're doing is pilot projects is they're partnerships with either Metro Vancouver or the City of Vancouver to try to find out where the bumps in the road are to implementing these kinds of projects in other business districts. The work we're doing is very much looking at how to scale it and using various levels of government and other nonprofit organizations and businesses to help us reach a scale where it does make an impact.
- There's definitely a scale where once you reach it, more businesses get involved.
- We'll be releasing toolkits to help other organizations implement these projects.
- The Strathcona BIA can scale in different ways:
 - You can take the Strathcona BIA and replicate it somewhere else.
 - You can also change the functional scaling by adding more things. Right now they're focusing on organics, for example, and soft plastics, and they can add other aspects to what they do.

12.0 Using education to promote dematerialization

- We shouldn't think of individuals as just consumers, which is a big part of how we think of individuals in North America particularly. [We should] really become citizens. We should shift from a conversation about consumers to citizenship.

12.1 The importance of educating children

- What can we do to reach the children and train them in reducing, reusing, recycling and refusing: all the Rs?
- What is Metro Vancouver doing or what can we do? The shift in attitude has to come also from young people if we're going to win this game.
- I'm a former teacher, and I know the power of what I used to call the "little Gestapo." We had a West Nile Virus scare in New Westminster and we were told to empty out all the backyard [water containers] and the kids went out and did it.

12.2 Educating children can bring about cultural change

- The reason why most households recycle is because 20 years ago the kids came home from school and said, "Hey, Mom and Dad, we're recycling now."
- There's a culture of conservation and not being wasteful that kids already are getting. People tell me they left the tap on when they were brushing their teeth and their six-year-old bawled them out for it.

12.3 What we should be teaching children

- There's so much that can be done in both the formal and the informal educational system as we keep learning together as a species.
 - Connecting people better to stuff. We can start building ecological literacy and connection to place into our school systems. That means getting to know the places within which schools are situated, connecting young children back to living systems and connecting them to community. That's a big part of what's been disconnecting us right now.
 - There are a number of skills we need as we move forward into a future of dematerialization and sustainability. For example, short-term and long-term thinking, and the capacity to hold a bit of uncertainty, to not know which way things are going to be moving. That means we're in a learning mode, which is very different from training people to be very linear and targeted on what they're doing.
- There are opportunities for teaching reuse skills.
 - The sewing machine cooperative was mentioned. I don't know how to sew. I could sew a button on, but I've never used a sewing machine.
 - Skills like that, that our grandparents' generation knew how to do because they had to. They had to reuse their clothes because they were getting handed down from other children, and tools as well.
- Children are often given the task of solving a lot of these issues. The biggest thing we can give them as a gift is to know that they're part of a much larger movement and that all of us of all ages are working to shift the systems. It's not all on their shoulders.

12.4 Teaching long-term thinking

- I love this example of long-term thinking:
 - At Oxford University there's a hall that's like the long, old hall in the Harry Potter movies. There's a beam down the middle of that hall. It was starting to rot about five years ago and the decision makers were really worried about where they were going to find trees as long as this hall.

- The caretaker said, “Don’t you know? Four hundred years ago, the people who put the beam in planted two trees because they knew that in 400 years they would need new beams, and this is where they are.” And they did find them.
- They replaced the beams and planted two more trees.
- These kinds of stories, and they come up in other cultures, can be used to teach long-term thinking.
- There’s a forest in England called the New Forest that was planted about 300 years ago to supply the needs of the British Royal Navy, which they thought would be building wooden ships forever.

12.5 Education initiatives by Family Services of Greater Vancouver

- [Family Services] partners with almost 50 different organizations to bring healthy food skills for families. We have been teaching new immigrant, low-income families and a large number of people in the City of New Westminster about how to cook healthy with the food that they have grown.
 - We teach how to grow food, how to cook healthy food, and how to reduce, reuse, recycle in the kitchen.
 - When we use a bottle of mayo, we tell people they can put it in their blue box.
 - We teach how to cook with fruits and vegetables and we teach them that this goes into their green cart.
 - Whatever we cannot recycle, we do arts and crafts with.
- [Family Services has] been teaching children in school about how to grow their own food. Spring is here and it is time to start growing your own food.
 - We are teaching how to compost and getting children to adopt red wiggler worms as their pets—successfully.
- [Family Services] is celebrating Earth Day in New Westminster.
 - We will give you seeds to start growing your own food.
 - We are teaching canning at harvest season.
- Every season: Easter, Christmas, Halloween, we want to have eco-friendly, zero-waste gifts.
- How can we improve and expand the programs we’re offering? What strategies can we use to get funding and to get the buy-in of larger groups?
- I would make the case that the best thing you can do is join up with others. We often think we need to do this on our own, but this is something we will be doing in groups.
- When we think about canning and this kind of collective activity, we can think about creating spaces for canning, for gardening and for having the kind of cultural conversations we’ve been talking about.

12.6 Metro Vancouver’s education initiatives

- Metro Vancouver is definitely providing education with its sustainability academies and these dialogues. This is where we can start to connect.
- If we’re going to get the cultural shift we’re looking for, [coming to these dialogues] is how it’s going to happen.
- One of the things that Metro Vancouver’s been doing is a campaign at Christmas called “Create memories, not garbage.”
- I’m with a group called the Burke Mountain Naturalists in Coquitlam. There’s a lot of waste associated with construction and renovation.

- A lot of people get influenced by ads to update and renovate without considering the waste and whether the materials can be locally sourced, and what the greenhouse gas costs associated with their granite kitchen tops will be.
- Metro Vancouver could do a service to the people of the community by providing that kind of information. We need to understand the full environmental cost of construction and renovation, which is a huge one in Vancouver.
- Metrovancouverrecycles.org is a resource you can use.

13.0 Cultural attitudes towards materials use

13.1 The cultural significance of materials

- Materials are deeply cultural.
 - The stuff we own isn't just what we have to survive or thrive, it's much more about how we communicate our identities to each other. It's a conversation.
 - People know certain things about who I am because of what I wear.
 - That's a superficial thing, but the antique clock that I have from my grandmother—this isn't just stuff for me.
 - Same with the food we grow as a community and what we eat at our tables.
- Metro Vancouver's "Create memories, not garbage" campaign is a cultural conversation about what materials and non-materials mean in terms of building community.
- There's a Japanese word "mottainai," which means "it's a shame for something to go to waste without being used to its full potential." This thinking is at the heart not only of individuals; it's also what businesses do and governments are thinking of.

13.2 Thinking in terms of sufficiency

- Should the concept be one of sufficiency not just sustainability? I'm a Suzuki Elder. I did a lecture at Capilano University, and at the end of it I asked people to consider the concept of sufficiency. Did they have what they needed, or did they have much more than what they needed?
- As people who have larger footprints one of the questions that is going to be part of our conversation about the economy and our quality of life is, what does it mean not only to be efficient, but sufficient? Part of what we need to talk about is the values that our culture is holding.
- When we talk about sufficiency, we can learn from the health sector to know when we're satiated when we're eating.

13.3 We have made big changes in cultural thinking in other areas

- We think it's impossible to change the consumer turnover culture, but there have been big changes that we've been able to make that have become the norm. For example shifting away from smoking or adding seatbelts to cars.

14.0 The role of business in dematerialization

- I'm a sustainability strategist. I advise companies on how to become leaders in this area.
 - There's a global conversation about the mandate of the corporation and whether the corporate mandate can be repurposed to take environmental and social factors into account.

- We talk about what's the role of individuals and consumers, that's one bucket. What's the role of government, that's another bucket. We're seeing some leadership here today.
- Then there's the third bucket: what's the role of business?
- How do we mobilize the business sector to step up and take the kind of leadership that's required, where they're not waiting for government regulations or price measures to start to show the direction in which they go?

14.1 Businesses want to be environmentally responsible

- One thing I wouldn't discount is that businesses are very innovative and they really want to do the right thing. I'm actually really surprised in talking to our many members. They'll jump on board sustainability.
 - Some of it is self-serving, for better marketing or reducing costs, but many of them want to do the right thing.
- I can't stress enough how much business owners value the feedback they get from their customers. I'm sure people in this room try to support local businesses as much as possible.
 - [To bring about change], I would really have a dialogue with the business owners that you support. I always hear from businesses about the feedback that they get from their customers.

14.2 Businesses want to keep up with their neighbours

- [The Strathcona BIA] has used that psychological technique to get some other businesses on board for our programs: we tell them "This program probably isn't good for you. Your business neighbours are doing it, but we don't think it's good for you." As soon as you say that, they want to find out what the other businesses are doing. It's very effective.
- There's definitely a scale where once you reach it, more businesses get involved.
- Part of creating innovative business models is the competitive edge of wanting to do what your colleagues are doing. There's also an opportunity for a collaborative advantage. We can get people to look beyond their individual business to how their business can start working along its supply chain, forming a collaborative effort to drive innovation. Also within an industry, they can start creating a change together.

14.3 Scaling up changes in business practices

- You can scale by replicating, that is, taking the same project and doing it somewhere else.
- You can also change the functional scaling by adding more things.
- As an industry as a whole, you can start creating business clusters to advocate for enabling environments, be it changes in the business culture or changes in policy.
- All of those things are necessary when we think about shifting business models. Some of the changes are going to happen by shifting the kinds of products groups make, but companies can also move from delivering a particular product like carpet tile to leasing that carpet tile to the Inn at Quayside and still owning the product.

15.0 The role of government in dematerialization

- How do we influence the most important people who can make some of the ideas we've just listened to actually happen?
- How do we get the levels of government on board to actually do something when it comes to environmentalism?

- I do a lot of work in China. Fifty years ago China was a third-rate country that was doing nothing. They've done more in 50 years including in environmentalism: today if you compare their 1.6 billion people to our 34 million, they're way ahead when it comes to dealing with environmental issues because those issues are that much bigger over there.
- Fifteen years ago, in the late 80s and 90s, we diverted 70% of the waste stream onto the guidance of the regional municipalities, and that was a great success and one that should motivate us to realize that these [goals] are doable if we want.
- What you can do to help [municipal government] is to support what we're trying to do. We're trying very hard.

15.1 Recycling fees added to the price of products go back into general revenue

- We live in a province that charges us a carbon tax. It charges us fees on our tires, batteries and bottles. It costs more for the fees on a bottle of pop than the product itself. But the money all goes back to general revenue.
- The problem in Canada is that the charges go to the federal government, to the provincial government and to a degree to the regional government but we get nothing but lip service when we try to get into the bureaucracies to try and make changes. They say that they want to make changes, but how do we get there?

15.2 Sometimes regulations stop dematerialization solutions

- Sometimes our laws prevent us from implementing what is already working well in other countries.
- We in Vancouver and Metro Vancouver are handicapped by our own air quality laws from implementing biomass energy.

15.3 Government initiatives are sometimes obstructed by other branches of government

- I share your frustration. For example, [the Strathcona BIA] is trying to establish something called a resource park in Strathcona.
 - It's a depot that will allow us to process compostables and recyclables on site, which would obviously reduce the transportation time and waste hauling costs.
 - This is very much aligned with the City of Vancouver's Greenest City 2020 plan, but going through the bureaucracy of trying to set this up, there are two departments, one that is very supportive of the project, and then the by-law enforcement people who really put the screws in and make it very difficult to get this project off the ground.
- You're saying that Mayor Gregor Robertson has green policies and wants to do something, but within his own organization there are forces that tend to prevent it from happening. How do we get large organizations in step with each other?
- To give an easy answer, a lot of it has to do with communication within the department.
 - I'm not being critical, because I think all the people, whether it's Metro Vancouver or others, have been supportive of what [the Strathcona BIA] is trying to do.
 - There's a clear disconnect in that government regulations don't always fit the policies that are being advanced by elected officials. The BIA is always engaging the city to try to update what we think are antiquated policies and by-laws.

15.4 Dematerialization requires a long-term political commitment

- One challenge is that we have electoral cycles. When do you get the attention of people to focus on making new solutions?
 - Most environmental issues are long-term, so you need the long-term commitment from politicians across the board.
 - Not from one group or one party, but finding a consensus that we are committed to for 10, 15, 20 years. I think that is a challenge.
- How do we get there? Maybe we can put this to the audience. I'm not any wiser than anyone here in this room on this point.

15.5 Once there's enough general support, political action will start to happen

- Social change usually comes from the bottom up.
 - I've heard this number of 20% as being a tipping point: if about 20% of the population is engaged in a certain social cause, that will create the impetus by politicians and bureaucrats to move ahead.
 - Governments represent the constituents, so they need to see that a larger body is ready to adopt policies. Academia can help move that forward as well by providing data to support the bottom-up movements.

15.6 Dealing with bureaucratic inertia

- One of the great challenges with bureaucracies is institutional inertia. You have to understand how bureaucracies work. What are they trying to achieve? Their objective is quite different from that of elected politicians.
- Bureaucracies and the institutions that make decisions are risk-averse.
 - They look at what has worked in the past.
 - They don't jump on new solutions easily.
- You have to really convince [bureaucracies] that new solutions are going to work, that doing a paradigm shift from one model to another is not going to leave them stranded, and that whatever investment they have made in their thinking and their structures can be transferred. How do you do that?
 - Show where else it's working: look around at other jurisdictions and other cities here in Canada, in the United States, in Europe and in Japan.
 - When you convince them that it can be done, then you get the realization that, well, maybe we can try it too.
 - You won't get them there unless you show that it can be done within physical parameters and within the constraints that they're facing.
- To make change happen, bureaucracies can set a context and then within that, some more nimble structures like businesses and nonprofit organizations can play a role in making faster changes and inspiring some shifts in behaviour in those bureaucracies.
 - The critical thing is that just as we've set up a very linear economic system, we've set up a very siloed [system] where people are in their own department and not a lot of conversations happen across departments. The focus has been on specialization and efficiency. What we lost with that is some of the cross-connection.
 - One thing we can do in government is get a much more systems approach built into the way the bureaucracy is structured, so that you have people whose job it is to look across for synergies, combine budgets in certain area and learn systems thinking within their organization.

15.7 Recognizing the strengths of bureaucracies

- We've just criticized the bureaucracies, as we always do. Are we, the citizens, too quick to blame? And to attribute blame onto these bureaucracies, which produces this risk-averse behaviour? Should we be more open and understanding and helpful?
- We often think of slow as being bad, but these systems have been established in order to create safeguards as well.
 - [There's] frustration, but there can also be a benefit in the fact that these systems don't shift at every whim.
 - We should also value that they hold past decisions.
 - We need to make a little more rapid change, which requires not only holding safeguards, but also more nimble behaviour in terms of specific by-laws or rules that need to be adjusted much more quickly.

15.8 Setting up lobbying bodies that pursue environmental goals

- My sense is that in order to change a change at four different levels—local, regional, provincial and federal—we need some broader lobby group that is representing business but that's not speaking for business as usual.
 - The problems that we're confronting aren't particularly technological or systems-oriented. We can come up with rules and regulations and tax structures to do the right thing, but I think what you're getting at is the bare-knuckle politics of how things happen.
 - I don't see such a lobby group in B.C. A lot of groups representing businesses—their representatives, not necessarily the businesses themselves—tend to be very knee-jerk anti-regulation, anti-tax, anti-government.
 - I can see where some of those sentiments come from but ultimately these are collective-action problems.
 - We need government as the organization that is going to do it. In order to effect the type of change we need progressive businesses like you to band together and create a counterforce that people in the premier's office or the [prime minister's office] will listen to.

16.0 We should stop incinerating waste and shift towards recycling instead

- I've been working to suggest alternatives to incineration, which is local remanufacturing. We have to de-globalize. We can do economic renewal through local manufacturing.
- All our money in Metro Vancouver is going to incineration.
 - A little bit is going to recycling and so on, into the diversion economy, but the biggest part, billions and billions of dollars, is being planned for incineration.
 - It seems to me to be possible to end incineration (with one more small incinerator) because every incinerator we build will be still burning our resources in 2050. What are the chances of using taxpayer money for the alternative in a big way, and ending incineration with this last tiny incinerator? We should all be pushing for the tiny incinerator—240,000 tonnes if they're going to do one.

16.1 Increasing the amount of incineration would release more climate change gases

- Most of my work these days is about climate change. To me that is the overarching challenge for our generation.

- If we move to an incineration model—we already have some incineration, but if we do more of it, we will be putting more CO2 into the atmosphere and we'll also be losing the opportunities to reuse the materials that are embodied in those goods.
- That's got to be way, way down the priority list.

17.0 Processing recycled materials locally

- My concern is, how do we get the word to Metro Vancouver to use taxpayers' money for remanufacturing our local resources? We have to start doing that.
- We have to move over to using our money for the positive, and we can't do this halfway.
- Asian markets are paying a lot for our recycled materials but when the markets collapse like in 2008, we're stuck with those recycled materials and we have to burn them or bury them. When that happens, what are we going to do with our stuff?
 - With the rising price of oil, we're not going to have any more overseas markets, and the Metro Vancouver plan acknowledges that. They think 80% recycling is merely an aspirational target.
 - We should start using taxpayers' money now to build [remanufacturing facilities]. We leave it all up to the private sector, but in fact [facilities are] shutting down. For example [the government] could have bought the Catalyst paper plant. When it was shut down, we lost 150 jobs.
- You make a really good point about where our recycling goes. Often we think about dematerialization as being movement towards recycling. We need to think a lot more about reducing [materials use].

17.1 Making sure we have the capacity to receive recycled materials

- Often we end up creating a demand from the other end. We work really hard to shift businesses and make those shifts ourselves and then sometimes we haven't considered whether we have the capacity to receive [the recycled materials].
 - It's not just the physical assets, it's also the skilled training.
 - If we assume we're going to retrofit all the houses in Vancouver or if we're going to create a lot more recycling repair systems, we need to think about training those people.

17.2 We need to create a local demand for our recycled materials

- There's a supply side and a demand side. We have a recycling supply, but it is getting exported.
 - We manufacture aluminum in B.C., but we export all of our aluminum cans to the U.S. for recycling.
 - We are major pulp and paper producers in B.C., but almost all of the newsprint that goes into the recycling gets sent to China.
- There's supply there that could be converted, but we need some kind of public sector market-maker that bridges the demand side.
- On the demand side we need rules like minimum recycled content requirements, using public sector procurement for these items to create markets for the stuff we have supply for.
- I work with Harvest Power. We run the largest compost facility in Western Canada and we're also building a biomass plant.

- The obstacle we meet is while we do receive the organic waste of most municipalities there's no procurement policy to buy back the composted material. Most municipalities do buy it back, but not all.
- This shows that many recycling programs are not followed through to the end. We recycle, but what do we do with the recycled material later on?

17.3 Processing recycled materials locally promotes changes in behaviour

- One of the interesting things in some of the projects [Strathcona BIA] has done is being able to keep a lot of resources, particularly waste within the community.
 - This promotes the view of waste as a resource for the community.
 - We partner with a lot of social enterprises in the area to use some of the waste products to create local jobs through things like repurposing or composting.
 - That helps people understand the cyclical nature of resources that has been referred to today, and that educational component can help with behavioural changes.
 - With things like recycling, a lot of people, including me before I started learning how recycling works, they assume that once you've put something into the recycling box you assume that you've done your duty. But really that's the beginning of the process. Those different mechanisms can have beneficial educational opportunities.

17.4 NIMBY effect is an obstacle to local processing

- Another problem we encounter is the NIMBY effect. We'd like to expand and have more decentralized compost facilities all over the Lower Mainland rather than bringing everything to our place. However, how do you feel about a compost facility in your neighbourhood? NIMBY. I was in a compost consulting company and we had odour complaints three months before construction started.

18.0 Population growth in Metro Vancouver

18.1 Metro Vancouver is expected to grow substantially

- We are expecting population growth of about a million in the Vancouver region over the next 10–15 years. We've been told in Langley there will be about 100,000 more people moving in there in the next 15–20 years.
 - There's no talk about the infrastructure. On one hand we are all working on sustainability.
 - On the other hand, we are increasing the demand for consumer goods. Not you or I, but the new people who will come to us.
- Since the last census, in the last five years, Surrey grew by two complete Port Moodys, plus another 4,000. I think the Langleys grew by a complete White Rock. The numbers people are giving are real and it does have quite an impact on trying to do these sustainability things.
- The forecast for the next 20–30 years is a million more people in the Fraser Valley.

18.2 Total resource use increases even with per-capita efficiency gains

- You're pointing to the trade-off: the scale and technique effect.
 - Technique means that per capita we're becoming more efficient.
 - But then when you have population growth then our overall footprint is going to get bigger.

18.3 Considering population changes in long-term planning

- That's [important for] waste issues but even more so for water resources and other infrastructure that is not keeping up with that kind of growth, like public transit.
- Thinking of where we're going to be in 20 or 30 years with the population growth that we can expect is a fundamental point that is easily ignored because we're focusing on short-term solutions.
- The real challenge will be to think ahead about how we're going to grow this infrastructure and make sure we're not enlarging our overall footprint.

18.4 Planning communities to absorb growth efficiently

- The challenge is to lever the population growth that we're anticipating in a way that fundamentally redesigns our communities. We shouldn't require, as we currently have in Metro Vancouver, three quarters of trips to happen in a car.
- We need more of what urban planners call "complete communities," where people live closer to where they work, shop, get public services, and where their amenities are.
 - [In such a community] a quarter of trips can be on foot, a quarter of trips can be on a bike and a quarter of trips can be on transit.
 - There still may be a quarter of trips by car, but that makes it possible to electrify those cars and have more opportunities for car sharing, rentals, taxis and this sort of thing.
- That is where we get to deep sustainability. It can't happen overnight. It's going to take a few decades to build that out. Population growth can be a means by which we do that:
 - We can redevelop shopping malls in those areas into town centres.
 - We can redevelop some of those big highway strips into new high streets or main streets where you have a lot of small business commercial opportunities.
 - That's where you start to get lot of the win-wins.
- Building a local economy can help alleviate some of the gross consumption through collaboration and those sorts of things.

18.5 Prioritizing action to keep pace with population growth

- As population growth happens, how can we shorten the cycle so that we do the important things urgently?
- Part of that is quick wins. Whenever I think about places to intervene in a system, there are some key aspects.
 - Look for places where your efforts can change the whole system. For example, if you change how national governments are measuring GDP, it trickles down and affects how businesses define the way they're contributing to society.
 - If you want to get something to scale quickly, get inspirational examples that draw people forward.
 - Look for places where there are large wins. We know that 70% of household footprints are in three sectors: mobility, housing or land use planning, and food and drink. We can place a lot of our efforts in those big clusters, because that's what's going to tip the balance.

19.0 Buildings should be designed to facilitate good waste management

- I come from a buildings engineering and design perspective and I constantly run into the problem of designing waste management systems for multi-unit residential and hospitals where diversion is very low.

- Even given the examples of dematerialization through decreased consumption and sharing, it requires a level of effort from every building user.

19.1 Building design should allow separate metering

- When I look at building designs, in particular strata corporations, there is a disconnect between individuals and their own waste streams, because when you live in a strata, you pay a strata fee that covers your waste disposal.
 - So you're not paying directly for how much waste you produce. If you have a flat fee that's invisible, you don't get a signal telling you that if you produce more waste you pay for that. Whenever you live in those type of communities there's a lack of pricing.
 - Same with water: if you have a flat fee for water you have no strong incentive to reduce your consumption because you're sharing with 50 or 60 neighbours.
 - This signal that you get from reducing your own waste or water use creates a direct incentive because you're saving some money, and that's a strong motivator.
- We can improve building design and get more incentives down to the individuals, instead of having the incentives at the higher level of strata corporations or flat rates for detached houses for water rates.

19.2 Multi-dwelling units should be designed to support separate waste streams

- When I look at the design of multi-dwelling units, often the garbage rooms are not designed to hold composting and recycling bins and other facilities that you may want in the future.
 - They're often designed without the right standards for managing waste streams efficiently by separating different types of waste.
 - Can we design buildings better to facilitate recycling and reuse? If you live in a multi-dwelling unit and you're forced to put your garbage into just one bin, you don't have a choice.

20.0 Lowering carbon emissions by using compressed natural gas

- I just attended GLOBE 2012 in Vancouver and there were cars and trucks displayed with compressed natural gas.
 - There are a few fleets already out there, but of course this would be something that we who have an abundance of natural gas could expand on.
 - We still would drive and we would have lower CO2 emissions.
- What is preventing us from moving to solutions like compressed natural gas? What would the effect on dematerialization, air quality and fossil fuels be?
- If natural gas is better than burning coal or gasoline, then let's go there and let's make perfection the next step.
- An alternative is compressed biogas.

20.1 Shale gas extracted by fracking is as harmful as coal in total emissions

- There are studies now that show that shale gas fracking, which is now half of our production in B.C., mostly in the northeast, is about as bad as coal.
 - It used to be thought that natural gas at about half the emissions per unit of energy as coal.
 - Shale gas fracking is a technique where you pump water and chemicals at very high pressure underground and essentially create miniature earthquakes, fracturing the shale gas formations where the gas is trapped and then capturing it.

- It's a very energy-intensive process and it leads to life cycle emissions that are a lot greater.
- It's the new frontier of extreme energy that we seem to find ourselves in, the Alberta oil sands being the other major one.
- I'm in favour of shifting away from fossil fuels entirely. I don't think shifting to natural gas gets us where we want to be. Although there may be certain applications for that.
- I'm not a fan of shifting to natural gas in the short term.

20.2 Natural gas is a viable short-term solution

- If you look at fossil fuels, there's a hierarchy of how bad their emission profiles are.
 - Coal is the worst, petroleum is second and natural gas is more benign. It's not good, but more benign than the other fossil fuels in the CO2 emissions that come from them.
 - If you look at the low-hanging fruit of reducing our CO2 footprint, shifting out of coal and more into natural gas is desirable.
 - If the U.S. were to shut down the coal-fired plant and replace it with natural gas plants, that would reduce their emissions by an order of magnitude.
 - For vehicles, it's a little more difficult because converting them is not cheap. There's a great company here in Vancouver called Westport that's developing those solutions. The weight of the extra equipment is a bit of an issue, and the extra cost.
- In the long run natural gas is cheaper than some of the other fossil fuels and if you look at taxi fleets, before hybrids became the key solution many taxis used to run on natural gas because it was more affordable and more environmentally friendly than the alternative.
- I'm not as pessimistic in the short term on natural gas. It may not get us to a long-term solution, which is to get away from fossil fuels and use more public transit, but it's something that in the short and medium term may offer some solution.

21.0 Biomass energy

- I understand that Finland generates 47% of their local energy out of biomass. That includes the conversion into electricity. That shows it can be done; we don't even need to reinvent the wheel.
- We in Vancouver and Metro Vancouver are handicapped by our own air quality laws from implementing this type of energy.
 - I'm talking now about the agricultural sector.
 - With some of the greenhouses we are trying to implement biomass energy.
- Germany will be holding their third international biomass conference in Vancouver. They are bringing their customers here to reassure them there's an abundance of biomass energy here.
 - They're selling us the burners, and we will sell them the wood, or whatever is used as biomass.
- I have some good news: not everything has to be natural gas. [Harvest Power] is building the first high solids anaerobic digester in Richmond—30,000 tonnes. We're extracting gas and our long-term goal is to produce compressed biogas.

22.0 Dematerialization initiatives from the New Westminster Chamber of Commerce

- As you know, chambers of commerce and boards of trade are led by businesspeople for the betterment of our business community. All of us have key pillars that we follow

and series of core services that we provide to the business community. But today I'm going to make a commitment to you for two of those pillars.

- I'm going to go back to my chamber and find out from our community: what are we doing to include dematerialization and sustainability in our communities' economic development plans? I want to go back and take a look at our economic development strategy and make sure that these two key issues are included in those strategies.
- I also want to go back and encourage the clustering of businesses to promote dematerialization in our community.
- I also want to be able to articulate the value statement and the economics about dematerialization in New Westminster.
- I want to be able to create awareness and opportunities for the business community. When I first arrived today I met a wonderful gentleman. I did not realize he was so passionate, but I'm glad that he is. He told me of his business model. What disappointed me is that I didn't know enough about his business model and his business service to be able to go out and share with my business community what he is offering. I'd like to ensure that moving forward I know everything about his business so I can articulate to our business community the opportunities that are available to them.
- I've also made a commitment to go back and review all the policy statements that are being lobbied on behalf of the local, regional, provincial and federal chambers of commerce and make sure that that lobby effort includes the benefits of dematerialization. I'll also make sure that we make recommendations to those levels of government to make sure that those regulations are in sync with the policies that I've heard today.
- Business communities are an important piece of this dialogue.