

# 2015

## WHAT'S WORTH KNOWING: EDUCATING FOR THE 21ST CENTURY GREEN ECONOMY SYMPOSIUM

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Learning for a  
Sustainable Future

**LSF**



L'éducation au  
service de la Terre

**LST**

*Final Report*

*May 14-15, 2015*

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## Thursday, May 14, 2015 – Learning for a Sustainable Future Gala Dinner

The 21<sup>st</sup> Century Green Economy dialogue began with Learning for a Sustainable Future's Gala Dinner on Thursday May 14, 2015 at the Arcadian Loft, Toronto. Over 100 thought leaders from across Canada representing the education, government, business and non-profit sectors, as well as middle school students, engaged in discussion about ways to reorient education to meet the needs of the 21<sup>st</sup> century green economy. Participants were inspired by a passionate address from LSF's Honorary Patron, the Honourable Elizabeth Dowdeswell, Lieutenant Governor of Ontario. Paul Madden, President and General Manager of 3M Canada spoke about the new agenda for business that must be embraced if we are going to live well, and within the limits of the planet and the role education must play in preparing our youth to explore science and technology; ignite their passion and curiosity; and foster a culture of collaboration and innovation.

### Keynote: The Honourable Elizabeth Dowdeswell, OC, OOnt, Lieutenant Governor of Ontario



*The Honourable Elizabeth Dowdeswell, addresses Gala guests*

It is more than just an honour to be here tonight, it is a definite pleasure to see so many people whom I have known over so many chapters of my previous lives. I feel as though I am at home among friends.

My connections with Learning for a Sustainable Future and with David Bell go back to the 90s when educators and business people had a vision about how they would change education in Canada. Little did we know that LSF would not only be successful but would later influence UNESCO and many other countries along the way.

That was also a time of vibrancy and intense activity in the field of environment. Scientific advances fuelled citizen awareness and that led to evidence-based policy development and organizational change. At home and on the world stage impressive Canadians were engaged. I remember:

- The negotiations on climate change and biodiversity culminating in the remarkable Earth Summit;
- The political acceptance and legitimacy of the concept of sustainable development – a concept so seductive – bringing together environmental, economic and socio-cultural considerations promised much improved decisions;
- The launching of the GLOBE series of Conferences on Business and the Environment;
- The formation of the International Institute for Sustainable Development (IISD) in Winnipeg;
- The creation of The National Roundtable on Environment and Economy;
- The introduction of Environment Canada’s EcoLogo – the Environmental Choice program;
- The establishment of The International Centre for Sustainable Cities in Vancouver;
- The hosting of Eco Ed (Education and Communication for Environment and Development) - the first follow up to the Summit, and the conceptualization of an Environmental Citizenship program and Eco Action.

I mention these examples of initiatives because they provide context to the origins of this organization and its remarkable persistence and dedication over more than 2 decades. Congratulations!

There is a wonderful Woody Allan story in which he is giving an address at a commencement exercise. He tells the students that they are at a crossroads. One path leads to utter hopelessness and total despair; the other to extinction. And, he hopes that they have the wisdom to choose wisely. I’m always reminded of that story as I think about the state of the world, because the fact is that for far too many people it is a depressing story. Whether we are measuring environmental harm, social inequalities and injustices, or economic hardship, hardly a day goes by without another bad news story. Two-thirds of humankind fall far short of having a decent quality of life. For them, sustainable development is clearly and charitably “a work in progress”.

But I am an incurable optimist. My observations and comments this evening come from a place of hope. And quoting alarming statistics may be far less dangerous than complacency. For I do believe that no environmental issue has yet emerged that is not within the capabilities of the human race to resolve. We have tremendous knowledge and technological capability. And we have very compelling evidence on most issues for the need to act.

But we do need to ask ourselves: How do we achieve a world that works for everyone? Where do we look for vision? Who are the models for inspiration? How do we achieve quantum change? Where is the instruction manual? I know that there must be a better way. Although evidence suggests that the institutions we once trusted may now lack relevance and leadership, they can change. Although many governments and politicians are accused of lacking imagination and being wracked with division and partisanship, they too can change. Even at the individual level we are learning how the brains can build new neural pathways. There simply must be a new model of inspiration for institutions, and an operating system for individuals.

On the eve of your symposium on What's Worth Knowing: Educating for the 21<sup>st</sup> Century Green Economy? The World Business Council on Sustainable Development warns that the brown economy of capitalism will require two and a half planet earths and thus it must be replaced by a new green economy. That economy needs to be guided by the integration of social, economic and environmental well being. The question really isn't whether or not that change will come about – rather it is how it will come about. Will we be thrust from crisis to crisis, trying to adapt and solve one problem only to discover it is fundamentally connected to many others? Or will we be more proactive and develop shared visions of what life could be like in the 21<sup>st</sup> century – more of a cooperative and collaborative world where social and environmental capital are as important as economic capital.

In that context what is the most strategic role for LSF? Having read Dr. Bell's paper on *Twenty First Century Education: Transformative Education for Sustainability and Responsible Citizenship* and looked at your website, I realize that there is not much that I can add about the direction of education for the 21<sup>st</sup> century, which you do not already know or are positioned to know better than I am. I know that tomorrow through your symposium you will address the issues of "the knowledge, skills, values, perspectives and practices essential to a sustainable future". So perhaps I may underscore and support just a few items for your consideration.

First, I take as fundamental the power of education and the consequent leadership of teachers in developing a new generation of environmental citizens. Citizens of all ages and places who understand their rights and responsibilities. Citizens who equip themselves with appropriate knowledge and make a personal commitment to act.

Secondly, I have witnessed the results of thinking holistically and systemically, recognizing that learning from many disciplines and sectors causes us to see the world in new ways – ways of thinking that go beyond discrete disciplines to thinking of relationships, connectedness and context. The English philosopher Bertrand

Russell used to tell a story about his visit to China in the 1920's. He was greatly taken by the country, and so he asked the President of the country's leading university whether he could apply for a faculty job. Needless to say the President was delighted and asked him whether he was principally a mathematician, or principally a philosopher. Russell thought about it, and finally said that he was neither, as he was interested in the dialogue between the two disciplines. The President shook his head and said, "Sorry, you can either be a mathematician or a philosopher, but you can't stand on the cracks in between." The problem, as Russell pointed out, is that "standing on the cracks" is where all the action is. The principles of ecology would suggest that we educate ourselves not only about toxic chemicals or endangered species. Understanding life is about recognizing patterns, taking an holistic view in which one species waste is another's food. In our quest to create sustainable communities, an education that celebrates diversity, cooperation, partnership and networking will be essential.

And finally, a comment about change and resilience. In this age of blinding technological change, integrated economies, blurring sovereignty and heightened security concerns, change is inevitable and resilience a common goal.

Science and technology will certainly provide some answers – but in many ways that's the easy part. Changing attitudes and behaviours – both of individuals and institutions will continue to be the real challenge. What sustainability demands is a change in the way we behave – a change in our attitude toward the world. Enter education.

It seems that many of us - NGOs, businesses and governments - are all operating without a shared consensus on how effective change comes about. It isn't that our goals are necessarily conflicting but our strategies often pit us against one another. If we truly want to get ahead of the issues before the brown economy fails, then I think we need to understand better how social change occurs. Without that, how can we prioritize or even coordinate our actions to have the most impact? From the field of social psychology we learn that the structure of a situation affects the process or interaction of those involved (behaviour) and these in turn affect their attitudes. By structure I mean legal and financial frameworks, infrastructure, technologies and social structures. This all sounds logical and straightforward – yet how often is it effectively considered in our decision-making.

As Jane Jacobs pointed out, the design of the streets and amenities in communities can increase or decrease their safety, vitality, sense of identity and social exclusion or inclusion. The design of schools and other buildings affect how people interact, perceptions of power and the formation of social groups. The influence of regulations on seat belts or smoking saved lives and health costs regardless of people's initial attitudes; and as a result of changes to those structures attitudes changed over time.

So LSF might consider workshops or participatory research to identify those structures, processes and attitudes which most affect our sustainability, to analyze

their impacts, and to develop strategies to strengthen those that support the changes we want and help remove barriers that are in the way. We know from others who have led the way that diverse groups make better decisions than single experts, that deliberative democracy yields greater commitments to outcomes and that interaction builds social capital which enhances resiliency and contributes to a sense of well-being. If that all sounds much too academic for an evening dinner, I apologize. I understand that the expectations of our educational system – both formal and informal - and of our teachers are profound. And I want to support and encourage you. I also understand that no one individual or sector of society acting alone will be able to bring about the change that is required. Equally profound is my faith in young people. They are simply an inspiration.

The answer to many global and local problems we face lies not in becoming permanently indignant. Hope begins not with wishing our problems would go away, or in ignoring them, or in denying them, or concluding that scientists must be wrong. Hope begins when we have a willingness to change. Thank you for allowing me to share some thoughts with you tonight. I wish you much success tomorrow and in the future – because you can make a difference – nothing is impossible.

**Paul Madden, President and General Manager, 3M Canada**



*Paul Madden welcomes gala guests*

Paul Madden welcomed guests on behalf of 3M Canada. 3M is a global innovation company, with businesses in health care, electronics, energy, industrial, safety, graphics and consumer sectors. 3M Canada is one of the first international subsidiaries of 3M Company. They are headquartered in London, Ontario and



employ about 2,000 Canadians. 3M operates Research and Development, Sales and Marketing and Manufacturing and Distribution operations, nationally.

3M's vision guides all business decisions. It guides what is done, how it is done, and where it is done. 3M advances, enhances and improves. 3M does so through technology, products and innovation. 3M's goal is to do this in every company, in every home and in every life. 3M is a company rooted in scientific exploration and discovery, and the belief that every problem has a solution. Improving Every Life is really what 3M Sustainability is all about. At its core, 3M is based In Science & Technology, and committed to improving our business, our planet, and every life. This is our Every Life Ambition.

3M has a long history of applying science to life. Many of 3M's innovative solutions are used to help address global challenges.

- 3M developed the first “clean” fire-suppression agent: Novec 1230, an engineered fluid that ensures highly effective fire-extinguishing performance with zero ozone-depletion potential and a large margin of safety around people.
- 3M's Thermal Bonding Films and Plastics Bonding Adhesives make it easier to recycle mobile devices, helping manufacturers fix damaged parts and salvage key components for easy reuse and recycling

In May 2014, 3M achieved an innovation milestone, receiving our 100,000<sup>th</sup> patent. This is a testament to our scientific strength. Ultimately, we are a Material Science Company. Yet the real power of 3M, is our ability to apply science to life. We believe that science is just science, until you apply it to many different applications, and solutions in the world. That is what 3M strives to do every day. We use science to improve lives and solve problems by working closely with our customers, and with each other.

Success for 3M includes the intention to balance the three key pillars of sustainability. To that end, we operate in accordance with these principles:

- Economic Success
- Environmental Protection
- Social Responsibility (Education, Community and Environment)

And, in 2014, 3M was proud to be named to the Dow Jones Sustainability Index ... for the 15<sup>th</sup> consecutive year.

Sustainability is not a new concept at 3M. We've been improving lives since 1902, and are continuously improving to address the challenges of today, and tomorrow. In the 1975, 3M showed leadership by creating the Pollution Prevention Pays – known as the 3P Program. The 3P idea is to prevent pollution at the source in products and manufacturing processes, rather than remove pollution after it is created.

At 3M, we know that a far bigger impact can be made through collaboration with our customers and partners, many of whom are here tonight, and particularly, Learning for a Sustainable Future.

We have many shared values:

- Education for sustainable development... and the Science and Technology that will get us there
- Developing passion and curiosity in students – our future employees, and
- Collaborating to discover innovative solutions to the uncertainties our world faces

This makes our partnership more than a corporate social responsibility initiative, for us it's a competitive advantage.

The question remains, and persists, among many organizations like 3M:

How can we create world where business success is driven by environmental stewardship, social responsibility and economic success? 3M invests heavily in the development of sustainable materials and the launch of many new products with sustainability advantages. We are committed to protecting the planet as we grow our business. And we are continuing to design products that reduce our customers' footprint.

Innovation is at the core of what we do at 3M and how we can continue to address the challenges the future holds. We have invested in developing a number of key technology platforms that span materials, processing, capabilities, and applications. 3M also invests significantly in research and development - almost 6% of revenue: \$2B/year. These platforms are shared across all business groups and we combine and deploy these platforms in innovative ways to solve our customers' problems.

Global Sustainability challenges in raw materials, water scarcity, energy and climate, health and safety, education and employment present opportunities for many 3M businesses and product categories. We look at megatrends to drive our company strategy. These five global challenges are a significant part of how we identify the role 3M can play in creating a better world.

Creating cleaner, safer, better products, is strategically vital for 3M. In our Purification and Filtration business, 3M offers some of the most technologically advanced drinking water systems available today. 3M Purification water filtration products provide you and your family with cleaner, clearer, better tasting water throughout your entire home.

For 3M to continue applying technologies and designing products to support sustainability for our customers, and our world, we will need future leaders who have grown up with Education for Sustainable Development. Integrated learning, modeling sustainability in classrooms and exploring or solving real world problems, will help students develop a true understanding of how the classroom lessons are

relevant to the real world. To put it another way, how to take science and apply it to life and the new world in the next century.

With Science and Technology as the foundation for a creating a sustainable future, we have also learned that encouraging, and harnessing the passion and curiosity of our people, truly drives our success.

How do we produce a seemingly infinite stream of new technologies that improve lives?

It starts with the way we innovate. And no one shaped our innovation culture more than William McKnight. McKnight was hired by 3M in 1907, as an assistant bookkeeper and he rose through the ranks to become president and chairman, ultimately serving until 1966. That's six decades of reinforcing what we call the "McKnight Principles".

At 3M, we have the freedom to take risks ... and learn from our mistakes. That freedom is essential to scientific discovery and progress.

Another McKnight principle was to encourage 3Mers to spend 15 percent of their time exploring their own ideas and projects. That initiative is alive and well today, and here are just two examples of products that came from 3Mers' 15 percent time:

- Multi-layer optical film, which reflects 95 percent of all light. It's likely in your laptop, smart phone and big-screen TV -making the screen brighter, while reducing energy use.
- Automobile window treatment films - which enhance comfort, security and privacy in your vehicle. We use similar film for office window, resulting in lower energy costs in buildings.

As a proud supporter of EcoLeague, 3M helps Learning for a Sustainable Future motivate students to help save the planet through school and community-based sustainability action projects. Wouldn't it be great if students could spend 15 percent of their school time, freely exploring what interests them? It's in those moments of self-directed exploration, that passion and curiosity is sparked in students. Passion and curiosity are often the most effective motivators.

It is also important to combine a culture of innovation and a commitment to collaboration. We collaborate with each other; we collaborate with our customers and with our community partners. We hold Technical Forums where our R&D team shares, and cross-pollinates ideas. Our scientists, engineers, marketers, and sales people work together to solve problems across the country, or even across oceans and continents.

3M strives to invent things that are not just new, but also useful. That is why collaborating with customers is also important. We call it "customer-inspired innovation." In more than 30 international labs our scientists work directly with local customers to solve their unique challenges. This includes challenges that our

customers have come to us for help with ... or challenges they didn't even know they had.

Here's one example of how 3M drives sustainable thinking throughout our business – to improve processes, and deliver a better product.

3M Canada is the global manufacturer of Red Dot Medical Electrodes. As a result of customer collaboration on medical electrodes, 3M re-engineered the product, created process efficiency and helped sustain the future of the Canadian plant. Today, 3M Canada, based in Morden, Manitoba is the low-cost provider of medical electrodes to the world.

Or, for a more international flavour, take tequila - made using agave. Since only the juice is used, often the rest of the plant is left to decompose in fields. 3Mers worked together, across continents, to create scrubbing fibers made of 50 percent agave. The plant-based fiber sponge in our Greener Clean line, uses 23 percent recycled material.

Education that takes students outside the school's walls makes a real difference. I'm always amazed at the ingenuity and creativity of young people, when they are challenged to work together to solve real-world problems. At 3M, we focus on solving our customers' problems – we know that is how we are most valuable to them.

Collaboration and innovation create a mutually beneficial loop of ideas and connections.

Connections into the community also offer a rewarding sense of responsibility and citizenship.

As a member of the World Business Council on Sustainable Development, 3M understands that the world needs a new agenda for business if we are going to live well, and within the limits of the planet. Learning for a Sustainable Future is helping transform learning, so that students today, and leaders of the future, understand Environmental Education, Citizenship and Sustainability.

It is in all of our best interests - for business, society, and our planet - to encourage students to explore science and technology; ignite their passion and curiosity; and foster a culture of collaboration and innovation. 3M is striving to achieve our Every Life Ambition: Improving Every Life. That is our vision, and we're happy to share that vision with Learning for a Sustainable Future.

# Friday, May 15, 2015 – What’s Worth Knowing: Educating for the 21<sup>st</sup> Century Green Economy Symposium

On Friday May 15, 2015 more than 70 decision makers drawn from across Canada representing the education, government, business and non-profit sectors as well as post-secondary students participated in a symposium at the BMO Institute for Learning in Toronto to address ways to reorient education to the green economy.

Activities and deliberations at the full-day facilitated session included the following:

- A welcome from Learning for a Sustainable Future (LSF) Chair, Dr. David Bell and President, Pamela Schwartzberg
- A keynote address by the Honourable Glen Murray, Minister of the Environment and Climate Change, Ontario
- A panel discussion featuring Richard Chartrand, 3M Canada; Bob Willard, author of Sustainability Advantage; Bernie McIntyre, Toronto and District Conservation Authority; and Bruce Rodrigues, Education Quality and Accountability Office
- A rotating “open space” activity facilitated by LSF Board members to examine a range of green economy issues in terms of “What’s Worth Knowing” and “Who Needs to Know it”.
- A presentation by youth leaders on the Our Canada Project
- An afternoon keynote key address by Dr. David Wheeler, President and Vice Chancellor, Cape Breton University
- Additional breakout group work, followed by reports and discussion to develop action plans for moving forward and getting the message out
- A closing keynote address by Dr. Gerald Farthing, Deputy Minister, Manitoba Education and Advanced Learning

Speaker slides and related notes prepared by LSF staff can be accessed on the LSF website. This report captures the output from the session participants in the facilitated activities that occurred during the day.

## Opening Remarks: David Bell, Chair, Learning for a Sustainable Future

Dr. David Bell, Chair of Learning for a Sustainable Future opened the What's Worth Knowing: Educating for the 21st Century Green Economy Symposium with a call to action. He described the green economy as more than just waste management, cutting carbon emissions and transportation. It is about transforming the economy for a more sustainable future. He referenced the World Business Council for Sustainable Development's Vision 2050 Report in which they indicated that we would need 2.3 more earths to support 9 billion people with current business and economic practices. This is clearly not sustainable. We need to figure out how to change course. Learning for a Sustainable Future (LSF) is working toward the goal of creating a sustainable future through education. In most instances Ministries of Education in Canada are talking about 21st Century education with little regard to including sustainability into the conversation. LSF prepared a paper *21<sup>st</sup> Century Learning viewed through a Sustainability Lens* for the Council of Ministers of Education, Canada – Deputy Ministers, at the invitation of Gerald Farthing, Manitoba Deputy Minister of Education and Advance Learning. The paper was well received and the topic of 21<sup>st</sup> century learning is now a standing agenda item at each meeting. This paper forms a background report to our discussions at this Symposium. The following 2 paragraphs of the paper summarize the importance of a sustainability perspective:

*ESD brings a critical and missing perspective. It is based on the assumption that appropriate education for the 21<sup>st</sup> century must pay careful attention to the interlinked environmental, social and economic challenges facing humankind over the next 100 years or so. Students in primary and secondary schools today will likely live through most of the balance of this century. Life expectancies in the 80's and 90's will be commonplace. Students in Kindergarten today will be in mid-career in 2050. What sort of world will they face? What kinds of learning, and what life skills, will they require to live well in such a world?*

*ESD also recognizes that the future itself is not predetermined. On the contrary it is amenable to conscious efforts to move in a more desirable direction (notwithstanding the hard kernel of truth in the old saying "life is what happens while we are making plans.") A critical element of ESD is futures thinking: enhancing students' capacity to envision a more sustainable future and to take actions in the present that will shift the trajectory of change in a more sustainable direction. Of course visioning, goal setting and strategic planning must be informed by an acute awareness of current reality and projected trends, of key drivers and high leverage opportunities.<sup>1</sup>*

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<sup>1</sup>David V. J. Bell, "Twenty first Century Education: Transformative Education for Sustainability and Responsible Citizenship" available at <http://bit.ly/GreenEconomyPaper>

## About Learning for a Sustainable Future – Pamela Schwartzberg, President and CEO of Learning for a Sustainable Future

Pamela Schwartzberg presented an overview of LSF's mission and programs and how LSF is helping to create a sustainable future through education.

Learning for a Sustainable Future is a Canadian charitable organization founded in 1991 by the National Round Table on the Environment and the Economy. LSF's mission is to promote, through education - the knowledge, skills, values, perspectives, and practices essential to a sustainable future. Working with business, governments, school boards, universities, communities, educators, and youth across Canada, LSF acts as a connector, a resource, and a facilitator for change.

LSF's innovative programs and strategic partnerships are reshaping education policy and transforming learning methods, helping students learn to address the increasingly difficult economic, social, and environmental challenges of the 21st century. This learning process is referred to as education for sustainable development (or ESD).

LSF's team is comprised of a strong Board of Directors, experienced staff and consultants from across the country, and graduate researchers from leading Canadian universities. In 2014, LSF reached over 275,000 Canadians through our programs,

LSF's core program strengths are:

- To serve as a research think tank to advance innovative education policies, standards and good practice
- To reorient teaching and learning toward active, responsible citizenship
- To foster sustainable communities that link education to informed action
- To support collaborative initiatives, networks and champions in support of Canada's leadership in the United Nations Education for Sustainable Development activities

## Keynote Address: The Honourable Glen Murray, Ontario Minister of Environment and Climate Change



*Honourable Glen Murray, provides inspirational opening Keynote address.*

The Honourable Glen Murray, Ontario Minister of Environment and Climate Change provided an inspirational opening Keynote Address. Murray discussed the importance of social enterprise and culture and the complexities involved in creating tight relationships in cities. For him, in order to create change, it is about setting very aspirational goals and not about regulations. To improve our productivity so that we can get down to well within one planet, we must make our carbon so productive that we use less of it. Murray described this process as a cultural shift.

Glen Murray then discussed his personal journey in helping build a green economy. He confessed that he did not have faith that we could make the changes we needed for our planet and that the hardest part was getting into one's own emotional place when dealing with the global crisis. The emotional and personal changes he made in his own life included getting rid of his car and riding his bike to work which in turn created a healthy lifestyle that he began to adjust to. Murray emphasized that to find a way to contribute to the world you must make the changes yourself, e.g. creating a community garden.

Another problem Murray addressed was the increasing biospheric destruction occurring on the planet. Murray's explained how his experiences in scuba diving enabled him to learn more about ocean acidification and the impact it has on reefs. Murray noted that a striking 25% of our reefs are dead. Seeing these dead areas, first hand, was the most morbid, grim environment he had ever seen. The live ones, on the other hand, were extraordinary. Moreover, there is a marginal difference in acid



levels between these dead areas and others located near some of the poorest countries, where 40% of the remaining reefs will also die in the next few decades. As Murray concluded, we are heading towards a saturation point, a point of no return and now moving past trigger points where we cannot rebuild a reef from scratch nor can Mother Nature. With this in mind, Murray emphasized the importance of a low-carbon economy and how it has the potential to expand the economy by \$6 trillion. This expansion will be bigger than the tech-boom.

How do we have this conversation with kids? How do we get back to hope? How do we address this issue in our schools? We must emotionally equip students to lead and manage change. Murray quoted Ian Pettigrew, Ontario Teachers' Foundation from the LSF annual report that LSF's resource for teachers, *"Connecting the Dots"* inspires hope and promise – antidotes to despondency and despair – and underscores a sense of purposeful agency for students and educators alike in their ongoing quest to be the architects of a better present and future, both locally and globally".

We need a sense of urgent and transformative leadership to bring hope because as Murray pointed out, "our children are the first who will not know normal climate." In order for this change to occur, we need to shift our culture and how do we do that? How do we call to account those leaders that want to not only ignore science, but also eviscerate it? Murray closed his speech by acknowledging and commending those who are addressing this global crisis and hoped those attending the symposium will share their brilliant insights on the discourse on educating for the 21<sup>st</sup> century green economy.

## Questions and Comments

### **How is the holistic thinking of First Nations people being addressed?**

The entire climate change strategy for Ontario is being built with the recognition of the important link between the environment and the economy. First Nations people have a much stronger relationship to nature (e.g. Turtle Island - all four races gathering on this land, 7 generations). People who come from a Western European culture are often over-represented in issues relating to the environmental movement. The next generation are much more active, but we have to make sure that everyone feels connected to this movement.

**To change the world, you teach a child - so why not make climate change, environmental studies, mandatory in the school system, from kindergarten all the way through.**

Cap-and-trade system is a significant source of revenue. We carefully laid out that the proceeds need to support children, families and business through the transformation of the economy. There is an opportunity to develop the best education program - to prepare psychologically and emotionally - to be agents of change.

As Chair of the working committee of cabinet. I would like to see a spectacular proposal. Learning for a Sustainable Future's Connecting the Dots strategies for teachers is brilliant. Could we put together a program across Ontario that would be sufficient to achieve these outcomes? One of the best ways to educate parents is through their children. The money is going to be there. It will start to flow in 2017.

**While inspiration and hope are critical, we also need to have the determination and resolve to act. To what extent do your provincial colleagues and mayor of Toronto share your concern and sense of urgency?**

I believe in tipping points. When I got elected as Mayor of Winnipeg that city had the highest taxes in the country. I was part of a transformation. Everyone tells you it is impossible. Everything in my life has been possible. When you spend your entire life overcoming the odds, will becomes second nature. Failure is not trying. My Deputy Minister Paul Evans helps turns these ideas and visions into action because he simply understands government.

**Being from Saskatchewan, meeting with former ministers of environment, I know and they know that climate change has been an issue across Canada. In Saskatchewan, our politicians appear to look elsewhere for solutions. If there is one thing that I could take back - as a model of what we can be doing - to support you in Ontario, but also across Canada, what would it be?**

Connectivity and culture: Saskatchewan invented Medicare. It's often been said, we're back into an era of activist provinces, all doing things that will shock our national leaders. Solutions to climate change will come from activist initiatives. In Saskatchewan - you could lead in geothermal; net zero homes, carbon capture and storage technologies, and create a way to export that. In Alberta. It will be interesting to see how Premier designate Notley's views will change the dynamic. We have to understand how little time we have. We need pragmatic approaches, but we can't screw this up.

# Moderated Panel Discussion: Connecting the discourse on 21<sup>st</sup> century education to learning for a green economy



*Expert Panel, moderated by David Bell (center)*

## **Richard Chartrand, Executive Director for Electronics and Energy Business Group, 3M Canada**

### *From Education to Sustainable Energy*

Richard Chartrand opened his presentation by first expressing how important it is for young students to get involved in action projects that create positive change in Canada. As a technology focused company, where “3M Science is applied to life”™, one third of 3M sales come from products that didn’t exist 5 years ago. This creates the need to get to action and the sense of urgency.

For him, being involved in 3M Global Sustainability Leadership Team has increased his awareness and improved his perspective in the area of sustainability. 3M Canada is trying to help with that transformation. According to Chartrand, 3M is tracking the percentage of new product sales that come from products with Environmentally Sustainable Attributes and that this segment is growing faster than core new product sales. 3M is seeing a change, not only as a technology company, but also with their customers. Moreover, they are seeing a change in behaviour.

The lifecycle of electronics is 6-12 months. Energy transformation is much longer and it is harder to make a difference in the short term. A dilemma that Chartrand addressed is that energy is produced very far from where it is consumed. People want to bring the source of energy closer or create more customization (e.g. having your own solar panel). What is really critical to this is the need to improve storage. Currently much of energy never gets to its destination, with the grid today being around 50-60% efficient.

Chartrand explained the role LSF has in creating awareness at a young age, which is really big in shaping how youth enter the workforce. As he explained, this is where enterprises come into play. For instance, the Network for Business Sustainability is actually working to identify what makes best practice for collaboration within an industry to get to better solutions. Chartrand believes we can help the process as we teach the young how to collaborate, which will help change the way we work in the workplace.

Chartrand ended his talk by outlining 3M's five very precise platforms where they feel the challenges for sustainability lie. Those five include raw materials, water, energy & climate, health & safety, and education & development.

## **Bernie McIntyre, Manager of Community Transportation Programs, Toronto and Region Conservation Authority**

### *Energy Efficiency and the Green Economy*

Bernie McIntyre described TRCA as a unique organization which is watershed-based and governed through the collaboration of Toronto, Peel, York and Durham. When most people think of conservation authorities' roles, they think of managing floodplains. When we at TRCA asked "What's our role in sustainability" we recognized so much was changing, that if we didn't get out of the box, working with and talking to people differently, engaging with them to understand the environmental impacts of what they're doing, we didn't have a hope that the GTA could get better. The big transformation was in how to engage with other organization, across the GTA, Ontario and Canada. Based on consultations with our stakeholders, the first place to start was with energy. To reduce environmental impacts, we have to grow in a way that works within the constraints of the resources we have available or to improve those resources. Furthermore, he also talked about the importance of green jobs and the need to focus on them as a way to reduce environmental impact in hopes for a greener economy and environment. He believes that a transformation to a green economy requires that everyone sees themselves as a part of that future.

In regards to the contributions TRCA has made in reducing impacts from energy on the environment, they have been working with a number of groups over the last 13 years around energy efficiency. One program was the creation of Partners in Project Green, the largest eco business zone in the world, in partnership with the Greater

Toronto Airport Authority engaging 12,500 business with 350,000 employees. TRCA has also created the Living Campus at the Kortright Centre to demonstrate and evaluate new technologies and practices. TRCA has also worked not only in sustainable programs but also in private and public partnerships on energy efficiency on trying to change the paradigm on how we approach energy efficiency. He also noted the importance of data driven decision making, and engagement with people around their energy and water use data and the implications of what they are doing in their day-to-day businesses within those buildings to help them save. An example is the Greening Health Care program (40 hospitals in Ontario, and 15 in Alberta) where TRCA helps facilitate a collaborative learning process on who is doing best in energy efficiency, helping them understand their conservation potential and learn from each other as well as from product and service suppliers about what can be done to achieve that potential. TRCA is also working with municipalities in the Mayors' Megawatt Challenge to help them learn from each other to drive deeper reductions in energy and water use.

McIntyre then discusses the reports prepared on school boards and their energy use. He referred to a graph, illustrating the top ten schools in Canada for energy use per square foot and referenced a report that will soon be released on the top ten most energy efficient school boards in Ontario. Moreover, he hopes to change the dialogue away from organizations just saving 10-15% in their energy and water use to have them address how much energy and water does my building need in order to operate effectively? In conjunction with energy efficiency, McIntyre pointed out that many municipalities are now looking at energy efficiency as an engine of local economic development, with each dollar saved through energy efficiency reducing the amount of money that leaves the city/province and country and thus supports the local economy. Lastly, McIntyre stated if we are going to successfully address the issue of sustainability, we all must have dialogue with people on topics outside of what we normally do in order to create a common understanding and literacy for what must be done. If we are to be successful, we need to raise peoples literacy around energy and sustainability because as he concluded, we have the technology, we have best practices, what we don't have is widespread adoption. It is how we communicate that needs to improve.

## Bob Willard, Speaker and Author, Sustainability Advantage

### *Future Fit Business Benchmark*

Willard opened his presentation by emphasizing the importance of trying to get sustainability literacy into the business community. He is helping businesses get ready for the future economy, positioning themselves to thrive in a different kind of world, economy, planet. He is driven by two questions:

- What does a sustainable business looks like? How would we recognize a truly sustainable business if we were to find one? What would we look for? How would we know?

- How much is enough? Right now, when companies are rated and ranked (e.g. Corporate Knights), they are comparing to other companies, and understandably, applauding those that are ahead of the curve. There are currently 3 benchmarks: historic, future and other organizations. We need a 4th benchmark - where you need to be if we're going to come out of this alive.

According to Willard, the business community is making good progress, but it is way too slow. They need to crank up the sense of urgency, and the way they do that is to help companies understand how to be more sustainable. Willard's Future-Fit Business Benchmark acknowledges that business and society are wholly-owned subsidiaries of the environment, and the environment is too big to fail. If a business is to be truly sustainable it needs to be able to add value to the environmental, economic and social dimensions of the planet throughout its value chain. This is what the Future-Fit Business Benchmark is intending to do.

The benchmark defines the necessary and sufficient set of goals and ways of measuring our progress, using key performance indicators (KPIs), regardless of the size or sector of a given business that wants to be fit for the future on a finite planet. There are eight science-based system conditions that define how society and the environment works on a finite planet. The benchmark identifies 21 goals, and how to measure progress on a 0-100% scale. The next draft will come out in June and Version 1 will be released in the fall of 2015 at [futurefitbusiness.org](http://futurefitbusiness.org). In collaboration with the Future-Fit Foundation in the UK, Willard states that this will be a free open-source resource. This first of five future-fit benchmarks is geared to for profit business. Others will include municipalities, academic institutions, and non-government organizations in hope to further incorporate sustainability literacy in society.

## Bruce Rodrigues, Chief Executive Officer, Education Quality and Accountability Office

### *Can we reasonably assess Learning for a Sustainable Future and why Education needs to pay attention*

Rodrigues discussed the linear model in education, which has always been to move from information to formation to transformation. We need to focus on re-formation. He stressed the importance of leadership and critical thinking. He explained it is not really about the position, but the thinking that influences change. He also talked about how leadership is needed to move policy forward and that what gets monitored gets done. Rodrigues then spoke about the changes happening to our planet. The current population is 7.2 billion. It took 123 years to go from 1 billion to 2 billion, whereas now it takes 12 years for the next billion to occur. Rodrigues referred to an infographic on his powerpoint that demonstrates the changes students are seeking and wanting to pay attention to in schools across the province. Many of the students want to focus on sustainability. Rodrigues emphasized that

what needs to be changed are the conversations about how we use our natural resources and the need for more discourse on 21<sup>st</sup> century skills, global competency and innovation. If the answers can be found on Google, we are asking the wrong questions! He argued that the world is shrinking and that we are seeing these effects on our planet much sooner. Moreover, he explained that global competency speaks about capacity, dispositions and action. In addition to global competency, he describes the term global as not just a multitude of countries, but about that interconnectedness between the people, cultures, ideas, problems and opportunities that constitute all of our experiences. Three concepts Rodrigues focuses on that students need to become more aware of are knowledge, skills and that sense of embracing moral imperative, which will draw them to action. He strongly believes that students' education is not complete until they experience another culture, particularly from a developing country, which will bring that sense of global competency and sustainability closer to home in what we do.

He also stated that this notion of sustainability is not static but dynamic, and that we need to change it and live with it and rediscover it as our students live within this climate and context. Lastly, he explains the sustainability curriculum as not a stand alone course, but ubiquitous within the curriculum. Thus, it requires a societal consciousness to move away from disposal mentality while also relying on educators' knowledge about how to integrate these ideas into the classroom.

## David Bell, Moderator

We see common themes among the 4 presenters around what needs to be done and what can be done to change our culture. The good news is that people are working to integrate sustainability ideas and values into decision making at all levels. It is important to rebrand environmentalism removing it from the fringe. We need to challenge standardized testing to bring skills like critical thinking, collaboration, innovation, entrepreneurship and creativity onto the table.

### **Peter Love**

Using data is very important to take discussions from high level concerns regarding sustainability to help drive action. A lot of Canadians agree that we should be concerned about climate change, but they can't see it, and it is a difficult concept to understand. 82% of our GHG come from Energy and we are currently wasting 68% of our energy.

### **Kathryn Cooper - Trustee**

As a Trustee I have a hard time telling people that the green economy is where our students need to be. Who is the advocate for the skills that graduates need to have? We need businesses help to nail down the competencies that are needed. This includes knowledge and fundamental facts about what's going on but also non-technical, soft skills to be more effective change agents, including collaboration, leadership, management, and interpersonal skills. We need wisdom - intersection of knowledge and experience. We don't do enough around experience. Education must

be a marriage of all of those. Unless students practice those competencies before they get to the marketplace, they will have a hard time. Technology is great, but it is not a competency. As well, people use language that others don't understand. We need communication literacy skills so that we're all on the same page when we talk to the school boards and the Ministries of Education. We're trying to bring a technical solution to an adaptive problem.

## Afternoon Keynote: Dr. David Wheeler, President and Vice Chancellor of Cape Breton University

### *Disruption and Disturbance – A New Paradigm for Sustainability Education*



*Dr. David Wheeler provides the afternoon keynote*

Wheeler began his presentation by dealing with how we build a more integrated educational ecosystem for a sustainable future. He described some principles that Cape Breton University instills regarding entrepreneurial approaches to usher in the new economy, the green economy. Wheeler's interest is in the intersection of sustainability education and entrepreneurial education. He acknowledged that this is something of a new direction for the sustainability movement because we are not used to celebrating business leaders. We initially saw them as being part of the problem. The first principle he addressed was the importance of educating through an entrepreneurial approach. He believes it is the younger, newer and disruptive business leaders operating in food and agriculture, IT, energy, etc. who will be role models for future generations. They will be the ones who will help bring together a passion for sustainability with the pursuit of business opportunity. The second principle is the ability to resist the temptation of wanting to change someone by making them wrong or believing in a solution and expecting that everyone should



behave and think the way we believe they should. The last principle he discussed was the importance of dialogue and the sharing of ideas and perspectives.

Wheeler's presentation then explored the significance of emerging youth citizenship and how youth and other empowered citizens change the world. He discussed various examples of new demands led by empowered citizens impacting the food industry (over genetic modification), the energy industry, and higher education. Extrapolating from actions taken by these movements, Wheeler suggested that a system-wide change is coming; with empowered citizens and educated young minds, anything is possible. One example he shared was with respect to energy. He believes there are fundamentally disruptive forces now at play in the energy sector such that solar, wind and storage solutions will come along, which will be more attractive than conventional power and thus it will very soon be cost effective to go off grid.

Another example he talked about is how higher education is headed for fundamental change in coming years. This partly due to unsustainable cost structures (e.g. pay inflation causing increasing system costs), declining domestic enrolments decreasing appetites of provincial governments to cover the full costs of universities, and young people wanting to access education in different ways. Wheeler believes that the best solution for what universities should do for their communities and the world is to reinvent models for higher education, the sharing of knowledge, and knowledge creation. Furthermore, universities must get closer to their communities, which mean being embedded as deeply as they possibly can so they can stay relevant in their students' lives and become more flexible in how learning and education are delivered.

Wheeler emphasized that the way to build an integrated educational ecosystem for a sustainable future is through three mechanisms. The first is the use of campuses as centers for social innovation, especially when dealing with entrepreneurial approaches. He referred to the Ashoka Changemaker campuses and explained how campuses should be used to empower higher education participants to be change makers and social innovators. The second is through the embedding of entrepreneurship education in conventional curricula. There is a massive opportunity to bring education centred on sustainable enterprise and entrepreneurship to young people searching for solutions. The third and last example is through teacher education. An example of innovation in teacher education is Cape Breton University's new Masters of Education program in Sustainability, Creativity & Innovation. He described the importance of equipping teachers throughout their career not only to know about sustainability and sustainable development, but also to know how to introduce concepts of creativity, innovation and entrepreneurship into the curriculum. The new CBU program integrates sustainability education with professional practice while also introducing mid-career professionals to sustainable entrepreneurship. As he noted, the key objective to the program is to foster the ability to design, to create, to perform and to recognize each person's ability to think and act creatively in ways that enrich our lives in substantial and meaningful ways.

Wheeler ended his presentation by stressing the role universities have in reinventing themselves in line with solutions-based pedagogies. What do we teach and how do we teach it? Most importantly, how do we integrate what we do within a broader education ecosystem? According to Wheeler, Cape Breton University is trying to place the university into an educational ecosystem with their school systems, aboriginal school systems and community colleges. CBU is trying to bring to life the driving elements of sustainability: entrepreneurship, social enterprise, and social innovation. Lastly, the university is hoping to increase awareness of sustainability education, environmental literacy and social justice literacy.

## Issues Analysis

*Rotating “open space” activity to complete a “STEEP” analysis*



*Through facilitated discussions participants identified the issues, the driving and restraining forces, what needs to be done, and developed action plans.*

	Key Factors	What’s Worth Knowing
<b>Social and Cultural</b>	<ul style="list-style-type: none"> <li>• Increasing engagement and participation of citizens</li> <li>• Grassroots organizations and community programs separate from institutions</li> <li>• Cross cultural education</li> <li>• Becoming urban centric</li> <li>• Inequalities, Idle No More movement</li> <li>• Social media</li> </ul>	<ul style="list-style-type: none"> <li>• Different societal segments are divided due to lack of understanding, self-identity issues, stigmatization, apathy and fear</li> <li>• Bottom-up paradigm change is needed to shift social and political forces to important things</li> <li>• There are major time and cost</li> </ul>

<b>Technological</b>	<ul style="list-style-type: none"> <li>• Decentralization and democratization</li> <li>• Driving information access and critical thinking</li> <li>• Increased access and portability</li> <li>• Massive open on-line courses (MOOCs)</li> <li>• Innovation drives technology</li> <li>• Nimble and scalable</li> <li>• Digital citizenship</li> </ul>	<ul style="list-style-type: none"> <li>• People put faith in it, but technology does not have all the answers</li> </ul>
<b>Economic</b>	<ul style="list-style-type: none"> <li>• Shared economy (e.g. UBER)</li> <li>• Cap and trade (Ontario)</li> <li>• Lack of funding to implement curriculum</li> <li>• Infrastructure investment needed</li> <li>• Pursuit of unlimited growth on a finite planet</li> <li>• Economy is driving choices</li> <li>• Government taxing the wrong things</li> <li>• Widening income gap</li> <li>• Increased business awareness and commitment to sustainability</li> </ul>	<ul style="list-style-type: none"> <li>• There are economic opportunities as well as challenges</li> <li>• We need to develop a broader social paradigm</li> <li>• We must focus on the underlying values and moral imperatives</li> <li>• There is a need to place greater value on social and environmentally friendly initiatives</li> <li>• Better incentives for sustainability are required</li> </ul>
<b>Environmental</b>	<ul style="list-style-type: none"> <li>• Declining environmental quality</li> <li>• Extreme weather</li> <li>• More consensus on climate change</li> <li>• Linked to income inequality – human rights issue</li> <li>• Resource depletion</li> <li>• Population growth</li> <li>• Toxification of water, air, food</li> <li>• Habitat destruction</li> <li>• Long food supply chain</li> <li>• Anthropocence (dominance of human activity)</li> <li>• Nature deficit disorder</li> </ul>	<ul style="list-style-type: none"> <li>• It is a wicked problem</li> <li>• All factors are interconnected yet taught in silos</li> <li>• We need a conduct for action that is not negative</li> <li>• We have to create a culture that is not GDP driven</li> <li>• Urbanization can be a good thing</li> </ul>
<b>Political</b>	<ul style="list-style-type: none"> <li>• Politics of resentment and divisiveness</li> </ul>	<ul style="list-style-type: none"> <li>• Not everyone is represented</li> <li>• Media play a major role</li> </ul>

	<ul style="list-style-type: none"> <li>• Lack of truthfulness, consensus, collaboration and transparency</li> <li>• Apathy, no sense of urgency</li> <li>• Individual expertise without systematic understanding or commitment</li> <li>• Short term approaches</li> <li>• Lack of leadership responsibility</li> </ul>	<ul style="list-style-type: none"> <li>• People need to understand power and take ownership of political system</li> <li>• Social capital, interest groups and social movements can counter trend</li> <li>• Need to move from me to we – and look at the greater good</li> </ul>
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## Who Needs to Know it?

Government	Education	Organizations	Individuals
<ul style="list-style-type: none"> <li>• Political Leaders</li> <li>• Funders</li> <li>• Regulators</li> </ul>	<ul style="list-style-type: none"> <li>• Educators</li> <li>• Policy makers</li> <li>• Universities</li> <li>• Teachers Colleges</li> <li>• Business schools</li> <li>• Students</li> </ul>	<ul style="list-style-type: none"> <li>• Business leaders</li> <li>• Media</li> <li>• Faith organizations</li> <li>• Innovators</li> <li>• Social movements</li> <li>• Food industry</li> <li>• NGO</li> </ul>	<ul style="list-style-type: none"> <li>• Voters</li> <li>• Parents</li> <li>• Children</li> <li>• Consumers</li> <li>• Community</li> </ul>

## Sectoral Action Plans: Getting the Message Out

*Breakout group work followed by presentations and discussions*

### Government

- Pursue green procurement (life cycle costing, sustainable buying)
- Embed sustainability in public mission and vision statements articulated by government
- Recognize that lack of action is more risky than before
- Set high standards for regulation
- Pass legislation supporting sustainability
- Invest in green infrastructure
- Build sustainability into every decision at all levels of government
- Maintain a continual dialogue with stakeholders

## Non-Government Organizations (NGOs)

- Improve relationships with the media and reach out to a wider audience
- Increase collaboration with other organizations and the community
- Engage in creative thinking outside the box
- Pursue more funding and greater financial sustainability
- Improve governance

## Education

- Increase interactions with other sectors re: sustainability
- Educate parents and other groups on how education has changed with the global society
- Institute flipped classrooms which encourage inquiry based learning
- Offer mandatory participatory courses: parameters decided locally; empowering students; participatory democracy; intergenerational; cross-cultural; involving all ages

## Business

- Provide Board and senior executive leadership in prioritizing sustainability in business planning
- Use Future Fit measures and tracking in every business activity
- Foster radical transparency in products and full corporate social responsibility
- Get involved in education and environmental literacy partnering with NGOs and others
- Build, support and reward employee lifestyle actions
- Immediately distribute Future Fit to every business leader and ask for input

## Closing Keynote Address: Gerald Farthing, Deputy Minister of Manitoba. Education and Advanced Learning – A Manitoba Perspective



*Dr. Gerald Farthing provides the closing address and call to action.*

The last speaker for the symposium, Dr. Gerald Farthing, Deputy Minister of Manitoba Education and Advanced Learning, explored the question, what should students know and most importantly, what should students be able to do in a 21<sup>st</sup> century green economy in conjunction with citizenship? With respect to the green economy, Farthing focussed his presentation on three areas: 1) what is most important in any economy?; 2) what is most important in the 21<sup>st</sup> century green economy? (Going green means working and living in ways that are going to be different than the ways in which we work now, thus, something needs to be changed); and 3) moving from knowing to doing.

Farthing then began to talk about what he believes students should know - that values matter and that history is important. In education presently, there may be too much focus on being competitive and on the instrumental purposes of education. Farthing argued that although some competition is good and that some parts of education should be instrumental, he still believes there should be more emphasis on values and why they are important. In a democratic society, this should mean a respect for inclusion, diversity and conversation. In order to do that, however, you must believe that having discussions about values is important. What is education about living sustainability doing in this regard? Farthing stated that in Manitoba, learning about values is included in the curriculum through discussions on issues such as human rights and diversity in the classroom. He went on to state that the Ministry of Education and Advanced Learning in Manitoba tries to ensure that the

purpose and objectives of education are inclusive and balanced. An example of this emphasis is ensuring that students learn more about and understand indigenous history and perspectives.

The second thing that is important for students to know about is history because it deals with identity and context. It is important to know about our history and our identities in order to better understand how we got here and what makes us who we are, especially in a globalized world that is interdependent. Farthing outlined the role the Department of Education and Advanced Learning has in instilling these notions in curriculum. These include: citizenship as the central concept in Manitoba's social studies curriculum; a grade 12 course entitled "*Global Issues, Citizenship and Sustainability*"; and an emphasis on the importance of teaching about indigenous perspectives and history for both indigenous and non-indigenous students.

Farthing emphasized the need for students to understand and know about ecology. His belief is that the world we built is nested in the natural world. Unless we protect that natural world (i.e. environment), it does not matter what we do in the built world, it is not going to be sustainable. Seeing things through an ecological perspective is fundamental in figuring out what to do both locally and globally.

Farthing then noted that there are three pillars of ESD (Education for Sustainable Development), which are the social, environmental and economic; however, he believes that there is not enough emphasis on the environmental/ecological part of ESD. He referenced the "*Global Issues, Citizenship and Sustainability*" course and its role in highlighting the importance of understanding ecological principles and processes. One of the themes included in the course is ecological literacy, which Farthing believes is very important. Farthing also highlighted the need for students to understand the role of technology, both as being a part of the problem but also how it can be part of the solution.

In terms of what students should be able to do, Farthing believes they should know how to read, write and do math well. In any modern society, it is these foundational skills that help equip children and youth to go on and do all the other things we want them to do, and on which all other learning happens. Farthing then spoke about technical vocational education and training (TVET). He suggested that if we are moving to a green economy and finding alternative ways of capturing energy, people need to have a certain set of practical skills. Moreover, the more we understand both the existential reason for doing things and the more we can actually do it in a practical way, the more real it becomes. Thus, if we want people to truly believe and be engaged in moving to a green economy, they need to know why it is important and how to be able to achieve it. Technical vocational education and developing practical skills is about learning how to live and work differently in a green economy. In regards to how ESD is integrated in TVET in the schools in Manitoba,

Farthing noted that a technical vocational program in renewable energy has been developed and as the TVET curriculum is being reviewed, ESD is being integrated.

Farthing stressed that for students, it is important that they develop soft skills, which includes critical thinking, problem solving, teamwork, entrepreneurship, and imagination. He believes that these skills are more about how we teach than what we teach and more about pedagogy than curriculum. Students need to learn and practice these skills in classrooms in order to become critical thinkers, problem solvers, and/or entrepreneurs. Moreover, students should be able to imagine something more than what exists in the present.

Farthing then went on to talk about what Manitoba is doing in K-12 education in relation to sustainability and the green economy. The Ministry is making ESD an explicit and public priority, allocating resources (financial and human) in support of ESD, partnering at the local level and networking on an international level about these issues. Furthermore, Farthing discussed Manitoba's goals for the future which are first, ensuring that every school in Manitoba has an ESD school plan; second, working towards ESD being embedded in teacher education and training; and finally, encouraging schools to offer technical vocational education that would lead to skills that students will need in a sustainable and green economy.

*Farthing concluded that all of these issues deal with citizenship in the 21st century - equipping students with what they should know and be able to do, now and in the future. Dr. Farthing ended his talk by discussing the importance of doing what needs to be done despite opposition and challenges because "it is the right thing to do".*

## Next Steps

In addition to the calls to action generated through the roundtable discussions and symposium activities, the goal of the following initiatives is to continue to include more diverse stakeholders in the conversation about educating for the 21<sup>st</sup> century green economy, and to begin to put ideas into action.

### 1. Establish "Educating for the 21<sup>st</sup> Century Green Economy" advisory committees

Present a proposal to the Council of Ministers of Education, Canada, and individually to provincial Ministers of Education, to create an advisory committee of leading sustainability business, NGO and university leaders to advise provincial/territorial governments on the knowledge and skills required for jobs in the green economy.



## 2. Identify Student Competences for the 21<sup>st</sup> Century Green Economy

Prepare a paper on student competences for the 21<sup>st</sup> Century Green Economy to be shared with the Council of Ministers of Education, Canada.

## 3. Support Technological and Vocation Education and Training (TVET)

Technological and vocational skills are vital for the 21<sup>st</sup> Century green economy. Colleges and Institutes Canada, and the members they represent, are prime providers of advanced skills and applied research for social, environmental and economic development. Support should be provided to advance TVET in support of ESD.

## 4. Promote ESD Schools and School Plans

To support educating for the 21<sup>st</sup> Century Green Economy, schools will need to transform their operations, physical surroundings, curriculum and extra-curricular activities. As part of the UNESCO Global Action Program for ESD, the Manitoba Ministry of Education and Advanced Learning, the Canadian Commission for UNESCO and LSF will promote the establishment of ESD schools across Canada. This will include identifying best practice models, key strategies for transformation, and sharing of techniques and success stories. In partnership with Manitoba, LSF will also support the establishment of ESD school plans in every school across Canada, as proposed by the UN Economic Commission for Europe ESD Steering Committee.

## 5. Encourage Professional Development for teachers linked to Climate Change and ESD

LSF will prepare a proposal to Glen Murray, Ontario Minister of Environment and Climate Change for the delivery of professional development institutes for teachers and education system leaders across Ontario. Similar proposals will be prepared for other provinces. These institutes will advance teacher education focused on climate change, ESD and transformational learning.

## 6. Enhance Resources for Teachers

LSF is committed to continue providing teachers with classroom resources that support educating for the 21<sup>st</sup> century green economy. This will be done by continuing to expand its existing Resources for Rethinking (R4R) teacher resource database to ensure that teachers have access to quality resources that help achieve the goals of education for sustainable development and the green economy. R4R resources on the 21<sup>st</sup> Century Green economy will be highlighted with a link to this report.

## 7. Reach out more effectively through electronic and print media

This symposium report will be distributed to key stakeholders including governments, business, and education leaders. Print, electronic and social media will be engaged to facilitate a dialogue among parents, educators, business, government and NGOs about preparing youth for the 21<sup>st</sup> century green economy.