An Appendix for

Charging Ahead:

Sharing ETF Pilot Learnings and Project Potential across Canada

With support from:

FONDATION FAMILIALE TROTTIER FAMILY FOUNDATION

RBC Foundation

Introducing the “Charging Ahead Initiative”

Over the 2023/2024 school year, GreenLearning led the Charging Ahead Initiative. This initiative helped us connect with various stakeholders across Canada to share our insights and learning materials from the Electrifying the Future (ETF) pilot project.

Our goal for these conversations was to identify and understand barriers, and gather suggestions for new learning materials. This initiative provided an opportunity to learn more about school and board readiness to incorporate electric vehicle information and instruction into their regular programs.

This Charging Ahead bundle includes:

1. Charging Ahead Promotional Piece
2. A recording of our live, student workshop
3. Charging Ahead Educator Kit
4. Charging Ahead Educator Video

Electrifying the EV Future

Charging Ahead with Learning Pathways for School Boards

Helping school boards integrate electric vehicle education and infrastructure through workshops, feedback and discussions. The EV transition will mean changes to infrastructure and curriculum and we want to see how your school board is preparing for these changes.

We encourage you to join the conversation to see how your board can lead this change.

1 Share the Charging Ahead Program with your Teachers

Share the attached promo piece with interested teachers in automotives, science, Eco Club Leads, careers, etc.

2 Explore our EV materials

We will share with you a wide range of resources we created specifically for electric vehicle education.

3 Let’s Talk: Feedback and Readiness

Hear about our learnings first hand, join us to discuss strategies for your board and what teachers are saying.

4 Join the Conversation

Share your thoughts, stay connected and join a national conversation to help your school and school board create pathways for EV learning.

Questions? We’d love to connect!
Reach out to andreana@greenlearning.ca

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Connecting With Stakeholders

Promotion of the Charging Ahead Initiative to boards and schools included sharing on social media, in our regular newsletter, and reaching out to personal networks. We've included our key findings from the initiative in this section, separated into stakeholder subcategories. Reflecting on our ETF pilot, we attribute much of the success in that vehicle conversion project to the engagement of all stakeholders at each level of the education system.

Student interest and excitement about electric vehicles is necessary for a successful school-based conversion project. During the ETF pilot, students at Crescent Heights High School were highly engaged in the conversion project, and even joined an EV club to dedicate additional time to it. A keen automotive teacher who is passionate about EVs and willing to pursue extra training is also essential as some of the high voltage work required for a conversion may necessitate additional certification. Administrative support to deal with "on-the-ground" processes and procedures outside the classroom is also essential (although not in the scope of the sharing included here). The school board or district level administration needs to be involved to assist with navigating policies and procedures. For example, they may be needed to permit high voltage work or coordinating the establishment of charging station protocols. Departments of Education can encourage conversion projects like the ETF pilot by updating the curriculum to include electric vehicles in the automotive classes.

Stakeholder Connections

STUDENTS	TEACHERS	ADMINISTRATION	EXTERNAL STAKEHOLDERS
10 Peaks Student Conference, ETF Virtual Workshop			
	Educator Presentations (Virtual, and CT Ed Conference), Charging Ahead Newsletter		
		Meetings	
Calgary Mayor's Environmental Expo, CTC Career Night, Palliser District Teachers' Convention			

Connecting With Students

Student enthusiasm ensures sustained momentum for vehicle conversion projects. With this in mind, we were eager to share our pilot project with students.

We presented to students at the 10 Peaks Student Conference at the Red Deer Polytechnic Institute; our Project Manager, Andreana was invited to lead a session. 10 Peaks is a not-for-profit organization with a mission to engage, inspire, and educate Alberta's youth about energy, the environment, and our climate and how they can play an essential role in the future of our province. Andreana conducted a session all about the electrification of transportation which included a Myth or Fact game about electric vehicles and spoke about our Electrifying the Future Pilot Project. 15 Alberta schools were represented at this conference: 470 students attended in person, and around 500 online.

A second student presentation was also developed and promoted to introduce the ETF pilot project, inspire youth, educate students on EVs and debunk common myths. An example of the student-focused workshop, can be found linked here. We hosted six student sessions (one in person and five virtual), along with 22 views of the student session recording, reaching 36 educators and 935 students.

Some highlights and popular questions shared by the students included:

- *How long did the conversion project take? What was the hardest part of the project?*
- *Do you drive an EV? Is there a rebate given to people that have EVs?*
- *"Are there any plans for more ethical means of sourcing materials for EVs such as cobalt? Many places have unethical mining practices such as Congo"*
- *"What is the point of making EVs if carbon emissions are created while making the electricity for them?"*

Teacher questions and comments from these youth workshops included:

- *Where did we receive funding from?*
- *Are there any EV incentives or rebates that the government currently has in place? What is the ZEVAI program?*
- *How can I recreate something like this with my class? Are you doing this project with a different school board?*
- *What kind of charging station did we install? Is it open to the public and how much does the Calgary Board of Education (CBE) charge/how have they determined how their charging stations will work and look like?*
- *Where did we purchase the conversion kit from? What company?*
- *Why did we choose to work with the CBE on this project?*
- *How can other schools do this project on a smaller scale?*

Connecting With Teachers

Educators across the map attended our Educator Presentations. From Calgary, Alberta to Mississauga, Ontario, a variety of teachers joined the presentations. The attendees included automotive, science, Environment Specialist High Skills Major, and English as a Second Language. Teachers of both English and French Immersion attended.

We were advised that the best way to provide professional development to educators directly was to develop a pre-recorded video they could watch when capacity allowed, and not require teacher release time or interfere with their personal time after school. With this insight, a video showcasing the automotive teachers involved in the pilot project was created. This allowed interested teachers to hear directly from those automotive teachers about expanding EV learning opportunities, how the project fits into current curriculum, potential shop requirements or updates, and the type of cross curricular opportunities available with an EV conversion project. This video has reached 26 teachers. Between the Career and Technology Conference and sharing the video, we engaged 43 teachers and over 1000 students.

The following responses were gathered from teachers after they viewed the video:

What benefits can an electric vehicle conversion project like this bring to your school?

- *Get young people excited and educated about electric vehicles (vs. gas powered vehicles)*
- *Develop technical/mechanical skills useful in the future that could be transferred to the workplace.*
- *Interdisciplinary project: science/engineering/automotive/tech*
- *Engage young people who enjoy hands-on learning, providing real world learning for our Career and Technical Education Auto Tech and Auto Body students to understand the latest and greatest green technology*
- *Develop leadership skills for many students.*

What barriers do you think you might encounter?

- *Time constraints/commitment and length of project*
- *Cost/funding*
- *Continued motivation to complete a project of this magnitude*
- *Relies on buy-in from tech teacher*
- *Safety expertise and training will be needed (e.g. training by firefighters, electricians etc. on electric vehicle safety, particularly when handling high voltage materials in conversions)*
- *Lack of support for students taking Technology courses among the parent community, our students face tremendous pressure to pursue "professional" programs at University (e.g. Doctor, Lawyer, Pharmacist, Engineer etc.)*

We also presented at the Career and Technology Education Conference in Calgary, Alberta. Cody Price and Evan Roberts co-presented with Andreana Salouk, GreenLearning's Project Manager. There were 17 attendees in total, ranging from automotive teachers to science teachers. Some great discussions were had about EVs:

Cody Price and Evan Roberts at the Career and Technology Education Conference

- Lithium mining remains a controversial topic (environmental and ethical concerns, but also a discussion to be had about the alternative)
- EVs raising the bar for what vehicles can do
- High voltage remains a safety concern
- Large class sizes can make a project like this difficult to start. Cody and Evan suggest starting smaller (like with an EV club, after school). Teachable moments with the conversion can still be easily demonstrated to larger classes.
- Old lawnmowers are a great small-scale conversion project!

New Myrnam School has previously converted gas powered golf carts into electric, and provided some great insights into how a smaller scaled project could be successful. As the winning entry of our 2021 Re-Energy Challenge for their golf cart conversion, New Myrnam School has created an excellent example of how a smaller scale conversion project can be successfully completed without a dedicated automotive shop.

Finally, we also maintained contact with interested teachers through our monthly Charging Ahead newsletter. A copy of the May 2024 edition can be found here: https://app.hubspot.com/email/8750861/details/166210579063/performance.

Connecting With School Boards

Many school boards were willing to meet with and share the Charging Ahead Initiative within their educator networks. We met with 10 people from the following school boards: Edmonton Public District School Board, Peel District School Board, Ottawa Carleton District School Board, Calgary District School Board, Dufferin Peel Catholic District School Board, and Calgary Catholic School Board. All in all, the boards were excited to hear about our pilot project, but were at different levels of readiness to incorporate EV learning opportunities. Some boards were already looking into installing charging stations at various schools, while others cited different priorities including garden programming, energy conservation and plastic waste reduction.

Connecting With Departments of Education

Meetings with the Alberta Education and the PEI Department of Education and Early Years were very insightful.

Alberta Education noted that the ETF project is ahead of the times, and that they are eager to see how it continues to unfold and what we do next. There is plenty of work to be done before a conversation about updating the current curriculum can be done, but Alberta Education mentioned that the high voltage EV safety training course that Cody attended at BCIT would be a valuable experience for Alberta teachers. This would also be a necessary step before EV conversions could be taught in schools. The closest thing to our project that is currently underway is the Registered Apprenticeship Program (RAP); W. H. Crossford in Airdrie has a RAP through a dealership. While that dealership isn't focused on EVs, a similar arrangement or agreement may be a way to initiate more EV learning in Alberta.

The PEI Department of Education and Early Years mentioned they just had 2 of their 7 automotive teachers receive EV training. Additional exciting news is that the electrification of school buses in PEI has begun recently, through a third party. The PEI Department of Education and Early Years cited that any EV training resources would be welcomed as it seemed to be currently lacking.

Other Insights

Insights from the Southern Alberta Institute of Technology (SAIT):

- GreenLearning ETF pilot program is cutting edge, SAIT hasn't dedicated much time and research into a similar program yet.
- Offering a dual credit program by SAIT x CBE has been a popular discussion recently, and the opportunity is promising! The curriculum is still reflective of outdated content, and this might provide an opportunity to begin connecting EV learning material to current curriculum.
- SAIT continues to make progress with EV integration in their diploma program. In the future, it could be a great benefit to add a more formal EV integration into the curriculum.
- **https://www.sait.ca/**

Insights from the Electric Vehicle Association of Alberta (EVAA):

- EVAA is a non profit with a mission to educate the general public on myths and facts about EVs. They were happy to help us spread the word about Charging Ahead through their social media channels.
- Noted that many community events they attend increased their primarily male-based following, but they are trying to increase diversity in their audience.
- A few years ago, EVAA was at a school to do a presentation and that school had also converted a car into an EV.
- **https://albertaev.ca/**

Insights from Calgary Regional Consortium:

- We reached out to see if they can help us spread the word about our Charging Ahead Initiative and build a connection between our organizations. They shared our initiative in their newsletter, and recommended we reach out to other consortiums as well.
- Provides learning opportunities for teachers and they helped the CBE organize the Career and Technology conference that Andreana Salouk, Cody Price and Evan Roberts presented at on ETF.
- **https://crcpd.ab.ca/**

Community Events

We also attended a few community events to spread the word about ETF. We attended the CBE's CTC Industry Night in December (2023), the Palliser District Teachers' Convention in February (2024), and the Calgary Mayor's Environmental Expo in June (2024). Each of these events offered an opportunity to connect through informal conversation in a fair-like setting, where teachers and students could ask questions and seek additional information. The diversity of interests and perspectives provided a great way to seek feedback and spread the word about the project.

"This is my favourite booth here!"
- Student at Environmental Expo

We were excited to Charge Ahead with people in the community!
CTC Industry Night - 200 people
PDTC - Over 4000 people
Calgary Mayor's Environmental Expo - 3400 people

Learning Material Suggestions

Based on the insights and ideas gathered from stakeholder meetings, we've compiled a list of learning materials that might benefit educators to facilitate teaching about automotive electrification in the classroom:

1. Vehicle Simulator - exploring how various EVs work (hybrids, full EVs)
2. Conversion Simulator - how to do a conversion in a step by step way
3. Trip calculator - compare and contrast emissions, cost, and range of EV and ICE vehicles going the same distance.
4. Career lists associated with EVs.
5. Hands-on activity that compares and contrasts the environmental impacts of EVs and ICE vehicles.