



BY INSIDE EDUCATION



# A+ FOR ENERGY

## 2021/2022 PROJECT SUMMARY WINNERS

### 1. **Annunciation World IB School** *Edmonton*

#### **THE ABC'S OF ENERGY** | \$4,155

Students will research energy in Alberta and Canada to learn more about how our province and country provide energy to its citizens.

We will be creating a story that will engage readers and teach them about energy in a fun and informative way. As authors of the story, we will share our final product, a printed book, with all Annunciation students as well as our parents and members of the community, with the intention of helping readers understand that how we use energy has an effect on our environment and motivating them to want to reduce their carbon footprint, on an individual level and as a school community.

### 2. **New Myrnam School & Myrnam Outreach and Homeschool Centre** *Myrnam*

#### **BIG IMPACTS START WITH "TINY" CHANGES AT HOME** | \$5,000

Students will design and construct a "tiny home" with all the amenities for living, getting as close as possible to net zero energy consumption within a budget of \$5000 to demonstrate energy-efficient construction practices to our community. Based upon their final design and completion of the project, students will use their learning and new understandings about sustainable construction and energy efficient practices to share their expertise with the Village of Myrnam council and stakeholders in the Seniors' Housing construction project.

### 3. Siksika Nation High School

*Siksika*

#### **S.T.E.A.M. MOBILE ENERGY FOR LAND BASED LEARNING** | **\$5,000**

Siksika Nation High School is working to develop an outdoor mobile science classroom with cameras, computers, microscopes and scientific testing equipment. However, without a readily available power source in the field we are limited by a device's batteries. Our plan is to build a student driven project for the development of a mobile Solar Technology Energy Acquisition Module (STEAM), that can be taken out to the field to enhance student learning experiences and knowledge synthesis. Grant funding for this project will help support the acquisition of solar panels and the required upgrades to our battery storage.

The STEAM module will be mobile and will allow for take down and set up in new locations therefore allowing future classes of students to continue to glean the benefits of energy education from the project.

### 4. West Island College

*Calgary*

#### **THE AMAZING RACE TO A CLEAN FUTURE** | **\$4,465**

Our student-led Roots and Shoots Club will organize an environmentally themed Amazing Race. Inspired by the currently televised "Amazing Race," we hope to educate students in an interactive manner on prevalent energy related topics. We have designed an amazing race which will allow students to explore the city they live in while also getting a grasp on various areas which affect the energy industry and this sector's impact on our ecosystems. The race will take place in downtown Calgary, an area of the city where students can see both green spaces and the high rises in the largely energy-based sector of the city.

Furthermore, each of our stations fits into a specific category which relate to five distinct aspects of climate and energy education: energy efficiency, renewable energy, climate crisis issues, impacts of energy & climate change on animals & ecosystems, and careers in green energy. It is our goal for students to be able to have fun while also having the opportunity to learn about how energy impacts each of our daily lives!

### 5. Rundle College

*Calgary*

#### **QUARANTINE WON'T GET US DOWN! (AT LEAST NOT DOWN ON ELECTRICITY!)** | **\$4,775**

In this project, students will explore different methods of generating electricity. They will explore the design of a turbine and how it creates energy, how man-made mechanical energy can produce electricity, the use of microbial systems to generate electricity and the use of solar panels (to name a few). Once they get a handle on these methods of electrical generation, their main action project will be to determine a method to make a system that is portable and usable within their home office. The prototype they develop should allow them to access power off-of the grid. The challenge will be, can they use their knowledge to become self-sustainable?

## **6. Michael Strembitsky School** *Edmonton*

### **PEDAL POWER BIKE WARS!** | **\$5,000**

Nothing gets kids interested like a little bit of healthy competition! Students at Michael Strembitsky School will compete to see how many kWh of power they can generate and divert from the electrical grid using student-built stationary bike generators. We will be working to equip 10 of the stationary bikes present in our school with electrical generators connected to power banks that will be charged by student pedal power.

These power banks will be used to charge digital devices used in the classroom. Students will monitor how many kWh are used with different devices and submit their results which will allow us to calculate how many greenhouse gas emissions will have been saved from entering the atmosphere. The class that is able to divert the most energy from the grid will win a prize!

## **7. Fort Assiniboine School** *Fort Assiniboine*

### **PLANTS FOR PROSPERITY** | **\$4,155**

Agriculture is a big part of our small rural community and students are hoping to bring this into the school in a practical way. We are planning on building a hydroponics system and then a greenhouse to grow fresh produce that we can sell locally. Our hydroponics project is going to be a whole school event that builds pride in the school community. Our younger elementary students will help with planting and monitoring the plants once the structure is built.

Older elementary students will track plant growth and look at the importance of nutrients to plants and other living things. Our Jr. High students will learn about project planning, budgeting, how to balance PH and the role that it plays in ecosystems. Our Jr. High students will also get to look at how to market the final product and sell it to local stores to help fund and grow the project as our future goals include building an outdoor greenhouse for even more

## **8. Strathmore High School** *Strathmore*

### **SHS "OFF THE GRID" FARMWALL** | **\$3,902**

Strathmore High School is building a sustainable, vertical farm wall. This farm wall will provide the student body with access to fresh produce and have the added benefit of being 'off-grid'. This system will use solar panels to provide the needed energy for pumps and LED lights. Students will be able to make real time, data driven comparisons between solar and more conventional forms of energy. Student's will be able to identify components of the system meant to increase efficiency (ie. LED lights, lighting schedule, battery type, etc.) and directly relate this to the ability to power the system with small solar.

## 9. St. Joseph School

Coaldale

### MAKE (R-SPACE) ANY BIKE AN E-BIKE | \$3,500

Rethinking the commute, using e-bikes to get there, all while utilizing the old bike in the shed! Reducing waste is one of our primary goals and directly impacts energy use. We will purchase E-Bike converter kits to retrofit students' old bikes into E-Bikes, and discuss the benefits of reducing waste, reducing vehicle emissions and mileage, and cutting down on fossil fuel use and dependency along the way.

## 10. Alexandra Middle School

Medicine Hat

### AMS MICROGENERATION ENERGY LAB | \$5,000

At AMS we want to explore site-based microgeneration. To achieve an authentic learning experience we would like to build an Energy Lab. This flexible learning makerspace will provide students with the opportunity to explore climate change science, clean energy technologies, sustainability principles, to participate in hands-on experiments and to create microgeneration projects. The Microgeneration Energy Lab will be built in a large, designated classroom that has significant potential as a flexible learning environment. A designated makerspace allows students to benefit from playing, tinkering, discovering and designing.

## 11. Jasper Place High School

Edmonton

### ARGUING FOR SOLAR POWER | \$4,176

In this project we want to provide students with the tools and opportunity to directly investigate the CO2 mitigation effects of photovoltaic solar panels. The project will involve purchasing 6 solar panels, constructing mounting brackets and installing them on the roof of Jasper Place High School. These panels will be used to charge a battery and the rate of charging total energy produced will be monitored. There are twin purposes for this project: (1) students will conduct experiments to determine the optimal angle of inclination, azimuth angle and location on the school roof and (2) supplying electrical power for the school's greenhouse.

Throughout the year they will gather data on the efficiency and energy production of the solar panels. This information will be used to estimate the CO2 mitigation and cost savings of solar power at the school. Finally, students will write a proposal to send to the school board detailing their findings and (if appropriate) recommendations for large scale school adoption of solar panels.

## 12. St. Angela School

Edmonton

### **BRAVO FOR BROADCASTING** | \$5,000

Bravo for Energy Broadcasting is about nurturing energy leaders at the school and focusing on solutions. Our grade four class has been adding Stem UP moments to their learning this year where unique facts, interesting topics, cool videos, motivating songs are shared for a brief Stem moment. They have been dreaming about a broadcasting initiative they could lead the school in to explore STEM topics and wanted to have a special feature on Energy. They will partner with the grade five class to delve into energy topics to share with the school and beyond our school. Each month they will delve into energy sources with a Stem UP flare.

The students will connect with our post secondary institute (Northern Alberta Institute of Technology) and their alternative energy program to delve into information, training and tidbits with the experts. The grade 4 team will lead the exploration, but the whole school will participate in the special broadcasts. Student teams will then design a school that is energy efficient and sustainable and share their models at an Energy Symposium!

## 13. Next Step High School

Sherwood Park

### **ROCK FOR SUSTAINABLE ENERGY** | \$4,000

Students will work with a local musician to write and compose a song that educates others and envisions a utopian society based on renewables, carbon zero and other environmentally friendly sustainability practices. Students will research these topics in the perspective of Alberta's energy landscape and come together as a band to have their voices heard. The song will be written, performed and recorded with the final product being produced in a CD or vinyl format for others to consume and listen to.

## 14. George Freeman School

Strathmore

### **TAKING ACTION TO DIVERSIFY OUR ELECTRICITY PRODUCTION: WIND POWER** | \$5,000

Our school has a large solar project on the roof. Recently, students in Science 7 asked, "Is solar or wind a better source of electricity in Strathmore?" We decided to do a school-wide project to find out! A multi-grade group of students will research, select, purchase, install, and monitor a small wind turbine for our school. Once the turbine is producing electricity, we will use the data to compare the electricity generation from our solar panels and wind turbine. After researching both solar and wind generation and putting both into action, students will be able to answer our guiding question based on evidence.

## 15. St. Mary's Elementary School

*Lloydminister*

### **FROM THE CLASSROOM TO THE SOURCE: USING VIRTUAL/AUGMENTED REALITY TO VISUALIZE AND CONSTRUCT ENERGY CONCEPTS** | \$4,557

Utilizing ClassVR virtual-reality headsets, students will actively engage in a wide variety of simulated environments, such as renewable and non-renewable energy structures, and be able to interact within these virtual spaces. In addition, accompanying software will enable students to utilize their planning, designing, and coding skills to create their own virtual spaces, based on the topics being delved into, and bring their ideas and learning to life in a visually and cognitively-immersive format. These virtual structures and scenarios will be shared by the students as they assume the role of mentors to younger peers, guiding them through their created renditions and concepts.

## 16. Joseph M Demko School

*St. Albert*

### **GROWING SMART** | \$3,493

We will develop a SMART Garden project as part of our K-9 STEAM program at Joseph M Demko School. Students will use Micro:bit technology to explore energy efficiency in agriculture, conserve water and reduce their carbon footprint while creating a more sustainable garden that offers fresh produce to our school and local community. First, students will research, design and engineer different methods for creating more efficient

classroom gardens while reducing their carbon footprint and participate in a field trip to a local greenhouse/farm to learn about the energy needs associated with growing. Then, studnets will build a portable greenhouse and collect data on plant growth and energy consumption.

## 17. Ecole McTavish & Fort McMurray Islamic School

*Fort McMurray*

### **THE FINAL FRONTIER** | \$8,986

This project began by looking for ways to improve environmental conditions within our classrooms. Preliminary data has shown that our classrooms have high levels of carbon dioxide (800-1300ppm). Students proposed two possible solutions: design air filters and/or grow plants to offset the carbon dioxide levels. Students started growing edible plants in tower gardens and noticed an improvement in overall carbon dioxide levels. However, this posed another challenge since the systems run on school electricity. This led to brainstorming possible ways to overcome the energy challenge.

Given the grant, it will help us facilitate energy education through project based learning for the majority of the grade nine science curriculum. Our goal is to give students an opportunity to learn about clean energy, propose an action plan in designing off grid renewable energy for our classrooms, recycle waste and research further fuel cell technology to advance our knowledge of energy storage and system efficiency.

## 18. Dr. Gladys McKelvie Egbert School

Calgary

### **PEDAL POWER!** | \$5,000

The purpose of the Egbert's Energy Experiment project, Pedal Power!, is to introduce students to the concept of energy through a transdisciplinary, interactive, authentic learning experience to instill a lasting connection to Alberta's energy sector. In partnership with community energy education groups and experts, students will investigate energy sources, human consumption and socio-economic issues pertaining to the Alberta Education curricula, to better understand what energy is, how we produce it, how we use it, how it impacts us as humans and its importance in our lived experiences and how we can conserve energy.

To apply their knowledge, students will develop bike generators to learn how to harness and generate clean, sustainable energy to share their understanding with the wider school community. Showcases of student learning will provide celebration and demonstrate of their newly acquired skills and expertise from math, science, language arts, social studies, CTF and physical education. As well, the bike generators will serve as an authentic energy source for students to use while learning at school for years to come.

## 19. Norwood Elementary School

Edmonton

### **SUNNY DAYS AHEAD!** | \$4,993

Students will learn about solar energy through academic, hands-on, and community focused activities and lessons. Students will research, learn, and share why renewable resources are important and how solar energy works. We will then build a solar panel set up that will be used to charge a battery pack to run electronic devices. Students will host a solar fair with table displays and explain how solar works in a gazebo on the outdoor learning grounds using the panels to run our Chromebooks, sound system, and lights so students can do a demonstration for other classes. We will arrange a field trip to see some renewable energy projects in the city including local community leagues who have installed solar with the help of the Alberta Municipal Solar Program, as well as schools involved in the solar for schools program.

We will go on a walking field trip in our neighborhood to see sites where solar is being used. Students will study the use of solar across Alberta and will write emails to reach out to different companies to learn how solar panels are installed in residential and commercial buildings. For our final closing activity we will invite local musicians to play music powered by solar in our playground.

## 20. **A. E. Cross School** *Calgary*

### **THE ALBERTA POWER GAME** | **\$5,000**

We will create a simplified working model of the Alberta Power Grid in the classroom. The purpose of the project is to engage students in the daily and seasonal complexities of power supply and demand in Alberta, as well as challenge them to model how the Grid could be adapted in the future to the changing requirements of a coal-free and carbon-neutral world. It is hoped that this might inspire them to consider a future career in helping to bring about the Clean Energy Transition in Alberta.

## 21. **Bonnyville Centralized High School** *Bonnyville*

### **SOLAR BOTS - A RAY FOR THE FUTURE!** | **\$5,000**

After taking part in various forms of STEM challenges and Science Olympics over the years, I cannot understate the value of allowing students to engineer unique solutions to open-ended, practical problems. This project will be primarily designed for high school STEM and CTS students to develop their skills in the design, engineering, and programming of solar-powered robots to complete assigned tasks efficiently. After developing their skills, these students will be encouraged to share what they've learned with younger learners in local middle schools, who will then take part in further age-appropriate challenges in the design and implementation of robotics that are driven by renewable energy sources.

## 22. **Spruce Grove Composite High School** *Spruce Grove*

### **TINY HOME 1.1** | **\$5,000**

Our Tiny Home 1.0 project that we received an A+ For Energy grant for in the 2020/2021 school year is taking shape even with the challenges of Pandemic teaching! Now that our timeline has extended for this project we want to leverage this opportunity to add more eco-friendly aspects to it. Our goal is to add a full suite of solar collection, storage and inversion to create an electrically self-sustaining home. We also want to take this opportunity to source and install energy efficient electrical components and appliances.



## 23. Ecole St. Joseph School *Whitecourt*

### **HEATING UP ENVIRONMENTAL STEWARDSHIP: ALTERNATIVE ENERGY SOURCE PRODUCTION** | **\$5,000**

Students will manipulate and build technologies to produce alternative Energy Sources from Biomass and light energy to run technologies within a greenhouse. Students will explore technologies to produce alternative energy using Mudd Watt cells, and photovoltaic cells. Specifically, they will manipulate variables such as soil type, temperature, light and moisture to investigate the effect of energy production with this technology. Moving forward, we plan to have students design and build their own watering system and test systems using micro bits to conserve energy and collect quantitative data. This will provide students with the opportunity to critically evaluate energy innovations within the province and prepare them for careers in the energy sector.

## 24. Kikino Elementary School *Kikino*

### **INDIGENOUS KNOWLEDGE: WIND, SOLAR POWER, PLANTS & STORY** | **\$5,000**

Students will find the place of wind in all aspect of life but especially its place in the growth of plants. By putting together solar-powered fans, our students will explore the place of wind in the development and growth of plants in our greenhouses. Kikino School has 3 large greenhouses assigned to grades k-2; 3-5; 6-8; Students will learn to measure solar energy and how it can generate wind and monitor and record the growth of plants. They will learn that solar energy will work as efficiently as power fans but uses natural energy vs manmade energy.

## 25. The Brick Learning Centre *Ponoka*

### **THE BRICK SOLAR ENERGY** | **\$2,370**

Students will learn how to harness renewable energy from the sun and build portable solar charging stations for the school! This project will provide students an opportunity to learn more about energy use and generation. Students will apply what they learn to build a solar powered energy station. This energy station will provide enough stored electricity to recharge phones, tablets and laptops. This enclosed energy station will have USB and AC outlets. They will be set up in our 5 primary learning classrooms that have sunlight throughout much of the day. It will also be an exhibition to our students, guests and public of our solar project.