Powering Albertans

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Who we are
The Alberta Electric System Operator (AESO) leads the safe, reliable and economic planning and operation of Alberta’s Interconnected Electric System (AIES). We are an independent, not-for-profit organization acting in the public interest of all Albertans. The AESO has no financial interest or investment of any kind in the power industry.

The AESO also facilitates Alberta’s fair, efficient and openly competitive wholesale electricity market, which in 2010 had about 175 participants and approximately $5 billion in annual energy transactions.

What we do
The AESO operates the provincial transmission system so that all Albertans can count on safe and reliable electricity to power our homes and businesses each and every day. The AESO also carefully plans upgrades to the system to ensure we keep pace with Alberta’s growing demand for power.

We're listening
Powering Albertans is published to help Albertans better understand the complex electricity industry and its importance to our quality of life and the province’s economic well-being. We would love to hear what you think about our publication. Previous editions of Powering Albertans are available at www.poweringalberta.com

Contest results
Thank you to the nearly 2,800 Albertans who entered the contest in our last issue. Congratulations to these winners of an electricity consumption meter:
- Pat Galas, Edmonton
- Mackenzie Miller, Fort McMurray
- Daniel Nish, Provost
- Gregory Powell, Edmonton
- Sandra Thederahn, Innisfail

Contact us at: powering.albertans@aeso.ca or call us at: 1-888-539-AESO (2376)

This publication is proudly printed in Alberta. By using 30 per cent post-consumer recycled paper we have achieved these environmental savings as compared to virgin fibre paper: 256 trees, 314,190 litres of water, 32 cubic metres of solid waste, 13.5 metric tons of greenhouse gas emissions and 232,000,000 BTUs of energy.
KILOWATT (KW) AND KILOWATT HOUR (kWh)
Power is measured in watts. One kilowatt equals 1,000 watts. Imagine 10 lamps lit with 100 watt bulbs for one hour. At the end of the hour, you will have used one kilowatt hour of electricity. Electricity retailers typically bill households in kilowatt hours.

MEGAWATT (MW) AND MEGAWATT HOUR (MWh)
A megawatt is equal to 1,000 kilowatts. A megawatt hour measures the amount of electricity a generator produces over one hour.

DEMAND
Demand refers to the amount of power customers require.

PEAK DEMAND
Peak demand indicates the maximum amount of electricity consumed during a specific period of time. Peak demand for electricity in the summer typically occurs on the hottest day of the year.

CONGESTION AND CONSTRAINT
A congested transmission system is one that cannot serve the needs of customers even when running at full capacity because the path between generators and consumers is constrained. Constraints restrict the flow of electricity.

COGENERATION
The production of electricity and heat or steam from an industrial facility.

INTERTIE
Transmission system connections that connect two neighbouring electric systems. Alberta has two interties—one with Saskatchewan and the other with B.C. Alberta relies on these interties to import power when we need it, and export surplus power when our supply is greater than what Albertans need.

ENERGY EFFICIENCY PARADOX
A seemingly contradictory situation where the use of energy-efficient devices actually increases energy consumption instead of reducing it. This is because we use many more electronic devices than ever before so our overall energy consumption has increased.

MERIT ORDER
Market participants offer to sell electricity to the wholesale market. These offers are ranked from lowest to highest price into a list called a merit order.

DISPATCH
The process used to coordinate the provision of electricity to meet changing demand. In Alberta, available electricity is dispatched from the merit order starting with the lowest-priced offers and moving to the highest-priced offers to keep supply and demand in constant balance.

POOL PRICE
The pool price represents the hourly wholesale market price for electricity.
The learning curve doesn’t stop there. Maintaining certification requires 200 hours of training every three years, which can feel like a full-time job in itself. The AESO has two full-time trainers on staff who ensure the system controllers’ skills remain current and comply with NERC standards.

Supporting real-time system operations

While it’s easy to plug in the computer and start it up, there’s a complex system behind that plug-in. Monitoring it is a big job that is made a little easier thanks to the SCC’s advanced technology infrastructure, which supports real-time electric system operations. A key component is the Energy Management System that enables system controllers to dispatch electricity to meet demand and monitor the status of the provincial electric system as well as interconnections to neighbouring jurisdictions.

Three system controllers are constantly at the helm to ensure Albertans have a reliable, sufficient and safe transmission system. One monitors and adjusts voltage and observes line flows across the province. A second dispatches energy according to market price and directs generators as required to ensure supply and demand balance.

The third manages Alberta’s interties with B.C. and Saskatchewan so power can be transferred in and out of the province as needed. System controllers are trained in all three areas and routinely rotate responsibilities among them.

Teamwork is essential

“Teamwork and ongoing communication between the system controllers is essential,” says Belsher, explaining that a change in one part of the system can have widespread consequences. “Spring can be the most challenging time,” he adds. “Wet snow and driving winds can snap lines and wreak havoc with the power system. That’s when the system controllers really have to be on their toes, working together to come up with contingency plans to keep the lights on.”

In addition to communicating internally, the AESO’s system controllers communicate constantly with the system coordination centres of transmission facility owners (TFOs) such as EPCOR, ENMAX, AltaLink and ATCO. Belsher says that while TFOs look after their own switching and line maintenance, the AESO coordinates the grid independently of all that. “We’re often in touch with the TFOs’ system control centres two or three times an hour as we work with them to coordinate outages, voltage control, switching, line flows and real-time studies of line outages.”

It’s all part of ensuring the safety and reliability of the provincial grid.

Belsher is part of a team of about 30 highly skilled system controllers whose job is to keep the lights on in the province 24 hours a day, seven days a week, 365 days a year. And much like air traffic controllers monitor flight patterns, air traffic flow and possible bottlenecks, system controllers monitor consumption patterns, electricity flow and potential congestion within our electric system.

Their job is to balance Alberta’s supply and demand for electricity to ensure the reliability of the provincial grid.

It takes up to three years of rigorous on-the-job training and study before a person is ready to take the helm as a system controller. Most system controllers have previous experience in the utility sector, often as linemen, substation or hydro plant operators or technologists. To become a system controller, they must first pass a comprehensive exam and be certified by the North American Electric Reliability Corporation (NERC). While the certification qualifies them within six months to a year, the AESO insists on at least another one to two years of training before they are full-fledged system controllers.

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The Energy Efficiency Paradox

We think ‘green’, compare energy ratings and make conscientious consumer choices. But are we really consuming less electricity today?

As responsible consumers, we pride ourselves on our choice of energy-efficient home appliances. We compare ENERGY STAR® ratings and buy front-load washers that use less water and dryers that shut themselves off when the clothes are dry.

We choose fridges, dishwashers and stoves that consume less energy than other models in the store. Our electric kettles shut off automatically and our outdoor lights turn on only when a sensor detects motion. We replace our incandescent light bulbs with compact fluorescent lights and install dimmers on ceiling lights.

We do all this so we can feel we’re doing our part for the environment. And these are all good steps to take. Certain appliances—in particular fridges, freezers and clothes washers—have become vastly more energy efficient, according to the Office of Energy Efficiency of Natural Resources Canada.

Compared with 20 or 30 years ago, most modern appliances are made to be more energy efficient. The problem is we have more appliances and electronics in our homes and we’re replacing them more frequently.

Thirty years ago, the average household might have had one TV, a “hi-fi” stereo and a few clock radios. And in the kitchen, the appliances likely included a fridge, stove, coffee maker, toaster and an electric mixer or blender that was only used occasionally.

Today’s homes include all of those things plus a dishwasher, microwave, more small appliances and a computer powered up in the corner. There may be several more TVs in today’s household, a couple of PVRs and DVD players, multiple computers and an abundance of other electronics for our use and amusement—all consuming energy. In addition, our homes are larger than they were even a generation ago. That extra square footage requires more energy to heat and cool our homes.

Despite our love for appliances, electronics and larger homes, Albertans use a relatively low amount of electricity compared to other parts of Canada or the United States. The natural gas we typically use to heat our homes means we use less electricity. And Alberta’s moderate summer climate reduces the need for electricity-intensive air conditioners.

Regardless of ongoing efforts to reduce the amount of electricity we use, Alberta’s growing population and economy mean our energy consumption is increasing. And that means it’s more important than ever to continue making energy-efficient choices.

See Power FACTS on page 11 for energy saving tips.
Behind the Scenes of Alberta’s $5-Billion Wholesale Electricity Market

Did you know that the AESO operates a wholesale electricity market to buy and sell power 24 hours a day, seven days a week?

Electricity cannot be efficiently stored. It must be used in the same instant it is produced, which means that supply (electricity produced by generators) and demand (electricity consumed) must always be balanced. System controllers at the AESO expertly manage Alberta’s wholesale electricity market to keep this complex system in balance at all times.

How it works
In Alberta’s deregulated wholesale market, generators of electricity powered by coal, natural gas, wind, water or biomass offer their power into the market at their chosen price up to a ceiling of $999.99 per megawatt hour (MWh). “Generators sell their power through the AESO by submitting offers to the market every hour, 24 hours a day,” explains the AESO’s Director of Market Operations Doug Simpson. These offers are combined and sorted from the lowest to highest price for each hour of every day into a list called a merit order.

The AESO’s system controllers use the merit order to balance the supply and demand of electricity in real time, starting with the lowest-priced supply offers and moving up to the highest until all the electricity required for that hour is supplied.

As the system controllers move through the merit order, they communicate with generators so they can adjust their energy output as required. The system controllers send this information through dispatches to generators.

While there are rules governing how generators must offer their electricity into the market, the offer price is completely up to them. “In this way, the AESO ensures Alberta’s overall electricity needs are met by the most competitively priced electricity,” says Simpson.

Competition among generators to serve the demands of the province determines the price consumers pay for the energy charge on their electricity bills.

Having Alberta’s total electricity energy demand met by an openly competitive wholesale generation allows Albertans access to competitively priced power.
Electricity prices are determined every hour at the lowest price that delivers enough supply to meet the total demand for that hour. This hourly price is called the pool price.

**Establishing the price for electricity**
System controllers constantly monitor the daily and seasonal fluctuations in demand, matching the supply from generators with demand from consumers, and use the merit order to determine pool price.

**What does the pool price mean for you?**
"Residential customers have two choices: they may choose a retailer to supply their electricity over a long term at a predetermined rate, or they have the option of a regulated rate, which essentially reflects the average pool price over a few months," explains Simpson. Regardless of which option a customer chooses, every consumer’s electricity bill will have an energy charge that is influenced by the pool price.

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**INFLUENCING FACTORS**

These are some of the factors that can influence the supply and price of electricity:

- **Available generators**
  Planned and unplanned outages affect the availability of generators to supply electricity.

- **Hourly demand fluctuation**
  Extremes of hot and cold temperatures can increase demand.

- **Intertie availability**
  Interties may be constrained, impacting our ability to import or export power.

- **Generator offers**
  Generators decide the price they will offer for their electricity within established market guidelines.

- **Shifts in demand throughout the day**
  Increases in demand may cause higher-cost generation to come online, which could increase the overall weighted average price.

- **Physical transmission constraints**
  Extreme weather conditions like lightning, ice and wind may cause damage to power lines and limit access to supply.

- **Availability of transmission**
  Alberta’s transmission system is constrained and at times a generator’s output may be limited due to lack of available transmission capacity. At these times, a generator’s ability to get power to the market is limited and can actually lead to higher pool prices.

Coal and natural gas are the fuels used for most of the generators in Alberta. Their costs are subject to market fluctuations.
Follow the Flow of Electricity!

*From its source to your home*

**A. Generating plants**
Power is generated using a fuel source to create a rotating motion that is turned into electricity.

**B. Transmission substation**
A set of large transformers increases the voltage of power coming from a generating plant for the long journey through the transmission grid to customers.

**C. Transmission line**
Transmission is the backbone of the electrical system, moving power from where it is generated to where it is needed in our homes, farms, businesses and industries. Towers and poles support sets of high-capacity wires that move electricity throughout the province.

**D. Intertie**
Connections with neighbouring electric systems allow power to move in or out of the province, enabling a stable and reliable supply of electricity.

**E. Solar panels**
When sunlight hits thin metallic plates called photovoltaic cells, it creates electrical currents that produce electricity. Photovoltaic cells are grouped together to form solar panels that can be installed on roofs of houses, office towers, barns and other buildings to supply electricity.
**F. Industrial customer**

Industry uses about 60 per cent of Alberta’s total electricity supply. Some facilities generate waste heat that can be converted into electricity and used as a power source or sold back to the transmission grid.

**G. Distribution substation**

Power lines enter a substation where a transformer reduces voltage to a level that can be safely carried on the lines that deliver electricity to homes, farms and businesses.

**H. Distribution line**

Low voltage power lines are best for transporting electricity over short distances. These distribution lines carry electricity from a substation to homes, farms and businesses.

**I. Power meter**

Power meters measure the amount of electricity delivered to a home, farm or business.

**J. Run-of-river hydro power**

The flow and elevation drop of a river is harnessed to generate electricity. Some of the river’s water is diverted through a pipe leading to turbines, then returned to the river downstream. Run-of-river projects do not require dams and flooding of surrounding land so the impact on people and the environment is minimal.
Regional Updates

North to south and east to west, industrial development, population growth and higher demand for power challenge Alberta’s transmission system to keep pace.

Efforts are underway throughout Alberta to upgrade the province’s transmission system to meet demand and connect customers. Approximately 50 regional projects are currently in progress or in development to support more than 200 customer connection requests.

By 2020 the AESO predicts peak demand to reach 15,600 megawatts (MW), which is 5,400 MW higher than our current peak. This growth is equivalent to adding three and a half cities the size of Calgary to the grid in the same time period.

EDMONTON REGION

Upgrades needed to support electricity development

In and around Edmonton, an estimated 33 per cent increase in demand for electricity over the next 10 years, led by residential and commercial growth, requires significant infrastructure upgrades in the region.

The Edmonton area is a hub for electricity flow between the Northeast, Central and South regions, and the area accounts for one-third or 4,457 MW of Alberta’s generation capacity. Most of this production comes from coal-fired power plants in the Wabamun Lake area.

“Upgrades are necessary to service increasing demand and account for the power requirements of major oil production facilities in the Northeast, which can have a significant impact on transmission infrastructure in the Edmonton region,” explains AESO Vice-President of Transmission Shan Bhattacharya.

Older equipment in Edmonton also needs to be replaced over the next 10 years. Among the improvements planned for the region are a new transmission line in northeast Edmonton and St. Albert and higher-capacity cables near the University of Alberta. Numerous upgrades between Wabamun and Edmonton are anticipated to ease constraints on the system and a new substation and line improvements will be made near Leduc.

Demand in Edmonton is expected to increase 33% over the next 10 years.
Increased pipeline and industrial activity in the Central region, as well as residential and commercial growth in the Red Deer area, will raise demand for electricity by about 50 per cent within 10 years, according to AESO forecasts.

The AESO’s 2011 Long-term Transmission Plan includes extensive infrastructure improvements in the Hanna area, transmission development in the Red Deer area, and substantial rebuilding of aging infrastructure in the Central-East area (east of Edmonton, between Cold Lake and Vermilion) and in the Central West (west from Wabamun Lake and Drayton Valley to Edson and Hinton).

**In the Red Deer and Didsbury areas, improvements to the transmission system are needed to handle an increase in demand and ease existing constraints.**

Around Hanna and Wainwright a number of new pipelines carrying bitumen and oil products, connecting northern Alberta oilsands projects to markets in the United States and elsewhere, will drive the demand for electricity.

“Central Alberta will be capable of generating over 2,000 MW by 2020, thanks to the addition of primarily gas-fired capacity and wind generation,” says Bhattacharya. “In fact, we’ve had a number of wind projects in the Central region totalling over 1,000 MW apply for connection.”

**Electricity demand to jump by nearly 50 per cent**

**SOUTH REGION**

**Power produced may double by 2020**

Wind-generation projects and gas-fired power plants coming online will need to be accommodated with an expanded transmission system in the South region over the next decade.

Historically, the South has relied on transmission lines to bring power from other parts of the province to the large demand centres of Calgary, Lethbridge, Medicine Hat and the Empress industrial area. The AESO expects that by the year 2020, however, electricity generated in the South region will jump from today’s 2,919 MW to between 4,955 and 6,000 MW.

Today, 89 per cent of Alberta’s transmission-connected wind capacity—or 695 of 777 MW—is located in the South. “This capacity is expected to increase substantially over the next five years,” notes Bhattacharya, who adds that energy production from these facilities will vary based on the available wind to drive the turbines.

During certain wind conditions, the South region will have a surplus of power to deliver to the rest of Alberta. The AESO is planning major infrastructure upgrades from Pincher Creek to Lethbridge to connect largescale wind generation.

Demand in the South region will rise by about one-third by 2020 as the population in the Calgary area grows and industrial demand increases. Demand is expected to increase from about 2,917 MW to 4,093 MW. Several transmission enhancements within Calgary and line upgrades in the Airdrie and High River areas are also planned to meet growth in demand and ensure reliability.

**Electricity consumption in the Northwest is expected to jump about 50%**

Over the same period of time, generation capacity in the region is expected to increase. Coal, gas, hydro, biomass and wind are the resources available for development. Key projects include the expansion of the HR Milner coal plant, the Dunvegan hydro project and the Swan Hills Synfuels’ underground coal gasification project.

Forestry and gas development in the Peace Country area is expected to lead the demand for electricity over the next decade in northwest Alberta. The AESO is planning line improvements in the Grande Prairie area to ease potential overloading. Aging lines near Slave Lake will be upgraded and substation conversions, four new substations and significant transmission reinforcement are also planned.

Electricity consumption in the Northwest is expected to jump by about 50 per cent between 2010 and 2020—from 1,039 MW to about 1,536 MW.

“We’ve taken into account the potential for oilsands development in the Peace River area as well as unconventional oil and gas resource development in the Drayton Valley and Hinton-Edson areas,” says Bhattacharya.
Many other industry leaders concur, saying Alberta businesses and ultimately the province’s prosperity depend on a reliable, sufficient and safe transmission system.

PROVINCIAL FORECAST

Overall in Alberta, demand for electricity is expected to nearly double in the next 20 years, with 13,000 MW of new generation needed. The AESO is working to make sure the transmission system across the province can accommodate this growth and meet the needs of Alberta’s homes and businesses today and over the long term.

Demand in the Northeast region is expected to climb from 2,300 MW in 2010 to 4,000 MW in 2020—an increase of 74 per cent. That’s a greater increase than any other region will experience—due, in large part, to the expansion of the oilsands and related secondary service industries in the Fort McMurray and Christina Lake areas. The Northeast already accounted for 23 per cent of the 2010 provincial peak demand.

Key projects underway

Key transmission projects in the area include the Heartland project, aimed at meeting increased power requirements to extract and upgrade bitumen in the oilsands industry. The Fort McMurray reinforcement project is needed to meet demand from the expected growth of the oilsands industry and ease congestion in the area.

The AESO’s regional plan also includes new transmission facilities to meet oilsands development needs, strengthening the transmission system in the Athabasca–Lac La Biche area to accommodate larger pipeline pumping loads, and providing increased operational flexibility in the Fort Saskatchewan area for heavy oil upgrader projects.

Visit www.poweringalberta.com to watch short informational videos from key industry leaders explaining what a strong transmission system means to the Alberta economy.

74% increase in demand is expected from 2010 to 2020.

NORTHEAST REGION

Industrial growth leading the province requires a strong transmission system

Transmission expansion is needed in the predominantly industrial Northeast region to support development that is a major driver of the Alberta economy. Some oilsands developers choose to produce their own electricity on site, most often through gas-fired cogeneration. “Oilsands operations require a very reliable source of power to maintain operations and therefore often rely on both an on-site generation supply plus a credible back-up supply,” notes Shan Bhattacharya, explaining why cogeneration facilities still need to be connected to the grid.

Oilsands developers say that with hundreds of billions of dollars in capital investment at stake, their businesses rely on a strong provincial transmission system. In fact, Devon Canada’s President Chris Seasons says none of his company’s projects in the Northeast would go ahead without it. “Everything we do depends on having a reliable power supply,” he adds.

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Power FACTS

Tips on Saving Energy: Look around your home and office and see where you can save energy. These tips can also help you save on your utility bills.

KITCHEN
- Use ENERGY STAR® dishwashers, stoves, fridges and freezers.
- Use a microwave or toaster oven instead of the stove to reheat food or cook small portions.

BASEMENT
- Keep return air grills and heating vents clear of clutter so heat can flow easily throughout your home.
- Add insulation to walls to keep it warm in winter and cool in the summer.

OUTSIDE
- Light the path to your door with today’s affordable solar-powered lights.
- Install a storm door to seal out drafts and seal in savings.

LAUNDRY ROOM
- Use the cold wash setting on your washing machine. 85% to 90% of the energy used to wash your clothes is used to heat the water.
- Remember to clean the lint trap on your dryer prior to every use. Your clothes will be dry sooner if the air can circulate freely and efficiently.

LIVING ROOM
- Turn off your TV when you leave the room. And don’t forget the PVR, DVD and gaming system.
- Replace incandescent light bulbs with compact fluorescent light bulbs. These use up to 75% less energy than standard incandescent bulbs and last up to 10 times longer.

BATHROOM
- Reduce your shower time by five minutes. Showering is one of the highest water use activities, using 11 to 20 litres per minute.
- Repair leaky faucets and keep your money from going down the drain.

HOMEROFFICE
- Plug your computer, printer and other digital devices into a sensing power bar. Simply turn off the power bar to turn off the equipment with one switch.
- Turn off your monitor instead of using screen savers. Screen savers can use as much energy as operating some programs.

What is ENERGY STAR®?
ENERGY STAR® is an international symbol of energy efficiency.
The ENERGY STAR symbol helps consumers quickly and easily identify major appliances and other energy-using equipment that save energy. ENERGY STAR® identifies products as the top high-efficiency performer in their category.
ENERGY STAR® is a dynamic government/industry partnership that makes it easy for businesses and consumers to save money and protect the environment.

Source: www.nrcan.gc.ca
Impacts of a Congested Transmission System

An uncongested transmission system benefits all Albertans

Transmission is the transportation network linking generators of electricity to consumers. Increasingly, frequent congestion and bottlenecks on that network are preventing us from accessing the full strength of the Alberta Interconnected Electric System.

In Alberta, as with many other jurisdictions, electricity is often generated far from where the largest demand is. This means power may have to travel hundreds of kilometres to get where it is needed. To get electricity from where it is generated to where it is consumed, Albertans currently rely on transmission infrastructure, lines, towers and substations that were predominantly built through the 60s, 70s and early 80s.

New transmission builds have not kept pace with the province’s annual growth rates. The backbone of our transmission system has not been significantly upgraded in nearly 30 years. During that same time, our population has grown by 45 per cent and gross domestic product by 455 per cent. The infrastructure that carries Alberta’s electricity from one corner of the province to another is aging and becoming more inefficient, and that can result in increased congestion.

The more congested the transmission system becomes, the harder it is to match the province’s varying supply and demand needs.

Benefits of an unconstrained system

A robust and unconstrained transmission system is the backbone of a cost-effective, competitive electricity market. It is also one that is more likely to withstand unplanned events like the spring storms of 2009 in Alberta and widespread outages that hit southern Ontario in 2003.

An unconstrained system provides equal access and sufficient transmission capacity so all customers can connect to the grid without constraint. It provides certainty to those who invest in new generation projects that they will have the ability to sell their electricity to Alberta industries, businesses, farms and homes. And it gives those in other industries the confidence to do business in the province, secure in the knowledge that power will be there when they need it.
The AESO's role
One of the AESO's roles is to identify where the transmission system should be improved in order to keep customers connected.

Current forecasts show our system needs to be expanded and reinforced to ensure a robust and unconstrained transmission system.

To date, Alberta has managed to maintain a reliable system by introducing tools and practices that stretch the physical limitations of the electrical system. The AESO's system controllers constantly monitor the grid to ensure electricity supply meets demand by bringing generators online when demand is high and gearing them down when demand drops, by coordinating planned outages, and by ensuring extra generation is in place in case of an emergency.

But as demand on the transmission system continues to increase, this is becoming more difficult.

The AESO's 2011 Long-term Transmission Plan identifies more than 50 projects that will meet Alberta's current and future demand for power. These planned improvements will continue to deliver the power Albertans rely on, and in many cases will reduce congestion and other system inefficiencies.

IMPACT ON INTERTIES

Interties play an important part in achieving an uncongested transmission system by providing a way to import or export power to help balance Alberta's transmission grid.

These power lines connect to B.C. and Saskatchewan and allow Alberta to import power when we need it and export surplus power when provincial supply exceeds demand. Since 2002, Alberta has imported more electricity than it has exported.

The B.C. intertie currently operates below its designed capability and increased congestion has resulted in times when the flow of power on the interties is restricted. Our transmission system needs to be reinforced to restore the capacity of our current interties.

Reducing congestion on our interties will allow greater access to lower-cost energy in other jurisdictions and ensure we have a reliable and adequate supply of electricity when we need it.
Your children are learning about electricity in their classrooms and it’s Inside Education’s job to help brighten their learning.

We’ve been working with students and teachers in Alberta for over 26 years now. Our classroom resources, classroom presentations and teacher professional development programs connect students and teachers with the people, places and perspectives of Alberta’s energy sector. And, while their classroom electricity education may take place between Grades 4-12, we hope to inspire today’s students to carry their own bright ideas long into the future.

Grade 4 Social Studies - Alberta - A Sense of the Land • Grade 5 Social Studies - Physical Geography of Canada • Grade 5 Science - Electricity and Magnetism Mechanisms Using Electricity • Grade 8 Social Studies - Geography of Canada and the United States • Grade 7 Science - Heat and Temperature • Grade 9 Science - Electrical Principles and Technologies • Science 10 - Energy Flow in Technological Systems • Science 24 - Understanding Common Energy Conversion Systems • Science 30 - Electromagnetic Energy, Energy and the Environment • Physics 20 - Dynamics • Physics 30 - Forces and Fields Electromagnetic Radiation