

Energy

With the rise of new technologies and devices, the role that energy plays in the daily lives of many people continues to increase in significance. Many different methods of harnessing energy have been developed, each with a unique impact on the environment. Practicing energy conservation, by using low-impact energy sources and high-efficiency devices works to ensure that those who live decades from now can still enjoy the physical world that we do today. It is important to consider the impact that the decisions we make today may have on generations to come.

There are many financial benefits that are a direct result of energy efficiency. Some of these benefits include a less expensive utility bill, increased life of electronics, and a lessened susceptibility to fluctuating energy costs through energy security.

Energy Sources

In 2011, 67 per cent of the energy used by Albertans was produced by coal-powered generators. The remaining 33 per cent came from various sources, including natural gas, hydroelectricity and wind power.

Fossil Fuels

Fossil fuels are materials that have formed inside the earth's crust from fossilized plant or animal remains that have undergone incredible temperature and pressure changes and been transformed into material that stores energy.¹ It takes millions of years for fossil fuels to form and since they are finite and cannot be replenished as fast as they are consumed,² they are considered non-renewable.

Examples of fossil fuels include:

- Natural gas
- Coal
- Oil

Burning these fuels to generate electricity releases gasses, such as carbon dioxide, that are known contributors to climate change and air pollution and have been found to impact human health.³

Did you know?

Renewable energy sources currently provide about 16% of Canada's total primary energy supply.¹⁰

Renewable Energy

Renewable energy sources impact the environment differently than non-renewable resources. Although there is an impact from the building and production of the structure to harness renewable energy sources, once built, the pollution created is minimal and therefore, they release fewer greenhouse gases per unit of energy. Renewable energy is created from natural resources that, if taken care of appropriately, can be naturally replenished within a reasonable amount of time, meaning they are a sustainable source of energy.

Examples of renewable energy sources include:

- Wind turbines
- Hydroelectric dams
- Photovoltaic cells or solar panels
- Geothermal energy
- Biofuel

Greenhouse Gases & Climate Change

Greenhouse gases (commonly known as GHGs) are a form of air pollution commonly created during most energy production, but are especially high in the burning of fossil fuels. They absorb heat radiation that originated from the sun and trap it in the Earth's atmosphere instead of letting it escape into space.

Common examples of GHGs include:

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous Oxide (N₂O)

They occur naturally and play an essential role in creating our moderate climate and living conditions. However, studies show that they are currently present in excess and trapping too much heat and causing climatic instability and a rise in the earth's average temperature. Combined, these phenomena are known as climate change.⁴

Did you know?

Adopting cost-effective and energy-efficient measures such as using renewable energy resources is estimated to save about 6.9 billion barrels of oil and support the creating of approximately 500,000 jobs.¹¹

Some commonly recognized impacts of climate change include:⁵

- Rising sea levels
- Loss of biodiversity
- Spread of pests and diseases
- Changes in seasons
- Increase in severe weather events

In Canada, about 80 per cent of total national GHG emissions are associated with the production or consumption of fossil fuels for energy purposes.⁶ Considering this, and the fact that the majority of Alberta's energy is produced from fossil fuels, the simplest way to reduce GHGs and combat climate change is to reduce energy consumption.



Energy at UAlberta

Envision

Launched in 2012, *Envision* is the next generation of the university's Energy Management Program that has been in operation for over 35 years. It is a multi-million dollar program which implements energy efficiency and conservation measures across campus. The Energy Management Program saved the university \$15.9 million in energy-related fees for the 2010-2011 year alone.

District Energy System

A District Energy System centralizes the production of heating, cooling and electricity for a neighbourhood or community.

In general it is more efficient than having separate systems in each building, because it uses less fuel and reduces maintenance, transportation and distribution costs.⁷ The University of Alberta owns and operates the fifth largest District Energy System in North America. It uses natural gas for fuel which burns with fewer emissions than a traditional coal fired plant. The heating plant, in which the gas is burned, uses cogeneration technology to capture the heat that is emitted as a by-product of electrical generation. This heat that would otherwise be lost, is reused to heat campus buildings.

Did you know?

The District Energy System produces 25% of UAlberta's annual power needs. It also produces and distributes steam, chilled water, compressed air, domestic water, demineralized water, and storm & sanitary drainage services to the university and greater campus area.

Sustainability Enhancement Fund

The Sustainability Enhancement Fund (SEF) is a granting program that encourages and supports collaborative projects that improve the university's operational performance, foster campus engagement, and demonstrate the viability of best practices and technologies. The funds originate from the savings generated from energy efficient projects from the University of Alberta's Energy Management Program.

Since 2011, the SEF contributed to four projects, totaling \$107, 579. One of these was the EcoCar: a cutting-edge, zero emission, and sustainability-focused vehicle that was designed by U of A students! For more information, visit ualberta-ecocar.ca.

Did you know?

There are three types of light bulbs commercially available with variable levels of energy consumption. Light emitting diodes (LEDs) have a life span of 50,000 hours; compact fluorescent light bulbs (CFLs) have a life span of 8,000 hours; while the traditional incandescent light bulb lasts around 1,200 hours.¹²

How to Reduce Your Energy Consumption

Get involved in energy on campus

- **Turn off the lights when you leave a room, or leave them off entirely if there is enough natural light.** In Alberta, lighting can account for up to 10 per cent of energy use in the commercial/industrial sector.⁸
- **Use sustainable modes of transportation** — such as walking, biking, using public transit or carpooling — to travel to and from campus.
- **Reduce and reuse as much as possible.** There is embedded energy in every product we use, so the less we use, the less energy we consume.
- **Learn more and spread the word.** Many organizations such as the [Energy Club](#) host energy-related workshops and presentations.
- **Make a *One Simple Act on Campus* commitment** to reduce your personal impact and adopt new energy saving behaviours. We have identified eight energy efficiency commitments that will help reduce our campus' impact.

Reduce your use of phantom power

Phantom power is electricity that is consumed by electronic devices and appliances when they are not being used, but are still plugged in. Appliances such as cell phone chargers, computers and televisions that are left plugged in account for 10 per cent of the average electricity consumption in Canadian homes.⁹

How you can avoid using phantom power:

- Unplug electronic devices when not in use or as soon as they are fully charged
- Purchase energy efficient electronics
- Use a power bar to plug in multiple devices and turn the power bar off when the appliances are not in use.
- Green your computing practices:
 - Adjust the energy-saving settings on your computer and set your standby time to the shortest time that suits your individual needs.
 - Dim the monitor and do not use screen savers (not only will this save power, but it will help your laptop battery last longer)
- Limit the number of electronic devices you purchase

Purchase Carbon Offsets

Carbon offsets are a way for individuals and businesses to take responsibility for the emissions that their activities create. Carbon offsets fund a variety of projects like the construction and operation of wind farms or planting trees. The projects funded either use up carbon from the atmosphere or prevent the emission of additional greenhouse gases. Generally, they are best purchased after efforts have been made to reduce emissions to cover the remainder of the impacts.

It is important to remember that not all offset projects are created equal, so if you decide to purchase offsets, it is valuable to research the projects that they buy from or operate.

Some places you can purchase carbon offsets:

- **Bullfrog Power** is a Canadian company whose green electricity comes from low-impact-certified wind and hydro facilities.
- **Less** is a Canadian company that makes it easy for businesses and individuals to offset their carbon footprint.
- **myclimate** develops and supports projects around the world that directly reduce greenhouse gases. Supported Certified Emission Reduction projects are official projects of the Kyoto Protocol-regulated Clean Development Mechanism, Gold Standard certified, and contribute to sustainable development in the project regions.

“We simply must balance our demand for energy with our rapidly shrinking resources.

By acting now we can control our future instead of letting the future control us.”

– Jimmy Carter

- **The Carbon Neutral Company** works to ensure that their programs are credible and have integrity. Their three major shareholders specialise in environmental technology and sustainable financing.
- **The Gold Standard** does not sell offsets itself as it is a third- party certification body, but it has links to key market actors who sell Gold Standard credits on each continent.

Online Resources

- **B.C. Hydro Appliance and Light Calculator** shows you how much energy each of your household appliances uses, and can help you see how much each one contributes to your electricity bill.
- **Beating High Energy Costs** gives you tips on how to save energy and cut your electrical bill costs. It has information on new products and different energy sources.
- **Treehugger** is an informative blog that features an entire section on energy. It updates regularly and has the latest stories on new technology developments, oil companies, policies, etc.

Did you know?

The David Suzuki Foundation, in partnership with the Pembina Institute, has published a manual called *Purchasing Carbon Offsets: A guide for Canadian Consumers, Businesses and Organizations* with a complete checklist of what makes high quality offsets.



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