Introduction to Solar Electricity

Re-Energy
Activity
Grade Level 6-12

Main Objectives

Learners will learn about the solar heat energy and how it can be harnessed in various technologies.

Learning Outcomes

By the end of this activity, learners will:

- Identify how solar heat can be converted into electricity
- Understand how photovoltaic cells function in converting solar heat into electricity
- Identify application of solar electricity in daily life
- Learn about the solar electricity projects in Indigenous communities across Canada

Curriculum Connections

Alberta

Science 7: Heat and Temperature
Science 9: Electrical Principles and Technologies
Science 10: Energy Flow in Technological Systems
Science 14: Understanding Energy Transfer Technologies
Science 24: Understanding Common Energy Conversion systems
Science 30: Energy and the Environment (D1.4, D1.5k, D1.3s, D2.3k. D2.4k. D2.1sts, D2.3s, D2.4s)

Ontario

Science & Technology 6: Electricity and Electrical Devices (1.1)
Science & Technology 7: Heat in the Environment (1.2)
Science 9: The Characteristics of Electricity (Academic) (E1.2)

- Electrical Applications (Applied) (E1.1)

Environmental Science 11: Scientific Solutions to Contemporary Environmental Changes (U/C Preparation) (B1.2)

- Conservation of Energy (U/C Preparation) (F1.1)
- Energy Conservation (Workplace Preparation) (D1.2)

Physics 11: Electricity and Magnetism (F1.2)
Physics 12: Energy Transformation (E1.1, E1.2)
Chemistry 12: Energy Changes and Rates of Reaction (D1.1)

Length of Activity

1 hour

Materials List

Internet-enabled device
Introduction to Solar Electricity Backgrounder

Procedure

Step 1: Distribute the Solar Electricity Backgrounder.

Step 2: In groups or individually, discuss the following questions:

1. List all the appliances in your home, school or neighbourhood that have a photovoltaic cell or array on them.
2. What are the advantages of solar electricity over electricity made from fossil fuels, nuclear fuels, or hydroelectricity?
3. What are the problems or disadvantages of solar electricity?

Step 3: Watch this documentary about the solar farm project in the Indigenous community of Fort Chipewyan by the Three Nations Energy: https://www.youtube.com/watch?v=BxTYNlC-NCk

Step 4: After watching the documentary, answer the questions below:

1. What role can solar power electricity play in the electrification of remote communities in Canada?
2. What are the benefits of transitioning to solar electricity in remote communities of Canada vs. relying on diesel?
3. Can you think of challenges that reliance on diesel energy might pose in remote communities? (Hint: explore the concept of energy poverty)
4. How does solar electricity align with the teachings of Indigenous peoples of sustainability?
5. What are some key takeaways from the success of the solar farm project in Fort Chipewyan?
6. How can we learn from Indigenous communities across Canada taking leadership in transitioning towards clean energy technologies?

Additional Resources

1. Three Energy Nations: https://www.3ne.ca/
2. Green Energy Futures: https://www.greenenergyfutures.ca/
3. Indigenous Clean Energy: https://indigenouscleanenergy.com/