Discovering Renewable Futures - Curriculum Connections

Suggested Grades: 3-10
Curriculum Connections: Earth Systems (Gr 3-6), Energy (Gr 5-6), Interactions & Ecosystems (Gr 7), Plants for Food and Fibre (Gr 7), Heat & Temperature (Gr 7), Mechanical Systems (Gr 8), Fresh & Saltwater Systems (Gr 8), Electrical Principles and Technologies (Gr 9), Energy Flow in Technological Systems (Science 10), Energy Flow in Global Systems (Science 10), Understanding Energy Transfer Technologies (Science 14)

Specific Learning Outcomes:

Grade 3

- *Earth Systems* - Students analyze changes in Earth's surface and explain how its layers hold stories of the past (human activities can change Earth's surface, link to electricity generation).

Grade 4

- *Earth Systems* - Students investigate the systems of Earth and reflect on how their interconnections sustain life (atmosphere - connect to greenhouse gases).

Grade 5

- *Energy* - Students investigate how forces can act on objects without contact (magnetism is used in electricity generation).
- *Earth Systems*
    - Students investigate the systems of Earth and reflect on how their interconnections sustain life (Impact of sunlight on organisms/biomass, natural resources, conservation).
    - Students analyze climate and connect it to weather conditions and agricultural practices (Climate is the long-term weather patterns of a region over a period of at least 30 years).

Grade 6

- *Energy* - Students investigate and analyze various energy resources.
- *Earth Systems* - Students investigate climate, changes in climate, and the impact of climate change on Earth (relate electricity to greenhouse gas emissions).

Grade 7

- *Interactions & Ecosystems* - Students will investigate and describe relationships between humans and their environments, and identify related issues and scientific questions (Human impacts on ecosystems).
- *Plants for Food & Fibre* - Students will investigate plant uses; and identify links among needs, technologies, products and impacts (Biomass energy).
- *Heat & Temperature* - Students will illustrate and explain how human needs have led to technologies for obtaining and controlling thermal energy and to increased use of energy resources (Examples of personal and societal choices in using energy resources and technology).

Grade 8

- *Mechanical Systems* - Students will analyze the social and environmental contexts of science and technology, as they apply to the development of mechanical devices (Illustrate how technological development is influenced by advances in science, and by changes in society and the environment).
- *Fresh & Saltwater Systems* - Students will analyze human impacts on aquatic systems; and identify the roles of science and technology in addressing related questions, problems and issues (Human water uses - connect to hydropower).

Grade 9

- *Electrical Principles and Technologies*
    - Students will investigate and interpret the use of devices to convert various forms of energy to electrical energy, and electrical energy to other forms of energy (Identify, describe, and interpret examples of mechanical, chemical, thermal, electrical and light energy; investigate and describe evidence of energy transfer and transformation).
    - Students will describe and discuss the societal and environmental implications of the use of electrical energy (Evaluate sources of electrical energies; identify examples of electrical technologies and evaluate in terms of benefits and impacts).

Science 10

- *Energy Flow in Technological Systems* - Students will analyze and illustrate how technologies based on thermodynamic principles were developed before the laws of thermodynamics were formulated (Describe current and past technologies used to transform energy)
- *Energy Flow in Global Systems*
    - Students will describe how the relationships among input solar energy, output terrestrial energy and energy flow within the biosphere affect the lives of humans and other species (Affects of climate change, greenhouse effect).

    - Students will investigate and interpret the role of environmental factors on global energy transfer and climate change (Human actions play a role in climate change)

Science 14

- *Understanding Energy Transfer Technologies* - Students will describe and compare simple machines as devices that transfer energy and multiply forces or distances (Explain the need to encourage and support the development of machines that are efficient and rely upon renewable energy sources)