



YOUNG MINDS ENERGY TOOLKIT

For Children and Youths



ELECTRICITY
LAWYER



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ALL ABOUT ENERGY

Energy is an element we experience every day and cannot escape; there is energy in the sun that shines, the seas, vegetation, and even in animals. Energy is simply the life-source of several of earth's components, therefore, it is important to understand its scope and usefulness in our daily activities.



Energy can be defined as the strength and vitality we need for sustained physical or mental activities, basically, it is the ability to do work; and this applies to not just human beings but also animals, plants, and equipment.

Think of a car, it cannot move on its own without an act done by its driver. What the driver does – usually inserting his or her car key into the ignition of the car, – is what gives the car the energy it requires to start and move. The movement of the car is also fueled by a source of energy.



What this shows us is that every function performed by human beings, animals, plants, and equipment depends on some form of energy which could be:



Fig I: Heat Energy



Fig II: Mechanical Energy



Fig III: Electrical Energy



Fig IV: Chemical Energy



Fig V: Nuclear or Atomic Energy

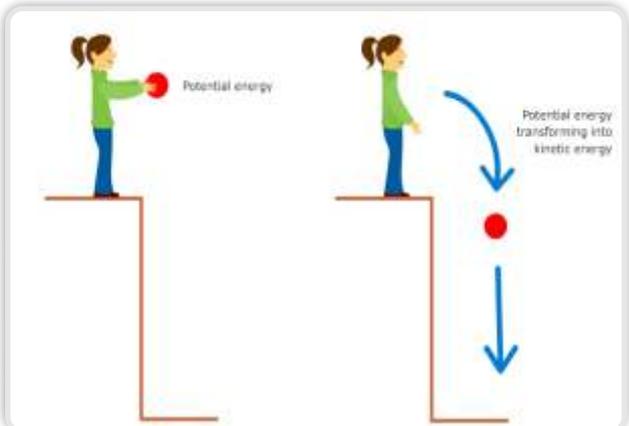


Fig VI: Kinetic and Potential Energy

What is Electrical Energy?



Electrical energy is one of the most used forms of energy. We use electricity in our homes, schools, places of work, hospitals, etc. Mankind today, is dependent on using electricity to ensure our productivity from day to day.

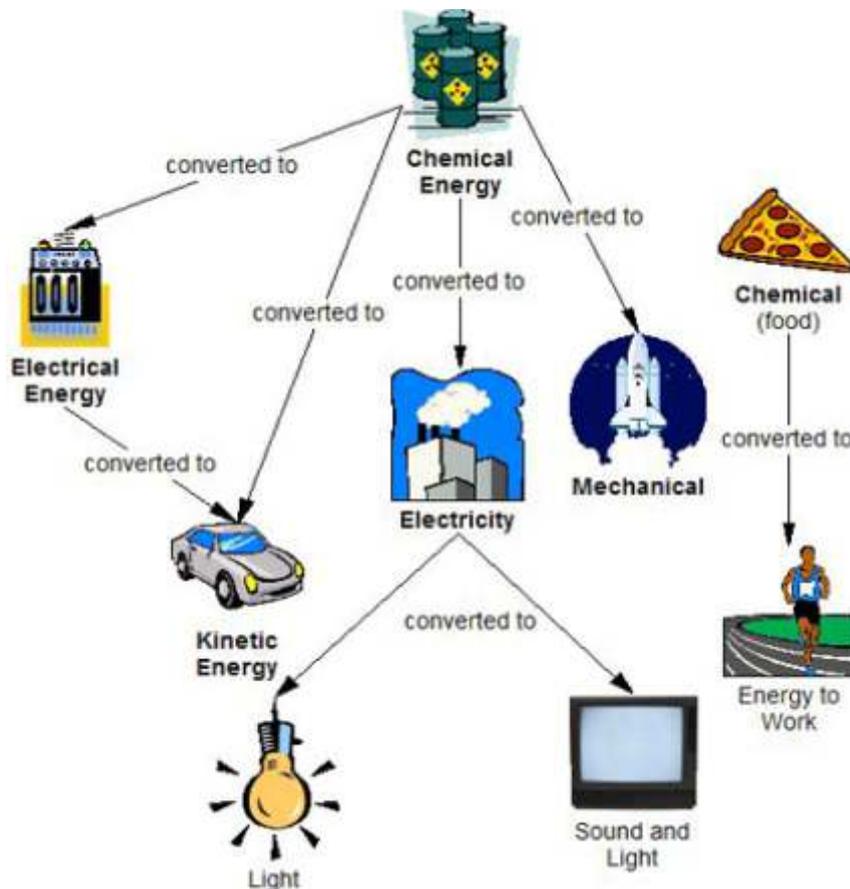
Electrical energy is, however, only a secondary source of energy as it is produced by:

Converting primary sources of energy such as coal, natural gas, nuclear energy, solar energy, and wind energy



Electrical Energy

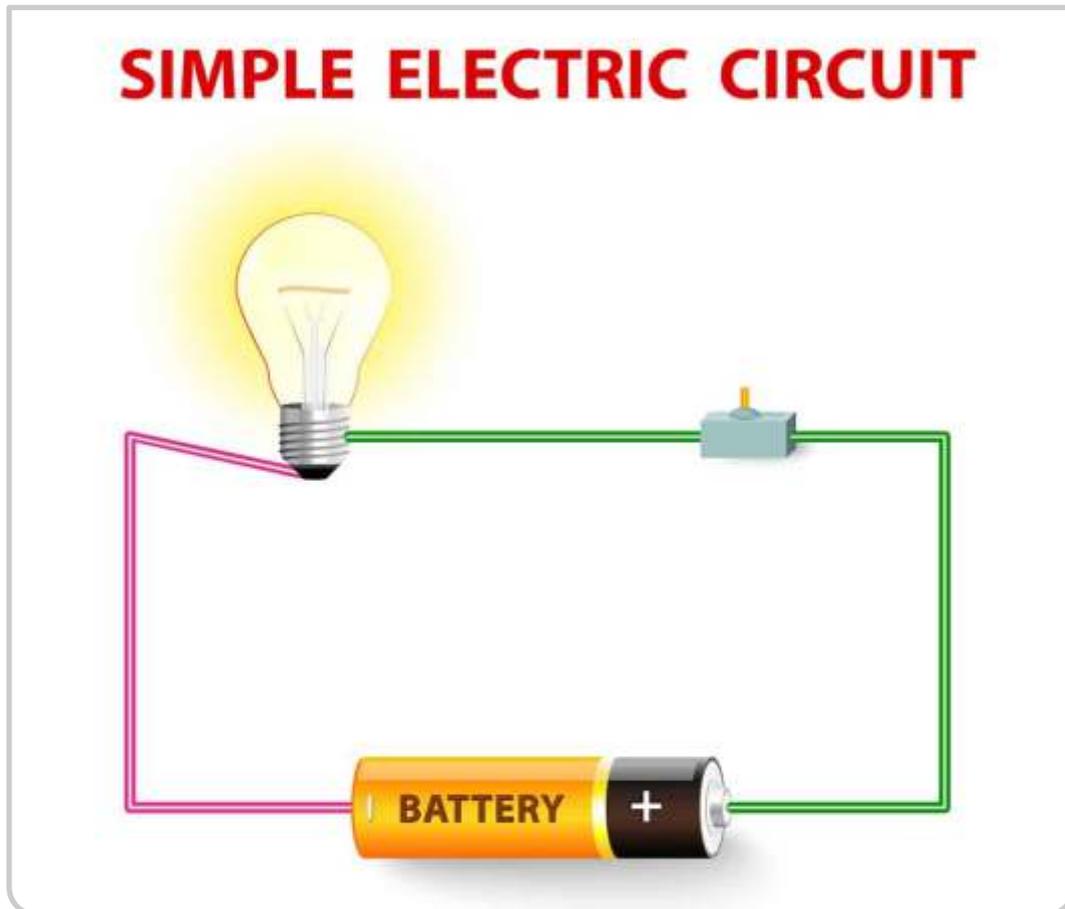
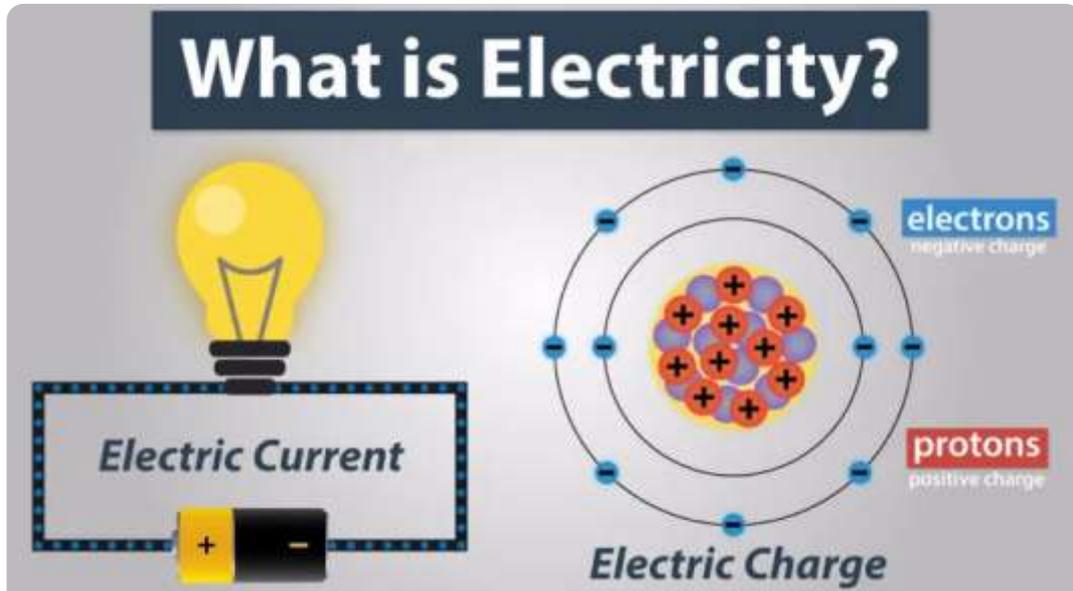
Electrical energy is also referred to as an energy carrier, which means it can be converted to another form of energy. For example, kinetic energy which is the energy an object or particle generates by reason of its motion or movement from one place to another. See the following illustration below:



What is Electrical Energy?

Electricity is a form of energy derived from the movement of electric charges within a circuit. These electric charges contain protons which carry positive charges and electrons which carry negative charges.

See the following illustration below:



USES OF ENERGY

There are various forms in which energy gets used in our households, schools, places of work, etc. These include:

I. Residential Usage

This involves the most basic form of energy use within our homes. Energy is often used residentially for watching television, washing clothes, heating, and lighting the home, taking a shower, working from home on your laptop or computer, running appliances and cooking.



II. Commercial Usage

This involves the use of energy to support commerce or businesses. Such commercial use of energy would include mechanical energy and electric power used by companies and businesses to run their trade.



III. Transportation

We need energy on the roads, sea and air for our transportation. Diesel, petrol (gasoline) and Liquefied Petroleum Gas are typically used for land transportation, heavy fuel oil (HFO) and diesel for sea transportation and aviation fuel (jet fuel/kerosene) for air transportation.



IV. Industrial Usage

Energy is also needed for the operation of machinery and appliances which are used across different economic sectors to produce finished goods or services.



V. Power Generation

Electrical energy is an important form of energy and to generate electricity, energy resources such as coal, diesel, hydro, wind, and solar energy are often required to produce the electricity which powers our homes, offices, etc.



CHILDREN AND YOUTHS AS ENERGY AMBASSADORS

Energy Ambassadors are high-profile individuals tasked with speaking out about the importance of clean energy and using different sources of energy to produce energy.

Children and young people as energy ambassadors are required to understand energy generation and energy efficiency, the relationship between energy and climate change, provide actions they can take to help themselves (and their parents) reduce their contribution to carbon emissions and know the climate career options available to them in the future.

Key Themes for Children as Energy Ambassadors

On the path to becoming energy ambassadors, children and youths must understand the following concepts:

I. Energy Production and Renewable Energy



II. Energy Production and Climate Change



III. Green Energy Career Opportunities



IV. Energy Generation and Efficiency



the carbon footprint



Energy Production and Renewable Energy

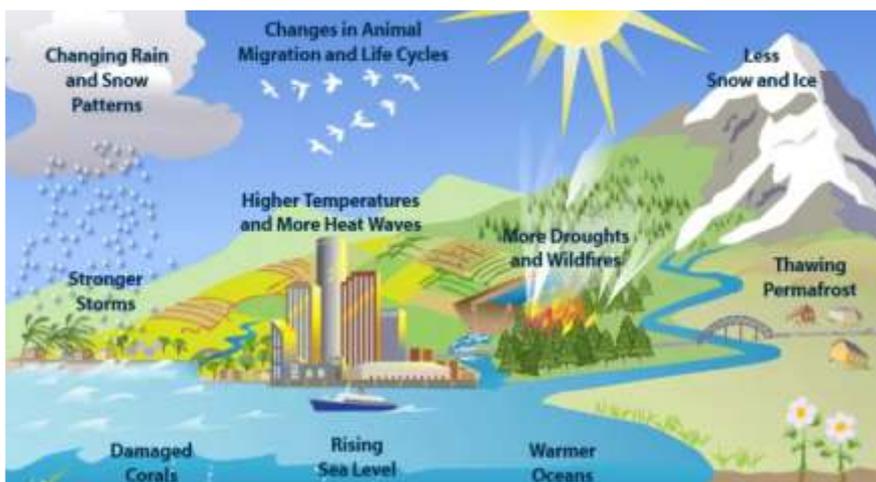
Renewable energy is a form of clean energy; it comprises energy resources that are infinite in nature, i.e., these resources are always replenished upon usage. These renewable energy resources include hydro, wind, solar, biomass resources, etc. In advanced countries such as China, India and the United States of America, these resources form part of the energy mix and help these countries reduce what is known as carbon emissions in their energy production.

Carbon or CO₂ emissions are carbon dioxides which are often released into the atmosphere when energy production is made from non-renewable or thermal energy resources such as coal or natural gas. See the following illustration below:



Energy Production and Climate Change

Climate change refers to regular changes in the global atmosphere which could last for centuries (100 years) or even a millennium (1000 years).



Carbon emissions is viewed universally as the major reason for the recent climate change impacts experienced throughout the world and as a result, countries that have signed the Paris Agreement which is an offshoot of the United Nation's Framework Convention on Climate Change (UNFCCC) have pledged to reduce their net carbon emissions to zero by 2050.



These pledges have been made to ensure that by 2050, the world is free of carbon emissions and climate change impacts are reduced.

Green Energy Career Opportunities

There are various career opportunities associated with clean energy that children and youths can aspire to make a living off. These career opportunities include the following:

Soil and Plant
Scientist

Public Relations
Specialist

Construction
Managers

Electricians

Arbitration, Mediation,
and Conciliation Experts

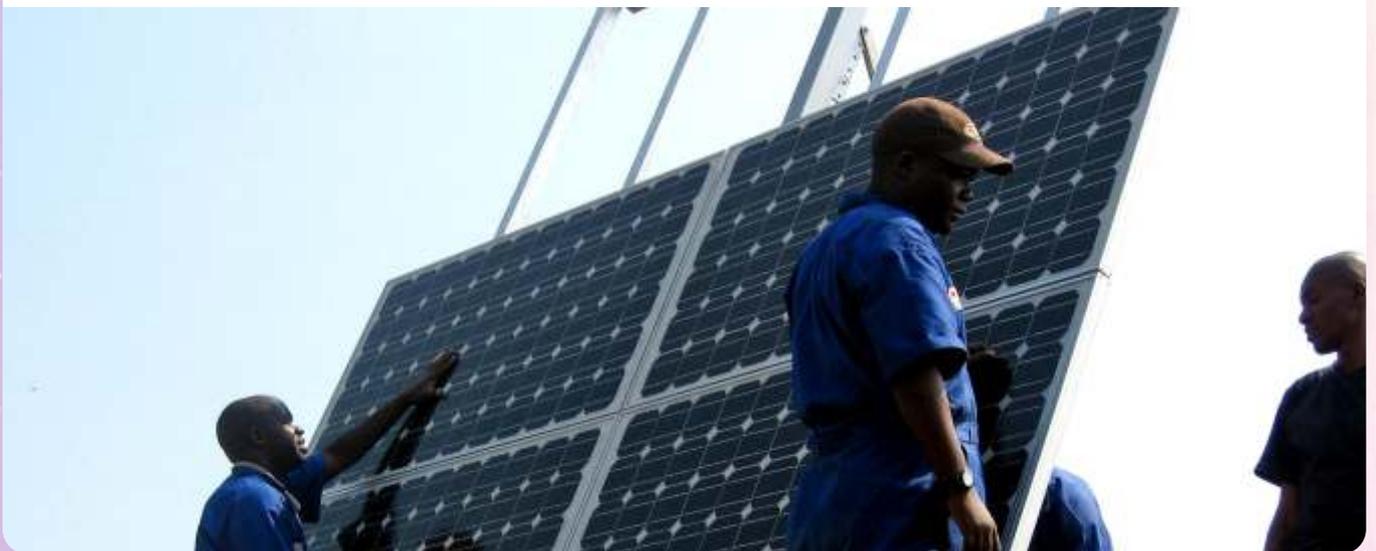
Environmental
Engineering

Industrial
Engineers

Architecture
and Design

Wind Turbine
Service Technicians

Solar Photovoltaic Installation
and Maintenance



Energy Generation and Efficiency

As much as we need oxygen to survive, mankind currently also requires energy to be as efficient as possible as it relates to our daily activities. Although there are territories in parts of the world where clean energy has not been experienced, it is without doubt that with the introduction of such energy, the benefits to be realized will cut across residential, commercial and industrial parameters.

Energy generation is the process through which energy is created. Energy generation is necessary for increased societal efficiency in not only the production of goods and services but also for our standard of living.

Reduction of Carbon Emissions

While countries have pledged to reduce their carbon emissions to net zero by 2050, it must be noted that the level of action required for countries to achieve that goal is not a duty for the government alone to adhere to, but also the governed. There are individual actions we take that contribute to the national carbon emission rate in our countries; some of these include burning trash around our homes instead of recycling, dumping wastes on the road, and using generators to power our homes.

What then are the things we can do to help reduce our carbon footprints?

Turning off lights at home when you are not using them

Adding solar panels to the roofs of our homes if financially possible

Properly disposing our trash

Volunteer for environmental cleaning activities

Using energy saving light bulbs in our homes

Eating locally produced and organic food

Limiting and recycling waste

Using public transport instead of cars to go from one place to another

Advocating for the use of alternative energy sources such as wind, hydro and solar where possible.

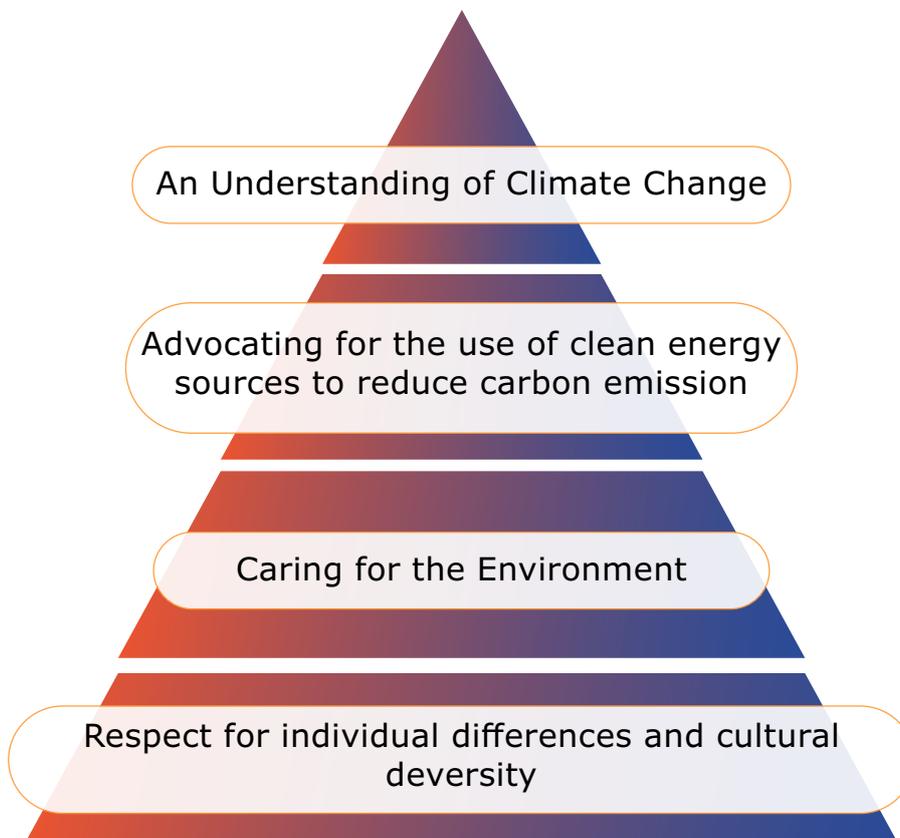
Planting trees in our homes



RESPONSIBILITIES AS CLEAN ENERGY AMBASSADORS



Children and youths have obligations as energy ambassadors. These obligations are necessary for the promotion of clean energy across the globe and include the following:



I. Understanding Climate Change

Climate change is also called global warming and it is the process of our planet heating up to extents that may be harmful to humans, animals, and vegetation. With climate change, our weather becomes more extreme and unpredictable.



As an energy ambassador, children, and youths should understand what causes climate change, how climate change will affect the planet, how people are coping with climate change, and how we can help prevent climate change.

Some of the causes of climate change include:

Burning of fossil fuels such as; oil and gas which become invisible elements that trap heat from the sun and release this heat into the earth, warming it. These 'invisible elements' are known as greenhouse gases.

Deforestation which is the cutting down of trees and plants that absorb carbon dioxide and release oxygen. These trees and plants breathe in carbon dioxide which is harmful to the environment and release oxygen instead; however, with the increase of deforestation around the world, we lose out on a means to limit climate change.

Carnism: Carnism is the belief in eating meat animals to satisfy hunger. This practice is popular across Sub Saharan Africa but actually contributes to climate change – when land is used to raise animals instead of crops, deforestation usually happens so needed space can be created for animals. Also, the heat often used in many homes to cook or fry meat releases greenhouse gasses into the atmosphere.

When climate change occurs, some of the effects which the earth will experience include increased rainfall, rapidly changing seasons, shrinking sea ice, and rising sea levels which can cause destructive erosion.

Climate change will also place animal habitats at risk – polar animals like bears, seals, owls, hares, and wolves will eventually end up losing their icy homes to the global heat temperature; also, animals living in forests may lose their habitats due to increasing bushfires.

Farming communities across Sub-Saharan Africa, amongst other regions of the world will also be affected by higher temperatures, increased rainfall, flood, and drought which will make it difficult for agriculture which is the backbone of the region to be sustainable. These weather conditions will also become more unpredictable.

Some ways children and youths can help limit climate change start from the home – telling your parents to switch to energy-saving lightbulbs, using other means of transportation like a bicycle or walking instead of a car that releases these harmful gases, turning off electronics in your home when they are not being used, recycling and reducing your food waste, trying vegetarian meals like cabbage, carrot, potatoes, and other fruits.



Tip: Get your family to start a light bulb challenge at home by recording and rewarding those that turn off the energy-saving light bulbs frequently and the number of times the light bulbs are turned off when not in use.





II. Advocating for the use of Clean Energy Sources to reduce Carbon Emissions

Many of the resources used to produce energy that lights up our homes or make cars function, are harmful to the environment. These resources are mostly fossil based like natural gas, coal and oil which produce thermal (heat) energy. When used, these resources create greenhouse gases that increase warming in the atmosphere and result in climate change.

However, there are clean energy sources which when used to produce electricity or make home appliances work, produce no harmful gases. These resources produce what is known as green (clean) energy. They include solar energy, wind energy, and hydro energy.

As an energy ambassador, children and youths must use all resources available to them to spread awareness in their communities and schools about clean energy and its importance to the environment. Clean energy should be used in our daily lives if the effects of climate change are to be limited.



Tip: Encourage your family members and friends at school and in your community to become Energy Ambassadors and have a copy of this toolkit with them to keep spreading the word and educating other children and youths. Go a step further and encourage your school to create an Energy Ambassadors programme in your school curriculum with support from EL.



Fig I: Solar Energy



Fig II: Wind Energy



Fig III: Hydro Energy



III. Caring for the Environment

Caring for the environment as an energy ambassador involves standing against things that cause dirt to the environment (land, sea, and air). Air pollution from cars, marine (sea) pollution from animal dung or waste dumping, and land pollution must be decreased if we are to save the environment and reduce climate change effects. One of the best ways to care for the environment is to recycle and reduce our wastes.



Tip: Children and Youths can set up recycling stations at their homes (where unavailable). Once the recycling packages are full, they can either be picked up by sanitation agents or dropped off at the main recycling plants and sometimes, a monetary token is paid to people that recycle waste.



IV. Respect for individual differences and cultural diversity

As an Energy Ambassador, you must respect the opinions of others and not discriminate against them based on their beliefs about clean energy or the state of their communities.

Clean energy may not be accepted at first in some communities until the benefits are seen, which is why energy ambassadors must lead by example, adopting clean energy and climate change limitation measures within our homes.



Tip: Create a poster and paste around your home highlighting clean energy measures that should be practiced by your family.



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All image sources have been referenced accordingly.

Available at

<https://www.blogger.com/blogin.g?blogspotURL=https://elperchero3.blogspot.com/2017/05/energy-in-our-planet.html&type=blog>

Oxford Dictionaries. Available at

https://www.google.com/search?q=definition+of+energy&rlz=1C1JZAP_enNG901NG901&oq=definition+of+energy&aqs=chrome.69i59j0i512l6j69i60.7428j1j9&sourceid=chrome&ie=UTF-8

See U.S. Energy Information Administration (EIA), Forms of Energy. Available at

<https://www.eia.gov/energyexplained/what-is-energy/forms-of-energy.php> ; Britannica, Energy. Available at <https://www.britannica.com/science/energy>

Britannica, Kinetic Energy definition. Available at

https://www.google.com/search?q=kinetic+energy&rlz=1C1JZAP_enNG901NG901&oq=kinetic+energy&aqs=chrome..69i57j69i59l2j69i60l3j69i61l2.2878j0j9&sourceid=chrome&ie=UTF-8

John A. Dutton, e-Education Institute, Energy Conversion. Available at <https://www.e-education.psu.edu/egee102/node/1906>

Howtomechatronics, What is Electric Charge and How Electricity Works. Available at

<https://howtomechatronics.com/learn/electricity/electric-charge-how-electricity-works/>

Also see Jack Dawson, The Different Uses of Energy in our Daily lives. Renewable Energy World, 2015.

Available at <https://www.renewableenergyworld.com/energy-efficiency/the-different-uses-of-energy-in-our-daily-lives/#gref> ; Energy and its uses, Anirudh Singh. March 2018. Morgan & Claypool Publishers.

Available at <https://iopscience.iop.org/book/978-1-6817-4901-3/chapter/bk978-1-6817-4901-3ch1>

361 Community Energy, Children & Climate Action. Available at <https://361energy.org/portfolio-items/children/>

Insider, 21 high-paying careers for people who want to save the planet — and also have job security. April 2021. Available at <https://www.businessinsider.com/high-demand-renewable-energy-jobs-of-the-future-2019-8?r=US&IR=T>

See COTAP, 25+ Ways to Reduce Your Carbon Emissions. Available at <https://cotap.org/reduce-carbon-emissions/#:~:text=Alternatives%20to%20drivingWhen%20possible%2C%20walk,always%20mean%20ow%20CO2%20emissions>

See 361 Community Energy, Children & Climate Action. Available at <https://361energy.org/portfolio-items/children/>

PETA, How does eating meat harm the environment? Available at <https://www.peta.org/about-peta/faq/how-does-eating-meat-harm-the-environment/> ; Future Learn, Is eating meat bad for the

environment? Available at <https://www.futurelearn.com/info/blog/eating-meat-bad-for-environment#:~:text=Meat%20consumption%20is%20responsible%20for,The%20destruction%20of%20forest%20ecosystems.>

Mckinsey, Winning in African Agriculture. February 2019. Available at

<https://www.mckinsey.com/industries/agriculture/our-insights/winning-in-africas-agricultural-market#:~:text=Agriculture%20in%20Africa%20has%20a,full%20agricultural%20potential%20remains%20untapped.>

National Geographic Kids, What is Climate Change? Available at

<https://www.natgeokids.com/uk/discover/geography/general-geography/what-is-climate-change/>

NRDC, Renewable Energy: The Clean Facts. June 2018. Available at

<https://www.nrdc.org/stories/renewable-energy-clean-facts>