

Energy resources

Energy may be non-renewable or renewable.

Non-renewable forms of energy

Non-renewable energy comes in many forms – fossil fuel, coal, natural gas, tar sands, oil shale and nuclear energy. Most of these sources of energy were formed by natural biological and geological processes over millions of years. The source of these forms energy is **finite**.

Even coal, the dirtiest fuel and most abundant with an estimate of 12 600 billion tonnes, will be recoverable over 1700 years at the current rate of consumption.

Nuclear power is non-polluting but it is the most expensive of the major sources and has several drawbacks such as safety and health implications, unresolved waste disposal problems and low social acceptability especially in the light of Chernobyl and Fukushima accidents.

Much hope is pinned on nuclear fusion where two hydrogen atoms are made to fuse under high temperature (hundreds of millions °C) to form a slightly higher helium atom with the release of enormous amount of heat. It is hoped that the heat could be harnessed to generate electricity.

Currently energy from fossil fuel, coal, natural gas are the ones on which industrialised societies have been built. Should the supply of these forms of energy be discontinued, supply of electricity will stop; industry, transport would come to a standstill and the comfort and easy social networking which form the very fabric of our well-being will disappear.

The developing countries are increasing adopting the same energy sources for their growth and development.

Renewable forms of energy

Renewable energy are derived from wood and other form of **biomass** which comprise **solid fuel** such as wood, and **liquid fuel** such as ethanol from maize, sugar cane and beet root and **biodiesel**, a diesel made from vegetable oils. Other

important forms of renewable energy are derived from solar energy, hydropower, wind energy, geothermal energy, waves and tides and hydrogen fuel. In the Republic, solar and wind energy are among the most promising.

Solar energy options

We are initial stages of a world powered by sun, wind, hydro, biomass and other

renewable energy sources. The technology will allow this in gradual steps

of development and decrease in cost. While solar energy is strictly finite, it is so abundant and clean that it will be the major contributor to world energy supplies.

Active solar systems include systems such as solar water heaters.

Passive solar heating include houses designed to heat space inside the house

using greenhouse effect, especially where the winter is cold.

Photovoltaics (PVs) provide a way of generating electricity from sunlight. The cost of using solar panels is high but it is gradually going down.

Solar thermal electric systems use sunlight to heat water to generate steam which turns a turbine to generate electricity.

Wind energy

About 2 % of the sun's energy striking the Earth surface is converted into wind. Wind energy is clean, abundant and fairly

inexpensive. However, because wind is intermittent, backup systems and storage are required.

Energy considerations in the Republic

Mauritius imports all of its fossil fuels to meet its energy needs. In 2009, the imported fuel was 82.5%. The remaining

needs (17.5%) were met from local renewable sources such as bagasse, hydropower, wind and fuel wood.

Changes in energy consumption and generation (1999-2009)

- 5% decrease in the energy from locally available renewable energy sources.
- 8% to 27% increase in coal import. In 2009, coal met 25% of energy requirements.
- For 2009, 48.4% of energy consumption is attributed to transport, 27.7% to manufacturing and 14.0% to household.
- Renewable energy has stagnated against a steady growth in energy requirement.

Target over the period 2010-2025

The long-term target for meeting energy needs as a mix of renewable and non-

renewable is as follows:

Fuel Source		Percentage of Total Electricity Generation			
		2010	2015	2020	2025
Renewable	Bagasse	16%	13%	14%	17%
	Hydro	4%	3%	3%	2%
	Waste to energy	0	5%	4%	4%
	Wind	0	2%	6%	8%
	Solar PV	0	1%	1%	2%
	Geothermal	0	0	0	2%

	Sub-total	20%	24%	28%	35%
Non-Renewable	Fuel Oil	37%	31%	28%	25%
	Coal	43%	45%	44%	40%
	Sub-total	80%	76%	72%	65%
TOTAL		100%	100%	100%	100%

Source : MID

Sustainable energy systems

The foundations of a sustainable energy system are *Conservation and Renewable Energy*.

Energy conservation

Energy is used wastefully in all nations. Minor changes in our life style can contribute to considerable increase in energy efficiency. For example, at home the following actions can cut down the electricity bill considerably:

- shutting off lights, television and other electric/electronic equipment and device when not in use,
- using compact energy saving light bulbs or the more efficient led bulbs
- driving within speed limit, keeping vehicles tuned up and properly inflated,
- using public transport, car-pooling, walk or use a bike
- planting trees around the house for cooling,
- using light reflecting colours for external surfaces,
- taking into consideration the movement of the sun and the prevailing SE'ly winds when building houses,
- using solar water heaters,
- using photo voltaic for some of the essential uses.

Promoting energy efficiency

Energy efficiency is needed at individual, business and government levels. Many options are available for the promotion of such efficiency:

- (i) education
- (ii) subsidies for solar and wind-generation equipment
- (iii) taxes, applied selectively
- (iv) encouraging research and providing living examples
- (v) government-mandated efficiency standards and application to its own ways
- (vi) voluntary programmes
- (vii) changes in pricing that encourages energy saving devices,
- (viii) drawn in the private sector

Current policies (from MID)

The following documents have been listed as relevant to the current situation and

level of implementation:

- MID Green Paper, 2011
- Outline Energy Policy 2007, MPU
- Long Term Energy Strategy, 2010 Ministry of Energy
- Renewable Energy Master Plan, 2011 , Ministry of Energy
- Long-Term Transport Strategy Document, 2011, Ministry of Land Transport
- Energy Statistics 2009, CSO
- Blueprint for the Energy Sector, 2010, NESC
- CEB Strategic Plan
- Energy Efficiency Act
- Building Code Bill
- Environment Protection Act
- Road Traffic Act
- Town and Country Planning Act
- Planning Development Act
- Business Facilitation Act
- Morcellement Act

ADD's actions

ADD's actions primarily include:

- (i) Contribution to **policy formulation** by participation in relevant group meetings where NGOs have been associated
- (ii) **Sensitisation** – either from its own resources or through projects, the Association has systematically run courses for school children on aspects of energy and especially explaining how they could contribute towards conservation.
- (iii) Development of a **flyer on energy resources**

Glossary

Energy resources

Energy is the ability to do work. Energy is all around us. We see it as movement, heat, light, sound, radio waves and more. In ancient times people used wind to sail ships and grind grain. A century ago

falling water was used for the first time to make electricity. Today, we get energy from different sources and use it in new and different ways.

Fossil fuel

Coal, oil and natural gas are fossils fuels. They were made millions of years ago from plants and animals which

decomposed under extreme heat and pressure. The type of fossil fuel depends on the nature of the plant or animal

Non-renewable energy

Non-renewable energy like the fossils fuels once consumed cannot be converted

back. The amount of such energy is limited.

Renewable energy

Renewable energy is generated from natural resources such as sunlight, wind, rain and tides. These sources are considered

renewable because they quickly replenish themselves and are usually available in a never-ending supply

Photovoltaic

Photovoltaics (PV) is a method of transforming solar radiation into electric power using solar panels that have semiconductors, a substance, as silicon or

germanium, with electrical conductivity. They are often considered as a sustainable source of energy and is third most used renewable energy after hydro and wind power.

Energy conservation

Energy conservation implies reduction in energy use as a conscious effort. Using the

bicycle or walking for an errand is saving energy or conservation.

Energy efficiency

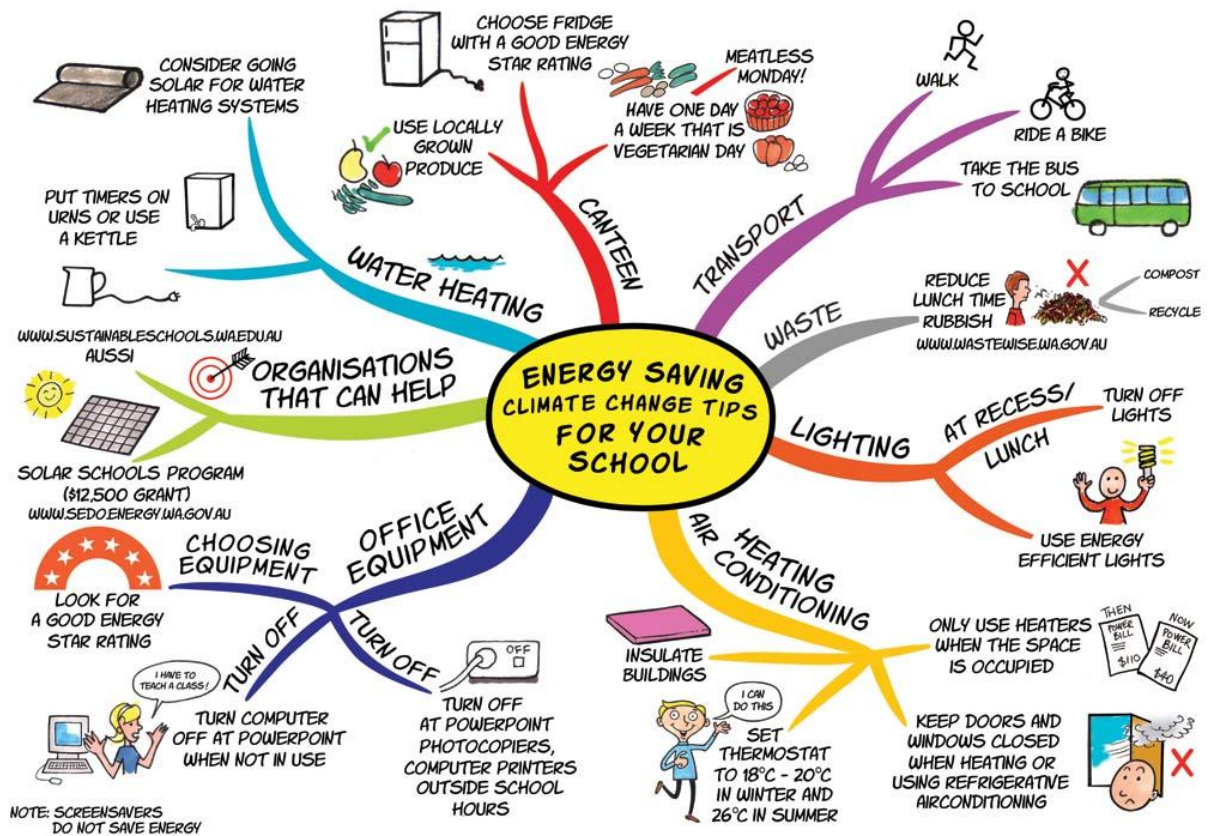
Energy efficiency refers to the use of less energy for a specific activity. A car that

uses less fuel than another for the same journey is fuel efficient

Energy saving

Energy conservation and efficiency are different techniques for reducing energy

consumption. A few ways of saving energy is given in the figure below:



Questions

1. Name the five principal sources of renewable energy.
2. The use of renewable energy aggravates global warming. *True or False?*
3. The use of non-renewable energy aggravates global warming. *True or False?*
4. What source of energy used today is among the oldest?
5. What is the tem used for non-renewable energy most used today?
6. Name five ways energy can be saved at home?