



PROTECT THE PLANET

Study circle



ENERGY: ORIGIN AND IMPACT ON THE ENVIRONMENT

This guide has been designed to help Centres/Groups of the Sathya Sai International Organisation (SSIO) facilitate a study circle on the topic of Energy. It has been developed to be delivered in two parts. This is part 2, having a duration of one hour.

Part 2 will cover: *The various sources of energy, including renewable vs. non-renewable sources and the impact of energy use on the environment.*

PART 2

OPENING AND INTRODUCTION			
ACTIVITY	NOTE TO FACILITATOR	RESOURCES	DURATION
3 OM's or silent sitting followed by an opening prayer	Whether Omkar or a minute of silent sitting is used depends on the audience this study circle is being delivered to. Either way, the objective of this activity is to help settle the group and establish group dynamics. This is the same for whether a prayer or short reading is used.		1 MIN
Introduce today's topic	<p>This study circle is part of the Serve the Planet (STP) initiative of the SSIO and is based on the theme 'Protect The Planet' with a focus on 'Energy.'</p> <p>In Part 1 of the study circle 1, we were able to understand various forms and sources of energy, how energy permeates everything and that it is one of the greatest gifts endowed to us by God.</p> <p>The purpose of this study circle is to help us have a deeper understanding of the various sources of physical energy, and the impact they have on the environment, guiding us to start thinking about how to reduce our energy footprint and conserve non-renewable energy.</p> <p>It is important to remain respectful and open at all times. Keep in mind that the Study Circle is about sharing and exploring the topic and inspiring each other rather than 'finding right answers.'</p>		1 MIN
Question 1: Why do we need energy?	Pose the question to the group. Once participants have shared their thoughts, the facilitator should round off the first question with the below thoughts and any ideas not shared by the group should be elaborated upon.		5-8 MINS

<p>(Divide into needs and wants – in the context of ‘Ceiling on Desires’)</p>	<p>Today, humans need energy sources for four main reasons:</p> <ul style="list-style-type: none"> – to grow and live (through ingesting food) – to obtain electricity and gas (to light our homes and places, to cook our food, to operate machineries and appliances, for driving, etc.) – to keep warm – to provide education, healthcare, transportation system and other vital services <p>However, humans also want energy to make material objects to satisfy desires.</p> <p>Pose a question to the group for introspection. After the participants respond, reach the quote below.</p> <ul style="list-style-type: none"> ● Why should we become conscious of our energy usage and desires in our daily lives? <p>Sathya Sai Baba emphasises on why we should be conscious of our desires:</p> <p>“Man should put a ceiling on his desires. As man’s conduct is perverted, today we find natural calamities taking place. You are aware of the devastation caused by the earthquake in Gujarat. Thousands of people lost their lives. The reason for this is that man is entertaining excessive desires. God maintains perfect balance in His creation. In God’s creation, the Earth and the oceans are endowed with balance. But man is indiscriminately exploiting the Earth for extracting oil.” – Sathya Sai Baba (SSS 34.3: February 21, 2001)</p>		
<p>Question 2:</p> <p><i>What are various sources of physical energy?</i></p>	<p>Pose the question to the group. Once participants have shared their thoughts, Attachment A can be displayed or read, which illustrates types and sources of renewable and non-renewable energy sources.</p> <p>Energy resources are classified into renewable and non-renewable sources:</p> <ul style="list-style-type: none"> ● Non-renewable sources of energy, also called finite sources of energy, are those natural resources that cannot be replenished or take thousands of years to replenish. Examples include: fossil fuels such as coal, petroleum and natural gas.¹ ● Renewable sources of energy, also called an infinite source of energy, renewable sources are those that can be replenished, constantly renewed or restored, in a human’s lifetime. Examples include: sun (solar), wind 	<p>Attachment A</p>	<p>10 MINS</p>

	<p>(wind power), water (hydropower), tide (tidal power), internal heat of the earth (geothermal), and vegetation (biomass).¹</p> <p>Further question for introspection and discussion:</p> <ul style="list-style-type: none"> How long do you think fossil fuels (i.e., oil, natural gas and coal) last if the global consumption of and demand for energy derived from their sources continue at the current rate? <table border="1" data-bbox="555 551 855 786"> <thead> <tr> <th>Fossil fuel</th> <th>Time left</th> </tr> </thead> <tbody> <tr> <td>Oil</td> <td>50 years</td> </tr> <tr> <td>Natural gas</td> <td>70 years</td> </tr> <tr> <td>Coal</td> <td>250 years</td> </tr> </tbody> </table> <p>Table available at: http://bbc.in/1ak4MP7</p> <ul style="list-style-type: none"> Does this fact affect how we view or use fossil fuels? <p>Non-renewable energy usage affects our climate and the environment, and it is therefore important for us to examine each energy type and its source to determine the areas where we need to alter our consumption habits and reduce individual impact.</p>	Fossil fuel	Time left	Oil	50 years	Natural gas	70 years	Coal	250 years		
Fossil fuel	Time left										
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<p>Question 3:</p> <p><i>What is the effect of our energy use on the environment?</i></p> <p><i>And why is conservation of energy important?</i></p>	<p>Pose the question to the group. Once participants have shared their thoughts, you may play Video 1. The facilitator should then round off the first question with the below thoughts and any ideas not shared by the group should be elaborated upon.</p> <p>Our heavy reliance on non-renewable sources, mainly fossil fuels, for energy is affecting our environment. The use of fossil fuels contributes to air and water pollution. It is also making our planet warmer because the burning of fossil fuels releases carbon dioxide (CO₂), which is one of the major greenhouse gases that forms a transparent blanket around the earth. The thicker the blanket, the more of the sun's heat is trapped inside the earth's atmosphere that results in warming of the earth, a phenomenon known as 'greenhouse effect.'²</p> <p>Refer to Attachment B that shows graph of rising CO₂ levels with time. Before the industrial revolution, CO₂ levels in the atmosphere were stable over a period of millions of years, allowing a huge array of species and life forms to evolve. Unfortunately, as humans started extracting and using more and more of earth's primary resources, the levels of CO₂ have been increasing exponentially.</p>	<p>Attachment B</p> <p>-----</p> <p>VIDEO 1 –</p> <p>https://www.youtube.com/watch?v=gXQSyqNGLcl&feature=youtu.be&list=PL99q3EoEAkeJiuo5E103Eokwvq_D29tbu</p> <p>(1:43 mins)</p>	<p>15 MINS</p>								

	<p>Furthermore, as the non-renewable energy sources are limited, if we continue to consume them at the current rate, these sources will be depleted. It is therefore vital that we conserve what we have and reserve natural resources for the future use, so that our children and those to come will have enough to use for their basic needs (e.g. to cook food, to light our neighbourhoods and homes, etc.).</p>		
<p>Question 4: Are renewable sources the answer?</p>	<p>Pose the question to the group. Once participants have shared their thoughts, the facilitator should round off the question with the below thoughts if needed to be elaborated upon.</p> <p>Increasing the dependency on energy that comes out of renewable sources is definitely a step in the right direction as they can be replenished, used again and again and are sustainable. Also, generation of energy from renewable energy sources, especially sun and wind, do not have detrimental impact on the environment than those caused by non-renewable energy. Generation of energy from wind, solar, and hydroelectric systems does not emit air pollution.³ Furthermore, wind and solar energy do not require any water to operate and therefore, do not impact water resources and its quality, and do not strain supplies by competing with agriculture, drinking water, or other important water needs.³</p> <p>Ultimately, it comes down to Sathya Sai Baba’s teachings of Ahimsa (non-violence) and ‘Ceiling on Desires,’ i.e. continually striving to live simply without causing harm to others and Mother Earth.</p> <p>“Make proper use of natural resources. God’s creation is very sacred. Do not pollute it. How sacred are the five elements given by God! But, today, the air we breathe, the food we eat, the water we drink, the sound we hear – everything is polluted. All these sacred elements have been made unsacred by humanity. That is why the world today is afflicted with so many diseases. That one is a true human being who makes sacred use of the five elements. Never waste natural resources. A small incident happened some time ago. While conversing with Me in the interview room, Siva Sankar Sai, the warden of our senior boys’ hostel, said, ‘Sathya Sai Baba, Your eyes have become red.’ I replied, ‘That is due to My own mistake. I do not waste water like you people. When you wash your face, you leave the tap open continuously. While you apply soap to your face, you waste a lot of water by leaving the tap open. But I do not do like that. I open the tap only when it is necessary and close it immediately. After applying soap to My face, I opened</p>		10 MINS

	<p>My eyes to open the tap. In the process, a small amount of soap entered My eyes and hence My eyes became red.' I do not waste even a drop of water because water is God. Air is also a form of God. That is why I switch off the fan immediately when it is not required. Some people keep the light on throughout the night even if it is not required. But I switch on the light when it is necessary and at once switch it off when it is not needed. This is not miserliness. I am not a miser. I am the embodiment of sacrifice. But I don't like to waste anything. Use everything as much as it is necessary. But people today are misusing the five elements." – Sathya Sai Baba (SSS 29.69: July 18, 1996)</p> <p>Relate incidents in your daily life where you can better utilize energy.</p> <p>Using energy efficiently is not new knowledge, yet sometimes we fail to practice this. Why? Brainstorm for ideas on:</p> <ul style="list-style-type: none"> ● How can we help ourselves practice or remind to practice and develop a remembrance strategy together? ● How do we track progress of our energy consciousness? What are indicators that we have become more responsible users? 		
<p>Discussion:</p> <p><i>Being aware of our energy footprint, how to reduce it</i></p>	<p>Every single object around us (purchased either through a need or a want) has utilised energy for its production, and eventually, will need energy for its disposal.</p> <p>Our energy footprint is the environmental, economic and social impact that results from the use of energy. Also known as a carbon footprint, which measures the amount of carbon dioxide (CO₂) given off when fossil fuels such as oil, coal and gas are burned.²</p> <p>The more we use non-renewable energy, the greater the emission of carbon dioxide (CO₂) into the atmosphere. Carbon dioxide is the main greenhouse gas responsible for climate change, considered by many scientists to be the greatest environmental challenge of our time.²</p> <p>Therefore, to overcome environmental crises and maintain balance in Nature, it is imperative for us to curtail our materialistic desires, conserve energy and reduce our carbon footprint. Sathya Sai Baba reminds us why balance in Nature is necessary:</p> <p>"Today the world is losing its ecological balance, as man, out of utter selfishness, is robbing the mother Earth of her</p>	<p>VIDEO 2 – https://www.youtube.com/watch?v=TPO0f0SBP1c (1:26 mins)</p>	<p>10 MINS</p>

	<p>resources like coal, petroleum, iron, etc. As a result, we find earthquakes, floods and such other devastating natural calamities. Human life will find fulfilment only when ecological balance is maintained.” – Sathya Sai Baba (SSS 33.15: September 25, 2000)</p> <p>What can we do to reduce our daily energy consumption, and help conserve non-renewable energy sources for future generations? <i>(All to be expanded upon in the next module)</i></p> <ul style="list-style-type: none"> ● Practising Sathya Sai Baba’s teachings on ‘Ceiling on Desires.’ Focusing on what we need, rather than running after endless desires, will help us reduce our overall consumption and help preserve the earth’s remaining vital natural resources. The next module will focus on other practical solutions we can implement today. ● Actively educate and humbly share with others what we have learnt about energy consumption and conservation. As a species and a global earth community, we are drastically running out of time and resources. We are losing more and more of the natural environment every second, at the detriment of our health, well-being and a stable society for future generations. <p>This Ancient Native American proverb below reminds us of our obligations towards Mother Earth and the future generation: <i>"Treat the earth well: it was not given to you by your parents, it was loaned to you by your children. We do not inherit the Earth from our Ancestors, we borrow it from our Children."</i></p>		
SUMMARY AND CONCLUSION			
<p>Closing summary of today’s session, what to expect at the next session, and homework</p>	<p>So far, we have learned:</p> <ul style="list-style-type: none"> ● What are renewable and non-renewable sources of energy? ● Areas where we utilise both of these sources and how long they might last emphasising the importance of renewable sources of energy. ● How these energy sources affect our environment in the context of climate change? ● How Sathya Sai Baba’s actions encourage us to be more mindful of our energy source usage? <p>In the next module, we will cover:</p> <ul style="list-style-type: none"> ● ‘Ceiling on Desires’ in relation to energy ● Energy use in our day-to-day activities including food, clothing, technology, and transportation 		5 MINS

	<ul style="list-style-type: none"> ● How we can reduce our energy footprint and live more consciously <p><u>HOMEWORK and preparation for next session:</u></p> <ul style="list-style-type: none"> ● What can we do in our daily lives to reduce our energy footprint and conserve non-renewable energy sources? ● Make a list of all the various activities you are involved in. Against each of them, note down the source of energy being used - renewable or non-renewable? ● What can we do in our daily lives to increase our spiritual energy? 		
CLOSE	<p>Closing prayer or reading. Prayer for universal peace - <i>Om Shanti, Shanti, Shanti</i></p>		1 MIN

Note: Ideally there should be two facilitators in groups of ten or more participants. The first facilitator is the one who is conducting the study circle. The second facilitator observes the group's dynamics and informs the first facilitator of any lethargy and confusion from participants. This second facilitator also conducts the opening activity (Eg. Omkar) and the sharing of insights at the end. This helps give variety to the participants, but also allows the first facilitator space to capture important feedback and learning points for insight sharing.

Attachment A

Energy resources are classified into renewable and non-renewable sources of energy.

Non-renewable Sources of Energy

Type of fuel	Where it is from
Coal (fossil fuel)	<ul style="list-style-type: none"> • Formed from fossilised plants and consisting of carbon with various organic and some inorganic compounds • Obtained by mining between layers of rock in the earth • Burnt to provide heat or electricity
Oil (fossil fuel)	<ul style="list-style-type: none"> • A carbon-based liquid formed from fossilised animals • Lakes of oil are sandwiched between seams of rock in the earth • Pipes are sunk down to the reservoirs to pump the oil out • Widely used in industry and transport and animal agriculture
Natural gas (fossil fuel)	<ul style="list-style-type: none"> • Methane and some other gases trapped between seams of rock under the earth's surface • Pipes are sunk into the ground to release the gas • Often used in houses for heating and cooking • Widely used to make artificial fertiliser
Nuclear	<ul style="list-style-type: none"> • Radioactive minerals such as uranium are mined • Electricity is generated from the energy that is released when the atoms of these minerals are split (by nuclear fission) in nuclear reactors
Biomass	<ul style="list-style-type: none"> • Biomass energy is generated from plants • It is burned to provide energy, e.g. heat, or electricity • An example of biomass energy is oil produced from rapeseed • After treatment with chemicals it can be used as a fuel in diesel engines
Wood	<ul style="list-style-type: none"> • Obtained from felling trees, burned to generate heat and light

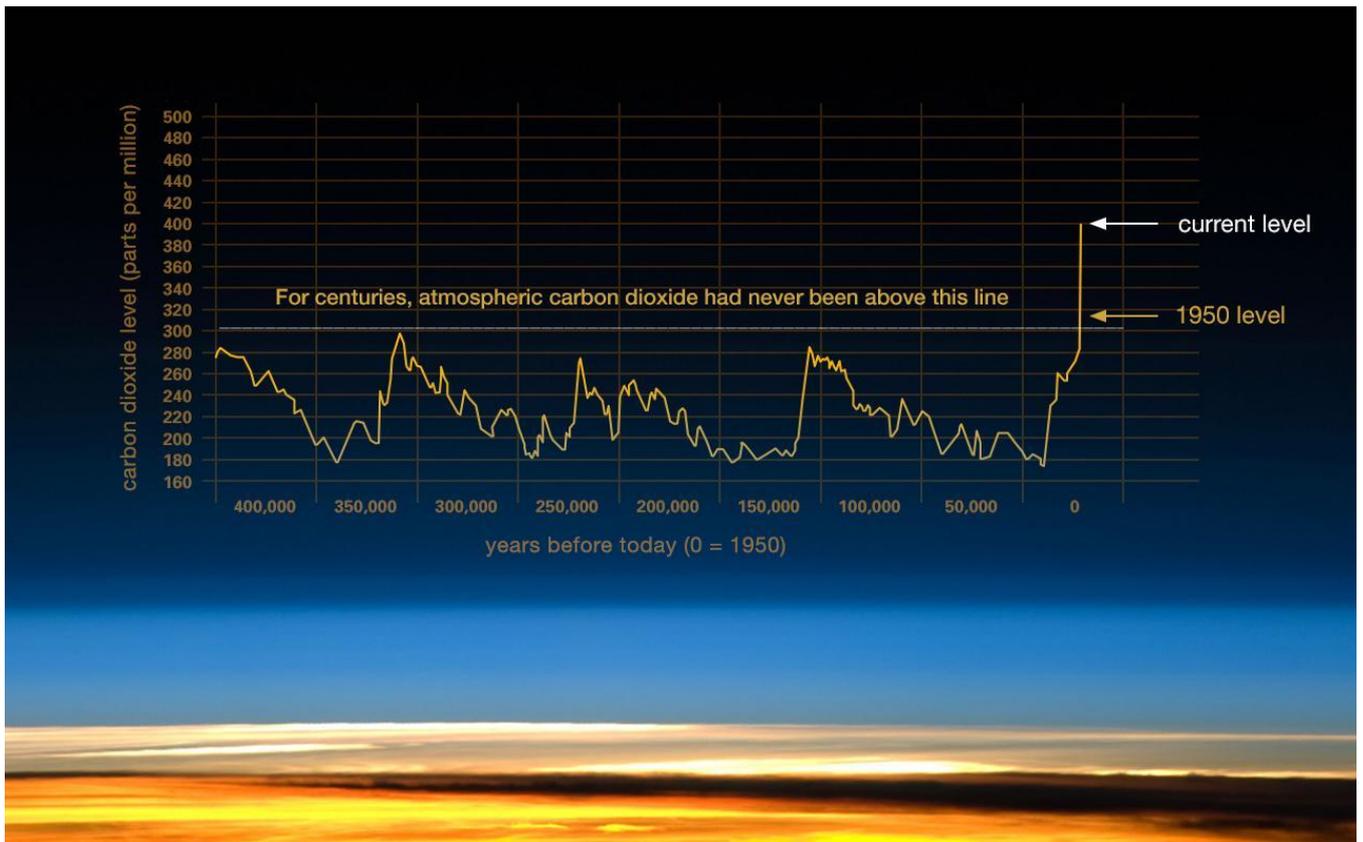
Table adapted from: http://www.bbc.co.uk/schools/gcsebitesize/geography/energy_resources/energy_rev1.shtml

Renewable Sources of Energy

Type of energy	Where it is from
Solar	<ul style="list-style-type: none"> • Energy from sunlight is captured in solar panels and converted into electricity
Wind	<ul style="list-style-type: none"> • Wind turbines (modern windmills) turn wind energy into electricity
Tidal	<ul style="list-style-type: none"> • The movement of tides drives turbines • In future, underwater turbines may be possible out at sea and without dams
Geothermal	<ul style="list-style-type: none"> • In volcanic regions, it is possible to use the natural heat of the earth • Cold water is pumped underground and comes out as steam • Steam can be used for heating or to power turbines creating electricity
Hydrological Power	<ul style="list-style-type: none"> • Energy harnessed from the movement of water through rivers, lakes and dams

Table adapted from: http://www.bbc.co.uk/schools/gcsebitesize/geography/energy_resources/energy_rev1.shtml

Attachment B



Graphic available at: https://climate.nasa.gov/climate_resources/24/

Recommended literature

1. **Carbon Dharma** – Dr. Sailesh Rao. Published 2011

References

1. <https://www.kqed.org/quest/64341/nonrenewable-and-renewable-energy-resources-2>
2. <http://www.globalfootprints.org/energy>
3. <https://www.ucsusa.org/clean-energy/renewable-energy/public-benefits-of-renewable-power>



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