SUSTAINABLE DEVELOPMENT SOLUTIONS NETWORK
A GLOBAL INITIATIVE FOR THE UNITED NATIONS

Global Schools Program

Schools For Goal 7: A Guide on Renewable Energy and The Energy Transition

An Activities and Action Toolkit

Produced by the Global Schools Program, UN Sustainable Development Solutions Network (SDSN) in partnership with Siemens Energy.

About the Global Schools Program
The Global Schools Program is an initiative of the UN SDSN in support of UNESCO's Roadmap for Education for Sustainable Development (ESD). The vision of the program is to create a world where every primary and secondary school student is equipped with the knowledge, values, and skills necessary to respond effectively to the most significant challenges of this century and shape a sustainable and prosperous world for all.

Global Schools Program

About Siemens Energy
The energy transition is the greatest challenge our generation faces. How do we reduce emissions while also increasing energy supply? It is an uphill battle, and there is no silver bullet. But finding solutions has always been in our DNA. For more than 150 years, our engineers have been spearheading the electrification of the world. Today, we are a team of 98,000, sharing the same passion, vision, and values. Our diversity makes us strong and helps us find answers together with our partners.

SIEMENS energy

About Sustainable Development Goal 7
Sustainable Development Goal 7 (Affordable and Clean Energy) aims to provide affordable, reliable, and sustainable energy for all by 2030. It is key to the 2030 Agenda, and transitioning to clean energy is vital to supporting the Paris Climate Agreement. Achieving SDG7 requires advocating for universal access to modern energy services—not by replicating fossil fuel models but by creating renewable energy infrastructures for the global economy. Its targets guide the transition from fossil fuels to clean energy access.

7 AFFORDABLE AND CLEAN ENERGY

Schools for Goal 7 is a project by Global Schools in partnership with Siemens Energy designed to train teachers and students in energy and sustainable development through gamified curricula. The initiative encourages active learning about SDG 7 to accelerate local sustainable development action. It provides hands-on experience in the energy transition, renewable energy, climate change, and sustainability, thereby equipping the next generation with essential skills for building resilient societies.

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Overview of the guide

Title	**Clean Energy and the Energy Transition**
Suggested Ages	12-17
Overarching Objective of the Guide	To develop the knowledge, values, and skills related to the issues, challenges, and importance of clean energy and the energy transition
Global ESD Competencies	Critical Thinking, Research Skills, Problem-Solving Skills, Teamwork, Collaboration, Global Awareness, Public Speaking, Civic Engagement
Learning Goals	• Students will gain knowledge of the **key elements of SDG 7** and why clean and renewable energy is crucial for sustainable development. • Students will increase their understanding of the **barriers and solutions** for achieving affordable and renewable energy globally. • Students will reflect **on their energy practices**, making SDG7 relevant to their daily lives, and how renewable energy sources could be implemented in their lifestyles, schools, and communities. • Students will **collaborate on SDG 7 activities and initiatives**, emphasizing an active and participatory approach (group discussions, peer-to-peer learning, or interactive methods help students become more engaged and prepared for the peer-based dynamics of Education for Sustainable Development [ESD]). Adapted from **Education for Sustainable Development Goals: Learning objectives, UNESCO, 2017**.
Learning Objectives	• Students will be able to **identify and differentiate between** non-renewable and renewable energy sources and their impact on the environment, health, and safety. • Students will be able to **analyze and demonstrate** the harmful impacts of unsustainable energy production. • Students will be able to **articulate and communicate** why renewable energy is needed and **evaluate** alternative energy sources for a given context. • Students will be able to **interpret** their energy usage and **assess** how they can become more energy efficient in their daily lives. • Students will be able to **identify and outline** energy-saving behaviors that can be applied in their day-to-day lives. • Students will be able to **cooperate** with others to develop action plans to achieve SDG7 in their communities. • Students will be able to **articulate** how SDG7 is interconnected with other SDGs. Adapted from **Education for Sustainable Development Goals: Learning objectives, UNESCO, 2017**.
Standards Explicitly Taught	*Global Schools encourages teachers to align the above learning goals and objectives to their national standards
Success Criteria & Assessment	Sample quizzes, essays, debates, and presentation topics can be found on the final pages of the guide.

Education for Sustainable Development Competencies

Competency	Description of the Competency	Applications to the Energy Transition
Systems thinking	"The abilities to recognize and understand relationships; to analyze complex systems; to think of how systems are embedded within different domains and scales, and to deal with uncertainty."	Encourage learners to consider how their daily actions contribute to more efficient energy consumption and how distinct energy sources are involved in the complex problem of the energy transition.
Anticipatory	"The abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's visions for the future; to apply the precautionary principle; to assess the consequences of actions, and to deal with risks and changes."	Encourage learners to envision a more sustainable world with renewable energy for all, along with inclusive and realistic pathways for more efficient energy use.
Normative	"The abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions."	Encourage learners to evaluate how their access/lack of access to energy is influenced by their culture, nationality, and status.
Strategic	"The ability to collectively develop and implement innovative actions that further sustainability at the local level and further afield."	Encourage students to work together to critically analyze their school communities and propose innovative actions to promote energy efficiency within their school and with peers.
Collaboration	"The abilities to learn from others; to understand and respect the needs, perspectives, and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership);...to facilitate collaborative and participatory problem solving..."	Encourage students to work together and empathize with those who have less access to energy or resources.

Competency	Description of the Competency	Applications to the Energy Transition
Critical thinking	"The ability to question norms, practices, and opinions; to reflect on one's values, perceptions and actions; and to take a position in the sustainability discourse."	Encourage students to quantify their habits and reflect on their community's energy consumption (town, school). Encourage learners to research carbon footprints and energy sources critically and use this research to inform actions.
Self-Awareness	"The ability to reflect on one's role in the local community and (global) society, … evaluate and motivate one's actions, and deal with one's feelings and desires."	Encourage learners to reflect on their energy consumption and opportunities to access clean and affordable energy.
Integrated Problem Solving	"Ability to apply different problem-solving frameworks to complex sustainability problems, develop viable, inclusive, and equitable solutions that promote sustainable development, and integrate the competencies mentioned above."	Encourage learners to analyze approaches to increasing the prevalence of renewable energy in their communities by engaging with their peers in various activities through research, discussion, and reflection.

SDG 7 Activities Overview

The following activities are organized within a sequence of steps:

Step 1

aims to help your students become familiar with SDG7.

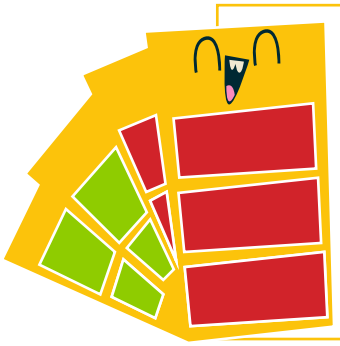
Step 2,3,4

encourage students to lead their learning process by researching and investigating.

Step 5,6,7

focus on student actions, student sharing, and the assessment of student knowledge.

The activities are divided into **two color codes based on age:**



Green for students aged 12 to 14 or beginners

Red for those aged 15 to 17 or advanced learners

All the activities detailed in this guide can be **carried out in the classroom or in the broader school community.**

All the activities are divided into parts so that they can be adaptable to different school contexts. **Feel free to adjust them to your students.**

You **don't need to complete all the activities**; each teacher can select the activities that best suit their educational context from each step.

Step 1 Introduction Activities

Activity one

SDGs BINGO

This introductory activity is the starting point of your student's engagement with SDG7 to help them understand the interconnectedness of this goal with the other SDGs. In this activity, students will learn how SDG7 is interconnected with other SDGs, practicing critical thinking and questioning skills.

Activity two

Energy that move the world

This introduction activity is the starting point of your student's engagement with different renewable and non-renewable energy types.

Activity three

Make a commercial

This introduction activity is the starting point of your student's engagement with communicating sustainability topics to others.

Activity four

Carbon footprint calculator

This introductory activity will teach your students how to use their carbon footprint to discover their energy usage. It is also a tool to raise awareness of energy consumption and sufficiency.

Step 2 Research

Activity

Exploring clean energy and the energy transition

Now that the students have been introduced to SDG7 and renewable energy, they will conduct guided research to explore the topic of *Clean Energy and the Energy Transition*.

Step 3 Investigate

Activity

Our contribution to the energy transition

Students investigate their schools' contribution to the energy transition. In this activity, students will act as detectives working to find clues. They will take notes, ask questions, and speak with peers, teachers, and school leadership.

Step 4 Additional Data Activities

Activity one

Evaluate your energy usage

Have your students work together to design their energy usage experiment to investigate further and learn how much energy they are using.

Activity two

Interactive map

The interactive map is an easy and highly visual way to access this data. We invite you to explore with your students how the world is progressing toward achieving SDG7.

Activity three

Clean energy infographic

In this activity, students will develop an infographic to explore and present data on renewable energy use in their country, region, or city.

Activity four

The Global Energy Mix

In this activity, students will analyze how the global energy mix has changed over time and make energy predictions.

Step 5 Take action

Activity one

Innovation

Now that students have researched and investigated SDG7 in their schools, it is time to encourage them to take action. Actions can be small; they can be long-term projects that are worked on throughout a few class periods or a new project that has never been done before.

Activity two

Campaign and raising awareness

Create a campaign to raise money for a specific issue related to SDG7 or advocate for the energy transition in the school community.

Activity three

Career Day

Organize a career day in your school, where industry experts can talk to the students about careers in the energy field or sustainability more broadly.

Step 6 Sharing Student Work

Activity one

Evaluate your energy usage

Once your students have completed their actions, celebrate their accomplishments and achievements. Invite parents, teachers, and other students to the school and organize an exhibition where everyone can see it.

Activity two

Host a Ted Talk Day

Students will speak for 5-10 minutes about their actions. Invite the head of the school, teachers, and parents.

Activity three

Encourage students to write a blog post about their work

Share it with socialmedia@globalschoolsprogram.org to feature projects on the Global Schools website and social media.

Activity four

Press release

Encourage students to write a short article for the school or local newspaper.

Step 7 Review and Assessment

Activity

Use the questions in this section to assess students' learning. Feel free to use any combination of quiz questions, debates, projects, and essays to engage your students and evaluate all they have learned.

INTRODUCTION ACTIVITIES

Photo credit: Febia.be

For Beginners

ACTIVITY ONE
SDGs BINGO

Link to SDG7 Learning Objective: Students will be able to **articulate** how SDG7 is interconnected with other SDGs.

Time Frame: 20 minutes

Suggested Ages: 12 to 14 or Beginners

Materials Needed: SDG Bingo Card printed or projected

Procedure:

1. Useful information for the introduction

The SDGs are a roadmap for all countries to build a fairer, more equitable, and more sustainable future where no one is left behind. They are inherently interconnected: it is not possible to achieve, for example, SDG4: Quality Education without SDG5: Gender Equality, or SDG 1: No Poverty without ensuring clean water and sanitation (SDG 6). The same applies to SDG7; it is closely connected to the others. Here are some examples:

Access to energy is crucial for economic development and poverty alleviation, as it enables income-generating activities and improves quality of life.

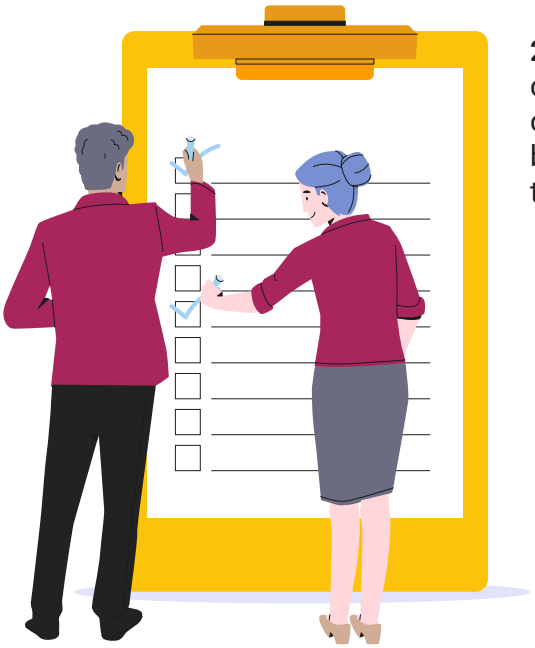
Reliable energy supports healthcare services, including the operation of medical equipment and the storage of vaccines.

Electricity enables extended study hours and access to digital learning resources, enhancing educational outcomes.

Modern energy access reduces the time women and girls spend collecting traditional fuels, allowing them to spend more time on education and economic activities.

Access to clean energy and electricity for everyone enables participation in technological progress to reduce the global digital divide.

Transitioning to renewable energy sources mitigates climate change by reducing greenhouse gas emissions.



2. Drawing Connections: Project or show the 17 SDGs in the classroom so everyone can see them. Ask your students to look carefully for a few moments, then ask them to find connections between the goals. If they find this difficult, give them ideas using the previous examples. Ask the students:

- In what way do the other SDGs affect achieving SDG7?
- What about the other way around—does SDG7 influence the success of other goals?
- Do you see any examples of this in your daily life?

3. SDG Bingo Card: Each student or group has the following bingo card, which contains a grid of all the SDGs except SDG7. You can leave the 17 SDGs image projected, or you can print out a poster for the classroom.

Ask the students about how SDG 7 interacts with the other SDGs. The guiding question for this activity is: How does the green energy transition influence the achievement of other SDGs?

- Every time a student or group finds a connection, they can write it down in the grid. Encourage them to find at least one or two connections per SDG, depending on your time for this activity.
- When students or groups complete the grid, they shout "Bingo!" and present their grid to the class.

For Beginners or Advanced Learners

ACTIVITY TWO ENERGY THAT MOVES THE WORLD

Photo credit: istock

Link to SDG7 Learning Objective: Students will be able to **identify and differentiate between** non-renewable and renewable energy sources and their impact on the environment, health, and safety.

Time Frame: 60 minutes

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials Needed: The energy sources worksheet should be printed, copied, or drawn

Procedure:

1. Useful information for the introduction

Oil, natural gas, coal, wind, hydroelectric, tidal, geothermal, biomass, and green hydrogen are some of the types of energy we will discuss. As a class, we will identify whether these sources are renewable or nonrenewable.

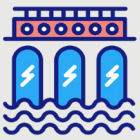
You can show or project the visual information about energy sources provided on page 16 or show the students this introductory video on renewable and non-renewable energy. Students can take notes or fill out the following worksheet as they are watching the video:

What is renewable energy? | Decomplicated

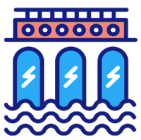
2. Classification

Write down the types of energy on the board and ask the students to categorize them based on whether they are renewable or non-renewable. Organize the information into a chart or print this chart out as a worksheet for students.

Ages 12 to 14 or Beginners

	Type of Energy	Renewable or Nonrenewable Energy	Key aspects
	Solar		
	Coal		
	Natural Gas		
	Wind		
	Hydropower		
	Oil		
	Nuclear		
	Geothermal		
	Biomass		

Ages 15 to 17 or Advanced Learners

	Type of Energy	Renewable or Nonrenewable Energy	Key aspects	**Advantages** *Are there any positive health, environmental, economic, or safety impacts?*	**Disadvantages** *Are there any negative health, environmental, economic, or safety impacts?*
	**Solar**				
	**Coal**				
	**Natural Gas**				
	**Wind**				
	**Hydropower**				
	**Oil**				
	**Nuclear**				
	**Geothermal**				
	**Biomass**				

3. Group Research on Energy Sources

Divide your students into small groups (based on class size) and assign each group an energy source. Students should work together to gather additional information and research on this renewable energy source. Advanced students can use the provided worksheets to answer questions about the different energy sources and their advantages and disadvantages.

Alternatively, give students a poster board. They can draw the energy source, attach an image of the energy source, or just write the source's name on the poster. Similarly, they should compile everything they know about this energy source. With this approach, the class will end the activity with a mural showcasing all the energy sources that move the world and their advantages and disadvantages.

Class Discussion

Bring the class together in a big group. Ask each group to present their worksheet or poster and describe their findings to the class. Then, ask the class:

Ages 12 to 14 or Beginners	What technologies would you recommend deploying in the school or your community?
Ages 15 to 17 or Advanced Learners	Why must we advocate for renewable energy technologies using the disadvantages and advantages gathered?

For Beginners or Advanced Learners

ACTIVITY THREE
MAKE A COMMERCIAL

Photo credit: istock

Link to SDG7 Learning Objective: Students will **collaborate on SDG7 activities and initiatives**, emphasizing an active and participatory approach.

Time Frame: 3 to 4 hours
Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials Needed: paper, colored pencils, printed images, cell phone camera

Procedure:

1. Useful information for the introduction

Commercials are one of the oldest forms of advertising. They are an excellent way to create a clear message or narrative, visual appeal, emotional resonance, and a call to action.

2. Class Discussion

To start the conversation about how to make a commercial, ask the class:

- What makes a commercial memorable or convincing? (is this celebrity endorsements, humor, songs, etc)
- Tell the classroom about your favorite commercial
- If you have access to the internet and a projector in your classroom, you can show your students examples of successful and unsuccessful commercials or campaigns. For some ideas, see the following videos:

UNITE TO ACT Unite to Act Campaign

WE THE PEOPLE THE GLOBAL GOALS For Sustainable Development — We the People for the Global Goals (9 languages subtitles)

together transforming the everyday — Siemens: Transform the everyday (with German subtitles)

3. Producing the commercial

- Break your students into small groups (based on class size) and assign each group the same energy source as in the previous activity. If you didn't complete the last activity, let the students choose their energy source.
- Have them elaborate a script or storyboard and create a commercial promoting using that form of energy.
- If they don't know how to do a script or a storyboard, there is a template on the next page with the key aspects to follow.

Template for Script	
Steps	**Description**
Define the Goal	What is the message or story you want to tell? What action or emotion do you want to evoke?
Write the Dialogue	1. **Introduction**: Introduce the topic in an engaging manner Example: *Do you know that clean energy can save the world?* 2. **Message**: Develop the message in a clear, short way Example: Clean energies, such as solar, wind, hydropower, or geothermal, are key to fighting against climate change, ensuring affordable energy for all of us, and protecting the planet. 3. **Conclusion**: End with a call to action or a thought-provoking message. Example: What are we waiting for? Let's say YES to renewable energies!
Template for Storyboard	
Steps	**Content**
Create the grid	Create a grid on a page with multiple frames. Each frame represents a scene or shot.
Scene Description	In each frame, briefly describe what will happen in that scene. Example: "The girl looks at the sun" or "The camera zooms in on the SDG logo."
Add Dialogue or Narration	Below each frame, write the dialogue or narration that will be spoken. Example: "Clean energy sources, such as solar, wind, hydropower or geothermal, are key to fight against climate change, ensure affordable energy for all, and protect the planet".
Include camera directions	If you're creating a video, include any camera movement. Example: Close-up on the girl as she says: "Do you know that clean energy can save the world?"
Identify Transitions	Mention how one scene transitions to the next. Example: "Fade out" or "Cut to."
Time Estimates for Each Scene	Estimate each scene's time so the video will flow smoothly and be within your time constraints.

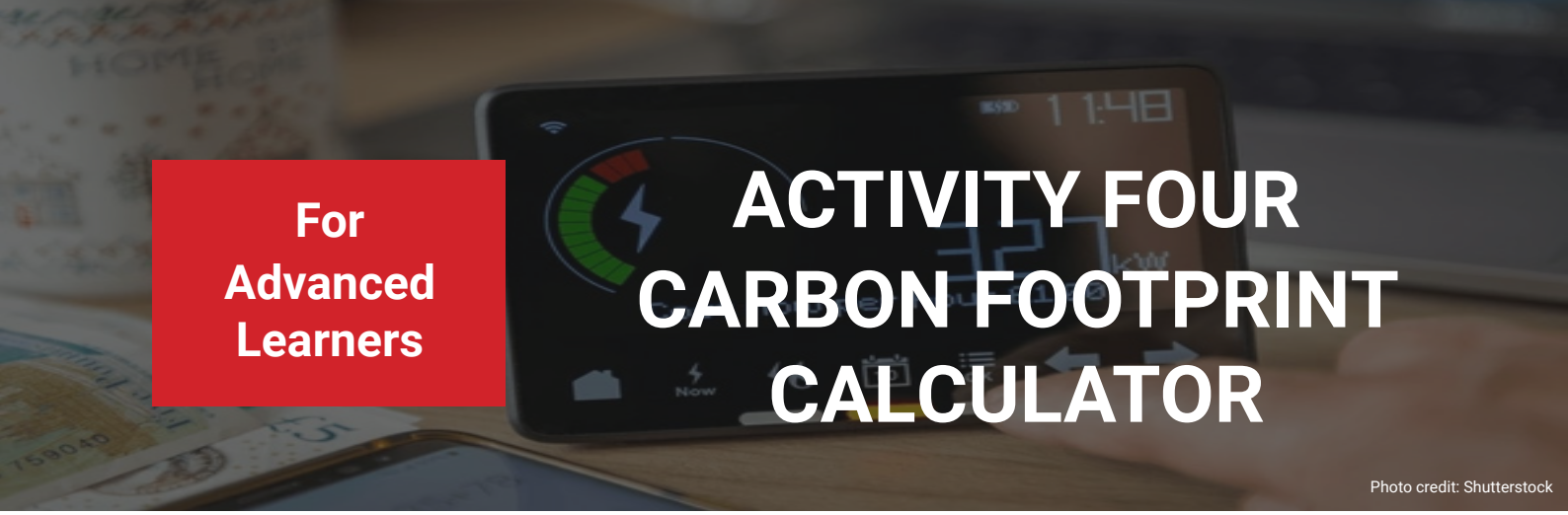
Format: Depending on the resources available, you can have your students film the commercial and play it for the class. They can also present the script record or interpret a radio commercial. Depending on your context, you can provide them with digital storytelling tools.

Digital storytelling uses multimedia forms, such as videos, images, audio recordings, and interactive elements, to present ideas and stories.

Remind them to create messages that reflect an equitable and respectful vision of men and women.

4. Presentation

Students can present their work to the class after creating their commercials. Have the students comment on their favorite aspects of the various commercials shown.



For Advanced Learners

ACTIVITY FOUR CARBON FOOTPRINT CALCULATOR

Photo credit: Shutterstock

Link to SDG7 Learning Objective: Students will be able to interpret their energy usage and assess how they can become more energy efficient in their daily lives.

Time Frame: 45 minutes

Suggested Ages: 15 to 17 or Advanced Learners

Materials Needed: A device with a connection to the internet. For schools with restricted access to the internet, jump from step 1 to step 4 and create a conversation about what aspects of daily living contribute the most to each student's carbon footprint and how we can change it.

Procedure:

1. **Useful information for the introduction**

   A carbon footprint is the number of greenhouse gases emitted by an individual, company, or organization's activities. We produce greenhouse gas emissions from burning gasoline when we drive, burning oil or gas to heat our homes, or using electricity from coal, natural gas, and oil. Globally, the average carbon footprint per person is close to 4 tons.

2. **Class Discussion**

   To start the conversation, you can discuss as a group some of these issues:

   - The concept of a carbon footprint.
   - The number of greenhouse gases emitted by an individual, company, or organization's activities.
   - How the calculator works.
   - Navigate through the web page Our World in Data to see the evolution of the world's carbon footprint over the last centuries. You can also use this information for the class discussion.

3. **Calculating our carbon footprint**

   Using this survey from footprint.conservation.org, have students calculate their household or transportation carbon footprint. Give them some time to experiment with inserting different values and see how the footprint changes.

4. **Final debate**

   Ask your students what surprised them and what they expected. Afterward, you can compare and contrast energy usage and explore what aspects of daily living contribute the most to each student's carbon footprint and how we can change it. Emphasize that individual change is necessary, as well as collective change.

RESEARCH

For Beginners or Advanced Learners

ACTIVITY ONE EXPLORING THE TOPIC OF CLEAN ENERGY AND THE ENERGY TRANSITION

Photo credit: istock

Link to SDG7 Learning Objective: Students will gain knowledge on the **key elements of SDG 7** and why clean and renewable energy is crucial for sustainable development.

Time Frame: 60 minutes

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials needed: Research Worksheet printed out or written by the students

Procedure:

1. Research can be completed independently in a computer lab, as a homework assignment, by talking to community members, by visiting a library, or as a classroom activity.
2. Give students a copy of the Research Worksheet or post the questions at the front of the room. Worksheets can be adapted based on the local context and the time allocated for the activity.
3. After students have completed the activity, lead a session where students make a presentation of their research.

Useful links for research

Ages 12 to 14 or Beginners	Ages 15 to 17 or Advanced Learners
Video Clean energy for a greener future (UNOPS)	**Video** Setting the Scene for SDG7 (Sustainable for All)
Article and visual data • SDG Index Interactive map • What is Goal 7	**Articles and visual data** • SDG Index Interactive map • What is Goal 7 • UN Women SDG7

Student Research Worksheet - Ages 12 to 14 or Beginners	
Name:	
Country:	
Local Community:	
Research Questions	**Answers**
In your own words, what is renewable energy?	
What is the most significant source of energy worldwide?	
What type of energy does your country use the most?	

An alternative approach to the following research worksheets is to assign each pair of students a different country or community, assigning countries from various locations and ecosystems. Then, bring students back together to compare what they learned and how they can apply basic principles to determine the most appropriate renewable energy strategy in a specific location.

Student Research Worksheet - Ages 15 to 17 or Advanced Learners	
Name:	
Country:	
Local Community:	
Research Questions	**Answers**
In your own words, what is renewable energy?	
Which country uses the most renewable energy, with a percentage of almost 100%?	
Describe the geography of your country and how this could affect renewable energy use. For example, is it in a cold climate that needs heat? Does it have an abundance of rivers that could be used for hydropower? Is it primarily urban, with industry, transportation, and higher energy consumption per capita?	
Are there any policies or government incentives in your country that encourage using clean energy?	
What renewable energy sources could be adopted in your home country or community based on the information gathered? Describe your vision for renewable energy in your country.	
How can we ensure everyone in your country has access to clean and sustainable energy, especially women and girls?	

INVESTIGATE

For Beginners or Advanced Learners

ACTIVITY ONE
OUR CONTRIBUTION TO THE ENERGY TRANSITION

Photo credit: istock

Link to SDG7 Learning Objective: Students will reflect **on their energy practices**, making SDG7 relevant to their daily lives, and how renewable energy sources could be implemented in their lifestyles, schools, and communities.

Time Frame: 60 minutes

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials needed: School Investigation Worksheet or questions written or posted in the classroom

Procedure:

1. Useful information for the introduction

In this activity, students will act as detectives working to find clues. They will take notes, ask questions, and speak with peers, teachers, and school leadership.

2. School Investigation

- Pair students together in groups of 2 - 4 and give students a copy of the School Investigation Worksheet.
- Allocate 20 minutes for students to work together to answer the questions. You can also have the students walk around the school, interviewing facilities managers or other staff.

3. Reflection

After students have completed the activity, lead a discussion session where students share and compare answers. Ask the students:

- Are there areas in the school where we can work together to improve the school's energy usage?
- How can we ensure that all students understand the importance of clean energy and how to practice energy conservation practices?
- How can we encourage students to be mindful of energy usage?
- How can we provide more access to clean energy for students?

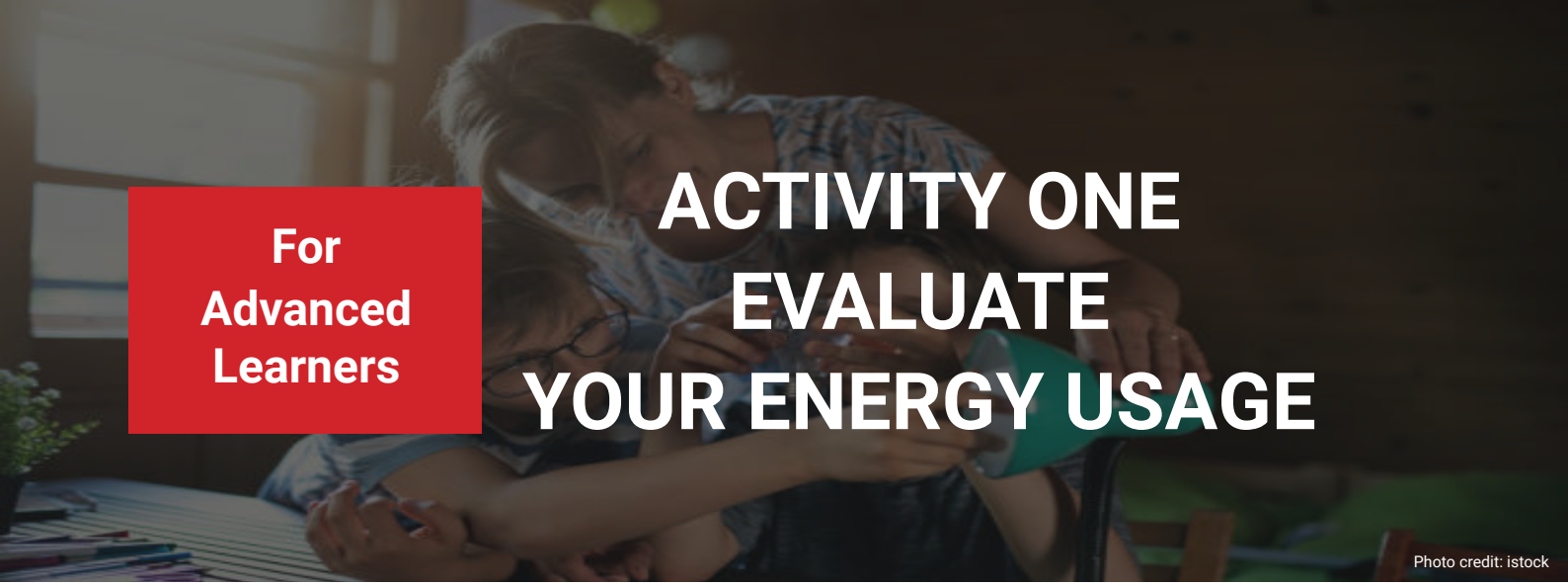
4. Beginning to take action

You can assign students to be responsible for turning off the lights, checking that everything is unplugged at the end of the day, or ensuring that devices are powered off when they aren't in use. This is a small-scale activity that can give students a sense of purpose. You can use this worksheet to facilitate this activity.

School Investigation Worksheet	
Where does your school's energy come from?	
Does your school's energy come from renewable energy sources? If not, what is your school's primary source of energy?	
Does your school have air conditioning? If so, where does the energy to support this come from?	
What part of your school uses the most energy?	
Are there programs or policies in your school encouraging sustainable energy practices?	
Is your school involved in community projects related to clean energy or the energy transition?	
What is the biggest problem in your school? How can you help your school community in this area?	

- Have the students work together with another school. Facilitators can set up a virtual meeting with a school in another community or country to share the results of this activity.
- Emphasize the crucial importance of sharing knowledge, innovations, and technology across countries to help drive access to clean energy and the energy transition, which will support the overall achievement of sustainable development.

ADDITIONAL DATA ACTIVITIES



For Advanced Learners

ACTIVITY ONE EVALUATE YOUR ENERGY USAGE

Photo credit: istock

Link to SDG7 Learning Objective: Students will be able to **identify and outline** energy-saving behaviors that can be applied in their day-to-day lives.

Time Frame: 60 minutes

Suggested Ages: 15 to 17 or Advanced Learners

Materials Needed: Calculating your energy usage worksheet printed out or projected

Procedure:

After collecting data, have students analyze their primary sources and uses of energy. What can they live without? What can they never sacrifice?

1. Useful information for the introduction

In our households, we use energy for various purposes: space and water heating, space cooling, cooking, lighting, or electrical appliances. According to Our World In Data (2023), in some countries, energy consumption is so low that it hardly registers. Beyond burning some solid fuels for cooking, people consume barely any energy. Meanwhile, in the wealthiest nations, a person consumes as much as 100 times more than some of the poorest countries.

2. Assessment of energy usage

Have your students use the worksheet below to calculate their energy usage. For this activity, they must multiply the hours by the energy consumption associated with each category. For a list of common appliances and their energy usage by hour, please click this link.

3. Reflection

After the students calculate their energy usage, either have them answer the following questions on a worksheet or in a class discussion:

- Take some time to reflect on your energy usage. Is most of your energy used to " fulfill basic needs," such as cooking? Or is it used for other items, such as taking a vacation flight or heating a swimming pool?
- What are some ways in which you can improve energy sufficiency in your day-to-day lives?
- What energy-saving habit will you implement this month? Write down one goal for your energy-saving habit.

You can also agree on an energy-saving habit as a class or a school.

Calculating Your Energy Usage

Item	Hours per day	
Lighting		
Lightbulb		(Number of Hours) x (energy usage per hour) = _____
Other		(Number of Hours) x (energy usage per hour) = _____
Technology		
Mobile phone		(Number of Hours) x (energy usage per hour) = _____
Computer		(Number of Hours) x (energy usage per hour) = _____
TV		(Number of Hours) x (energy usage per hour) = _____
Other		(Number of Hours) x (energy usage per hour) = _____
Transportation		
Walking		(Number of Hours) x (energy usage per hour) = _____
Biking		(Number of Hours) x (energy usage per hour) = _____
Riding in a car or driving		(Number of Hours) x (energy usage per hour) = _____
Taking the bus		(Number of Hours) x (energy usage per hour) = _____
Other		(Number of Hours) x (energy usage per hour) = _____
Cooking		
Using the microwave		(Number of Hours) x (energy usage per hour) = _____
Using the stove		(Number of Hours) x (energy usage per hour) = _____
Other		(Number of Hours) x (energy usage per hour) = _____
Total estimated daily energy usage:		

For Beginners or Advanced Learners

ACTIVITY TWO INTERACTIVE MAP

Photo credit: istock

Link to SDG7 Learning Objective: Students will be able to **articulate** how SDG7 is interconnected with other SDGs.

Time Frame: 60 minutes

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials Needed: Interactive map tool.

Procedure

Useful information for the introduction

The SDG Index ranks countries based on their performance across 17 goals. The interactive map is an easy and highly visual way to access this data. The progress of each country is shown through a color-coding system:

- Green: SDG achieved
- Yellow: Challenges remain
- Orange: Significant challenges remain
- Red: Major challenges remain
- Grey: Information Unavailable

Project the interactive map onto a visible spot for all the students.
Guide students through the map by clicking on the different countries they choose

1. **Select your country on the map** to view its details. In the left panel, click the “Country Profile” option to view in-depth information about your country's progress.
2. **Ask students questions** to promote analysis and discussion.

    - How many countries have achieved SDG7? What are these countries?
    - What country is first in the ranking of the SDG Index?
    - How many countries have achieved SDG13: Climate Action? Are these the same as the ones that have achieved SDG7? Why or why not?
    - How many countries have achieved SDG5: Gender Equality? Are these the same as the ones that have achieved SDG7? Reflect on the intersection of these SDGs.

For Beginners or Advanced Learners

ACTIVITY THREE CLEAN ENERGY INFOGRAPHIC

Photo credit: istock

Link to SDG7 Learning Objective: Students will increase their understanding of the **barriers and solutions** for achieving affordable and renewable energy globally.

Time Frame: 60 minutes

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials needed: computer or cell phone with a design program (canvas, PowerPoint) or paper, colored pencils, and cut images.

Procedure:

1. Useful information for the introduction

An infographic visualizes information or data designed to present complex ideas quickly, clearly, and effectively. They combine text, images, and graphics and can be put in pie charts, diagrams, timelines, and flowcharts. Here are some examples of institutions that use infographics to explain these concepts and statistics:

- International Energy Agency: Statistics about energy and gender, focused on employment and access.
- United Nations: Why invest in renewable energies? A visual graphic explaining the consequences of fossil fuel use and the energy transition roadmap.
- Our World in Data: Energy consumption and production shown by countries and its evolution since 1800.
- UN Environment Programme: An infographic illustrating the challenges and potential solutions related to SDG7.

2. Brainstorming

Students can identify key concepts or statistics to include in an infographic based on the examples and previous activities. For instance, they might create a visual chart representing the list of renewable energy sources and their advantages and disadvantages from Step One.

3. Divide students into small groups

Based on the concepts or statistics they want to focus on, have students identify the main ideas they wish to include in their infographic.

4. Design the Infographic

Students can use free online tools like Canva, Piktochart, Infogram, or Microsoft PowerPoint to create infographics. Ask the students to keep their infographics simple and visually engaging. For schools with limited or restricted access to the internet, infographics can be drawn or made by cutting and pasting images.

5. Presentation

Each group presents and explains their infographic to the class. The rest of the class can ask their peers questions. Some possible questions include:

- Why did you choose this topic and type of infographic?
- What challenges did you encounter, and how did you overcome them?

Find out when World Energy Day is celebrated, and display the student's work in a visible location to share their efforts and raise awareness.

STEP 5

TAKE ACTION

Photo credit: istock

For Beginners or Advanced Learners

ACTIVITY ONE INNOVATION

Link to SDG7 Learning Objective: Students will be able to **cooperate** with others to develop action plans to achieve SDG7 in their communities.

Time Frame: One semester

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials needed: Dependent on type of action project

Procedure:

1. Useful information for the introduction

Innovation involves generating new ideas, methods, products, services, or solutions that have a significant positive impact and value. It also involves transforming creative concepts into tangible outcomes.

2. Class Discussion

If you have done the activity in Step 3 or Activity One in Step 4, your students have a sense of the energy situation in their school, community, or country. Now, think collaboratively about a new project that has never been done before. Here are some ideas:

- For the school, it could be investing in forms of renewable energy or joining a global movement like the Earth Hour
- As a teacher, this could include hosting a workshop on Education for Sustainable Development for your fellow teachers.
- For students, this could be creating a new prototype for a sustainable city that uses clean energy and displaying that innovation in the hallway.

Art is a powerful tool for creating an impact. Your students can design an art exhibition about SDG7. Get inspired by the Carbon Ruins Exhibition held by the Manchester Museum in England.

3. Designing and implementing the project

Have your students define their goals and create a roadmap for their chosen project, setting clear deadlines for each step. On the next page, you will find an Action Planning Template to help you ask the right questions as you guide the students' projects.

4. Presentation

Have the students present the results of their projects.

Action Planning Template	
Describe your idea or action.	
Where will you implement your action? Your school, classroom, or local community?	
What is your #1 goal in completing this action? How many people do you want to reach? What exactly will you accomplish?	
What do you know about this topic? Use research, facts, and statistics you gathered.	
What are your next steps for completing this action?	

For Beginners or Advanced Learners

ACTIVITY TWO RAISING AWARENESS

Photo credit: istock

Link to SDG7 Learning Objective: Students will be able to **cooperate** with others to develop action plans to achieve SDG7 in their communities.

Time Frame: One semester

Suggested Ages: 12 to 14 or Beginners and 15 to 17 or Advanced Learners

Materials needed: This depends on the type of campaign. This could include online or offline presentations, posters, cell phones with cameras and videos, paper, colored pencils, etc.

Procedure:

1. Useful information for the introduction

Raising awareness inspires people to take action, change behaviors, or support a cause. It involves campaigns, discussions, presentations, or social media posts that bring attention to an important issue. For example, raising awareness about SDG7 means informing people about its goals, effects, and ways to accomplish it.

2. Goal and content

Have students define the main objectives of their campaigns. They could be about:

- the gender gap in energy employment
- the transition to renewable energies in their school or community
- raising awareness about the environmental impact of fossil fuels
- an energy efficiency campaign
- advocating to leadership and teachers to take a stance on fossil fuels
- raising money for an NGO that focuses on sustainable energy.
- selling artwork or sustainable food and using the funds raised to donate to an energy conservation organization

3. Audience

Have students decide who they want to reach with their campaign. Will it be other students, your community, private businesses, or the local government? Once the audience has been chosen, the appropriate approach to reach this audience can be selected.

4. Campaign medium

Have students choose how to carry out their campaign. This could include online events, workshops, social media posts, flyers, posters, or pamphlets to be distributed in schools, businesses, or public spaces, as well as interviews on the local radio or in newspapers.

5. Collaboration

One of the most critical SDGs is SDG17: Partnerships for the Goals. For campaigns to be successful, encourage students to collaborate with local businesses, organizations, or influencers already working on sustainable energy issues and support them in engaging experts to help promote the campaign.

Link to SDG7 Learning Objective: Students will be able to **cooperate** with others to develop action plans to achieve SDG7 in their communities.

Time Frame: One day

Suggested Ages: 15 to 17 or Advanced Learners

Procedure:

1. Useful information for the introduction

- With the economy being greened, it is crucial to help students make connections about how they can apply what they have learned about SDG7 to their futures.
- Students can turn a passion or interest in sustainability and clean energy into a full-time career!
- Organize a career day at your school. Industry experts can talk to the students about careers.

2. Steps to hosting a green career day could include

- **Speak** to your school leader or administration for permission. This is best done at least 3 months in advance.
- **Solidify** a date for the career day.
- **Recruit** fellow teachers and staff for a Career Day
- **Create a committee** to help organize and plan the event.
- **Involve** the Parent Teachers' Organization to help plan and see if any parents would like to be speakers.
- **Start the publicity** for the event and ensure that fellow teachers promote it to their students.

Find and contact industry speakers for the event. Ensure you collect their bios and company information to circulate to the students and teachers.

Remember to remind speakers before the event, including the timing, location, and other information. If your school has regulations for outside guests to visit campus, ensure all forms and procedures are in place.

Ensure you have all the logistics, including securing the proper space for all guests, students, and attendees.

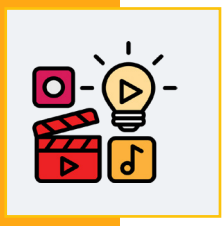
Prepare the students for the day by ensuring you have communicated the dress code, the purpose of the career day, and to prepare any questions in advance.

Enjoy the career day! Send thank-you notes to speakers for attending, and debrief with your committee members on the successes.

Teachers can also have their students research or discover potential careers in energy, especially clean energy, as a homework assignment.

Please click here for a complete, detailed resource on planning a career day.

Additional Global Schools Action Ideas!

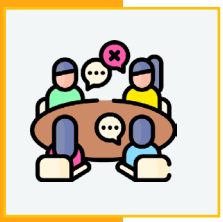


Make a Comic/Video/Mural

Have your students choose a nonrenewable or renewable energy source, such as coal, nuclear, wind, tidal, solar, etc. Then, they can create a comic, mural, video, or TikTok demonstrating how the energy works and its environmental impact.

Host Live Communication Programs

Hold a daylong workshop or session in your school and invite professionals and experts to discuss clean energy and the environmental impact of fossil fuels. Examples of experts can include workers at a local energy plant, engineers, and others. The experts can discuss the environmental impact of non-renewable energy and teach your students about job opportunities in sustainable energy.



Organize an excursion to an energy site with a community partner

During the excursion, discuss the pros and cons of different energy sources.

Be an Advocate for SDG7

Have your students create a speech or position paper advocating for clean energy at a school assembly. They can also be spokespersons in their community, raising public awareness of clean energy. Students can also write a letter to their school director, local school board, or government officials.

Go to SDGs in Action or view The Lazy Person's Guide to Saving the World for more ideas you and your students can do to make an impact!

SDG7 Best Practices

Best Practice 1

Sustainable Use of Energy at Harare International School, Zimbabwe

Teachers in charge: Sarah Santillan-Isern, Brenda Makokoro, Nomusa Shamu

Through experiential learning, students developed a profound understanding of sustainable energy by participating in hands-on activities and solving real-world problems. They designed energy-efficient solutions like solar-powered devices and explored biomimicry to improve their designs by mimicking nature's efficiency. Observing energy transformations and testing energy-converting devices gave them insights into conservation and resource management. This approach emphasized the importance of wise natural resource management and the societal implications of technology, ultimately equipping students to make responsible decisions and fostering a commitment to a sustainable future while connecting scientific concepts to real-life applications.

Best Practice 2

Advancing SDG7 at Delhi Public School, Lava, Nagpur, India

Teacher in charge: Shahnaaz Ojha
Learners: Whole-of-School activity

As part of their commitment to SDG 7, Delhi Public School, Lava, Nagpur, India, has implemented impactful renewable energy projects on campus. Solar panels installed on the rooftop generate a portion of the school's electricity, with excess energy contributed to the National Grid, offsetting the costs of the school's electricity bill through government subsidies provided in return. This initiative has effectively reduced the school's reliance on non-renewable energy. The school further reduced its energy consumption by using rainwater harvesting systems that channel rainwater to underground sumps, thus striving to achieve SDG indicator 7.2.1, increasing the renewable energy share in the total final energy consumption.

Recognized twice as a Green School by India's Centre for Science and Environment, the school maintains a 60% green cover and designs classrooms with ventilation that minimize the need for air conditioning and LED light bulbs. Students actively participate in these sustainability efforts, encouraging their families to adopt solar energy, practicing mindful electricity use, and conserving water. The school collaborates with the NGO "Energy Swaraj" and introduced the "Unironed Mondays" to save energy. These measures have successfully reduced the school's electricity consumption and bills while promoting a culture of informed and conscious energy use among students, who report similar energy-saving practices at home.

Best Practice 3

Promoting the use of sustainable and energy-efficient cooking solutions in a rural area at Nabuganyi R/C P/S School in Kayunga, Uganda

Teachers in charge: Shiella Atto and Samanya Lucy
Learners: 9-15 year-old students

During the 2023/24 school year, teachers and students at Nabuganyi R/C P/S School identified deforestation caused by firewood use as a key issue and researched energy-efficient alternatives. Through hands-on participation, students contributed to the project and gained practical knowledge of renewable energy concepts and environmental conservation.

With the guidance of skilled facilitators, the school community came together to build an energy-saving stove using locally available materials such as bricks for the main structure, tiles for insulation and heat retention, cement and clay for binding and reinforcement, and other materials like sand and water for construction. The stove was designed to use less firewood by optimizing combustion, cooking large quantities of meals at once, improving efficiency by reducing the need for multiple cooking sessions, and quickly reaching higher cooking temperatures—further decreasing firewood consumption.

Since its construction, the school's firewood use has decreased by over 50%, reducing the need to cut down trees. The project has raised awareness about sustainable practices and empowered students to advocate for renewable energy solutions within their communities. The same stove design has now been implemented in four additional schools in the Nabuganyi community.

Best Practice 4

Promoting Sustainable Energy Solutions at San Estanislao de Kotska School, Málaga, Spain

Teacher in charge: Jose Alberto Peña
Learners: 16-year-old students

First-year high school students have just completed the construction of an impressive wind turbine featuring a dual-turbine design. This turbine can charge a 12-volt battery, which will later be converted to 220 volts of alternating current for use in the garden's irrigation system. They intend to install this wind turbine at the current Environmental Center, which houses part of the school's garden. This began a series of projects to provide the Environmental Center with facilities designed and built with sustainability and energy efficiency in mind.

By incorporating renewable energy solutions like this one, the school is not only supporting sustainable infrastructure development but also providing valuable hands-on learning experiences for students, fostering environmental awareness and practical skills. This initiative aligns with the school's commitment to SDG7, ensuring access to affordable, reliable, sustainable, and modern energy for all.

SHARING STUDENT WORK

SHARING STUDENT WORK

Photo credit: Izabella, Global Schools Advocate Alumni, Brazil

This final step aims to increase the outreach of the activities and enhance the student's sense of agency. Adopting a peer-to-peer approach makes them multipliers for SDG7 within their community. Some ideas for activities can be:

Hosting events

Host an exhibition in the school lobby or courtyard. This is where everyone in the class can showcase their projects and share their accomplishments. Invite parents, teachers, and other students.

Host a Ted Talk Day. A TED Talk is a showcase for speakers presenting great, well-formed ideas in 10-15 minutes with a conversational approach. Students will speak about their projects. Invite the head of the school, teachers, and parents.

Steps to organize a TED Talk:

- Create a theme.
- Create a selection committee.
- Select your speakers
- Prepare your speakers: Outline + script, + prepare slides
- Elaborate on an Event flyer and spread the word!

Writing

- Encourage students to write a blog post about their work. Share it with socialmedia@globalschoolsprogram.org to feature projects on the Global Schools website and social media.
- Encourage students to write a short article for the school or local newspaper.

REVIEW AND ASSESSMENT

REVIEW AND ASSESSMENT

Photo credit: istock

Use these questions to assess students' learning through quiz questions, debates, projects, and essays. Feel free to use any combination of questions and activities to engage your students and all they have learned.

Exam or Quiz Questions

Ages 12 to 14 or Beginners

1. What is SDG7? Explain how it links to one other SDG.
2. List one source of renewable energy. Explain its key characteristics and how it contributes to a cleaner environment.
3. How are women and girls affected by the lack of access to clean energy?
4. What is a carbon footprint?

Ages 15 to 17 or Advanced Learners

1. Define carbon footprint. Should the world increase or decrease its carbon footprint to achieve the SDGs?
2. How does the adoption of clean energy technologies contribute to the reduction of greenhouse gas emissions?
3. Explain the concept of the “energy transition.” What is it, and what is its significance in addressing climate change?
4. Reflect on why, in some countries, the lack of energy affects women and girls disproportionately.
5. What is one potential governmental policy or project that could be implemented in your country or area that focuses on ensuring access to affordable and sustainable energy for all? How would this policy help achieve SDG 7 and work towards cleaner and renewable energy sources? Consider the role of communities, industries, private businesses, and the economy in implementing your policy/project. What are some potential barriers to success?

Debate Topics

Ages 12 to 14 or Beginners

1. Climate change is not man-made. It is a natural phenomenon.
2. Clean energy is too expensive to implement on a large scale.
3. The energy transition would improve women's and girls' lives.

Ages 15 to 17 or Advanced Learners

1. There should be widespread bans on the use of non-renewable energy sources.
2. Individuals and businesses should be penalized financially for excessive energy consumption.
3. Governments should play a more prominent role in regulating energy usage.

Example Questions for Essays and Projects

Ages 12 to 14 or Beginners

1. Write out three recommendations for your school to practice more responsible energy consumption. Be sure to include evidence on why these policies would contribute to positive environmental outcomes. Be sure to include evidence on why these recommendations are practical and achievable by the school.

2. Consider the intersection of SDG7 with the other SDGs, precisely the societal dimension. How is access to clean and affordable energy linked to human well-being? Draw connections to at least three additional SDGs.

Ages 15 to 17 or Advanced Learners

1. Choose a current renewable energy project in your country. This could be a solar farm, an off-shore wind park, or similar. Analyze this project's impact and long-term effects on different stakeholders, including the community, the environment, and the economy.

2. Select a new, innovative technology that promotes clean energy. Analyze this technology and assess its viability in your country and community.

Global Schools Program

Connect with Us

Email: globalschools@unsdsn.org
Facebook: Global Schools Program
Instagram: @globalschoolsprogram
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New York Office

475 Riverside Dr.
Suite 530
New York, NY 10115
USA
+1 (212) 870-3920

Paris Office

19 rue Bergère
75009 Paris
France
+33 (0) 1 84 86 06 60

Kuala Lumpur Office

Sunway University
Sunway City
Kuala Lumpur
5 Jalan Universiti
Selangor 47500
Malaysia
+60 (3) 7491-8622