



C.H.A.N.G.E.R.S. - 2.0

Module 2: House Performance

Energy household use, energy poverty,
behaviour changes, energy and
water-saving tips.

<https://changers2.eu/>



Co-funded by
the European Union



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Topic - House Performance

Lesson Plan

- Aim:-** To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.
- Objectives:-** Know the different energy sources and advantages/ disadvantages of their use.

Description of Activities

1) **Distinguish renewable energy sources from non-renewable energy sources.**

- Give examples of renewable energy sources and non-renewable energy sources.
- Let participants discuss advantages and disadvantages of using renewable and non-renewable energy sources.
- Help seniors understand the need for efficient and sustainable use of natural resources to ensure their viability on a time scale adequate for their recovery.



Topic - Energy poverty.

Lesson Plan



Aim:- To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

Objectives:- Evaluate the social and environmental implications of the different energy models based on the use of fossil fuels

Description of Activities

1a) Facilitate a discussion to help seniors recognise that the world's dependence on fossil fuels will lead to the depletion of current reserves.

- Present the implications of fossil fuel exploitation, namely oil and natural gas, in many wars and conflicts between countries.
- Let them identify environmental impacts resulting from the use of fossil fuels, namely the increase of greenhouse gases in the atmosphere and research alternatives to reduce dependence on fossil fuels.

1b) Divide the seniors into small groups and provide them with case studies or scenarios related to energy poverty and its impacts.

- In their groups, ask seniors to analyse the social and environmental implications of the current energy model presented in the case studies.
- Encourage critical thinking and discussion on topics such as energy access, affordability, health disparities, environmental degradation, and potential solutions.





Topic - Energy sustainability and efficiency.

Lesson Plan

- Aim:-** To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.
- Objectives :-** Recognise the use of renewable energy and the promotion of energy efficiency as two fundamental pillars for energy sustainability. Participate in actions to promote energy efficiency

Description of Activities

1a) Relate energy efficiency to the use of technologies and processes that reduce as much as possible the waste of energy at all stages.

- Start a discussion and help participants identify behaviours that promote the "Rational Use of Energy" and consequent reduction of energy waste.
- Show them a) how the optimisation of energy use for a given task/process associates responsible behaviour with technologies that allow reduce energy waste, and b) relate the increase of energy efficiency in a given process/task with the decrease in consumption of non-renewable energy resources (in useful for mankind).

1b) Let seniors reflect on how the use of renewable energy allied to energy efficiency enables a more sustainable management of energy resources locally and globally.

- Let participants research concrete examples of adoption of behaviours, practices and technologies that promote energy efficiency.

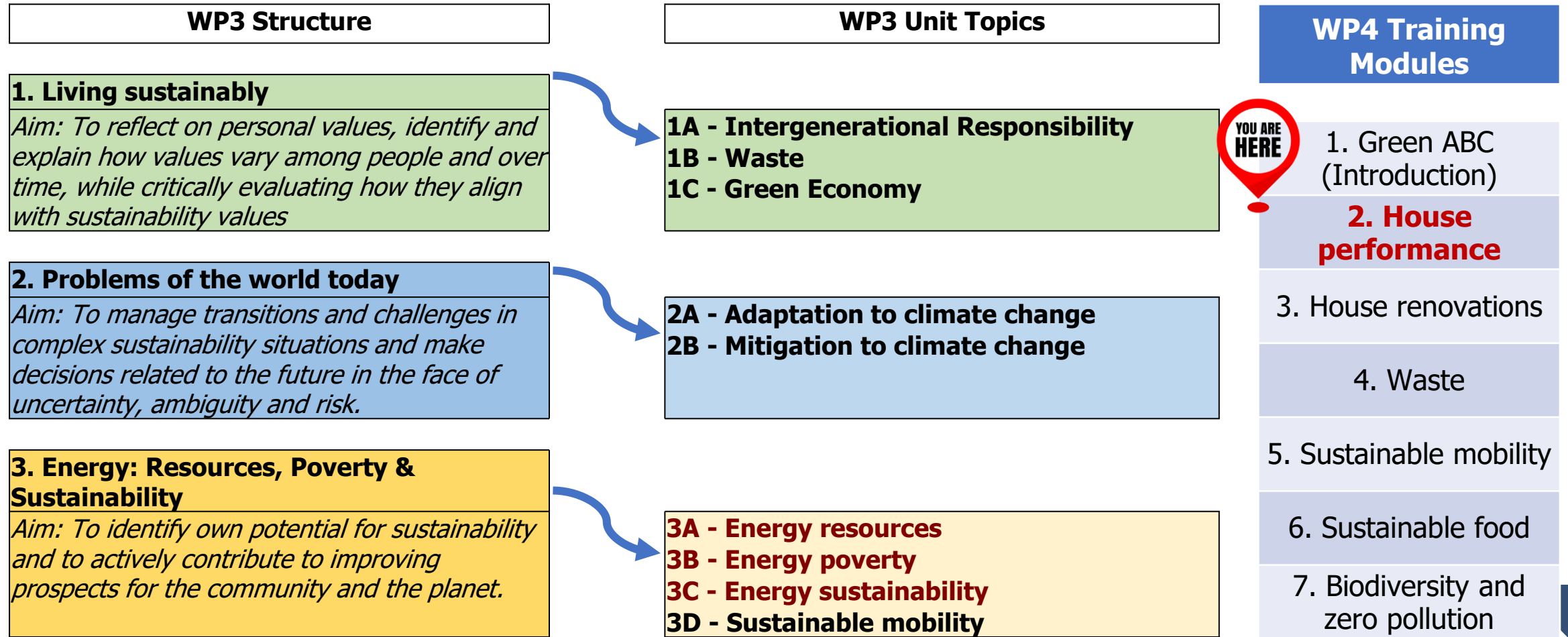
2) Discuss the possibility of seniors promoting information and awareness campaigns for the efficient use of energy and taking part in initiatives that promote the efficient use of energy.

- Let participants conduct a simplified energy audit (identify behaviours/ habits in the surrounding community that lead to energy waste;
- Identify causes of energy inefficiency and consequences;
- Identify the different actors and places where the waste of energy is more significant;
- Point out possible solutions leading to a more rational use of energy and consequently to greater energy efficiency.
- Distribute personal action planning worksheets or provide a whiteboard to write down their plan to promote energy efficiency (set goals and indicators of achievement);
- Evaluate the results and disseminate them to the local community using various communication strategies/ media.





Training modules and unit topics



Clarifying important concepts and terms

The list below contains the main concepts to be used in this methodology:

- **Energy** - is an abstract physical quantity that relates to the capacity to produce action and/or movement, which can be expressed in many forms: kinetic, chemical, potential, etc.
- **Energy poverty** - is the inability of households to maintain adequate levels of energy services at an affordable cost.
- **Climate Change** - refers to global climate variation or regional climate changes that occur over decades and affect the balance of ecosystems.
- **Sustainable Development** - "meeting the needs of the present without compromising the ability of future generations to meet their own needs". (UN, 1987)
- **Intergenerational Commitment** - is a moral and ethical obligation related to sustainability which includes the defence of a healthy environment as a duty and inalienable right of current and future generations.



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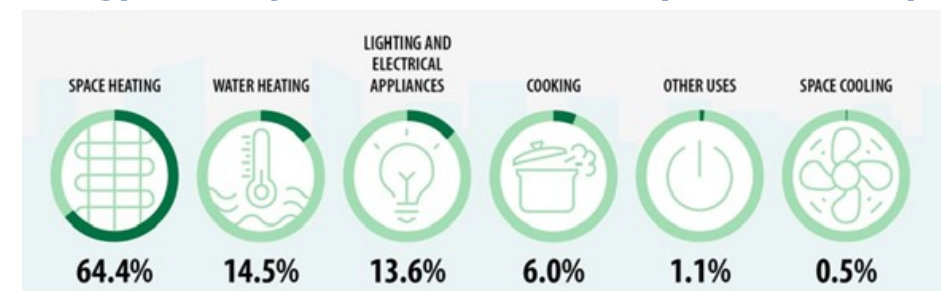
1. Energy use in the household



Energy use in the household

- In 2021, households represented 27% of final energy consumption, or 18.6% of gross inland energy consumption, in the EU.
- Natural gas accounted for 33.5% of the EU final energy consumption in households, followed by electricity (24.6%), renewables and wastes (21.2%) and oil & petroleum products (9.5%).
- The main use of energy by households in the EU was for home heating (64.4% of final energy consumption in the residential sector).
- Energy use in households up 6% in 2021.

Energy consumption in EU households. (% share, 2021).



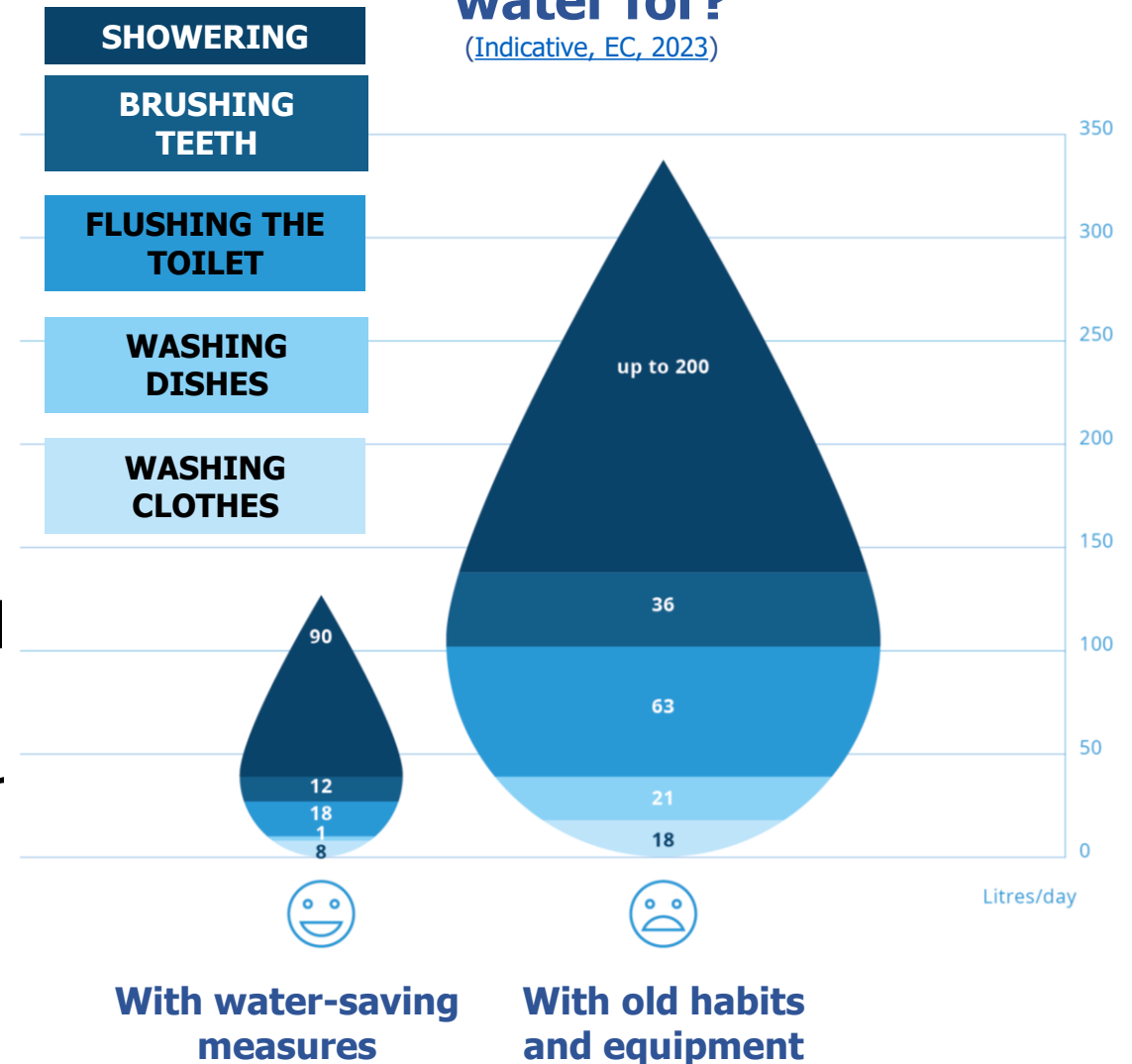
Water use and demand

On average, 144 litres of water per person per day is supplied to households in Europe.

- Agriculture accounts for the largest use of total water (40%) used per year in Europe.
- Energy production also uses a lot of water (28%; ex. cooling in nuclear and fossil fuel power plants).
- Mining and manufacturing accounts for 18 %, followed by household use, which accounts for around 12 %.

What do Europeans use tap water for?

(Indicative, EC, 2023)

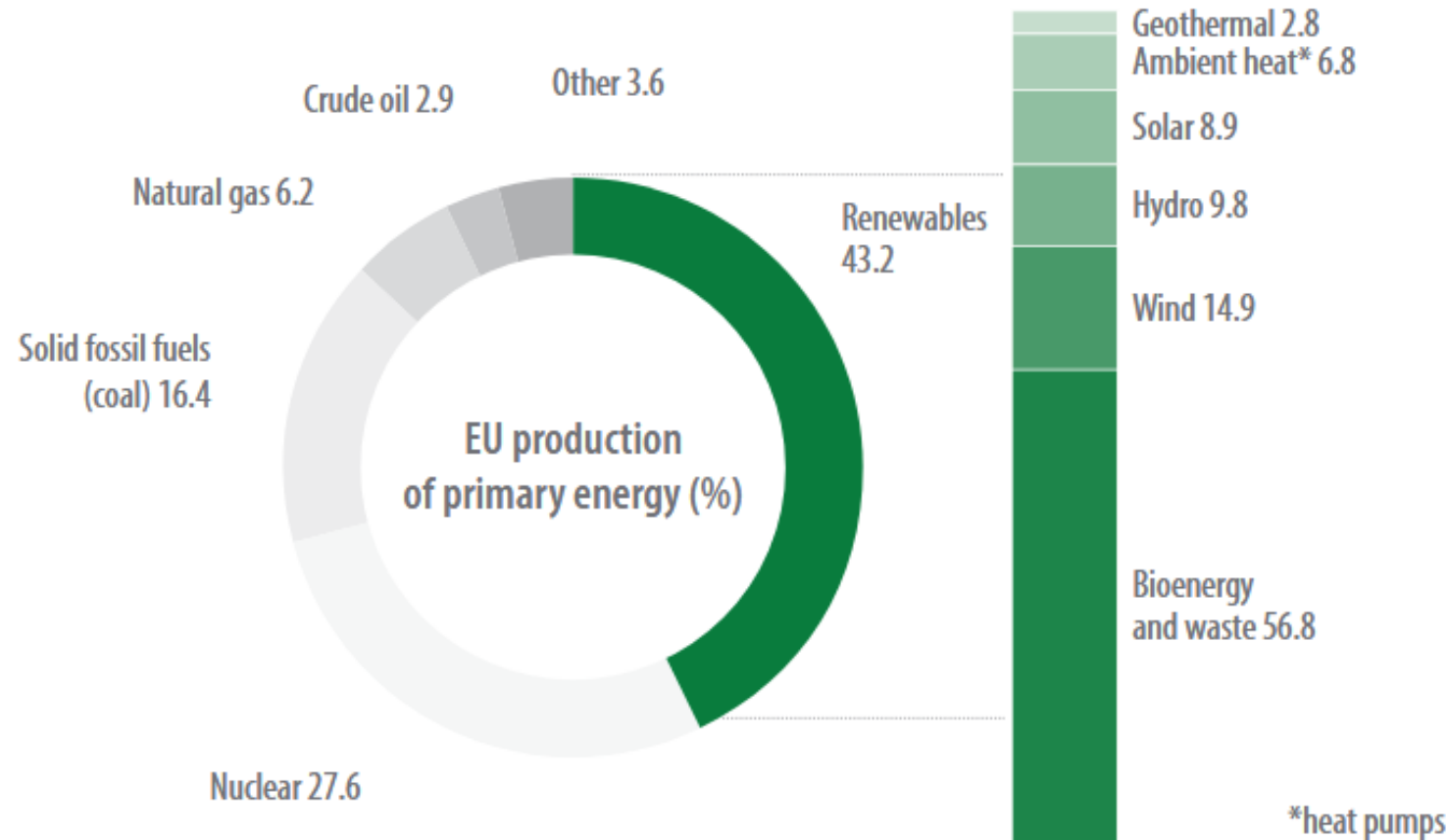




Energy sources in the EU

- Overall, energy sources across the EU for 2022 were produced mostly from renewables (43.2%), followed by nuclear energy (27.6%), then by solid fuels like coal (16.4%).
- Renewables are produced mostly from bioenergy and waste (56.8%), followed by wind (14.9%), hydro (9.8%) and solar (8.9%).

Share of energy sources in EU production of primary energy, 2022



CO₂ emissions per capita worldwide

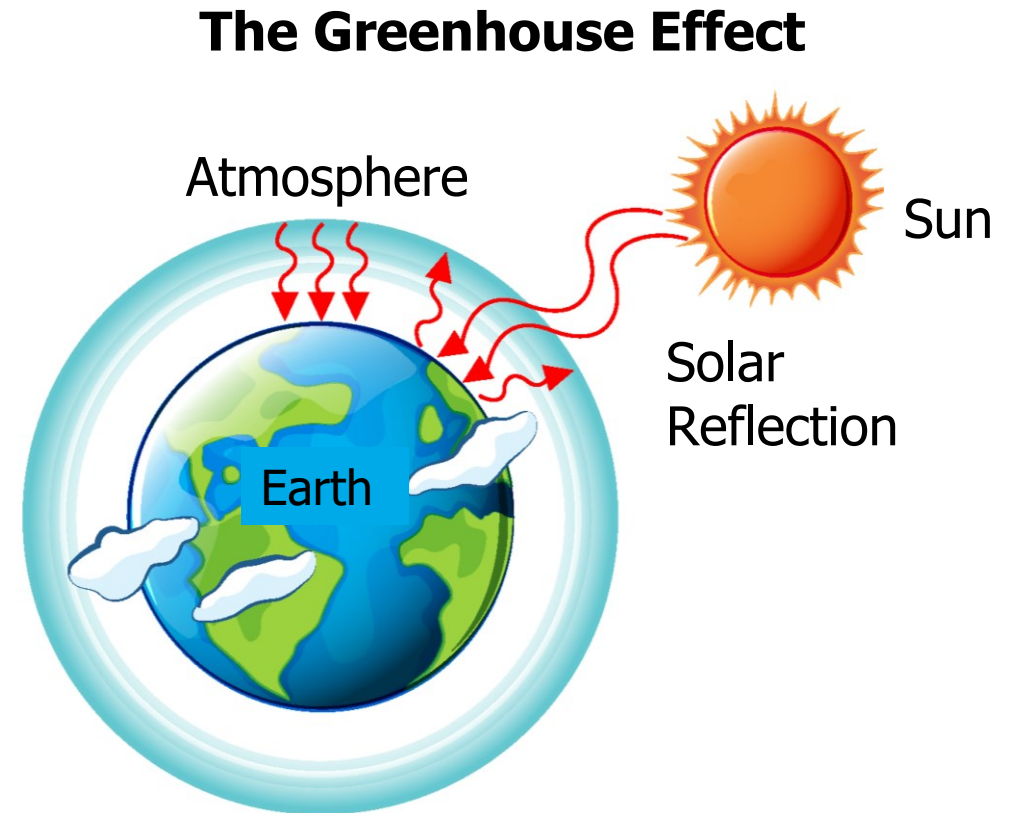
- In 2021, global emissions reached 33.6 Gt CO₂, a 5.8% increase from 2020, likely due to the post-pandemic economic rebound.
- Around 0.9% of the increase was due to population growth, while a significant 4.8% stemmed from rising per capita emissions.
- Huge disparities exist in per capita CO₂ emissions. The average American or Canadian emits approximately 2.5 times more than their EU counterpart, totalling around 14 t/yr versus 5.6 t/yr, respectively.
- Developed countries like Qatar can emit as much as 32 t/yr, while developing nations like Yemen register levels as low as 0.25 t/yr.

If all countries were to raise their per capita emissions to the world average, this would result in a 40% surge in global emissions.




Energy use and a changing climate

- Global warming is caused by increasing concentrations of greenhouse gases produced by human activities such as the burning of fossil fuels for energy and deforestation.
- The effects in global temperatures include a rise in sea levels, changes in precipitation, desertification, loss of habitats, extreme weather events (droughts & flooding), ocean acidification, species extinction, threat to food security.



Activity 1 - Energy resources.

Discussion points:

- Can you share thoughts on which energy sources you grew up with in your childhood years?
 - Can you identify environmental impacts resulting from climate changing that you can compare with your childhood memories?
 - Can you name some major differences between renewable and non-renewable energy sources today?
 - What are the advantages and disadvantages of using renewable and non-renewable energy sources for the future generation?
 - Can you give some examples how we could use natural resources more efficiently and sustainably to ensure their recovery over time?
- 

Activity 2 - Energy resources/Sea level rise

Explore the [Surging Seas Interactive Map](https://coastal.climatecentral.org/) (link is external) to investigate the projected impacts of sea level rise in different geographic areas.

<https://coastal.climatecentral.org/>

- Are there any locations close to your home on the interactive map, which are vulnerable to different sea level rises?
- What do you think will the impact of sea-level rise be on communities and people around these areas?
- What can communities do to keep people safe?





2: Energy Poverty



What is Energy Poverty?

- Energy poverty refers to **the lack of access to essential energy services**. Typically due to a combination of high energy expenditure, low household incomes, inefficient buildings/ appliances, and specific household energy needs.
- Energy poverty is associated with adverse consequences for people's health and well-being -respiratory and cardiac illnesses, mental health, exacerbated due to low temperatures and stress associated with unaffordable energy bills.
- It is estimated that more than **50 million households in the EU** are experiencing energy poverty. At EU level, the inability to keep one's home adequately warm, affected 9.3% of the total population in 2022.





Groups that may face increased barriers to affording energy

single-parent households

People in rental properties

Larger households with dependent children

Low-income pensioners

Migrants/refugees

The unemployed, quasi-jobless households

Households living in older dwellings

People living in segregated communities

Persons with disabilities

Households in remote areas

Beneficiaries of social assistance

Households lacking access to energy support benefits



Health implications of warm or cold homes



Heat stress

Aggravated existing medical conditions

No rest at night leads to death



Increased minor illnesses

Exacerbated existing conditions

Heart and lung diseases

Respiratory problems

Death



Activity 3 - Energy poverty

- Do you have any friends or relatives living in energy poverty?
- Can you share your thoughts on energy access, affordability, health disparities, environmental degradation, and potential solutions?
- Can you identify how energy poverty can be mitigated through local actions?

For case studies and ideas visit https://energy-poverty.ec.europa.eu/system/files/2021-11/EPAH_inspiring%20cases%20from%20across%20Europe_report_0.pdf





3: Energy Efficiency, Energy Sustainability, and the role of behaviour changes

Energy sustainability

Energy sustainability is defined as:

... "the provision of energy services for all people now and in the future in a manner that is sustainable, i.e., adequate to meet basic necessities, not unduly environmentally detrimental, affordable by all, and acceptable to people and their communities."

Energy sustainability involves the use of energy during all aspects of its life cycle in a manner that supports the various facets of sustainable development.

Sustainability = profits = sustainable growth = zero CO₂ emissions

Beware it is not...

Energy efficiency = profits = unsustainable growth = higher emissions

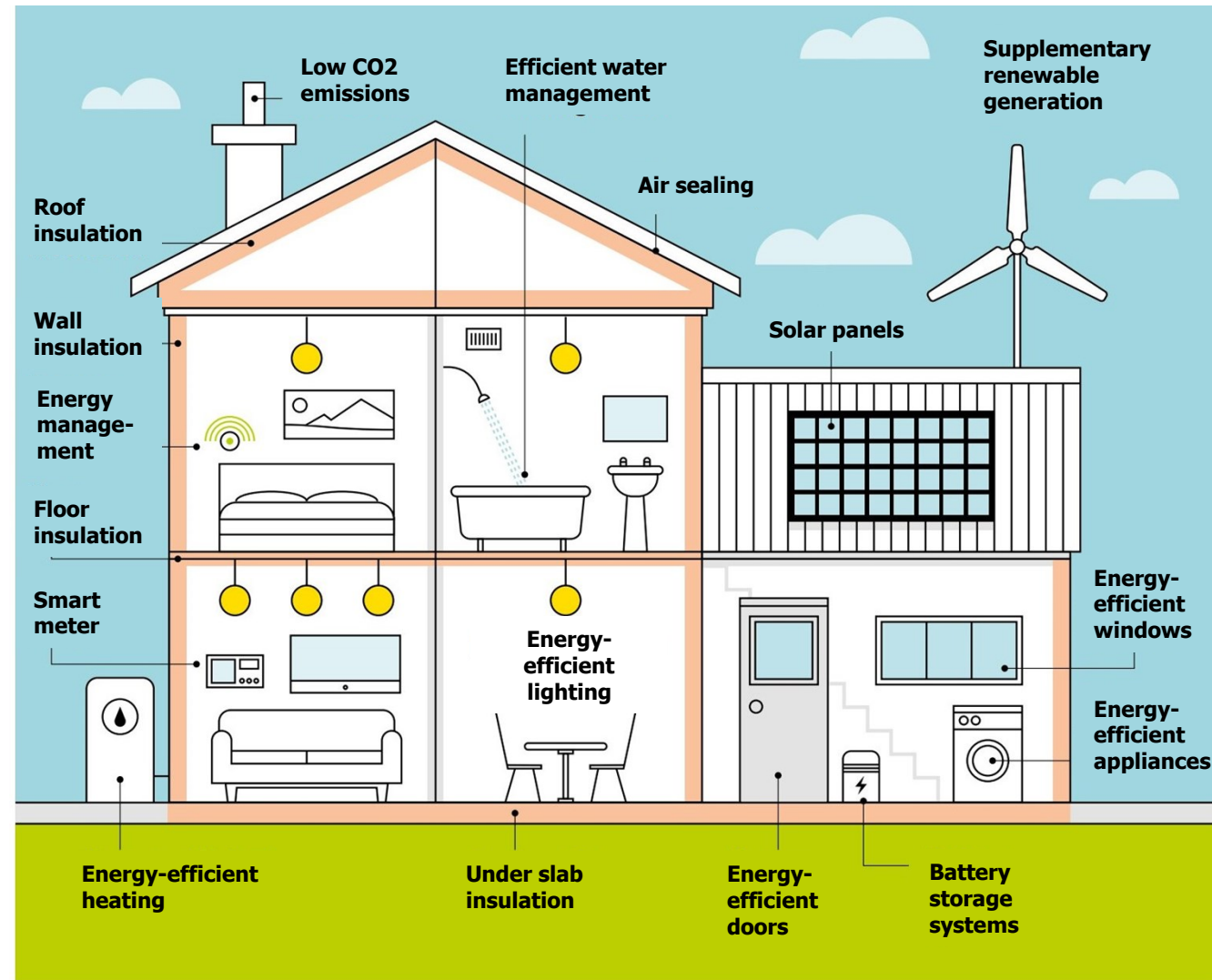




What is Energy Efficiency?

Energy efficiency means doing more with the same amount of energy or less energy.

- Reduces costs,
- Reduces pollution,
- Slows down global warming,
- Makes our economy stronger,
- Increases our energy security.



Insulation and ventilation tips

Keep the doors closed when heating or cooling.

Insulating the roof can save you up to 10-20% on your energy bills by reducing heating and cooling demands.

Insulating your walls is one of the greatest energy savings you can make.

Replacing single glazing with double glazing is an expense but it will help reduce your bill.

Use draught excluders for doors and windows, close off the staircase with a curtain.

Use draught proofing to close gaps and cracks.

Use window shading.

Hang thick curtains in front of your windows.

Replace dated ACs, and set the thermostat at the right temperature.

In winter, the recommended temperature is 19-20 degrees; in summer 23-24 degrees.

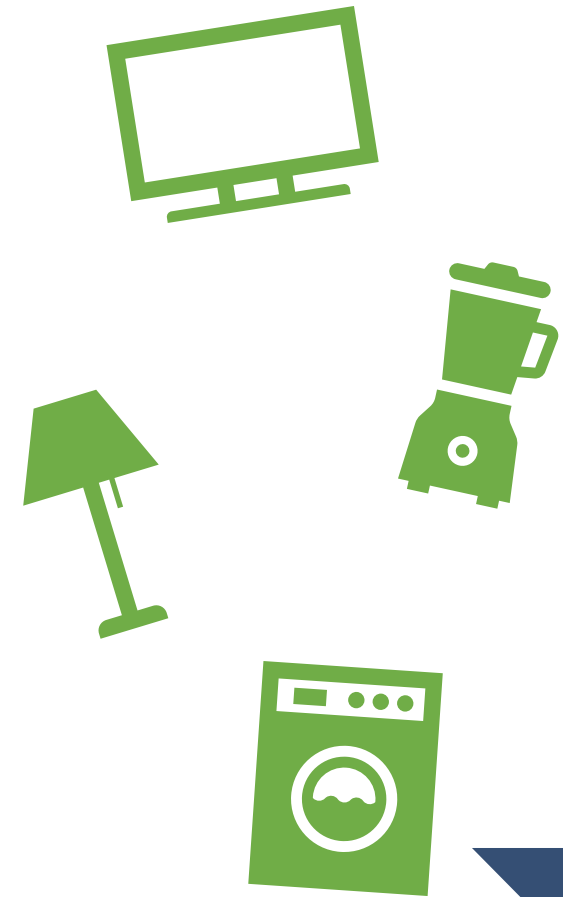
Plant trees or shrubs or use other shading devices to shade the house and air-conditioning unit from direct sunlight.

Ceiling fans are very efficient and effective.



Kitchen, living and electricity tips...

<p>Washing clothes at 30° instead of 40° degrees uses around 40% less electricity! Don't over-spin clothes. A full load is more energy efficient than two half loads.</p>	<p>Borrow a plug in-energy monitor and measure the energy usage of your appliances when they are in use and when they are on 'standby'.</p>
<p>Microwave ovens use around 50 percent to 65 percent less energy than conventional ovens.</p>	<p>You can save 25% of the energy being used by keeping the lid on the pan while cooking.</p>
<p>Most TVs are left in factory settings which means that they are far brighter than necessary. The bigger the TV, the more energy it uses.</p>	<p>Make sure you regularly decalcify your hot water geyser tank (once every 1-2 years depending on how hard the water is in your area)</p>
<p>Switch off your devices and TVs when not in use.</p>	<p>By cleaning your freezer 2 to 3 times a year (on a cold day) you can save up to 10%.</p>



Kitchen, living and electricity tips

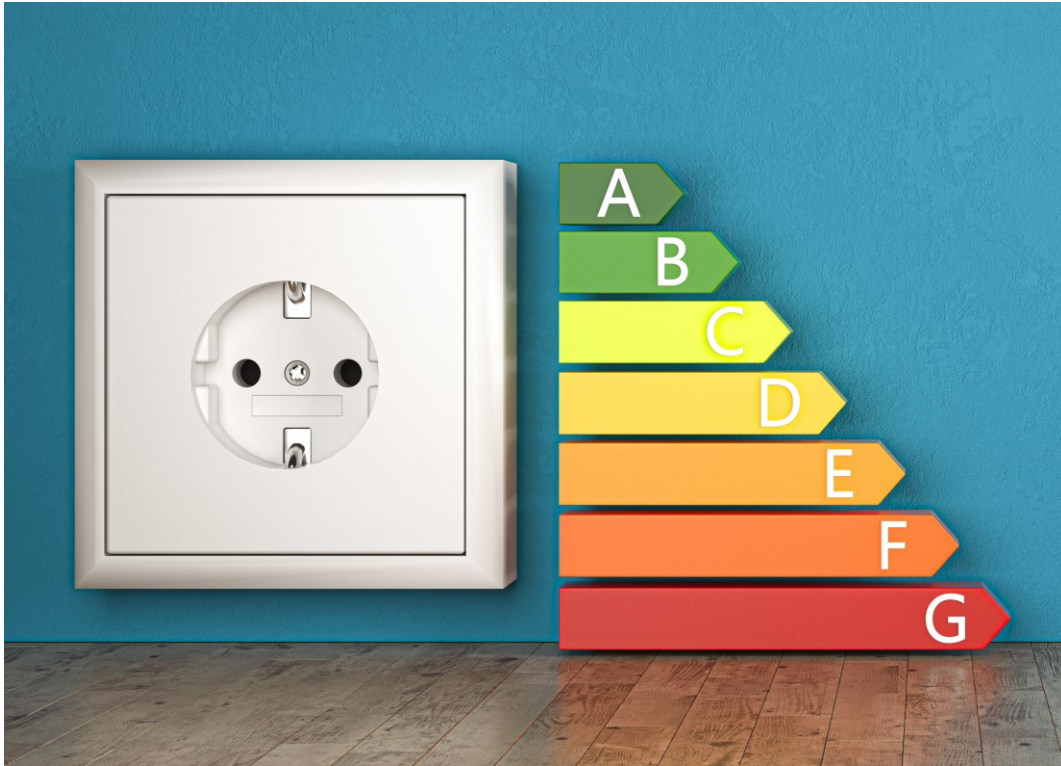


Image: [AdobeStock 416234389](#)

- Buy household appliances which bear the **EU energy label**.
- **Chargers** continue to consume energy when left in the socket, even without an appliance connected to them. Unplug them!
- Energy-saving **light bulbs** use up to 80% less electricity than a standard lamp.
- Use **lighting controls** like occupancy sensors, dimmers, or timers in order to reduce lighting energy use.
- Dark **wall colours** absorb 2 to 3 times more light, so more lighting is needed.

Water heating energy saving tips

- You can reduce your hot water consumption by 10% by using **pipe insulation**.
- Install **solar water heaters** that will provide for your hot water needs for 80% of the year on sun power alone.
- **Insulate hot water cylinder** by fitting a foam 'jacket' around your cylinder - it will cut heat loss by over 75%.
- A **shower** can consume half the amount of water than that of a bath.
- Use your **well** ... for toilet flushing, for the washing machine and for washing the car and floors. Do not drink or use well water for showers, baths, and wash-hand basins.
- Do not leave the **tap** running while you brush your teeth. A family of four can save up to 200 buckets of water per year by this simple measure.



Image: [AdobeStock_259881968](https://www.adobe.com/stock/259881968)



Activity 4 - Energy sustainability, and the future

(Intergenerational)

Children and future generations are at the forefront of bearing the burdens of the climate crisis. For discussion:

- What are your main concerns, and hopes regarding climate change?
- Do you think climate change will effect your lifestyle or endanger life, and how can we prepare ourselves?
- Do we have a duty to future generations and is de-growth possible?
- Do you think you have enough information to protect yourself or children from climate change?
- How are we part of nature and how can we reconnect?
- What is the future we wish for and how can we create that future while taking real climate action.
- How can we build community for change?





END OF MODULE

Thank you for your attention and please complete the exit questionnaire.



References

Eurostat (2023). Energy consumption in households. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Energy_consumption_in_households#Energy_products_used_in_the_residential_sector

Visual Capitalist (2023). Mapped: Europe's Biggest Sources of Electricity by Country <https://www.visualcapitalist.com/mapped-europes-biggest-sources-of-electricity-by-country/>

European Parliament (2023). At a glance. Renewable energy in the EU. [https://www.europarl.europa.eu/RegData/etudes/ATAG/2023/745693/EPRS_ATA\(2023\)745693_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2023/745693/EPRS_ATA(2023)745693_EN.pdf)

IEA (2024). Greenhouse Gas Emissions from Energy Data Explorer <https://www.iea.org/data-and-statistics/data-tools/greenhouse-gas-emissions-from-energy-data-explorer>

AQAL Capital (2023). CO2 Emissions Surge in 2021: Total and Per Capita Rise <https://aqalgroup.com/2021-worldwide-co2-emissions/>

European Commission (2023). Report on access to essential services in the EU Commission staff working document <https://ec.europa.eu/social/BlobServlet?docId=26940&langId=en>

(Eurostat (2023). Water statistics. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Water_statistics#Water_as_a_resource

European Environment Agency (2023). Water use in Europe — Quantity and quality face big challenges. <https://www.eea.europa.eu/signals-archived/signals-2018-content-list/articles/water-use-in-europe-2014#:~:text=On%20average%2C%20144%20litres%20of,differs%20from%20region%20to%20region.>

EC (2023). Water use at home. https://www.eea.europa.eu/signals-archived/signals-2018-content-list/infographic/water-use-at-home/image/image_view_fullscreen

Oresome Resources, Diagram of the Greenhouse effect. <https://www.oresomerresources.com/media-centre/diagram-of-the-greenhouse-effect/>

European Investment Bank (2024). Young Europeans and climate change. <https://www.eib.org/en/infographics/2nd-climate-survey-young-europeans-climate-change>

Baker, W., Acha, S., Jennings, N., Markides, C. and Shah, N. (2022). Decarbonising Buildings: Insights from across Europe. Grantham Institute Briefing Paper. <https://www.imperial.ac.uk/grantham/publications/decarbonising-buildings-insights-from-across-europe.php>

British Council (2022). Climate action in language education: Activities for low resource classrooms. https://www.teachingenglish.org.uk/sites/teacheng/files/2022-08/CALE_activities_low_resource_contexts.pdf

Energy Poverty Advisory Hub (2022). Tackling energy poverty through local actions– Inspiring cases from across Europe Energy Poverty Advisory Hub 2021. https://energy-poverty.ec.europa.eu/system/files/2021-11/EPAH_inspiring%20cases%20from%20across%20Europe_report_0.pdf

United Nations (2021). Towards the achievement of SDG 7 and net-zero emissions. https://www.un.org/sites/un2.un.org/files/2021-twg_2-062321.pdf

UNESCO (2013). Climate change in the classroom: UNESCO course for secondary teachers on climate change education for sustainable development. <https://unesdoc.unesco.org/ark:/48223/pf0000219752>





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**Funded by
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