ENERGY USE @ HOME

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Table of CONTENTS

Further Resources

- Calculation sheet.xlsx
- Graph sheet.xlsx

YOUR ENERGY USE AT HOME

Teaching guide

*Overlaid on the Worksheet in blue

Time: ~80 min

Style: Group working (3-4 peers in each group)

Materials: Worksheet, Calculation sheet, Graph sheet and Tables of solar energy supply

(i) Divide students into multiple groups, and distribute Worksheet, Calculation sheet and Graph sheet to each group.

(ii) Explain the following aim and setting, and assign each group one of the four days listed below.

Aim

To understand the concept of the stability of energy supply.

Scene setting

You are a member of a family of four (father, mother, brother and you) living in Amsterdam. Today is a holiday, and everyone in your family stays home all day. Then, you come up with a question. "*How much energy do we use at home today?"*

[Date: Weather:] <- Fill in the selected day and weather.

A)	February 1st	Snowy
B)	May 1st	Cloudy
C)	August 1st	Sunny
D)	November 1st	Rainy

(iii) Make students work on Calculation sheet following the direction below. Make sure all students participate in the discussion in a group.

1. The change of your energy use during a day (~35min)

On Calculation sheet, electrical devices and activities are listed together with their energy consumption.

1) Think about what your family members do during the day. Blackout the grids on the sheet when one of your family uses the electrical devices or does the activities on the list. (~15min)
2) Calculate the total energy consumption in each hour, and note the value. (10min) [Note] Sum up the energy consumption by the devices and activities on the list. Use calculators if necessary.
3) Plot the calculated energy consumption and draw a graph on Graph sheet. Then, discuss the following question in your group. (~10min)

Question:

- *When does your family use energy the most/ the least in the day? Why?*

(iv) Distribute Table of solar energy supply to each group, and explain that the tables show the change of energy supply by a typical home solar system during the four days. Then, make students work on the graph sheet following the direction below.

2. Compare your energy use to the solar energy supply (~15min)

1) Overlay the graph of the solar energy supply of the day on the graph of the energy consumption. (~5min)
2) Discuss the following questions in your group (~10min)

Question:

- *Does the solar energy supply cover your energy use in the day?*
- *How can you fill the gap between supply and consumption?*

3. Presentation and discussion (~20min)

- Explain your energy use to the other groups focusing on the questions above.
- Compare your energy use to that of other groups. Find similar/ different points.

Wrap-up (~5min)

Wrap up the discussion explaining the following points.

- Home solar panels are just a part of energy sources in reality.
- Other natural energy sources (i.e. wind) also have the same disadvantage as solar panels: instability.
- To cover the disadvantage, we still use "stable" energies such as nuclear and fossil fuels.
- What is important is the concept of "stable energy supply", supplying energy stably by mixing different energy sources.

YOUR ENERGY USE AT HOME WORKSHEET

Aim

To understand the concept of the stability of energy supply.

Scene setting

You are a member of a family of four (father, mother, brother and you) living in Amsterdam. Today is a holiday, and everyone in your family stays home all day. Then, you come up with a question. "*How much energy do we use at home today?"*

[Date: Weather:]

1. The change of your energy use during a day

On Calculation sheet, electrical devices and activities are listed together with their energy consumption.

1) Think about what your family members do during the day. Blackout the grids on the sheet when one of your family uses the electrical devices or does the activities on the list.
2) Calculate the total energy consumption in each hour, and note the value.
3) Plot the calculated energy consumption and draw a graph on Graph sheet. Then, discuss the following question in your group.

Question:

- *When does your family use energy the most/ the least in the day? Why?*

2. Compare your energy use to the solar energy supply

1) Overlay the graph of the solar energy supply of the day on the graph of the energy consumption.
2) Discuss the following questions in your group

Question:

- *Does the solar energy supply cover your energy use in the day?*
- *How can you fill the gap between supply and consumption?*

3. Presentation and discussion

- Explain your energy use to the other groups focusing on the questions above.
- Compare your energy use to that of other groups. Find similar/ different points.

ENERGY GENERATED BY HOME SOLAR PANELS

A) February 1st Weather: snowy

Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

B) May 1st Weather: cloudy

Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
W	0	0	0	0	0	30	100	200	400	700	1100	1500	1800	1500	1100	700	400	200	100	30	0	0	0	0

C) August 1st Weather: sunny

Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
W	0	0	0	0	0	100	300	600	1000	1500	2300	3500	4000	3500	2300	1500	1000	600	300	100	0	0	0	0

D) November 1st Weather: rainy

Time	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
W	0	0	0	0	0	0	0	0	50	100	250	400	500	400	250	100	50	0	0	0	0	0	0	0