

Powering Your House Challenge



How many solar panels and wind turbines did you use for your house in the workshop?



Powering your house

There is a way to generate exactly 50kW

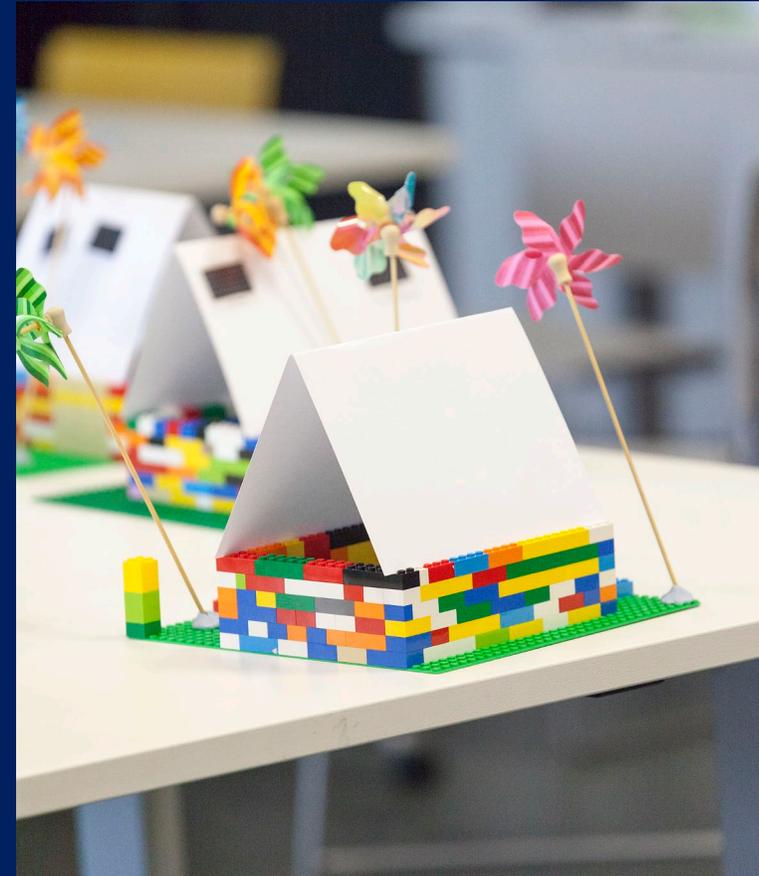
Can you work it out?

Remember!

A house will use 50 kW of electricity each day.

A solar panel will give around 5 kW of electricity per day.

A small wind turbine gives us 15 kW of electricity.



Powering your house

There is a way to generate exactly 50kW

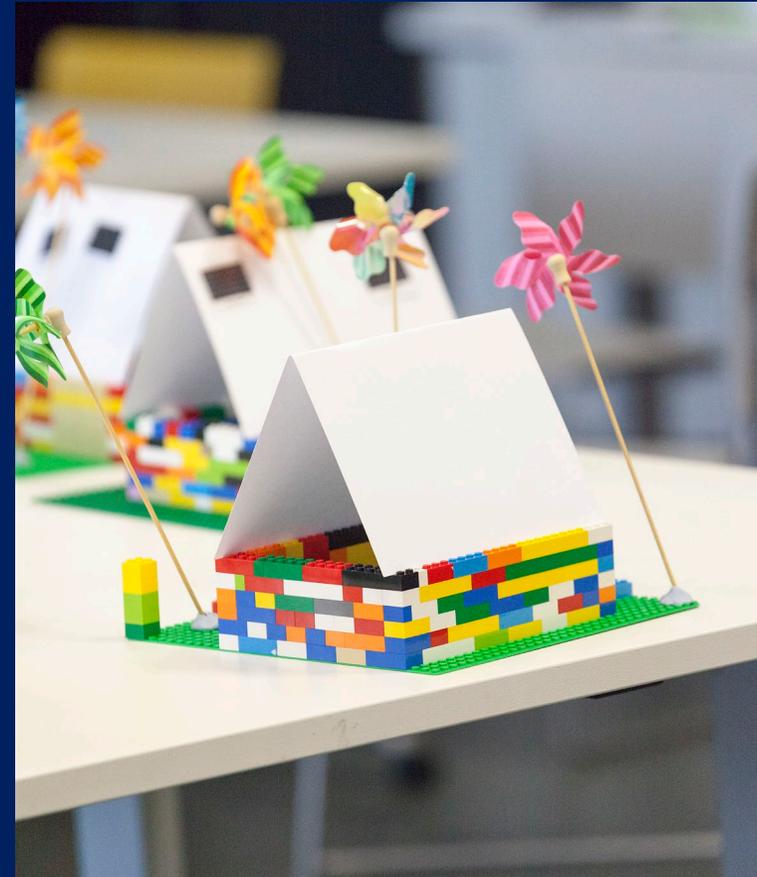
One answer is: One wind turbine and seven solar panels

$$15\text{kW} \times 1 = 15$$

$$5\text{kW} \times 7 = 35$$

$$15 + 35 = 50\text{kW}$$

Did you find any others?



How much does it cost?

Wind turbine are a lot more expensive than solar panels but they do generate more electricity



*Wind turbines cost
£20,000*

*Solar panels cost
£5,000*

Mild

How much would it cost for the way you chose to power your house?

Hot

What is the cheapest way to generate at least 50 kW or more of energy?



How much does it cost?

Did anyone generate more energy than they needed? If you did then you can sell it back to the National Grid.

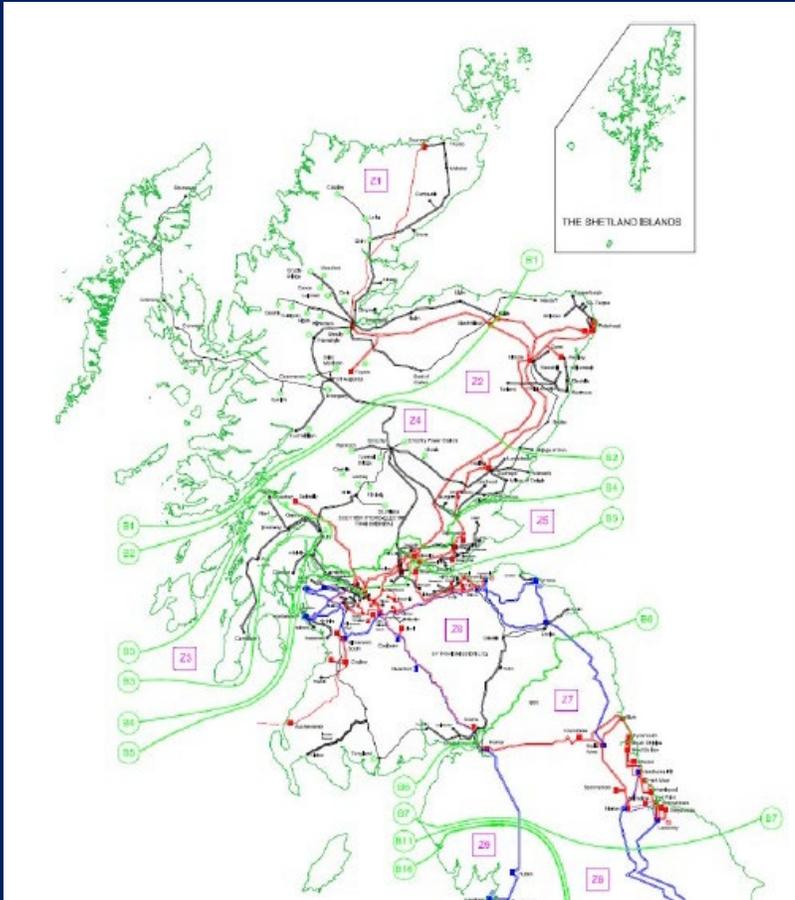
If you generate 1kW extra per day, over a year you can earn £500.
So 1kW= £500 and 2kW= £1000...

Mild

How much could you earn from the extra energy you produced?

Hot

How many years would it take to earn back the cost of your power system?



How much does it cost?

You can also save money by using less energy in your home. There are two ways to do this:

Insulating your house (preventing the heat escaping) Costs: £3000 saves 10kW

Getting appliances (like fridges and kettles) which are energy efficient. Cost: £1000 saves 5kW



The Final Challenge!

Mild

If you added insulation (saves 10kW) and energy saving appliances (saves 5kW) to your house how many kW of power would you still need to produce? What combination of wind turbines (generating 15kW) and solar panels (generating 5kW) would you use to generate this energy?

Hot

How much would it cost to build the energy project you designed above? Wind turbines cost £20,000 and solar panels cost £5,000.

Flaming Hot

You have £70,000 to spend. If you add additional wind turbines or solar panels to your project. You have space for a maximum of 8 solar panels and a maximum of 4 wind turbines. How much money could you make per year? (you can sell energy at £500 per kW)