

# Powering Your House Challenge



# Powering your house

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 6 kW of electricity per day.

A small wind turbine gives us 14 kW of electricity.



# Powering your house

There is a way to generate exactly 50kW

**The answer is:** One wind turbine and six solar panels

$$14\text{kW} \times 1 = 14$$

$$6\text{kW} \times 6 = 36$$

$$14 + 36 = 50\text{kW}$$



# How much does it cost?

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



*Wind turbines cost  
£20,000*

*Solar panels cost  
£6,000*



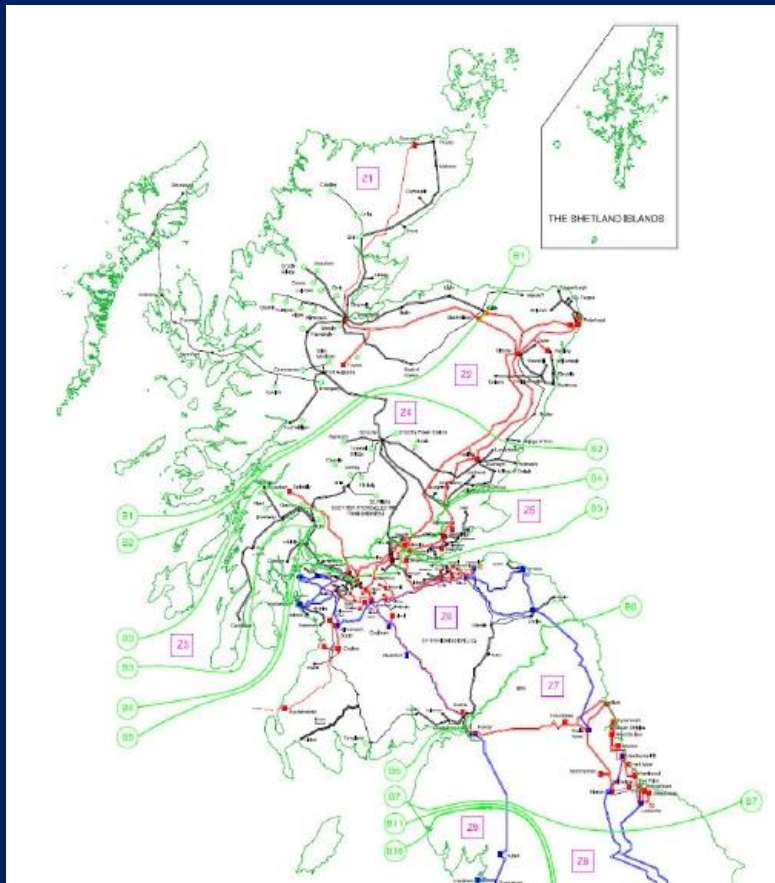
## **Mild**

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 9kW

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



# The Final Challenge!

## **Mild**

If you added insulation (saves 9kW) 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 14kW) and solar panels (generating 6kW) 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 £6,000.

## **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)