

RWE

The Role of Hydrogen in the Energy Transition



Learning objective

Add your chosen Learning objective to this slide (see lesson plan)

Vocabulary



Circuit



Electrolysis



Hydrogen



Reversible



Electricity



Solid



Oxygen



Irreversible



Conductor



Liquid



Metal



Renewable



Battery (cell)



Gas



Fuel



Greenhouse gas

Odd one out



Which is the odd one out and WHY?



Card sort

1. What do all the cards have in common?
2. How many different ways can you sort the cards?



Coal



Solar power



Gas boiler



Oil boiler



Camping
gas stove



Log burner



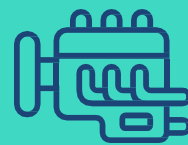
Wind turbine



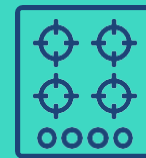
Steam train



Petrol



Ship's engine
room



Gas hob



Hydro power

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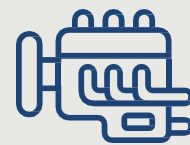
Wind turbine



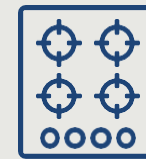
Steam train



Petrol



Ship's engine
room



Gas hob



Hydro power

Which are advantages and which are disadvantages of using hydrogen as a fuel?

To turn hydrogen into a liquid to make it easier to transport uses lots of energy to chill it to -253°C and keep it that cold

It is a light gas and escapes easily

Hydrogen is expensive to transport

Can be produced from renewable sources using water and electricity from solar or wind power

Could be used to power lorries, trains, ferries, ships, planes and buses

Much of the hydrogen currently used is produced from non-renewable sources

It can be turned into a liquid to make it easier to transport

Currently few hydrogen pipelines

No greenhouse gases made during its production when renewable sources of electricity are used

Currently expensive to produce

Existing gas pipes and storage could be adapted to transport and store it

When hydrogen burns or is used up the main waste product is water



Advantages

Can be produced from renewable sources using water and electricity from solar or wind power

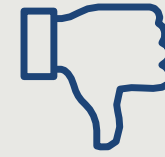
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Disadvantages

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Producing hydrogen

Make a circuit similar to the one shown in the picture.

You will need:



A 9V battery (cell)



2 leads with crocodile clips at the ends



2 small metal objects
(e.g. paperclips or folded kitchen foil)

Make sure the pieces of metal are not touching each other and make sure the crocodile clips attached to the battery are not touching.

OBSERVE CLOSELY!

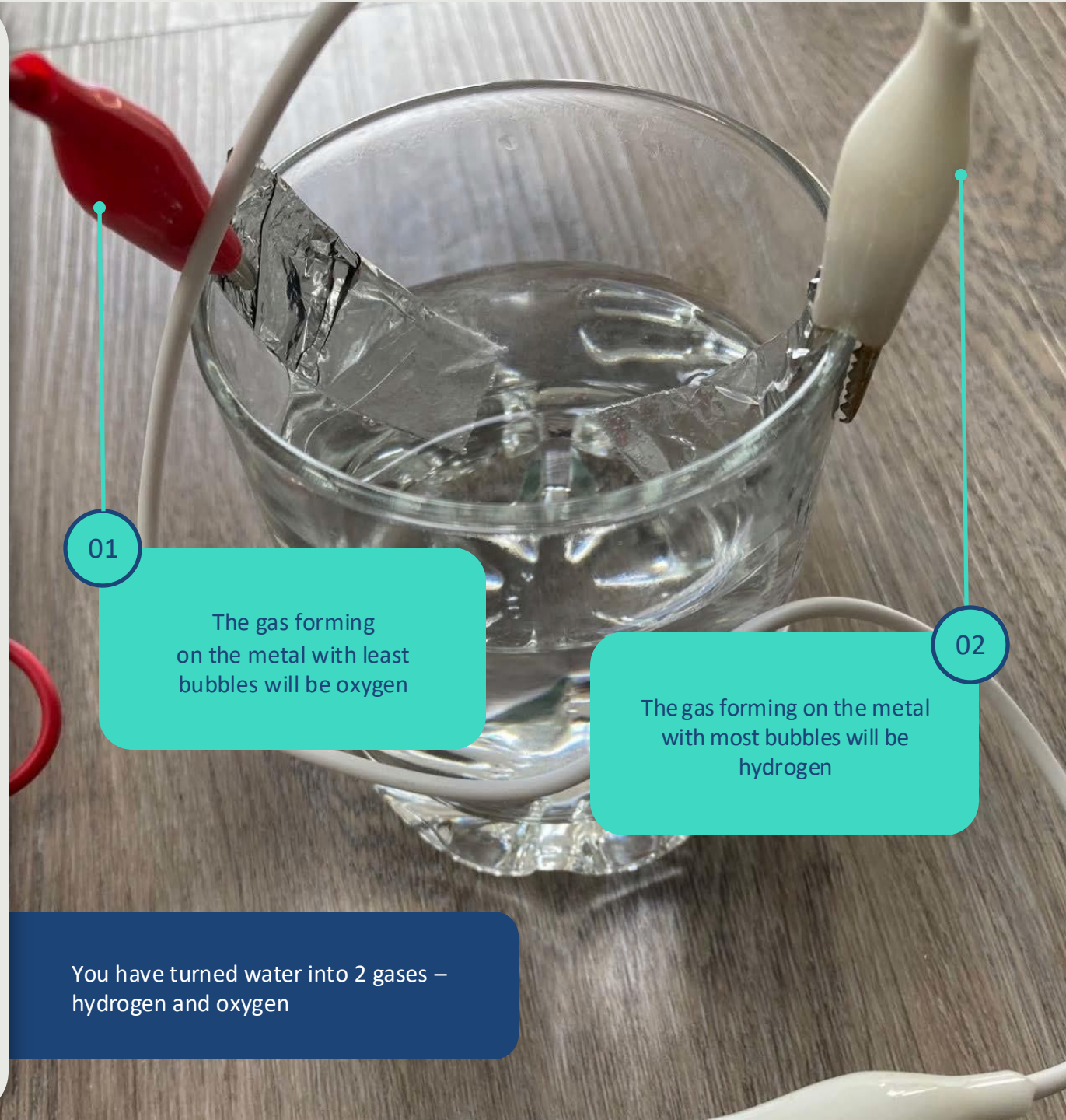


Electrolysis

Electrolysis can be used to produce hydrogen.



Is this a reversible or irreversible change?



01

The gas forming on the metal with least bubbles will be oxygen

02

The gas forming on the metal with most bubbles will be hydrogen

You have turned water into 2 gases – hydrogen and oxygen

RWE are planning to produce a lot of hydrogen!

This is an electrolyser being delivered to a new hydrogen production factory in Lingen, Germany, for RWE. It will produce hydrogen that can be used as a clean fuel.

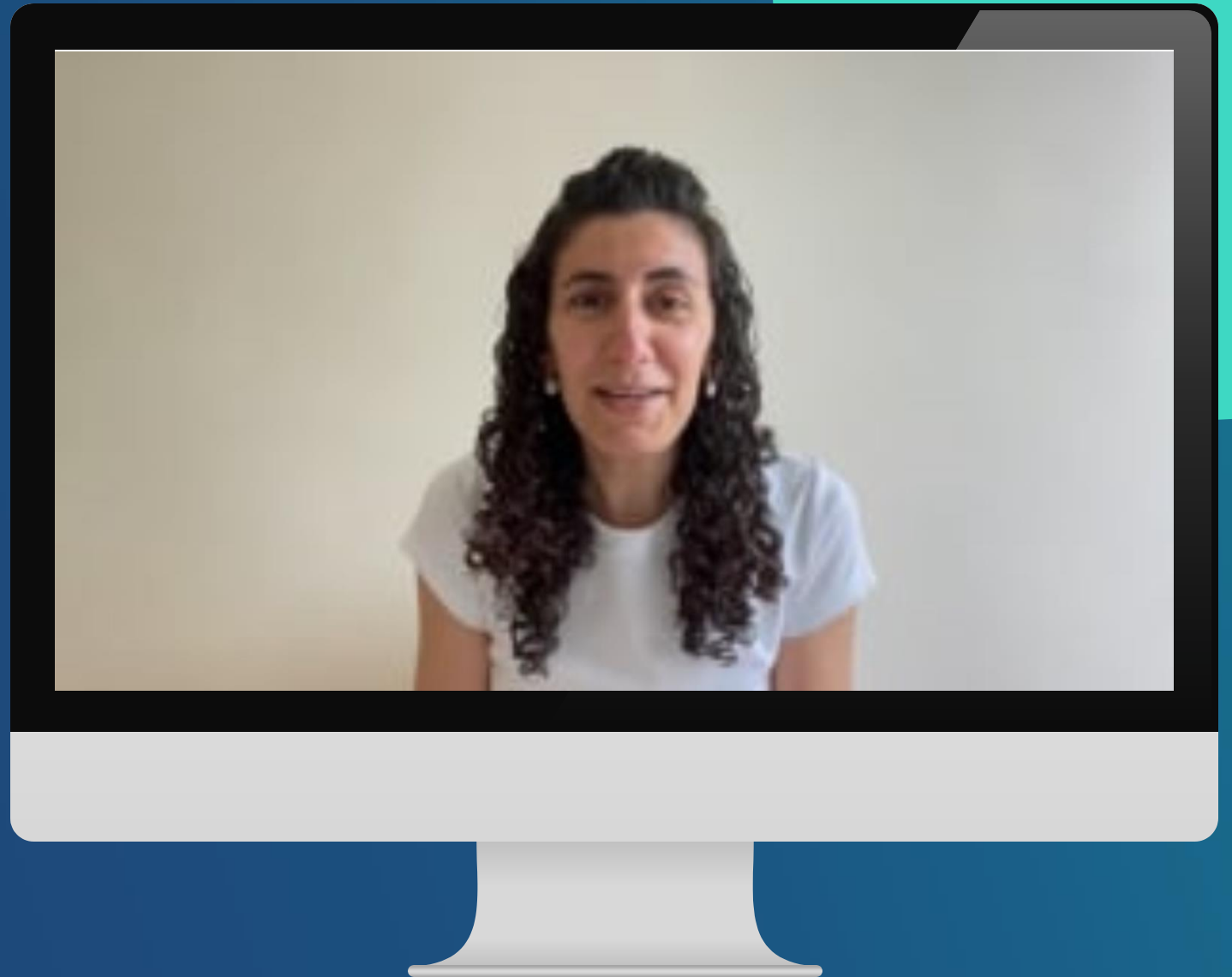


Meet Yasmin

Yasmin works as a hydrogen project developer for RWE. In this short video she talks about why she wants to work in green hydrogen production, how water can be split into hydrogen and water, and some of the many job roles at RWE.

Click on Yasmin's picture or the link below to watch the video
(2 mins and 56 seconds)

[RWE - introduction video on Vimeo](#)



HAIKU

- A three line poem that doesn't rhyme
- First line has five syllables
- Second line has seven syllables
- Third line has five syllables



Can you write a Haiku about producing hydrogen?
What vocabulary will you include?



GREEN HYDROGEN

A stylized illustration of green hydrogen storage equipment. It features a tall, white cylindrical tank on the left, connected to a horizontal white storage tank on the right. The horizontal tank has the words "GREEN HYDROGEN" printed on it in a bold, dark blue font. The entire scene is set against a dark blue background with a grey ground plane at the bottom.