



Climate Change Resource: Part 2

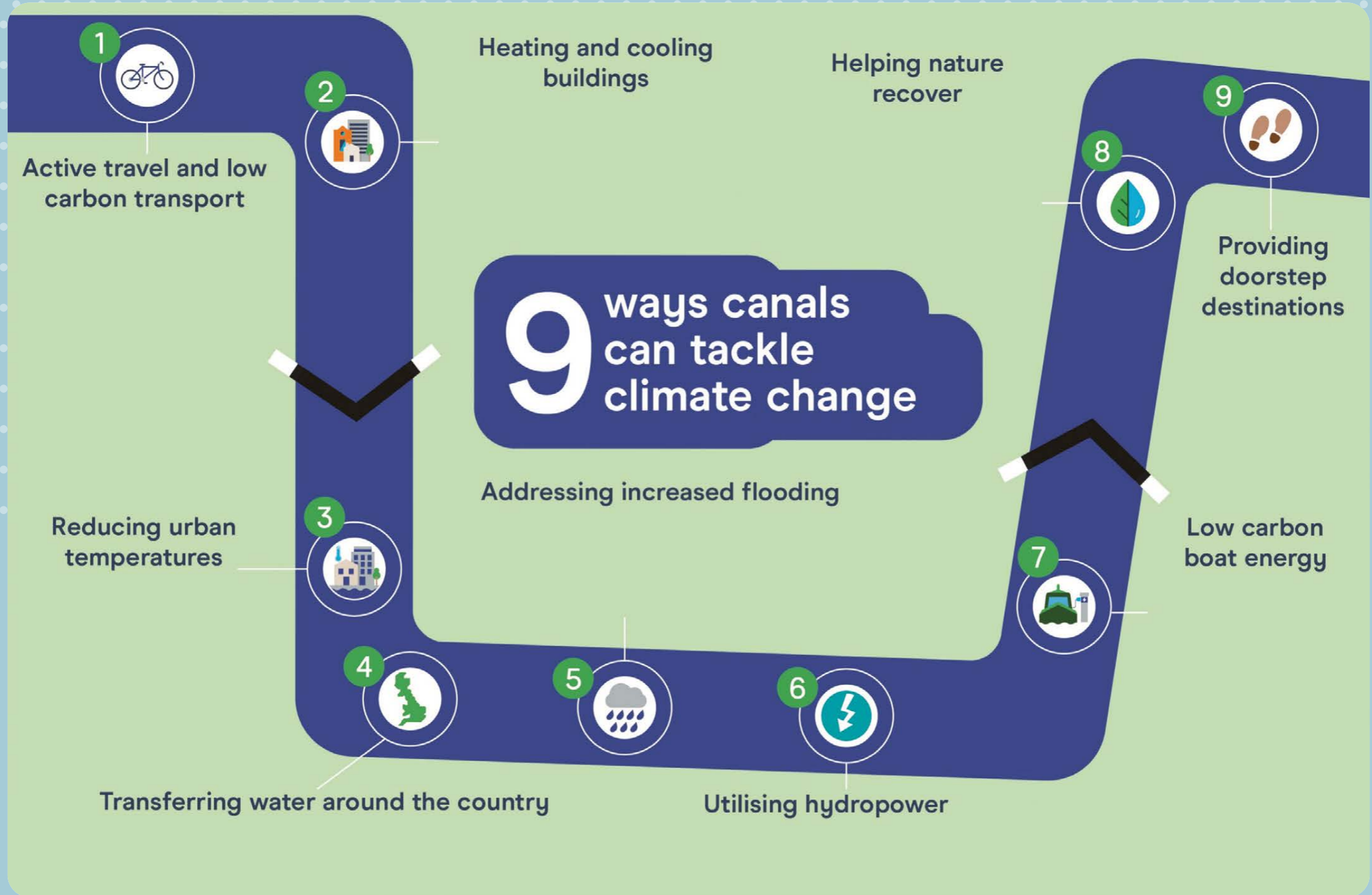
How canals can help fight against climate change

canalrivertrust.org.uk/stem



Canals and rivers can play a vital role in the fight against climate change. Before watching the video how many of the 9 different ways can you think of?

Click the image to play the video





1

Active travel and low carbon transport

Active travel and low carbon transport.

0:22 / 3:30



- Towpaths are traffic-free active travel routes for walking, cycling, running, commuting and other activities.
- Moving freight by water removes c.12,500 HGVs from the roads.

Click the image
to play the video



CO2 emission estimates

Mode of transport	g/tonne-km
Road	207-280
Inland waterways	40-66
Air	1160-2150

- Which mode of transport produces least CO2?
- Which mode of transport produces most CO2?
- Can you think of an alternative way of presenting the data in the table?

Discuss:

Are canals always a good option for transporting freight?

Think about sending goods to a nearby city from where you live.

2

Heating and cooling systems

Heating and cooling systems.

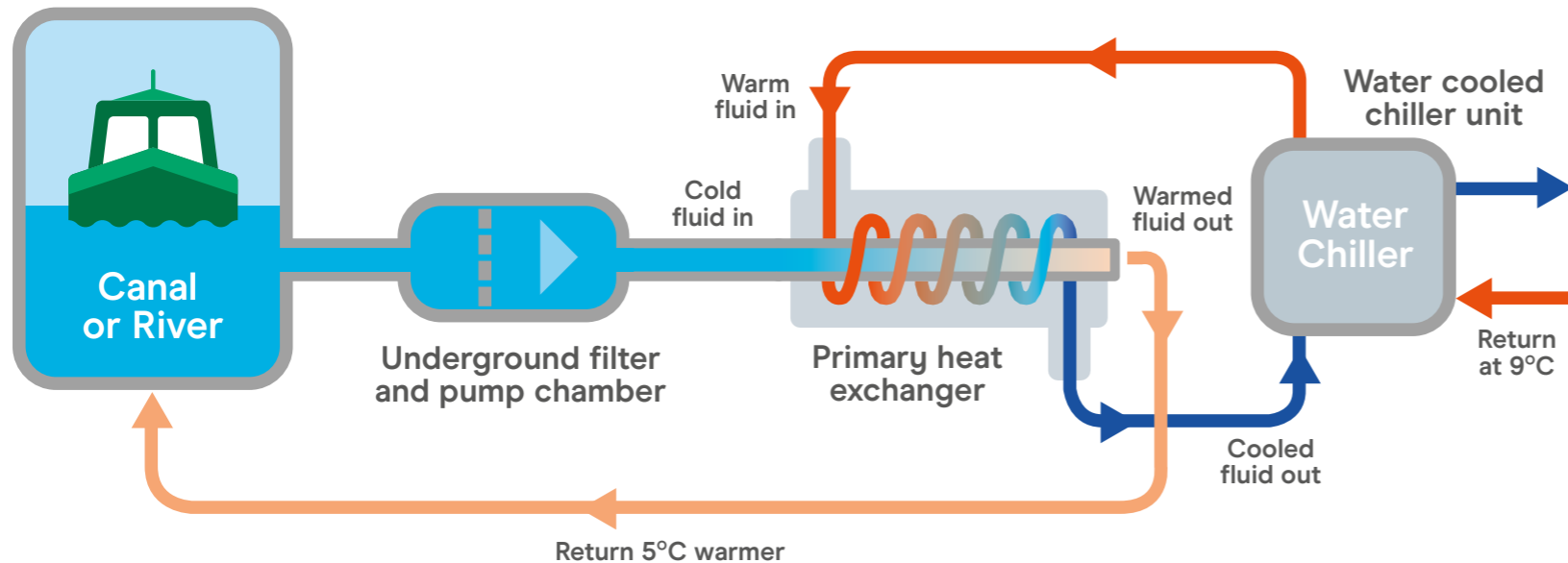
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- Water from canals and rivers can be used to heat and cool waterside buildings.
- Canals and rivers could produce enough energy to heat and cool 250,000 homes.

Click the image
to play the video

Heating and cooling



Remember

- Air temperatures vary, canal water temperatures are more steady
- Air is everywhere but water has to travel through pipes

Water and air can both be used to heat buildings

Which do you think is better?

How does it work?

Heat is absorbed from a water or air source and transferred to a fluid inside the system. This fluid is then compressed, which raises its temperature and provides heating or hot water.

For cooling, heat is absorbed from inside the building and transferred to the water or air outside, removing heat from the building and lowering the indoor temperature.



3

Reducing urban temperatures

Reducing urban temperatures.

0:55 / 3:30



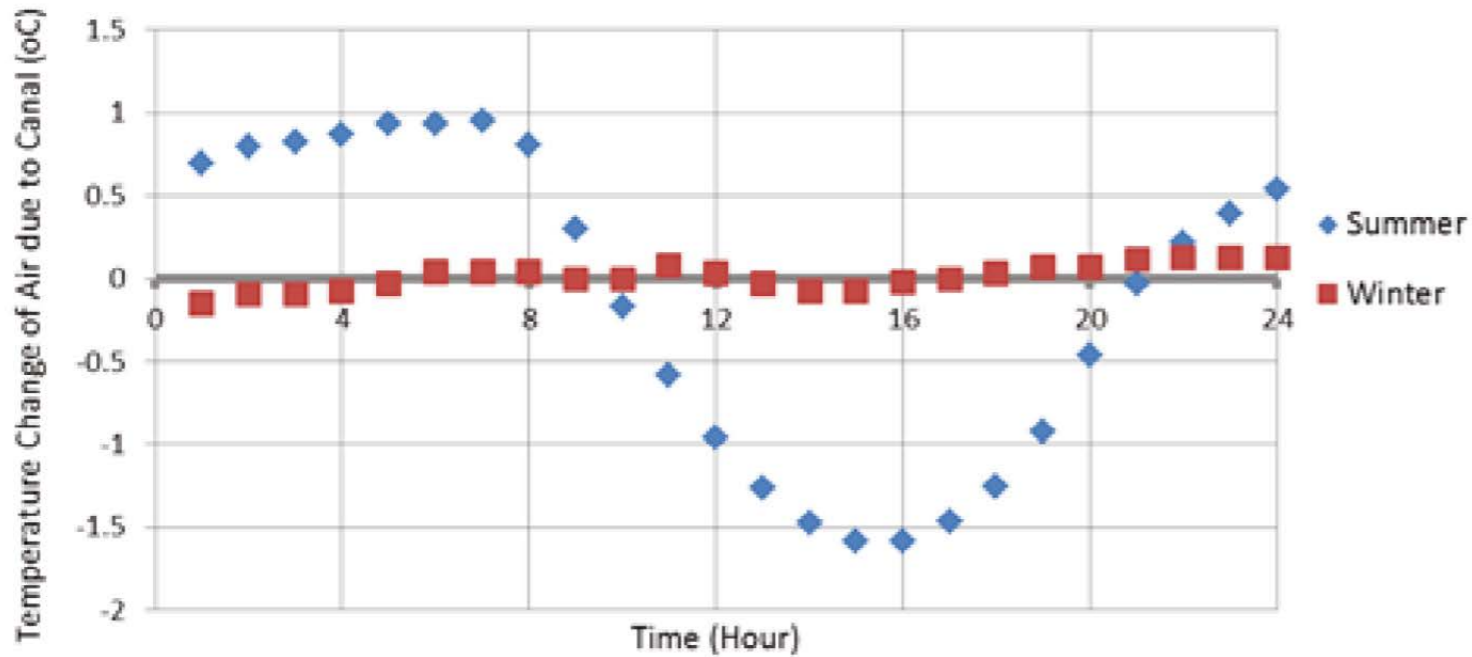
- The 'Urban Heat Island' effect increases temperatures in towns and cities during hot weather.
- A study by University of Manchester showed canals help reduce temperatures by up to 1.6°C.

Click the image
to play the video

Reducing urban temperatures

Here is some of the data collected in Rochdale

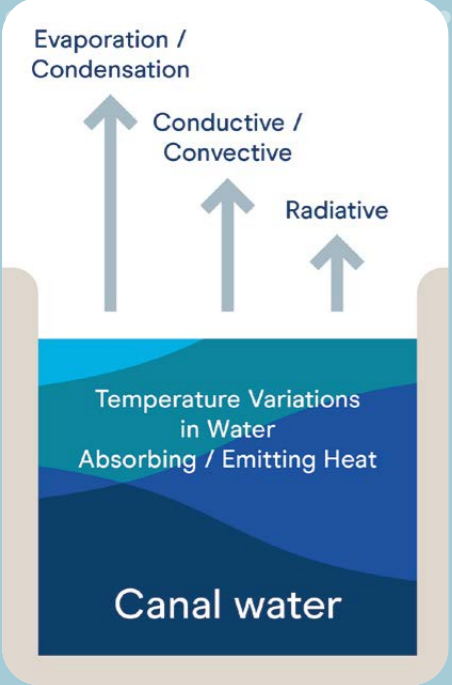
Temperature Change of Air due to Canal (Summer vs. Winter)



The study said canals help cool urban areas. Do you agree?

Find the point on the chart that shows the biggest difference in temperatures

- Which season was this?
- What time of day was it?
- What time of day was it?
- What do you notice about the difference in winter temperatures?



Heat energy inputs and outputs from the canal
(Adapted from Lu 2008)

4

Transferring water

Transferring water.

▶ ▶ 🔊 1:16 / 3:30



- Using the existing network of canals is a sustainable, eco-friendly way to transfer water.
- Water can be moved from areas with lots of water to places with shortages.

Click the image
to play the video

Water transfer



Severn Trent Water are investigating how to move 115 million tonnes of water (enough for 700k residents) from Minworth to Leighton Buzzard.

- Find the route on the map
- Which canals will be used?
- Where will the water be stored?

Can you think of a way to transfer water without the canals?

5

Addressing flooding

Addressing flooding.

1:33 / 3:30



Canals can reduce the impact of flooding

- Water can be pumped or re-directed into canals.
- The canals can move water away from towns and properties at risk.

Click the image
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Addressing flooding

PROTECTING

Embankment



Reservoir

840 sub stations protected



387 sub stations protected

128 schools protected



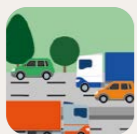
34 schools protected

Railways protected at 570 locations



Railways protected at 55 locations

Motorways protected at 114 locations



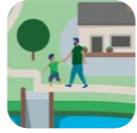
Motorways protected at 18 locations

Embankment



Reservoir

370,294 people protected



193,663 people protected

31,881 businesses protected



122,428 properties protected



80,693 properties protected

A reservoir is an artificial lake where water is stored. Most reservoirs are formed by building a dam across a river. The dam controls the amount of water that flows out of the reservoir.

An embankment is a wall or bank of earth built to prevent a river flooding an area.

- These structures protect people, but they also need to be protected.
- What could happen if we don't protect them against climate change?





Flowing water can be used to generate sustainable energy called hydropower. Water flows over river weirs non-stop so power can be generated 24 hours a day, every day.

Click the image
to play the video

Utilising hydropower



This is an aerial photo of a hydropower station

- Can you spot the weir in the picture?
- Why does a weir make a good site for hydroelectric power (HEP)?

Do you think hydropower is a good solution for our energy needs?



7

Low carbon energy for boats

Low carbon energy for boats.

2:12 / 3:30

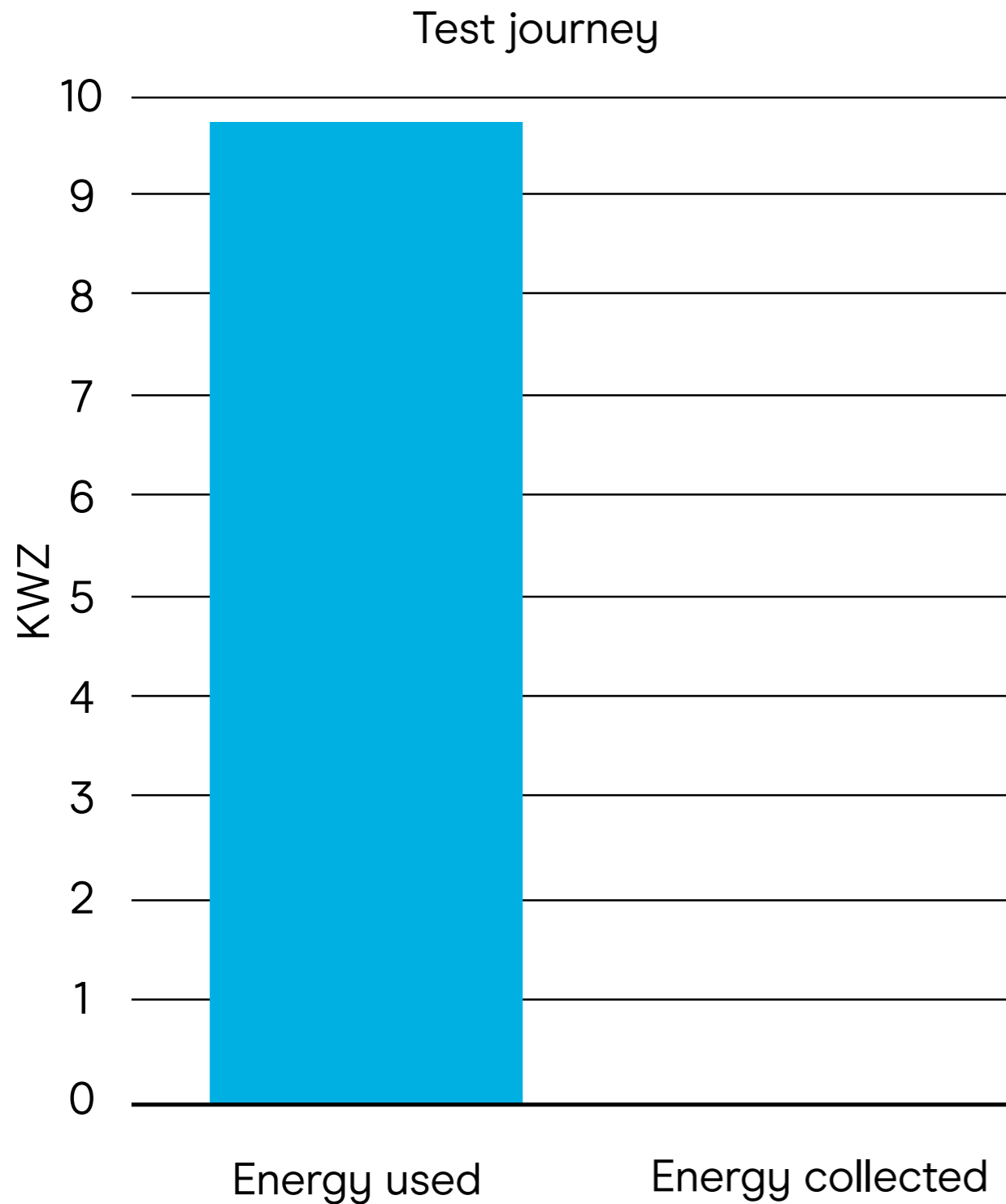


Most boats on inland waterways have diesel engines and use solid fuel for heating

Low carbon alternatives

- Hybrid (battery and diesel engine)
- Fully electric
- Solar power and battery
- Greener fuel

Click the image to play the video



The chart shows the amount of energy used by a boat during a test journey.

The boat collected 2.9 KWz of energy via solar panels during the journey.

- Plot this figure on the bar chart
- Would the boat be able to make the same journey again using the energy collected?
- What will boaters need to help them go electric?



Helping nature recovery

Helping nature recovery.

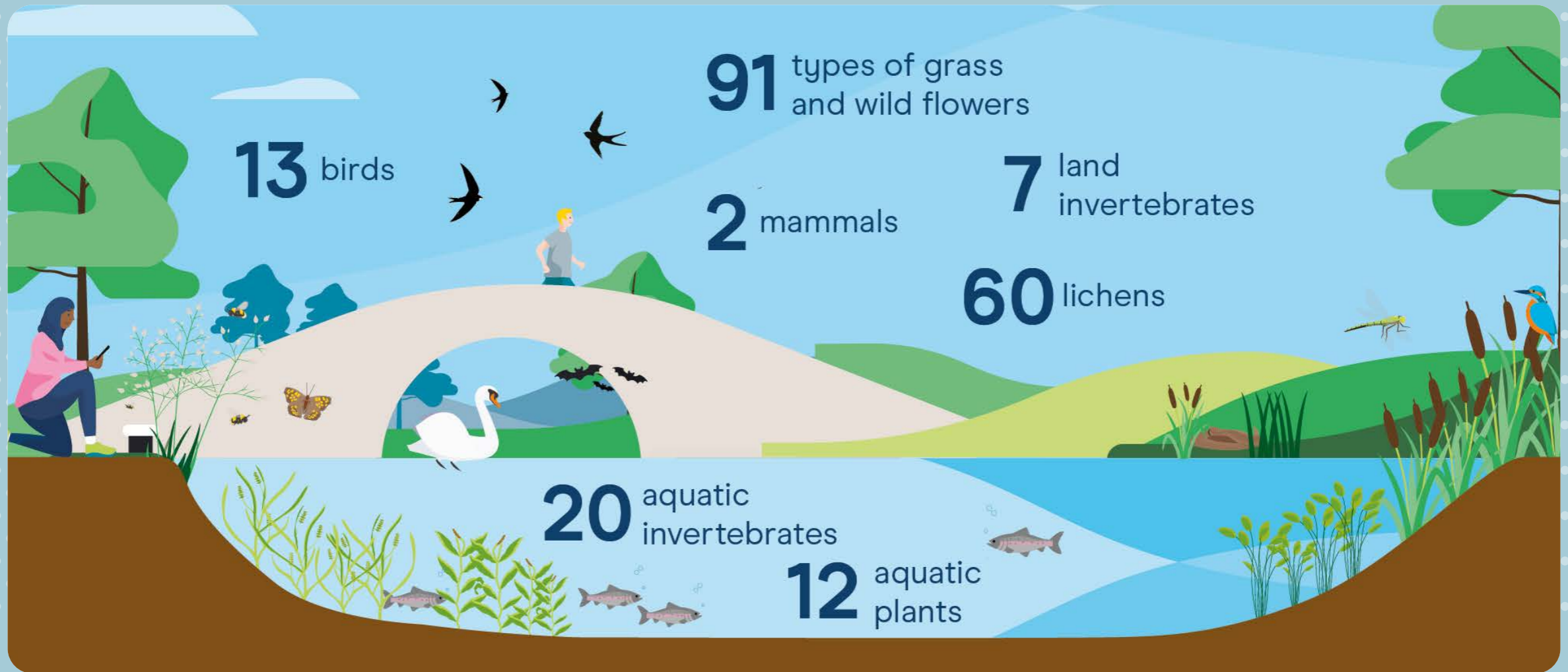
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Canals provide vital waterside habitats for wildlife. The Trust works hard to improve these habitats and help nature recover and to protect threatened species such as water vole.

Click the image to play the video

Helping nature recovery

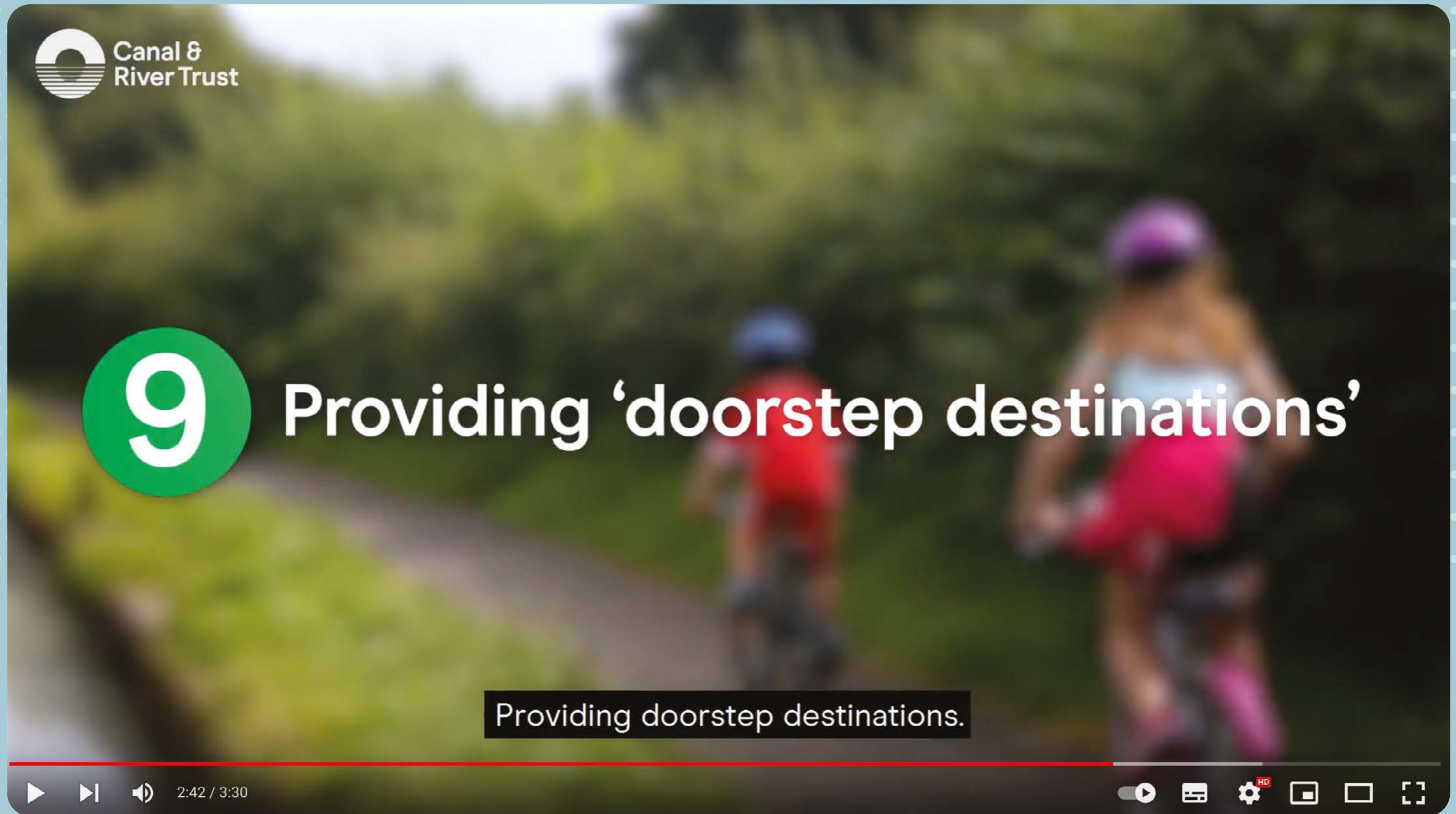


Bioblitz study results showing the number of different species seen in one day at Aylestones Meadows on the Grand Union Canal.

How many species were spotted during the day of the study?

Choose a site near you to conduct your own 'Bioblitz' study.

How could you present your findings?



Nearly 9 million people live within 1km of a canal, river navigation, dock or reservoir.

Doorstep destinations reduce the need for car journeys and CO2 emissions, and improve physical health and mental wellbeing.

Click the image to play the video

Reasons for visiting canals: 2022/23



Have you visited a canal or river? What did you do when you were there?

List the three most popular things people like to do when they visit a canal or river

If there are 10.3 million users, how many visit a waterside attraction?