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Opportunities for Circular Economy Chemicals in Wastewater Treatment

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Topics

Who are Scottish Water

Why the Circular Economy is important to us (and you!)

Scottish Water's Circular Economy Approach

The Wastewater Treatment Process

Opportunities for Circular chemicals in each part of the Process

What we need to do next together

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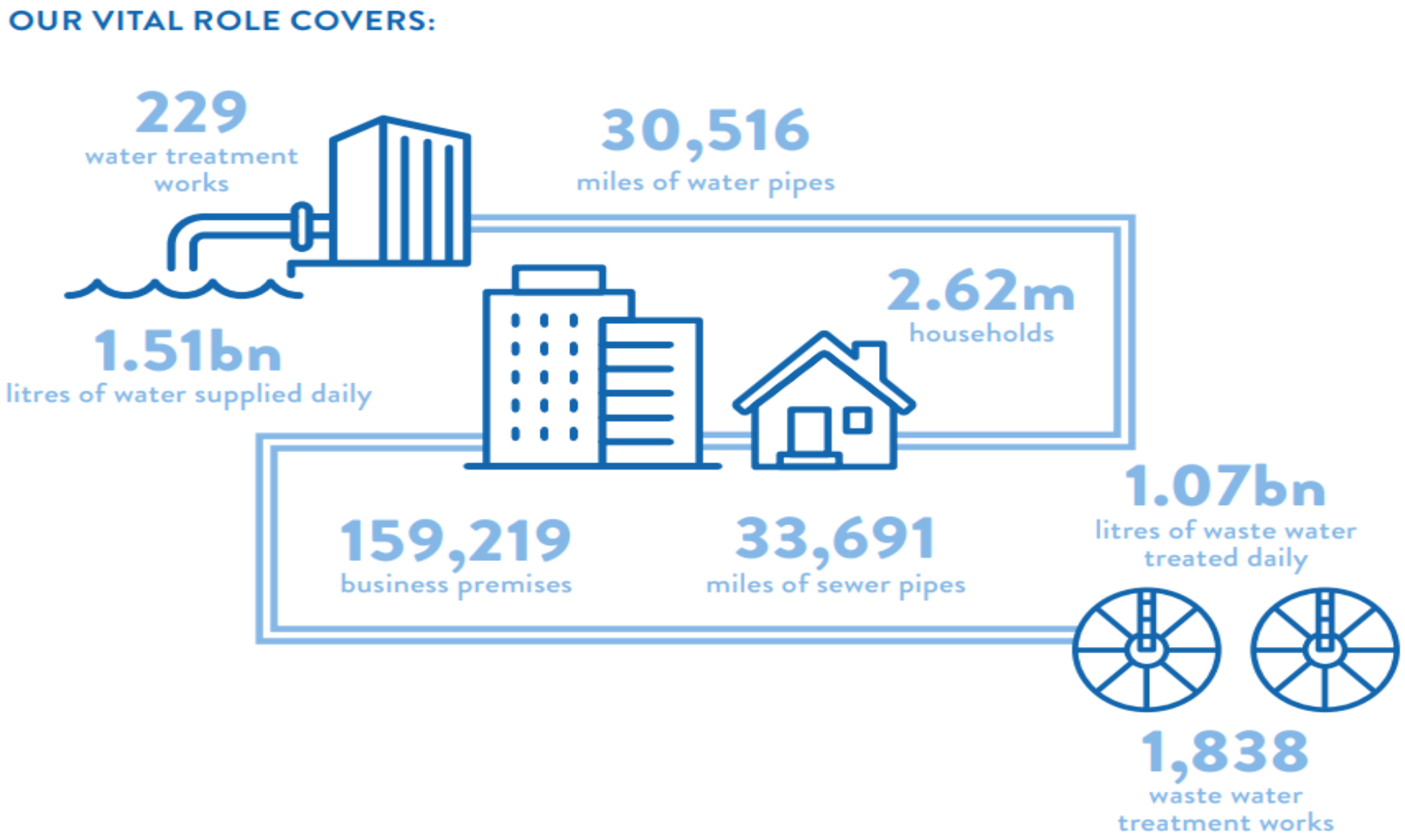
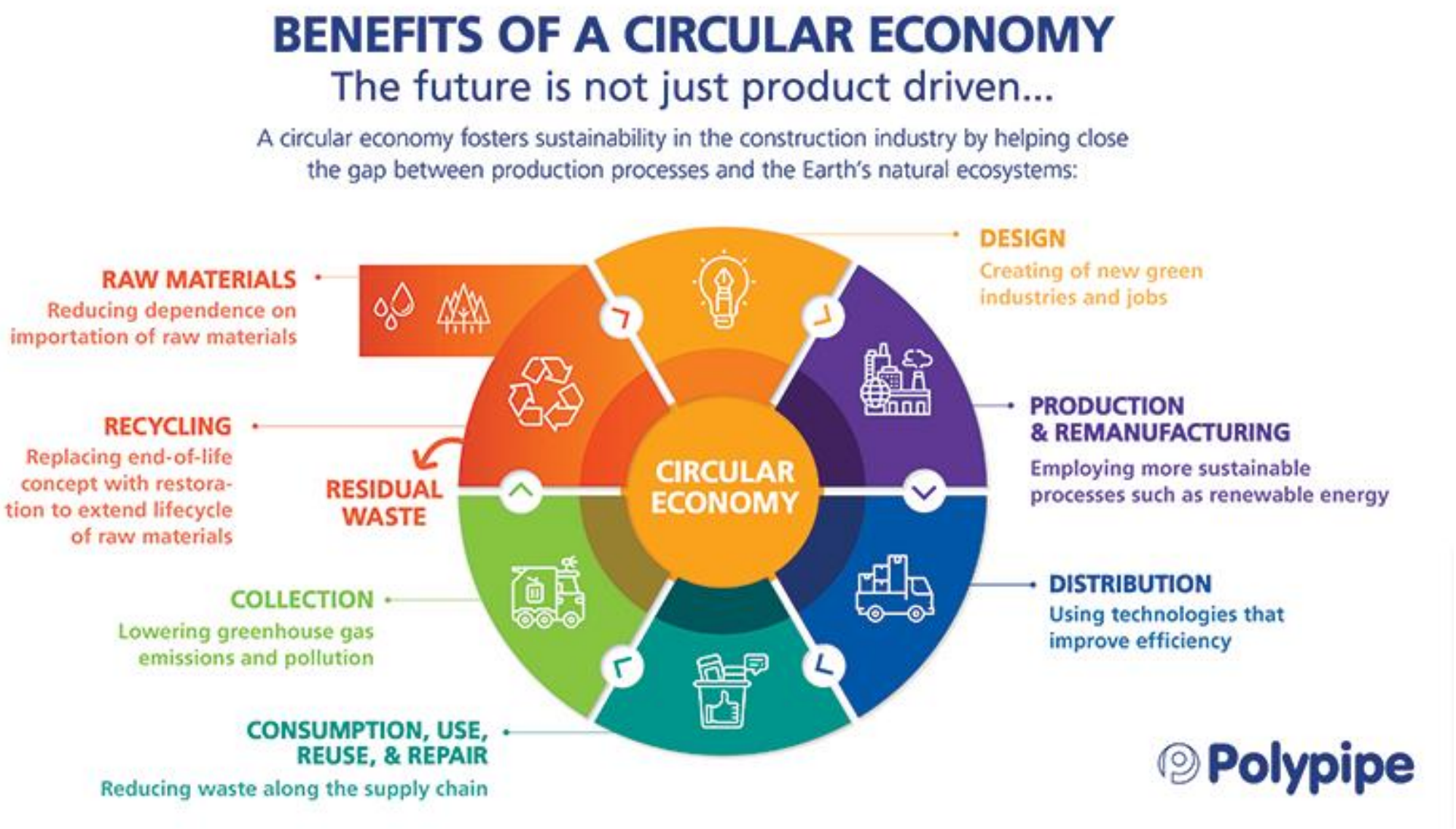
Scottish Water's Vital Role



Why is it important?



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Our Ambitions

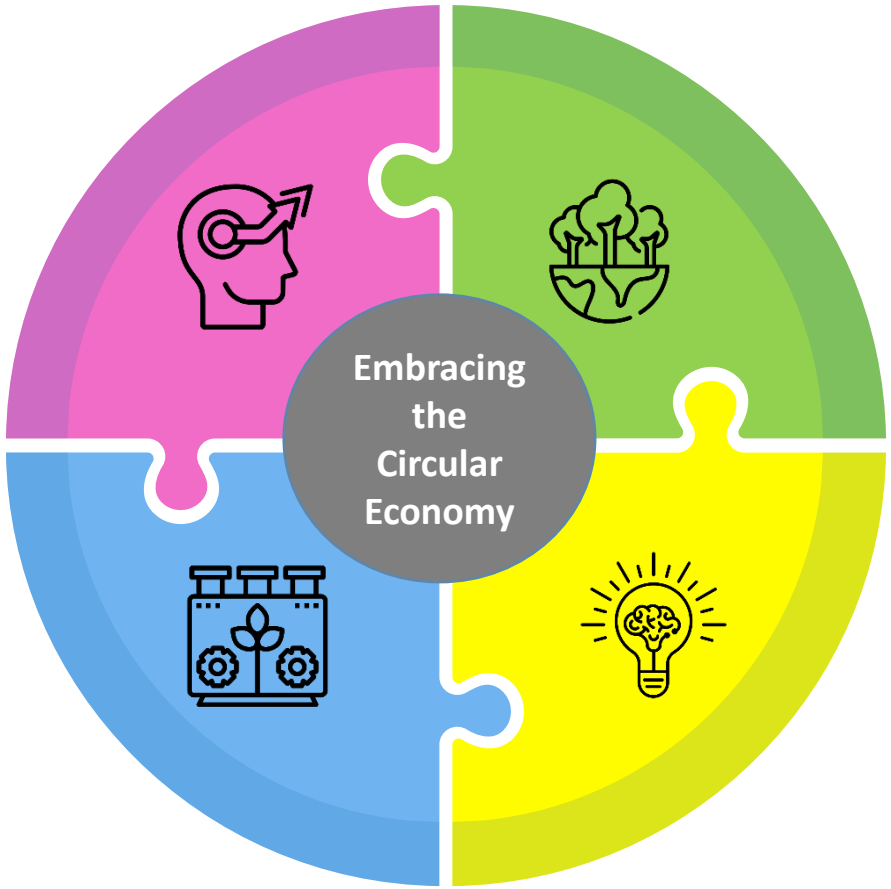
Our Circular Economy approach

Embedding Circular Economy behaviours

We will live the circular economy together with our customers and suppliers. We will incorporate the principles into our processes, skills and decisions wherever we work.

Keeping assets performing

We will maximise the total value of our assets with innovative materials, design and operation.



Working with nature

We will minimise the resource use of our services and investments. We will enhance the biodiversity of our environment.

Viewing waste as an opportunity

We will increase valuable resource recovery from our vital water and wastewater services and stop all material going to landfill.

The Current Wastewater Treatment Process

1. Screening

Sets of screens trap rubbish like: toilet paper, grit, wood and plastic. These currently go to landfill.

2. Primary Treatment

The wastewater rests in open tanks where solids sink to the bottom, making a thick material called primary bioresrouces.

3. Secondary Treatment

Bacteria eat up any organic material and chemicals in the wastewater to produce gas and secondary bioresources.

4. Tertiary Treatment

The almost clean water is then polished by chemicals to remove anything left which could harm plants and animals.

5. Bioresource Management

The nutrient rich bioresources are treated with chemicals making it safe to use in agriculture.

The wasterwater journey

1. Screening

Input

Mixed water streams (foul and surface)
pH neutralizer (e.g. Phosphoric Acid)

Opportunities for Circularity

Source Control
P from Tertiary

1. Screening

Sets of screens trap rubbish like: toilet paper, grit, wood and plastic. These currently go to landfill.

Output

Wastewater
Grit and Screenings

Opportunities for Circularity

Construction, RDF

2. Primary Treatment

Input

Wastewater
Energy

Opportunities for Circularity

CHP, RDF

2. Primary Treatment

The wastewater rests in open tanks where solids sink to the bottom, making a thick material called primary bioresrouces.

Output

Wastewater
Primary Bioresources

Opportunities for Circularity

Bioresource Management

3. Secondary Treatment

Input

Wastewater, Oxygen
Coagulant/Flocculant – Aluminium Chloride

Opportunities for Circularity

Hydrogen
Alum sludge

3. Secondary Treatment

Bacteria eat up any organic material and chemicals in the wastewater to produce gas and secondary bioresources.

Output

Wastewater, Gas
Secondary Bioresources

Opportunities for Circularity

CHP
Bioresource Management

4. Tertiary Treatment

Input

Wastewater
Polishing Chemicals (e.g. Ferric Chloride)

Opportunities for Circularity

Ion Exchange
Microalgae

4. Tertiary Treatment

The almost clean water is then polished by chemicals to remove anything left which could harm plants and animals.

Output

Water for the environment
Bound Chemicals (e.g. Phosphorus)

Opportunities for Circularity

Water reuse
Phosphoric Acid

5. Bioresource Management

Input

Wet Bioresources
Thickener e.g Lime

Opportunities for Circularity

HTLF
Mechanical process

5. Bioresource Management

The nutrient rich bioresources are treated with chemicals making it safe to use in agriculture.

Output

Drier Bioresources

Opportunities for Circularity

Biochar
Insect Digestion

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What we need to do next (together!)

-Cross Industry collaboration

-Common Metrics

-Strategy

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Questions?

https://www.linkedin.com/in/tamsynk/

www.scottishwater.co.uk

https://www.parliament.scot/bills-and-laws/bills/circular-economy-scotland-bill