

UK ICE-SRM The Circular Economy

Delivering a sustainable future

Nick MacInnes

Program Lead, Circular Economy & Resource Security
Office of the Chief Scientist

Lynsay Blake

Head of Science and Evidence
Resources & Waste

Department for Environment Food & Rural Affairs



Department
for Environment
Food & Rural Affairs



Department for
Energy Security
& Net Zero



RESOURCE MANAGEMENT
WEEK 2024



Philosophy: Sustainable Energy

Carbon emissions are the rate limiter

- **Priorities:** Carbon & GHG emissions, natural capital usage, resource use
- **Short term. Downstream:** Reducing the need for energy by promoting low carbon recycling - circular materials.
- **Mid-term. Core:** Supporting green transition by developing the sustainable supply of critical minerals.
- **Long-term. Upstream:** Reducing the need for energy through 'keeping products in circulation for longer at their highest value point'. Reuse and repair – the circular economy.

UK ICE-SRM: Focus

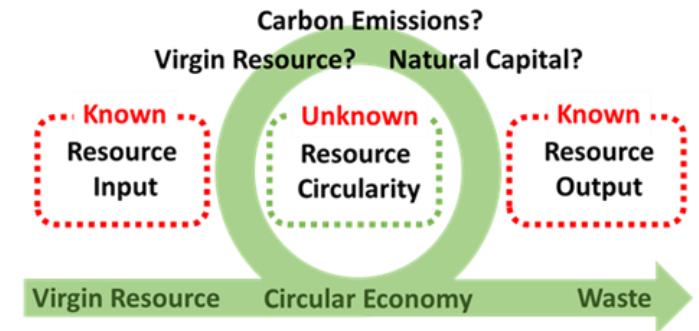
Policy, Innovation, Data

- **Exeter Circular Economy (CE) Data Observatory.** Delivering live, consistent, reproducible data streams mapping the flow of products & materials (Lysaght, Zils, Hopkinson)
- **Swansea:** Enhanced metal sorting to promote circularity of existing material and thereby spare the earth's existing resources (Pleydell-Pearce).
- **Brunel:** Improving the durability metals and developing repair technology that will keep metal components in circulation at their highest value point for longer (Cantor, Fan).
- **UCL:** Tracking the lifecycle of materials in construction and thereby highlight areas where reuse can occur (Stegemann).
- **British Geological Survey:** Identification of critical and priority minerals across their complete life cycle, from extraction to reuse, recovery to disposal (Bide).
- **Exeter Critical Minerals Centre:** Sustainable primary extraction and secondary circulation of critical minerals to support green transition (Ward).

UK ICE-SRM: Delivery

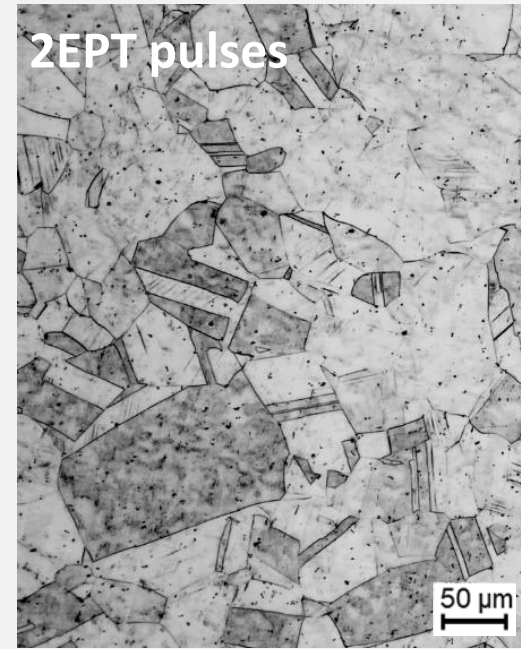
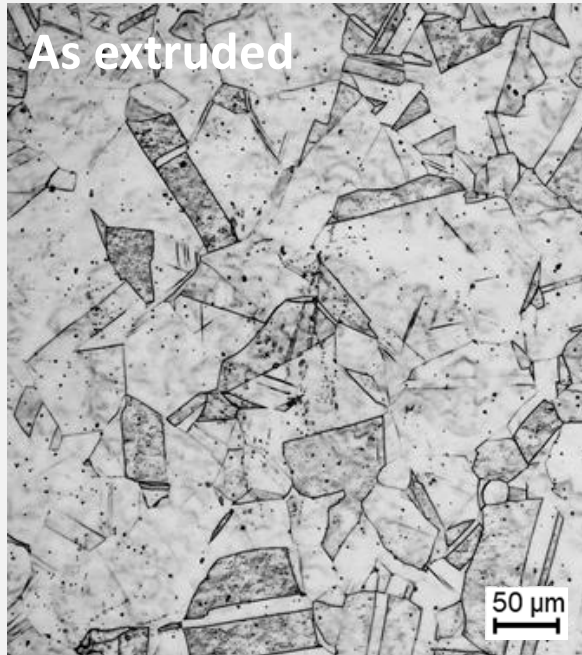
Diffusion of Innovation

- Key centres are experienced in data, innovation, policy.
- Supporting UK transition to sustainable resource use.
- Key outputs directly applicable to the UK, EU, UNECE and beyond.
- Waste management is a global business, cross boundary shipments. Solutions are global.
- UNECE ideal delivery mechanism to enhance uptake of innovation across the region.
- Quantifying the 'missing link'.
- Supporting UNRMS
 - Information framework and methodology
 - Developing the system and delivering the innovation to manage the life cycle of resources



Example: Brunel (Brain Cantor, Zhongyun Fan)

Innovation: Keeping products in circulation



- Extruded austenitic stainless steel 316L
- Low cycle fatigue. 3000 cycles
- Electrical pulse treatment (EPT)

- Experimental stress in stainless steel producing hairline fractures.
- Repair by electrical pulse treatment.
- Potential to repair steel components in situ.

The UK, EU and UNECE situation

Applications

- **Commitments in the UK Resources & Waste Strategy**
 - Double in resource productivity by 2050
 - Can help us move towards zero avoidable waste by 2050
 - Can help us move towards zero avoidable plastic waste by 2042
 - Eliminate waste crime and high risk illegal waste sites by 2042
- UK challenges are also EU & UNECE challenges
- The same legislation ‘The Waste Framework Directive’.

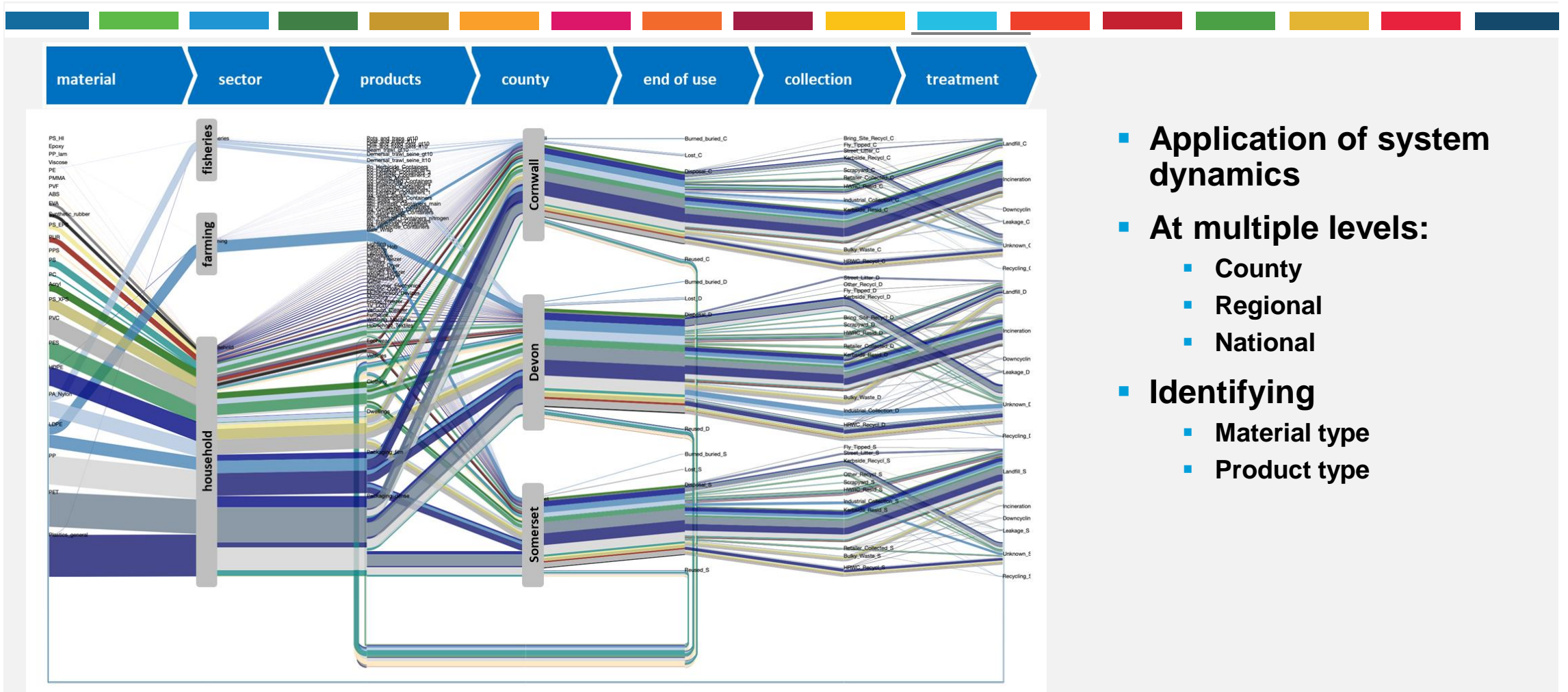
The UK, EU and UNECE situation

Delivery

- **Appointment of 6 fellows to support delivery of a Circular Economy Data Observatory.**
 - Data collection critical.
 - Waste is a business, if business can see a waste feedstock they will capitalise, rPET, paper/card, glass, WEEE, batteries, textiles.
 - Data allows us to model the impact of policy tools prior to introduction, plastic tax, EPR (paper, card, glass)
 - Data allows us to measure the success of policy: pre policy then post policy introduction
 - Solutions for the UK waste environment directly transposable to the EU and UNECE regions.
 - Waste companies operating in the UK also operate across the UNECE region.

Example: Exeter Data Observatory (Hopkinson, Zils, Lysaght)

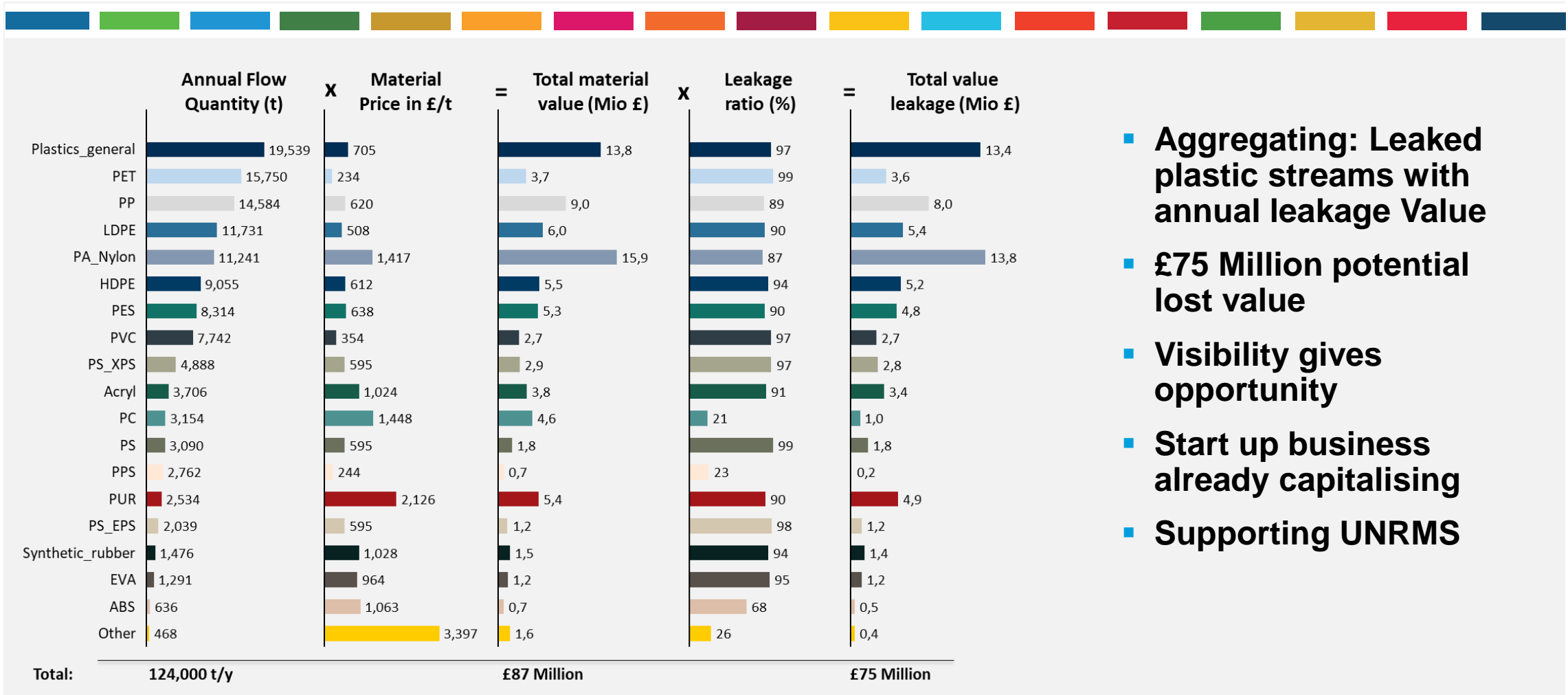
Circular Plastics



- Application of system dynamics
- At multiple levels:
 - County
 - Regional
 - National
- Identifying
 - Material type
 - Product type

Example: Exeter Data Observatory (Hopkinson, Zils, Lysaght)

Circular Plastics



- Aggregating: Leaked plastic streams with annual leakage Value
- £75 Million potential lost value
- Visibility gives opportunity
- Start up business already capitalising
- Supporting UNRMS

Conclusion

- **Holistic view of sustainable energy**
- **Change demands upstream and downstream modifications**
- **Short, long, mid term solutions across a range of material flows**
- **Delivery of innovation, data collection, policy recommendations.**
- **Application of UNFC and UNRMS to enable regional and global quantification**

If they can see the opportunity they will come

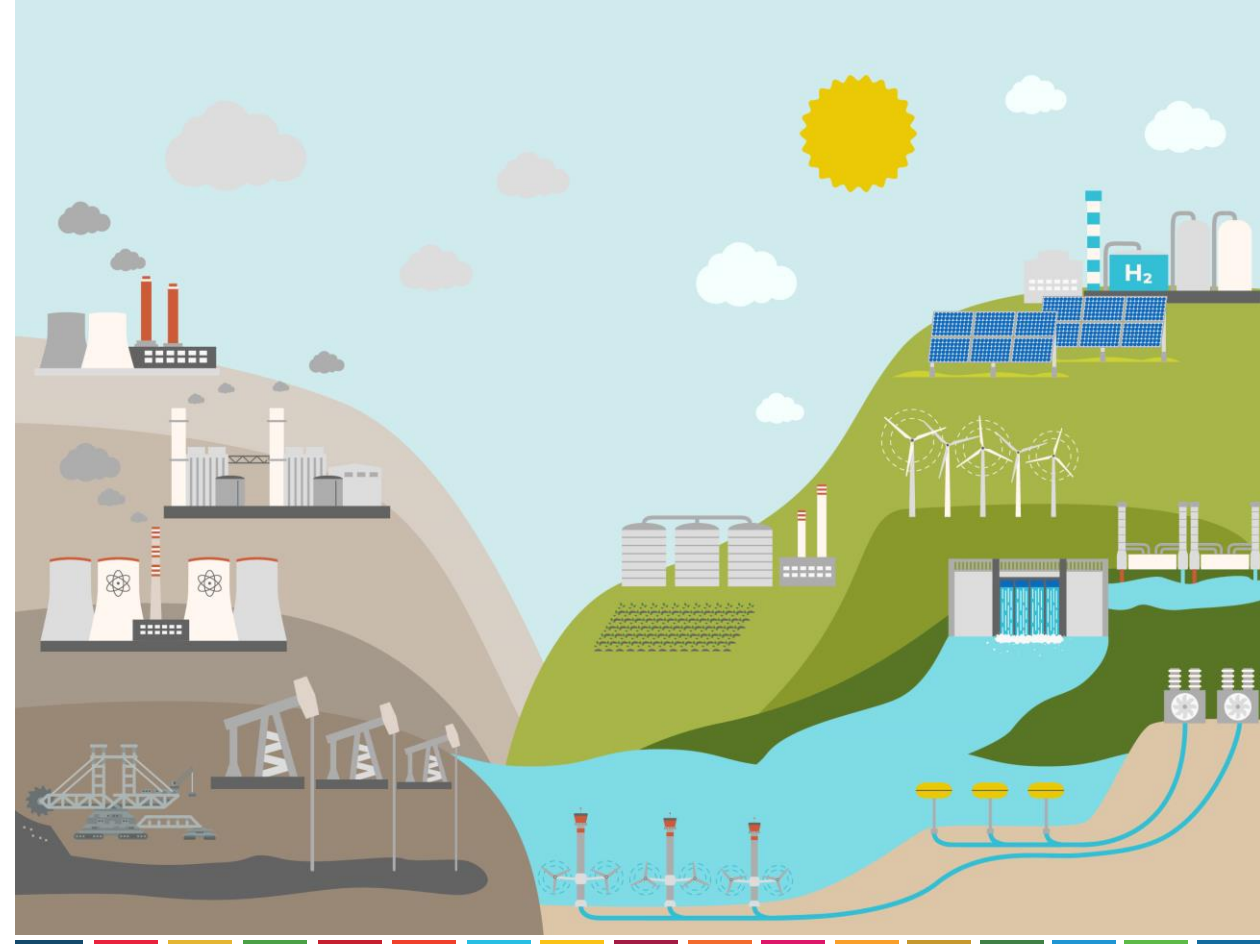
Nick MacInnes
Lynsay Blake
Department for Environment Food & Rural Affairs

UNECE

Date 25 | 05 | 2024, Geneva

Thank you!

THE VIEWS EXPRESSED ARE THOSE OF MACINNES & BLAKE AND DO NOT NECESSARILY REFLECT
THE VIEWS OF THE UNITED NATIONS.



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