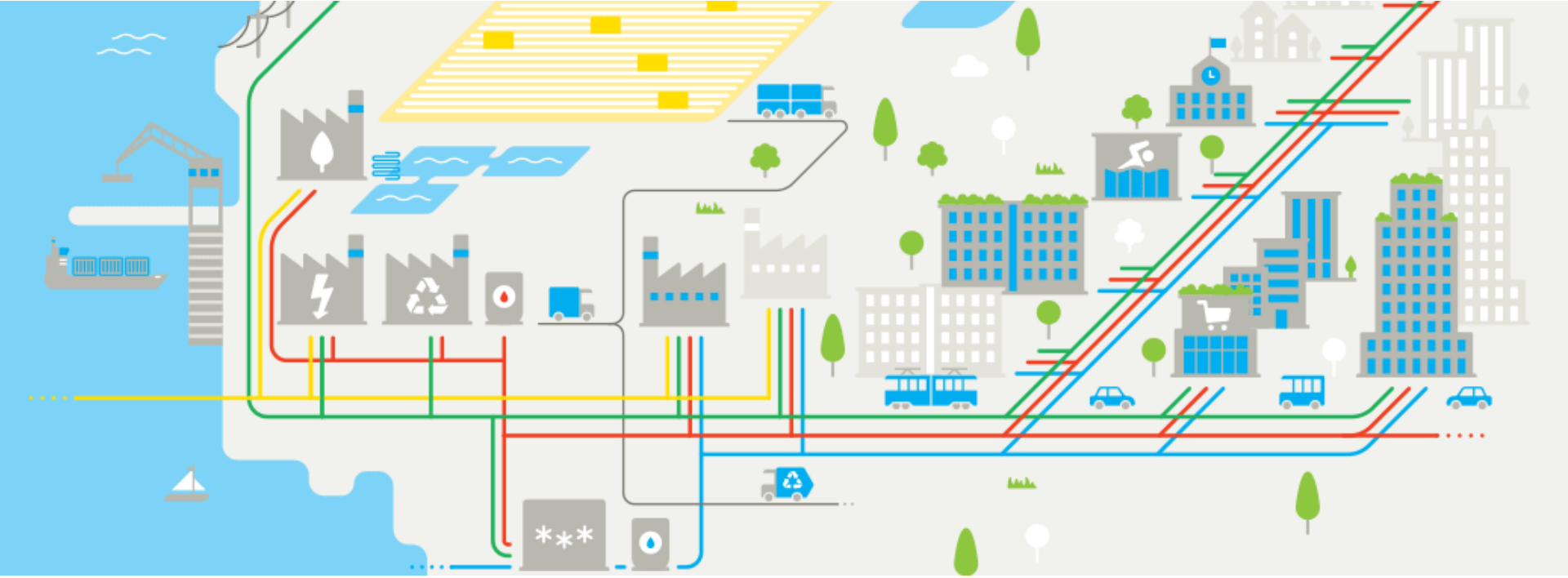

Public event – 17th September 2018

Identification and analysis of promising carbon capture and utilisation technologies

Summary Task 2: Regulatory Assessment

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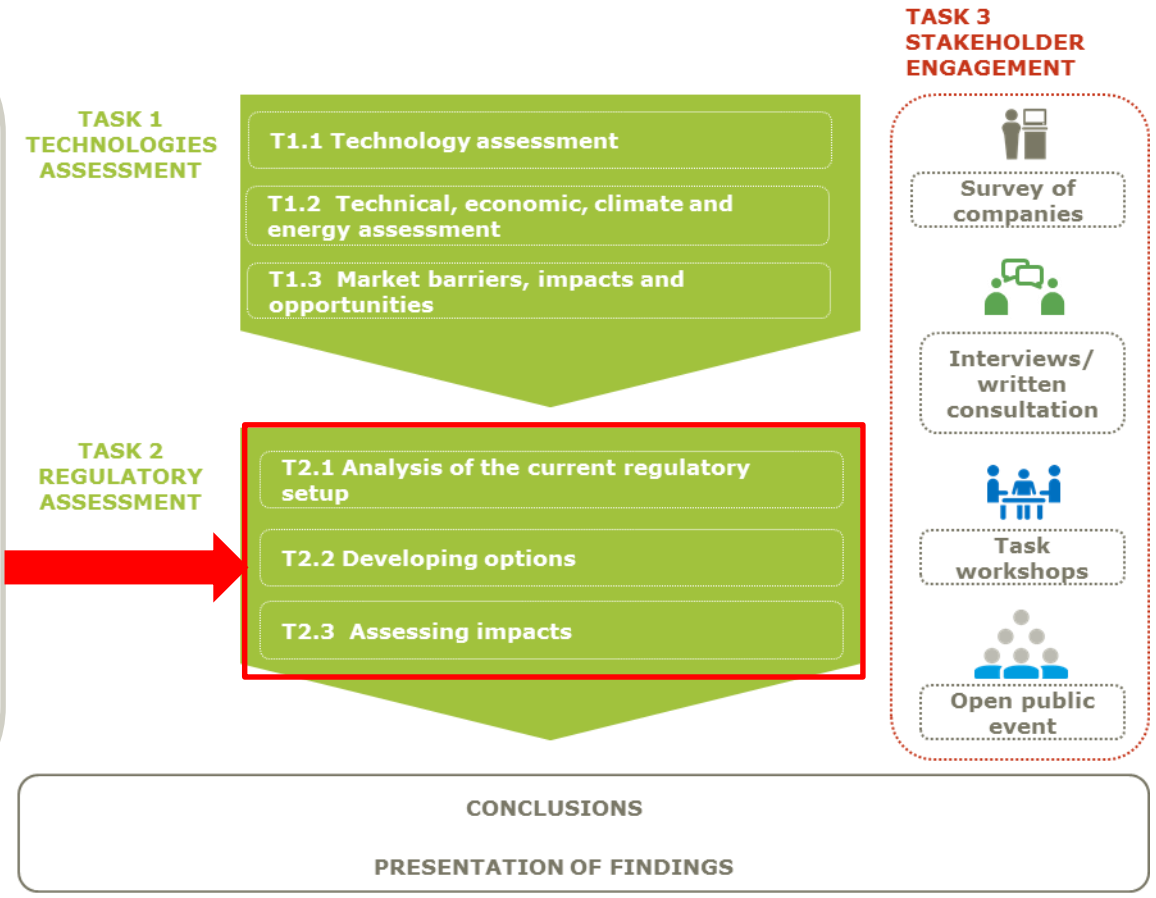
TASK 2: REGULATORY ASSESSMENT
OVERVIEW OF TASK AND METHODOLOGY

Objective Task 2:

To map and analyse the current regulatory setup affecting CCU technologies, develop options for addressing the issues identified, and provide a preliminary assessment and comparison of these options



TASK 2: REGULATORY ASSESSMENT

Policy mapping: 25+ legal texts analysed for relevance

Key legislation identified:

Climate and Energy:

- EU Emission Trading System
- Renewable energy
- Energy efficiency

Waste and Circular Economy

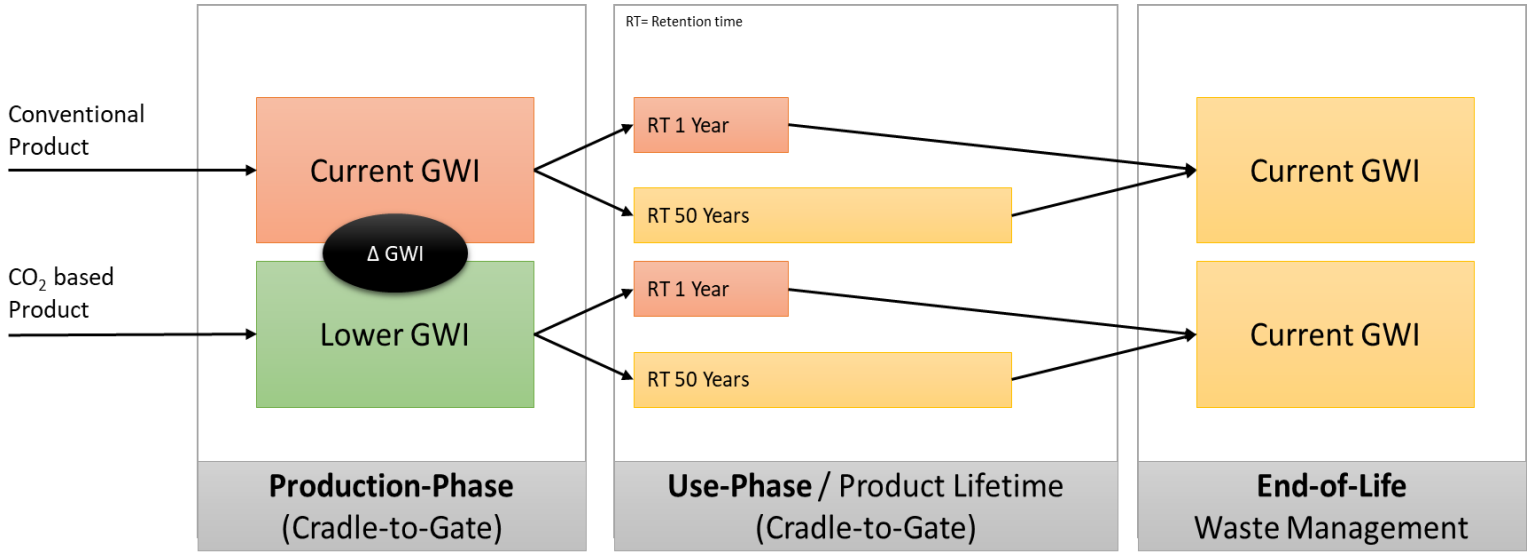
- Waste Framework
- EU action for a circular economy

EU financing programmes

TASK 2: REGULATORY ASSESSMENT

Measuring GHG emission mitigation from CCU: What did we learn?

- Compare CCU production with conventional production.
- Only production-phase GHG differ.
- Use-phase, CO2 retention time, and end-of-life are not relevant, except in ETS reasoning.



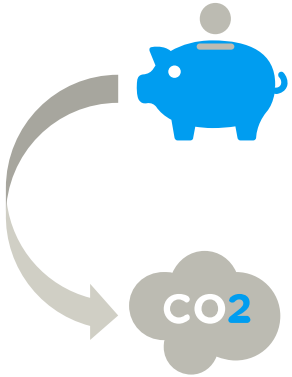
GWI = Global Warming Impact
RT = Retention Time

TASK 2: REGULATORY ASSESSMENT

EU Emission Trading System in a nutshell:

- ETS framework to monitor, report and verify industrial installations' emissions.
- Incentivise GHG emission reductions.

How?



Installations in sectors at risk of carbon leakage receive free emission allowances up to a benchmark, and purchase additional allowances.

Installations monitor GHG emissions, report their emissions, and surrender an equivalent amount of allowances for emitted carbon.

Problem for CCU:

- ETS recognises CCU but does not incentivise CO2 capture except for geological storage.
- Capturing installations must still report used CO2 as emitted.

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Why?

- CCU processes capture CO2 temporarily, CO2 is re-emitted after use or disposal.
- ETS sector coverage is limited, the rest is under Effort Sharing.

ETS regulates large industrial installations in certain sectors: power/heat generation, industrial production (metals, cement, lime, glass, paper, etc.).

Effort Sharing regulates transport, buildings, agriculture, waste, and smaller industrial installations. Accounting occurs at the level of Member States.

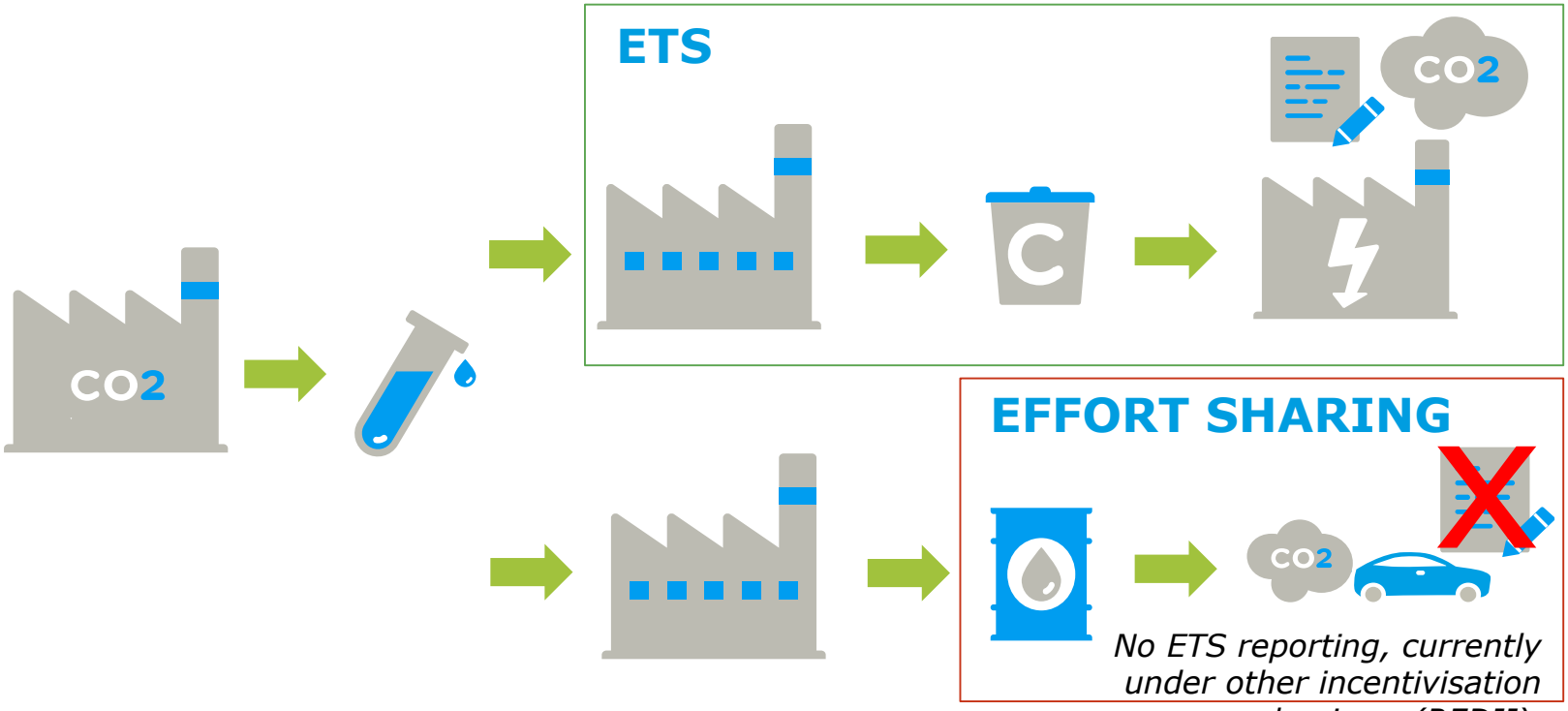
Risk of loophole:

- Carbon captured in CCU product can be transferred to Effort Sharing sector, where it is re-emitted (end-of-life).
- Emission is then not reported in the ETS.

TASK 2: REGULATORY ASSESSMENT

Example: Production of methane via CCU, used for:

1. Producing carbon-based product (e.g. plastic), burned in co-incineration plant under ETS.
2. Fuel (transport), tail-pipe emission.



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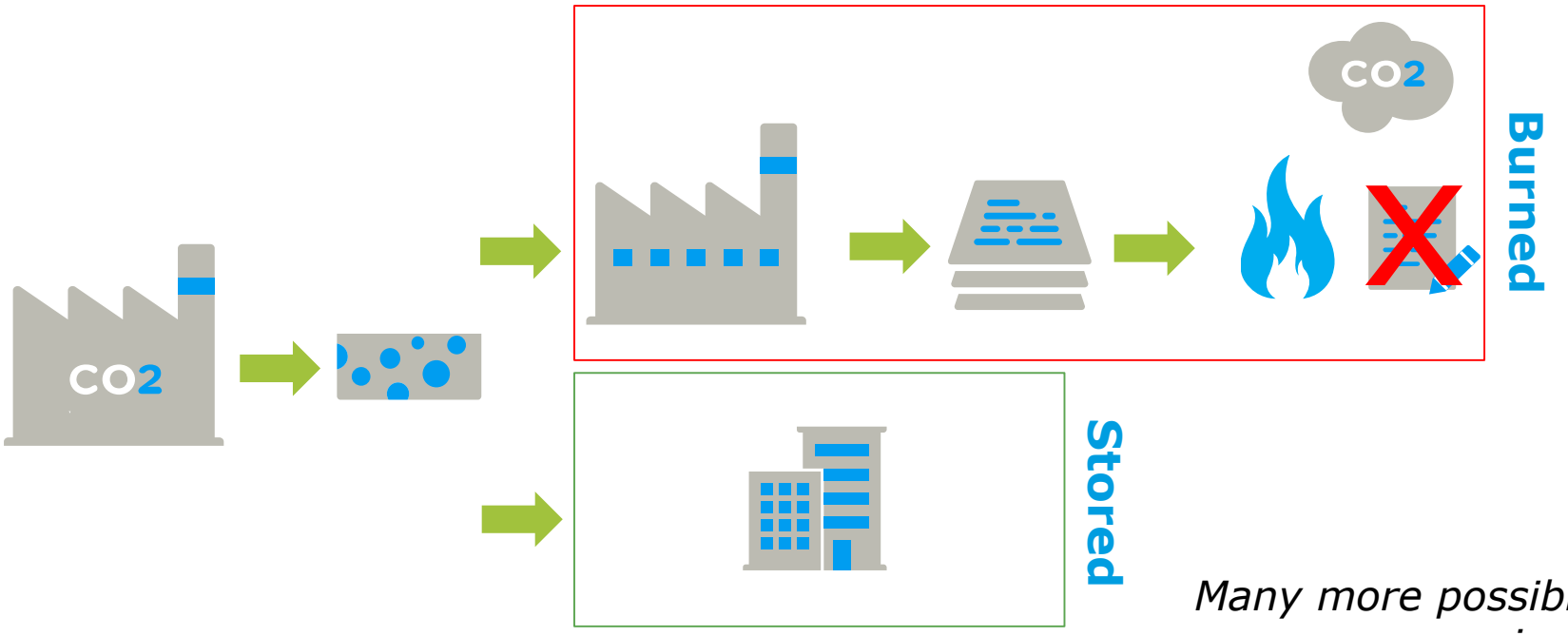
TASK 2: REGULATORY ASSESSMENT

Some CCU applications avoid loopholes as CO2 is potentially never re-emitted, i.e. carbon is 'stored' similarly to CCS.

Example: production of calcium carbonate used in:

1. Paper production (burned)
2. Construction materials (stored)



Many more possible scenarios…

TASK 2: REGULATORY ASSESSMENT

European Court of Justice ruling in favour of Schaefer Kalk

- CO2 transfers for producing calcium carbonate should lead to exemptions from surrendering emission allowances.

Problem

- Ruling does not address loopholes, yet must be implemented.
- Need to identify when CO2 will be released, and which installation should be incentivised.

TASK 2: REGULATORY ASSESSMENT

Principles for environmentally sound policies supporting climate-beneficial technologies:

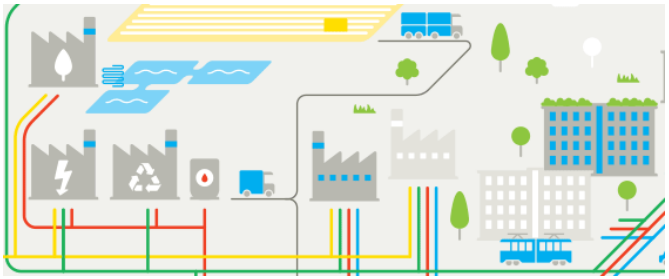
1. Maintain the **integrity of the EU environmental policy framework**, avoid double counting;

2. Avoid **technological lock-in** effects and account for **negative impacts on other environmentally promising technologies**;

3. Continue to ensure **technology neutrality** of the EU policy framework.

TASK 2: REGULATORY ASSESSMENT

Options for attributing ETS incentives to installations in CCU system:



	OPTIONS	ADVANTAGES	CHALLENGES
Short-term	Only incentivise permanent storage applications	• CJEU ruling implemented • Mitigation potential recognised for permanent applications • Avoid unreported emissions	• Not technology-neutral (mineralisation) • Which product uses lead to permanent storage?
	List production processes, product uses and end-of-life scenarios	~~• Knowledge of emitted CO2~~ ⇨ ~~• Easy decision-making~~ ⇨	• Each production process is different • High complexity of product markets
	Track carbon and product transfers	• Know where product is used and carbon re-emitted	• Monitoring/reporting burdensome • Verification by third party legally impossible outside of ETS
Long-term	Project-based GHG accounting	• Use LCA comparative methodology • Ongoing research to develop methodologies	• How to integrate in existing carbon market mechanisms? • Project-specific assessment needed

TASK 2: REGULATORY ASSESSMENT

Conclusion: reforming the ETS?

- No 'one size fits all'. Each CCU process is different.
- Options for accurate monitoring, reporting and verification of CCU seem costly.
- Is ETS the right tool?
- ETS unlikely to change fundamentally until 2030.

However, financing becoming available:

- CCU will be financed by ETS Innovation Fund.
- Other EU financing programmes could synergetically finance CCU:
  - Horizon 2020
  - European Fund for Strategic Investments
  - European Structural Investment Funds
  - Research for Coal and Steel Fund

Other support mechanisms exist:

- Renewable Energy Directive II recognise CCU fuels from renewable energy and recycled carbon fuels under certain conditions.

TASK 2: REGULATORY ASSESSMENT

Solutions beyond the ETS:

Waste and Circular Economy

- Promote carbon recycling under circular economy
  - Facilitate re-use of carbon-based products to improve energy efficiency

Products and Labelling

- Products blending quotas (similar to Renewable Energy Directive II)
- Ecolabelling

CONCLUSIONS AND RECOMMENDATIONS

- **CCU needs support to be viably developed and deployed, but ETS does not fully accommodate CCU.**
  - Continue to pursue diverse policy options and financing.
  - Create a level-playing field between EU market and rest of the world: harmonise carbon trading schemes.

- **Each CCU project must prove environmental benefits.**
  - Facilitate adoption of standardised LCA methodology.
  - Compare cost-benefit of CCU with that of low-carbon technologies for making policy decisions.

- **CCU climate mitigation potential limited by available renewable energy, but contributes to circular economy (closing the carbon cycle), replacing fossil feedstocks and reducing fossil imports.**
  - Provide clarity to EU debate: CCU ≠ CCS.
  - CCU can be used where carbon is needed.

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CONCLUSIONS AND RECOMMENDATIONS

- **CCU fuels can store renewable energy otherwise curtailed.**
  - Explore role of CCU fuels as energy storage in the low-carbon transition (considering other energy options).
  - Higher energy conversion efficiency in use for batteries, hydrogen production.

- **CCU projects cut across sectors (industrial symbiosis).**
  - Support CCUS networks.
  - Facilitate knowledge transfer.

THANK YOU

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WASTE AND CIRCULAR ECONOMY: Ensuring circular principles

Status of waste policy:

- Waste Framework Directive

Problem: Cases where (incineration waste-based) carbon-recycled construction materials integrating hazardous materials produced in one country are rejected on other national markets due to waste status.

Policy already aiming to address this: Waste Framework Directive has been revised.

Key points of the Commission's proposal for a revised WFD:

- Sets targets for re-use and recycling of waste (60% by 2030) → general incentive for waste recycling.
- Empowers the Commission to establish detailed end-of-waste criteria, making possible the harmonised application of e-o-w criteria by EU.