



CO₂ Utilization in Europe

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Who.....?

- *Director for Climate and Industry (Dutch Government)*
- *Director for CCS (Dutch Government)*
- *Evaluated the CCS Directive and future CCS policy for EC*
- *Research on CCU in SCOT and CarbonNext Project*



Why CO₂ Utilization....?

- *No business case for almost all CO₂ utilization*

- Chemistry: CO₂ in Chemistry is not very logic
- Mineralization: Sooo slow
- Fuels: Costly and still emitting CO₂

So why do we want it anyway.....?



Why CO₂ Utilization...?

- *CCS has only one goal and one goal only: Climate*
- *CCU has more angles: innovation-resources- RES ánd also climate*

Different but related,
both have their own 'reason for being'



Why CO₂ Utilization is Required

- We can't make our plastics from fossil forever
- We do need to stabilize our new intermittent sustainable energy sources
- We absolutely have to reduce CO₂ emissions to the atmosphere

So no businesscase, not very logic, but very necessary



Alternatives sources of Carbon for Chemical industry

Fossil ...?

Bio-based ...?

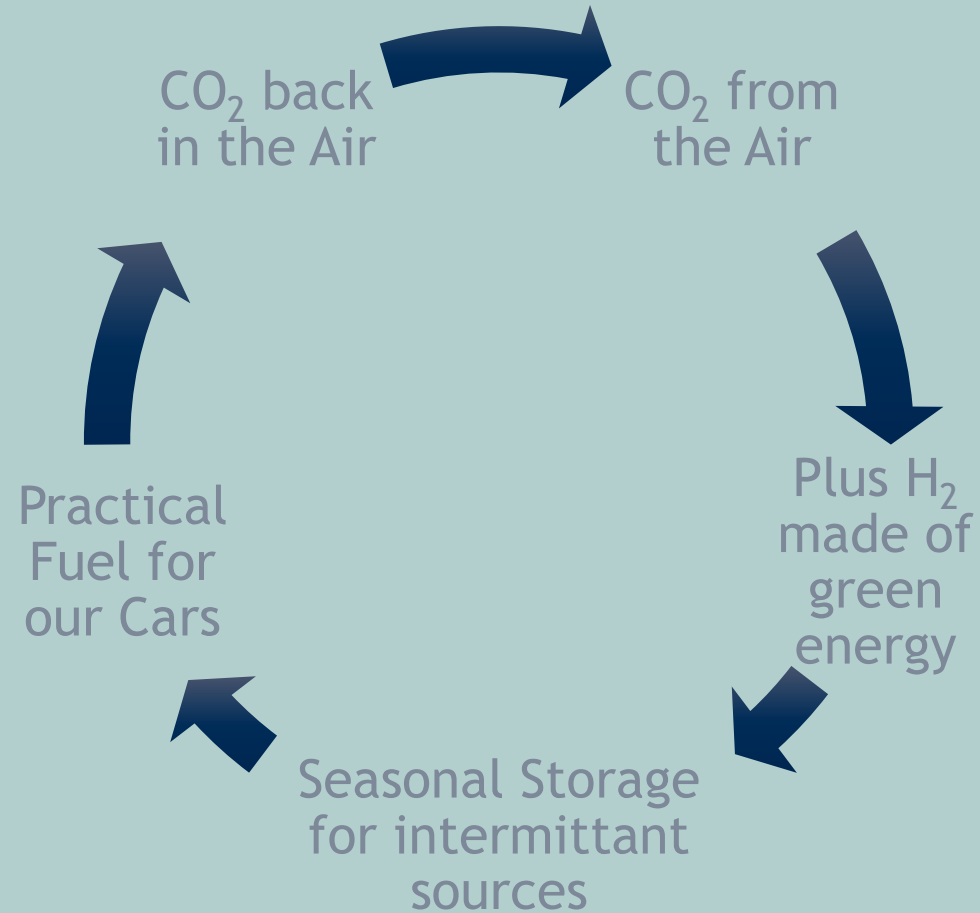
CO₂ Utilization....?

Recycling....?



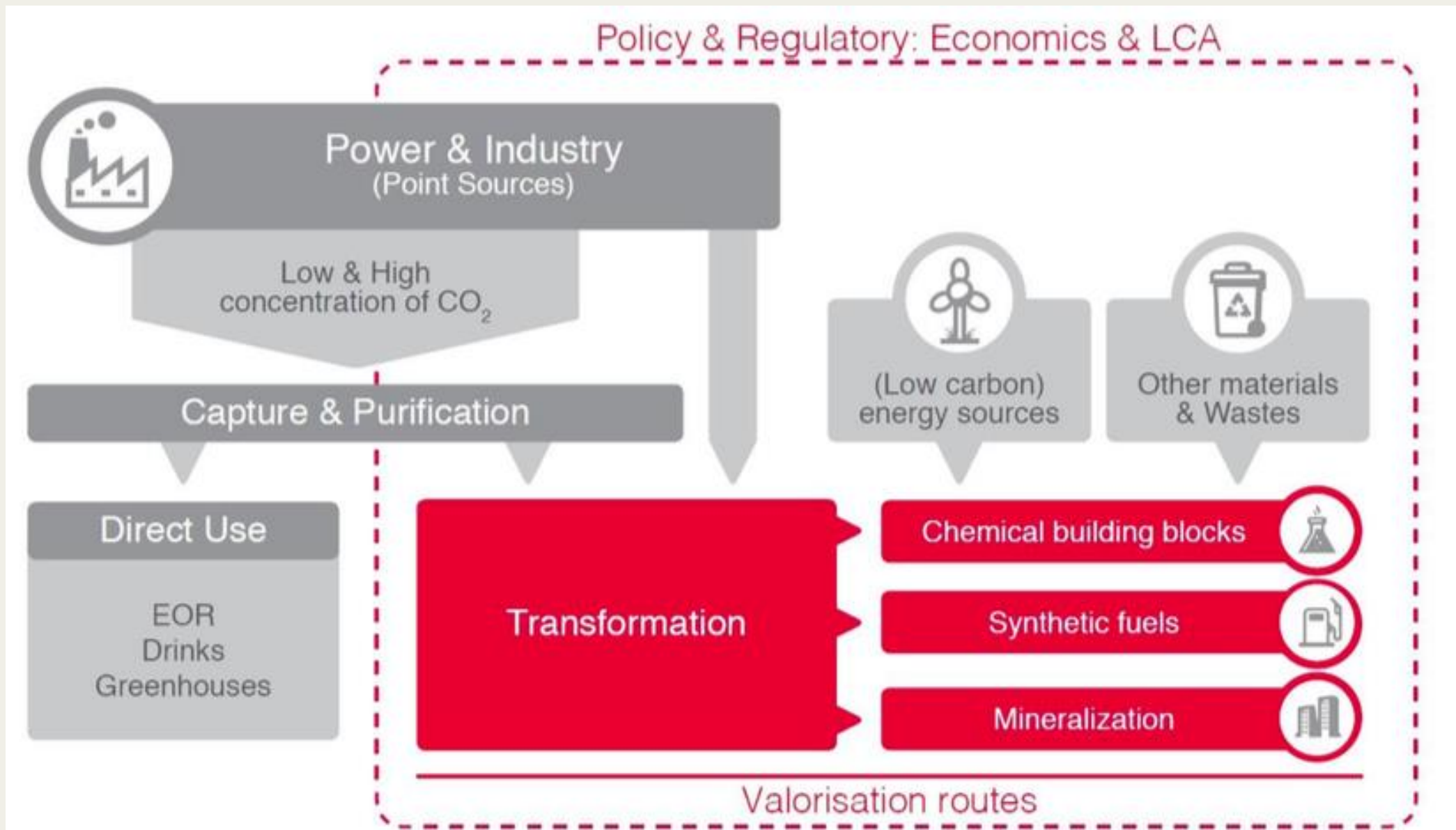
What is it...a bright future...?

3. Circular Economy



A very expensive dream....!

What... is it?



The SCOT Vision



Buy a mattress made with recycled CO₂ from major European retailers



Live on an island that has a sustainable agricultural industry powered by renewable energy, green urea and synthetic tractor fuels all made from CO₂.



Construct a truly carbon-negative house from mineralised wastes and CO₂ capturing cements



Travel on a plane powered by CO₂ derived aviation fuel and fill a long distance freight truck with CO₂ derived synthetic fuel

What... is it not?

- It's not the silver bullet for climate
 - Its not easy
 - Its not cheap



When....?

1. Mineralization: Closest too market
Real storage
Volume potential
next 10 years

2. Fuel

Is it needed or smart?

Old technology...very expensive (green hydrogen)

But very easy to implement



When....?

3. Chemical building blocks

- Technical possible
- Innovation to bring cost down
- Policy to bring cost alternative up

4. Without strong support for innovation and policies it will take decades...



Summary:

1. It's going to be a very likely part of our near future (as CCS)

2. It's only going to happen with strong support (as CCS)

3. It needs realistic explanation to public and to politicians
(as CCS)





Thank you for your attention, please contact us for more information



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