



Scaling Negative Emissions

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Beccs Stockholm

NEGATIVE EMISSIONS BY STOCKHOLM EXERGI



This project has received funding from the European Union's Innovation Fund under grant agreement no 101051202.

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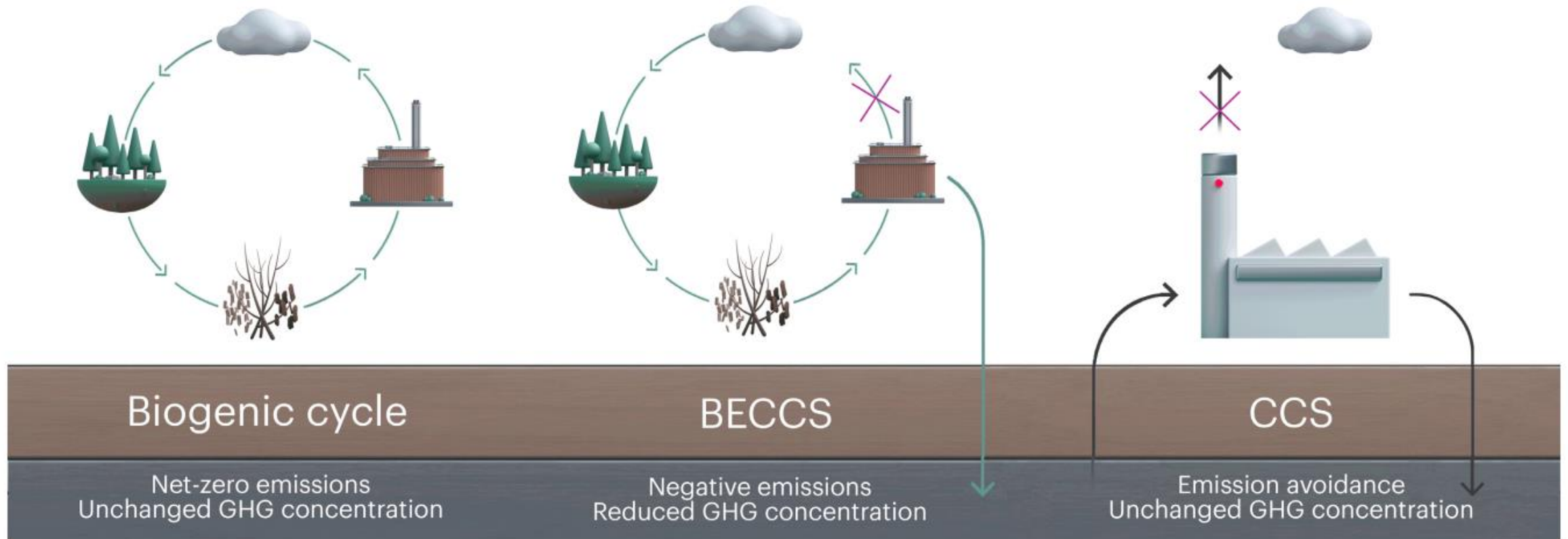
Stockholm Exergi

Sweden's largest district heating company

- 10 TWh Energy generation
 - 3.7 GW Heat
 - 0.7 GW Electricity
 - 280 MW Cooling
- €700 m turn-over
- 50% owned by City of Stockholm
- 99% of production based on recovered, reused or renewable sources
- Next step: Remove CO₂



BECCS w. geological storage (Negative Emissions) remove carbon dioxide from the atmosphere permanently



BECCS Stockholm in short

Key Benefits

- Removal of 800 000 tonnes CO₂ per year
- Heat recovery to district heating network – no energy loss
- Sustainable biomass. No additional outtake
- Proven and environmentally friendly capture technology
- High concentration of CO₂, around 19%.
- 90-95% capture
- Ownership of steam, electricity and harbor

Funding legs

- EU Innovation Fund (BECCS Stockholm)
- Swedish state aid – Reversed auction
- Sales of Carbon Removal Certificates (CRC) to Voluntary Carbon Market (VCM)



The BECCS Stockholm value chain



Will we make it until 2025?



Technology

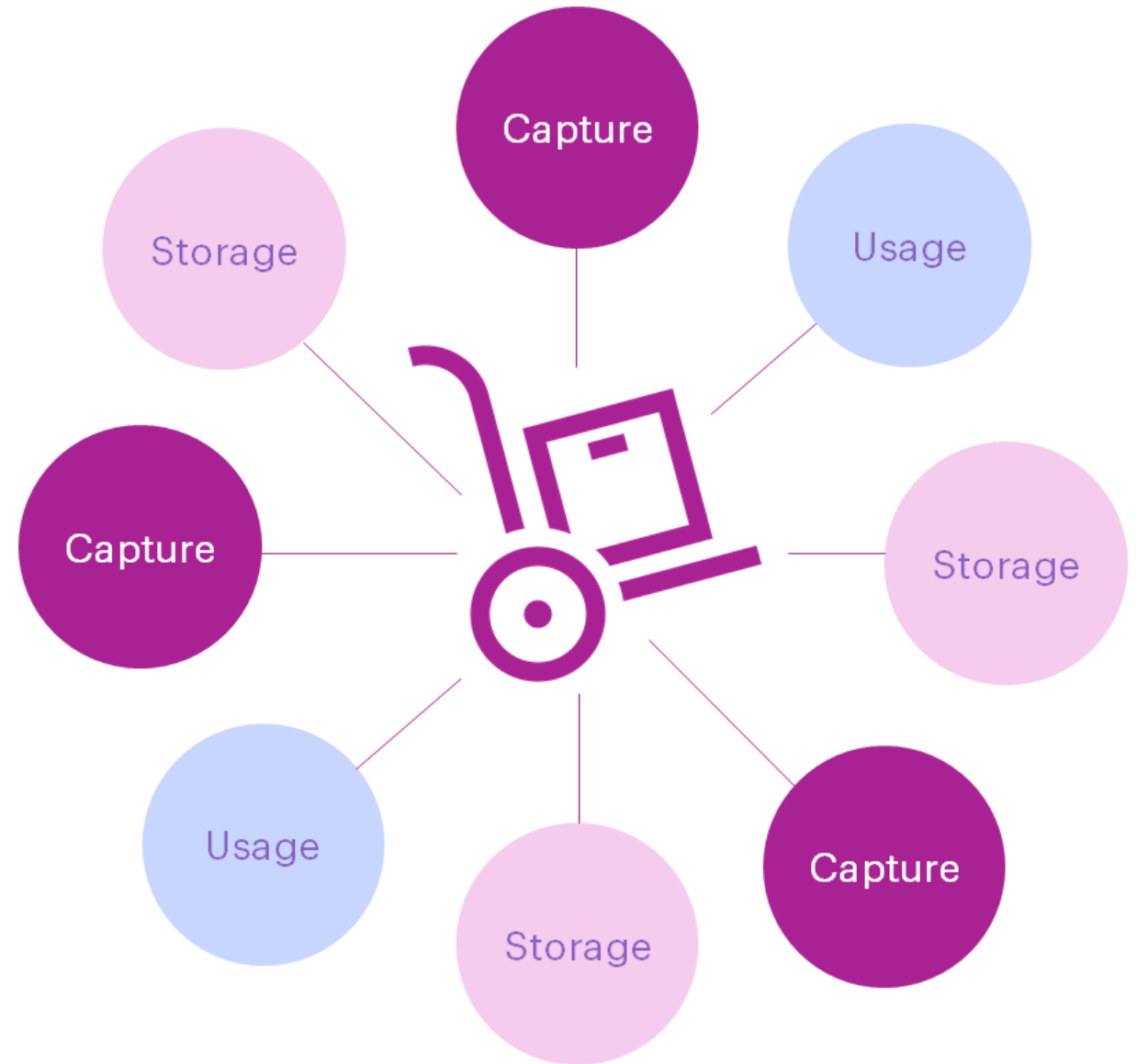


Transport



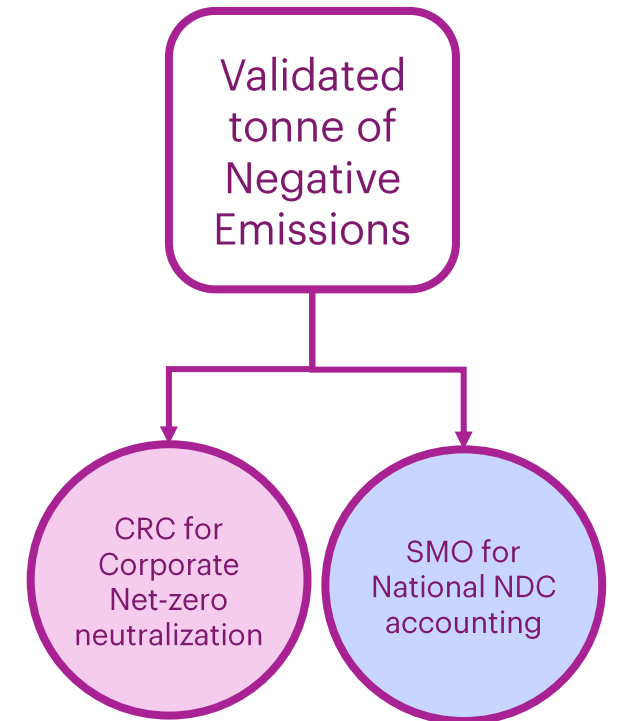
Funding

Transport vision – Standardized Multipoint to Multipoint Carbon Dioxide Hubs



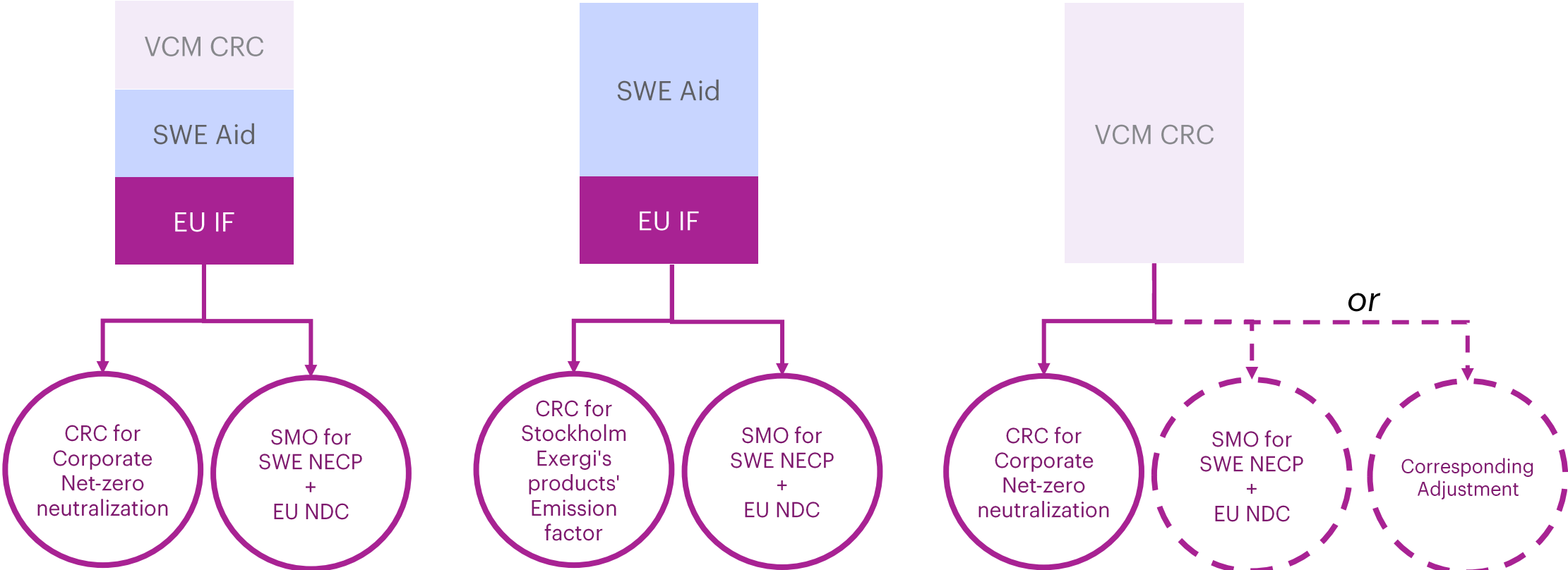
The certification rulebook will settle the conditions for funding and scaling Negative Emissions

- Responding to the need for negative emissions, as identified by IPCC, we should encourage co-funding and trade in mitigation outcomes
- For a stored tonne, issue one certificate for the capturing company (CRC) and one certificate for the nation where the capture has taken place (SMO)
- The SMO allows governments to aggregate removals on its territory, or to sell it to other nations, applying Corresponding Adjustments
 - Maintain today's practice where national and corporate climate accounting are kept separate
- The CRC/SMO should focus on the physical characteristics of the stored tonne and other attributes needed for the VCM should be added as layers
- For reversal, rely as far as possible on the already existing CCS/ETS approach
- Have separate certificates for different removals methods in order to acknowledge the different levels of permanence of different methods



*) SMO = Standardized Mitigation Outcome

The concept of double claiming will result in decreased ambitions. Whereas co-funding and co-claiming will increase ambitions, also across borders



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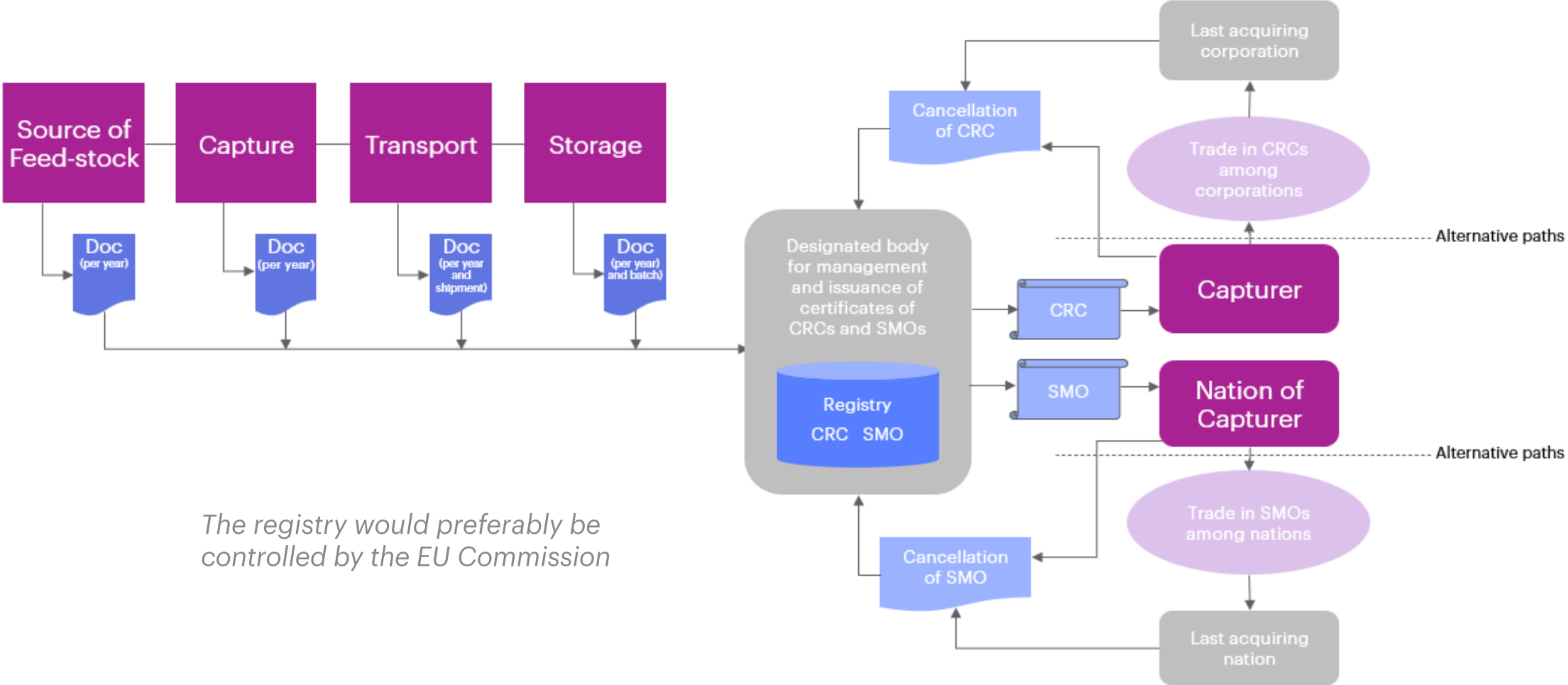
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The flow of a CRCs and SMOs



The registry would preferably be controlled by the EU Commission