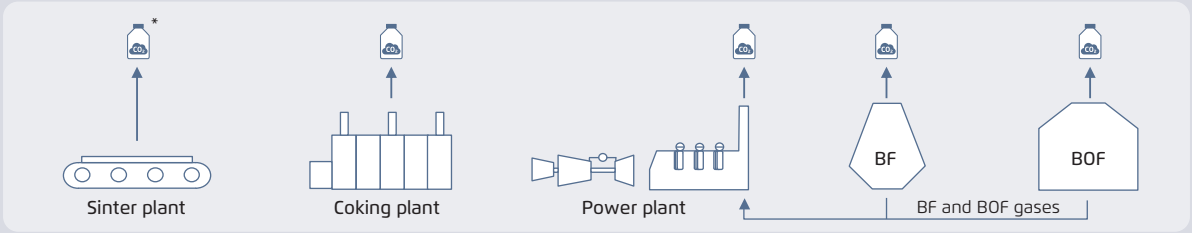

BF-BOF CCS...

...leaves high residual emissions

- BF-BOF CCS will likely only reduce direct CO_2 emissions by 73% compared to the BF-BOF route
- While higher emission reductions are technically possible, it is questionable whether they are economically viable

...will be prone to disruptive technology cost developments

- Direct electrification technologies such as molten oxide electrolysis would likely be cheaper once they become commercially available in the 2030s
- There is a risk that the combination of cost factors (CO_2 transport, storage and residual emissions compensation) will make BF-BOF CCS uncompetitive

...cannot address upstream emissions

- Upstream emissions from coal mine methane leakage currently add ~12% in addition to the current direct CO_2 emissions of the steel industry**
- BF-BOF CCS cannot address upstream emissions directly and if they are included in the future regulation of the steel industry, they may worsen the business case for BF-BOF CCS

...faces an offtake risk in green lead markets

- Progressive companies that strive to decarbonise their supply chains (i.e. automotive, household appliances) and want to advertise this fact to their customers may not want to be associated with coal-based technologies

Agora Industry and Wuppertal Institute (2023). BF-BOF CCS costs vary significantly depending on which CO_2 point sources are included in capture and whether the CO_2 is stored onshore or offshore. Offshore CO_2 storage tends to be more expensive than onshore CO_2 storage. *The figure illustrates the capture of CO_2 from the sintering plant which is technically feasible, but may not be economically viable. **Upstream methane emissions from coking coal are currently estimated to be 384 $MtCO_{2e}$ based on a GWP 100 measurement (authors' calculations, IEA Methane Tracker, 2022).