Life Cycle Assessment of a Coal-Based Hydrogen Supply Chain for Energy and Agriculture in the Appalachian Region

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Background/Objectives. We performed environmental analysis of a coal-based hydrogen supply chain in the Appalachian region of the US. The objective of the project is to assess the sustainability of a potential transition path towards a low-carbon economy in a region that is highly vulnerable to the energy transition as it is highly dependent on fossil fuel activities.

Approach/Activities.
We executed a lifecycle assessment (LCA) of the hydrogen (fuel)- ammonia (precursor for fertilizers) supply chains in the region. We executed a carbon-allocation analysis from the joint production and compared its impacts with current alternative supply chains.

Results/Lessons Learned.
Producing hydrogen from coal in the Appalachian region not only can have positive social impacts (to protect jobs in the coal industry), but it can lead to less carbon emissions compared to the current alternative for thermal fuels (natural gas). Also, a joint supply chain of hydrogen and ammonia from coal can further improve those environmental benefits.