

Planetary boundaries footprints of chemicals and fuels

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Operating safely within the Earth's ecological capacity is a major challenge facing us today. In this talk, I will start by motivating the need to transition towards a more sustainable chemical industry based on renewable carbon, discussing its most critical impacts and the role of catalysis in enabling the shift to renewable carbon in chemicals and fuels production. I will then describe how to evaluate the environmental impact of emerging catalytic systems by combining process modelling, life cycle assessment (LCA) and the planetary boundaries concept. I will finally discuss the planetary footprints of primary fossil and renewable-carbon-based chemicals, identifying critical hotspots and providing some guidelines to reduce impacts across chemical supply chains.