Polycarbonate polyols from biogenic CO_2 - Feasibility assessment

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Carbon dioxide has recently been used as feedstock to produce high-performance polymers, such as flexible polyurethane foams. So far, only 20-30 % of the carbon in the feedstock polyols, used as building blocks for polyurethanes, has been from CO_2 while the rest is fossil-based. Due to large market volumes of these polymers, millions of tons of CO_2 could be utilized annually on a global scale.

VTT is developing a concept where polycarbonate polyols are produced from biogenic CO_2 and clean hydrogen. In the project, preliminary economic assessments for CO2 capture and production of bio-CO_2 based polyols have been conducted. The economics of the concept was found to be very attractive with a short pay back time. Electricity needed for electrolysis and capital investment annuity were found to have the greatest effects on the production cost.