

Legal challenges at the end of the fossil fuel era: Shaping energy futures through legal intervention

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PANEL 2. Legal challenges of a clean and just energy transition

Energy Return on Energy Investment (EROI): A net-energy yardstick for the use of CCS in the transition to a low-carbon economy

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Energy Return on Energy Investment (EROI) constitutes a key metric of net energy analysis. An EROI analysis assesses the amount of useful energy yielded from each unit of energy input to the process of obtaining a given energy source. Hence, EROI provides a measure of the relative utility of an energy technology. EROI assessments are not embedded in the current European legal framework. Yet we specifically advocate that to embed EROI considerations could prove helpful to influence potential policy interplays with regard to cross-cutting technologies, and in particular Carbon Capture and Storage (CCS). In particular, an EROI assessment could better inform decision-making to the siting of bridging energy sources and technologies such as CCS against the need to phase out conventional fossil fuels generation. While CCS reduces the EROI value of energy generation activities with which it is combined, this decrease has to be considered in the light of economic, social, and practical considerations, and the urgent need to reduce greenhouse gases emissions. This highlights the role of EROI as a decision-making tool to adequately deploy CCS technologies in the transition to a low-carbon economy. The research builds on the scientific literature on EROI and the case study of the waste-to-energy and CCS Klemetsrud plant in Oslo. The upshots of the contribution are as follows: - Technology-oriented and project-specific EROI approach should be hallmarked while evaluating energy production projects, including the use of CCS, in order to strengthen the EU's Green Deal objectives; - EROI improves the quality of energy investment decisions; - The inclusion of EROI into the European legal framework on spatial planning and siting of infrastructures (EIA, SEA) should give renewables and CCS a stronger place in the Member States energy portfolios while conventional power production from fossil fuels should become a less rational choice.