

**Key findings from *A review of planned and implemented land-based EU mitigation policies*:**

- Ex-post analyses show many past failures in land-based mitigation policies leading to significant lessons learned that are informing current and new policy initiatives;
- Key sources of controversy and stakeholder disagreement persist in the mitigation potential of policy measures and mandates related to bioenergy and indirect land use change (ILUC), associated with stated science gaps and methodological deficiencies;
- The Common Agricultural Policy (CAP) was shown to be ineffective in supporting land-based mitigation, and further steps are required to unlock the potential of the CAP to support emissions reductions;
- There is a lack of harmonization between EU member states on the implementation of market-based instruments and auditing schemes leading to inconsistency and inefficiency in policy implementation, especially in the forestry sector.

**Land-use change: assessing the net climate *forcing*,  
and options *for* climate change mitigation and adaptation**



## What is the Challenge?

About 40% of the ice-free land surface is covered by crops or pastures, grown and managed by humans. Together with forest management, the practice of land cover change (LCC) and land use change (LUC) have many effects on the climate, both by increasing greenhouse gas concentrations globally, as well as by altering surface biophysical factors, such as albedo, surface heat fluxes, aerodynamic roughness and others.

In recent years the mitigation potential of land use and land use change has come to the attention of national governments and pan-national organizations, with the **European Union at the fore-front** of leading regional and global (trade-related) policy initiatives. These policy mechanisms, primarily, in the field of agriculture, forest-based carbon storage and the production of bioenergy are still at the stage of **first round implementation** or **development** (e.g. accounting for indirect land use change from agricultural crops). Consequently, field research and analytical forecasts for the real world outcomes of certain policies have created a lively debate, which is supported by the science outputs of the LUC4C project. Accordingly, the LUC4C team has analyzed the current policy landscape, through the peer-reviewed and grey literature and relevant stakeholder positions.

## Our Approach

This analysis focused primarily on EU policy initiatives, and recent and upcoming policy options, of relevance to the next round of mitigation commitments, expected after COP21 in Paris. We summarized the current debate at the land-use and climate change interface by analysing 70 of the most recent and relevant ex-ante and ex-post policy evaluations of EU and international policies surrounding **biofuels**, **forestry** and **agriculture**. We focussed on **what is and what is not** working in currently implemented policies (e.g. the EU Renewable Energy Directive or elements of the Common Agricultural Policy) and took stock of existing options and proposals for policy change.

A pre-screening process was conducted of hundreds of peer-reviewed and grey literature articles, based on targeted searches. A shortlist of sources was analysed using a standardized spreadsheet template containing 42 criteria, on the basis of which quantitative and qualitative information was extracted and assessed. Particular attention was paid to extracting and assessing data about real-world barriers and impediments (including science gaps) to policy implementation, as well as potential synergies between sectoral policies with regard to mitigation and broader sustainability issues.

In addition, a small number of expert interviews were carried out to corroborate specific findings or claims of policy stakeholders, specifically with regard to recent EU agriculture and biofuels policies.



## Main Findings

The results from the academic and grey literature suggested that significant lessons have been learned from the misinformed or misdirected application of land-based mitigation policies. The biofuels and agriculture sectors, in particular, face a daunting challenge in factoring in the indirect emissions arising from trade imports and the recognized phenomenon of indirect land use change (ILUC). Somewhat surprisingly, it was found that key bioenergy industry stakeholders, especially among specific biofuel feedstock industries, do not agree on the best options for applying different paradigms and methods in attributing and accounting for emissions. Meanwhile, industry, academia and conservation groups have expressed support for moving toward second generation bioenergy options, but do not categorically oppose a limit on first generation food crop fuels, which is now in the final stages of institution by the EU. An attributional approach toward ILUC is subject to much more controversy, including from overseas importers of bioenergy crops.

The Common Agricultural Policy (CAP) was found to have contributed insufficiently to the land-use sector mitigation effort during the recent programming period, despite high expectations. Significant potential for climate mitigation remains untapped, such as grassland protection and climate-friendly land conversion (e.g., reed grass cultivation, rewetted areas). In order to unlock this potential, efforts should be stepped up to provide new relevant mechanisms under the CAP. This, however, necessitates a broader process of participation among experts and member states, knowledge exchange and reaching a common understanding.

For the forestry sector, the analysis showed that previously implemented policies (e.g. 2007-2011 Forest Action Plan) mostly addressed climate change mitigation in a tangential way, leaving room for interpretation and fragmentation in member state implementation of National Forestry Plans and other sector initiatives. Due to the relatively small impact of EU domestic forest management, compared to deforestation, due to indirect land use change in other regions, mandatory sustainability criteria and market-based instruments of international scope are better able to achieve tangible results.

## Open Issues

For all sectors, a lack of scientific data and/or consensus about climate change impacts and mitigation potential was cited consistently as a barrier to, or justification against, implementing certain policy options. This was especially the case for ILUC, as well as management practices related to grasslands, soil carbon, etc. Despite such issues being used as a roadblock by certain industry stakeholders, progress could be achieved by integrating attributional ILUC effects into LCA-based methodologies, which, however, need to be region, sector and industry specific.



Another significant issue affecting future policy development is the socio-economic costs and tradeoffs, inherent in changing course from current practices. These may relate to grandfathered investments and jobs within the EU bioenergy industry, pressure for maintaining existing trade and import regimes, or to the external nature of some socio-economic costs.