



Summary – *ILUC Prevention Project*

Increased demand for and use of biofuels over the past decade has led to closer scrutiny of the risks and benefits of their feedstock production. The debate has focused particularly on the concept of Indirect Land Use Change (ILUC). The risk of ILUC has so far been analyzed using aggregated, global economic models. The models show large variability in the size and GHG emissions of ILUC for different crops and different settings, with definitive results remaining uncertain. In addition, these models have paid limited attention to measures that can prevent displacement, such as increased agricultural productivity. Therefore, the *ILUC prevention project* investigated:

- How ILUC (risks) can be mitigated by taking a sustainable approach to all crop production (whether for food, feed, fiber or fuels);
- How this can be quantified; and
- How ILUC (mitigation) may be regulated.

The **key ILUC prevention measures** studied in this project were above-baseline yield increases and cultivation of currently under-utilized land. The ILUC prevention measures were quantified for **four case studies** by assessing how much additional biofuels can be produced with low risk of causing ILUC (hereinafter referred to as the low-ILUC-risk potential¹). The case studies were assessed for three scenarios in order to allow for uncertainties in the data used. The results are summarized and compared to biofuel targets for the case study regions in the table below.

Low-ILUC-risk potential in case studies

Feedstock	Case study location	Low-ILUC-risk potential as a percentage of the 2020 production target ^a
Miscanthus ethanol	Lublin province, Poland	140 – 410 %
Corn ethanol	Hungary	200 – 860 %
Rapeseed biodiesel	Eastern Romania	50 – 340 % ^b
Crude palm oil	North-East Kalimantan, Indonesia	120 – 180 %

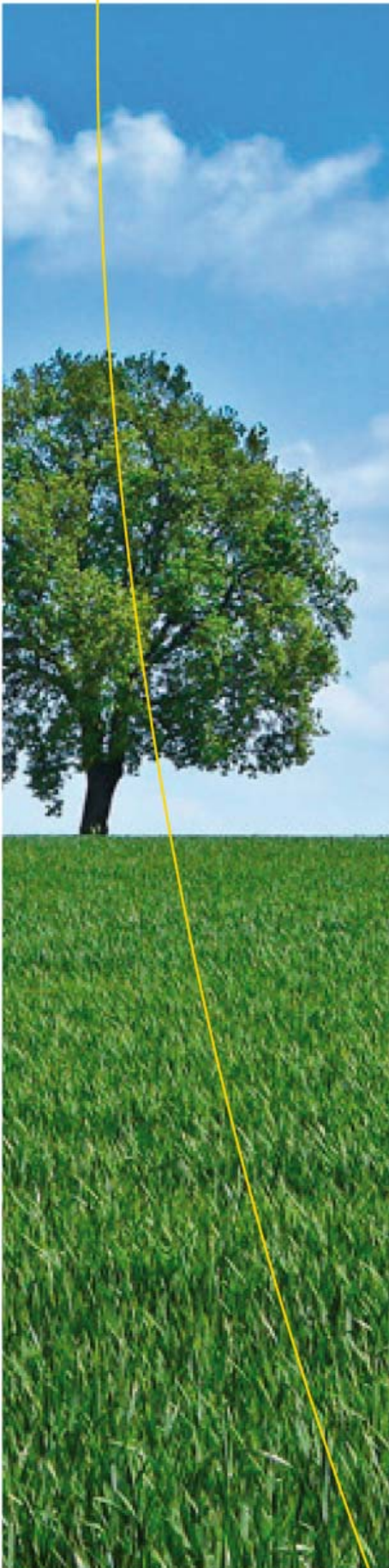
a – The target is defined per case study: *Lublin province*: Second generation bioethanol target specified in the National Renewable Energy Action Plan (NREAP); *Hungary*: bioethanol target specified in the Hungarian NREAP; *Eastern Romania*: the regionally-disaggregated biodiesel target from the NREAP; *North-East Kalimantan*: regionally-disaggregated palm oil production target projected in MIRAGE (target includes demand for all uses, not only fuel).

b - Rapeseed is part of a four-year crop rotation so that only one fourth of the land is used each year. Thus, more biofuels from other feedstocks could be produced each year without causing ILUC.

The case studies show that **large amounts of additional biofuels can be produced with a low risk of causing ILUC**. In the high scenario, already 1.3% of the total energy use (or 13% of the renewable energy use) in road transport in the EU in 2020 could be met by low-ILUC-risk biofuels produced in only the three European case studies investigated in this project.² Thus, **low-ILUC-risk biofuels produced from these three EU case studies alone could meaningfully contribute to sustainable biofuels in the EU in 2020**.

¹ Sometimes this potential is called ILUC-free as no displacement occurs. However, as this study did not account for market-mediated effects of the measures, it is here chosen to use the term “low-ILUC-risk”.

² Note that the three case studies cover only 6% of agricultural land in the EU, so the potential for all of Europe is substantial.





Project funding:

Umbrella project: Netherlands Enterprise Agency, Dutch Ministry of Infrastructure and the Environment, Dutch Sustainable Biomass Commission, Rotterdam Climate Initiative / Port of Rotterdam

Case studies: ePURE, MVO/FEDIOL, Neste Oil, Shell

More information and publications from the project:

<http://www.geo.uu.nl/iluc>

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In addition, other countries in Europe and elsewhere have untapped low-ILUC-risk potentials that could be further explored and mobilized (e.g., mixed production systems in Western Europe such as double cropping, pasture intensification in Latin America, yield increases in Africa). Thus, **ILUC as determined in economic models is not an irreversible fact, but is a risk that can be mitigated and in many cases even be prevented.**

Above-baseline yield developments and **use of under-utilized land** are the most important measures for preventing ILUC. In the Eastern European case studies, increased yields contribute in most scenarios to over 75% of the potential. In the Indonesian case study, use of under-utilized land contributes to over 90% of the potential.

ILUC is a consequence of the interconnected nature of the biofuel and agricultural sectors. As a result, a governing framework for ILUC mitigation needs to take a broader and more integrated perspective by **stimulating increases in resource efficiency and productivity across all crops** and by **addressing all land use**. Both of these are goals defined in the European Council's conclusion on the 2030 Climate and Energy Policy Framework, which promotes sustainably intensifying food production and optimizing the sector's contribution to greenhouse gas mitigation and sequestration.

Substantial investment in the agricultural sector is essential to realize the low-ILUC-risk potential of biofuels as estimated in this study as well as to strengthen and enforce land use policies. The project's **key recommendations** to prevent ILUC and to promote sustainable production practices for all crops include:

- Stimulating increasing productivity and resource efficiency in the agricultural sector through support and incentives schemes, including access to capital and technology, and capacity building.
- Providing support and incentives for production on currently under-utilized land.
- Promoting land zoning that excludes high carbon stock, high conservation value and important ecosystem service areas from conversion to any agricultural use, and incentivize forest maintenance.

Addressing ILUC in this way has the **additional benefits** of increasing the performance of the entire agricultural sector, reducing its pressure on land resources, and reducing GHG emissions in the biofuel supply chain.

Given the potential to produce large amounts of low-ILUC-risk biofuels found in this study, EU legislation on ILUC mitigation should consider including more ways to mitigate ILUC than just capping all first generation biofuels. **Implementing the measures proposed in this study and certifying low-ILUC-risk biofuel production is the key option proposed to mitigate ILUC.** For this, a sustainable approach to all crop production for food, feed, fiber and fuel purposes is essential. **EU legislation on ILUC mitigation should then consider allowing certified low-ILUC-risk biofuel production to contribute to the renewable energy target.**