



Centre de Versailles-Grignon



# Sharing the burden of GHG mitigation in European agriculture: an economist's perspective

The European Union has set ambitious targets to curb its greenhouse gas (GHG) emissions until 2020. Meeting this goal in a cost-efficient manner requires that mitigation policies do not cover only fossil-fuel related CO<sub>2</sub> emissions, but encompass all sources of GHG emissions. With about 10% of total EU emissions and 17% of the emissions from the sectors not currently covered by the European Emission Trading Scheme (ETS), agriculture is likely to play a key role in this respect.

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The European target for non-ETS emissions (reduction by 10% in 2020 relative to 2005 levels) is thus likely to have important consequences on European agriculture. The total costs and distributional impacts of meeting this target will depend on how the mitigation effort is shared among sectors and Member States, and on whether or not flexibility mechanisms will provide the incentives to direct the mitigation efforts toward the least-cost options. The 'Effort Sharing Decision' (2009) decomposes the overall non-ETS target into 27 country-specific binding targets that impose emission reductions (up to 20%) to some countries while allowing increases in other Member States. We examine the economic consequences of this decision for the European agricultural sector.

We use the results of a supply-side economic model of European agriculture to calibrate a generic marginal abatement cost function of agricultural non-CO<sub>2</sub> GHG emissions at the Member-State level. These functions enable simple calculations of the total costs of complying with any abatement target under various effort sharing rules. We use these functions to determine the cost-effective effort sharing, *i.e.* the distribution of the abatement among the Member States that minimizes the total cost of reaching a given target at the EU level.

Our results indicate that the cost-effective effort sharing would imply a total cost two to three times lower than that associated with the strict implementation of each country's target. Should the cost-effective solution be implemented through a cap-and-trade system, the equilibrium emission price would range between 32 and 42 €/tCO<sub>2</sub>eq. Moreover, if initial allowances are based on the agreed national targets, a cap-and-trade system would involve substantial transfers from EU-15 to New Member States, an important share of which being made of "hot air".

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