Mr. John Courtis
Manager, Alternative Fuels Section
California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812

29 September 2011

By email - Open Letter

Dear John,

Novozymes has been following the ongoing revision of the indirect land use change (ILUC) analysis applied in the Low Carbon Fuel Standard (LCFS) with interest incl. the recent workshop on this issue (14 September). Novozymes would like to thank CARB for their dedicated work and openness to feedback. The present letter constitutes Novozymes' comments to the information presented at the workshop. Given the short time period for review of workshop presentations and background material, Novozymes has chosen to focus on a limited number of issues.

Sensitivity analysis of fixed food consumption

At the recent workshop, Prof. Tyner from Purdue University presented a number of changes to the GTAP model applied for the quantification of global land use change (LUC). In addition, he presented a number of sensitivity analysis performed, which the Californian Air Resources Board (CARB) had asked for. In one of these sensitivity analyses, global LUC from biofuels production was estimated when food consumption in parts of the world or globally was fixed. While this exercise may provide interesting information, Novozymes strongly discourages incorporating fixed food consumption in the modeling applied for the revised ILUC values to be applied in the lookup tables of the LCFS. The issue of food consumption is important but should not be handled by modeling of 'virtual' land use change from biofuels production, which would not be expected to take place in the real world. This would be a step away from the ambition of trying to model the actual environmental consequences of biofuels production in terms of direct and indirect greenhouse gas (GHG) emissions.

Other indirect emissions

Along the lines discussed above, it should be noted that CARB is only considering some indirect emissions in their analysis, i.e. the land use emissions. The economic model behind CARB's ILUC numbers shows that biofuels production leads to a decrease in paddy rice fields as well as livestock production[1]. It is well known that paddy rice fields emit methane (a strong GHG) and that the livestock sector is also a major source of GHG

[1] Based on Taheripour et al. (2011): *Implications of Biofuels Mandates for the Global Livestock Industry: A Computable General Equilibrium Analysis*, Agricultural Economics 42

emissions (see e.g. the report 'Livestock's Long Shadow' by the United Nations Food and Agricultural Organization). On this basis, it is recommended that CARB also commissions a sensitivity analysis estimating the GHG implications of the indirect effects on paddy rice and livestock production.

Thank you for your consideration of these comments.

Sincerely,

Jesper H. Kløverpris, MSc, PhD

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member of CARB's former expert workgroup on ILUC

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