

# Carbon Cycle Impacts of Plantation Land-Owners as Joint Producers of Timber and Fuel: Towards Incentive-Compatible Modeling of Land Use Change Policy Impacts

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Simulation modeling with FLAMES [1] demonstrates BECS technology reducing Carbon in atmosphere ( $C_{at}$ ) towards pre-industrial levels under strong land use change policy e.g. motivated by Abrupt Climate Change precursor signals [2]. Profit maximizing sequestration plantation landowners may forgo carbon storage incentives and realize sales as timber and biofuel raw material, then replanting under continued C-incentives or realizing alternative rent value. Modeled optimal decisions depend on prices of land, timber and biofuel, growth profile of trees, maximum timber content at felling, and discount rate. Implausible price profiles from FLAMES are smoothed. Absent high rents, there is minimal change in  $C_{at}$  effectiveness.

[1] P. Read, J. Lermitt and P. Kathirgamanathan, 2002. "Modelling Bio-Energy with Carbon Storage (BECS) in 15-Region Version of FLAMES". Proceedings GHGT-6, Kyoto, October, Elsevier.

[2] Obersteiner, M., C. Azar, P. Kauppi, M. Mollerstern, J. Moreira, S. Nilsson, P. Read, K. Riahi, B. Schlamadinger, Y. Yamagata, J. Yan, and J.-P. van Ypersele, 2001. "Managing Climate Risk", Science 294, (5543): 786b.

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