

Abstract:

## **A SCGE Modelling Approach Assessing Regional Effects of Energy Policy**

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Environmental issues, increased focus on security of supply as well as the energy systems role in economic growth has led to pressure towards a more sustainable energy system. This will require systematic long term planning on regional, national and international level. So far the majority of research has addressed the national and international level. In Norway there is a political objective to build a substantial amount of renewable energy supported by green certificates. These investments will be supported by national policy and instruments, but they will also depend on regional policy and affect regional development.

To cope with these challenges we will develop a hybrid modelling approach for the regional level which combines a TIMES regional model of the energy system and multiregional (macro) economic model of the regional economies with a particular focus on energy and transport. Combining these approaches result in a hybrid type of modelling involving an optimising model and a general equilibrium model.

There are very few examples where energy models and economic models are combined at the regional level (within a country). A suggested approach linking MARKAL/TIMES energy system models and the REMI regional economic model is given in “Linking MARKAL/TIMES with REMI policy insight” (R. Loulou, et.al, 2005) and Goldstein (2006). Several examples on work with soft links between national CGE models and the global and national energy models are available, cf. Martinsen (2011).

Multiregional models that allows prices and price behaviour through a Spatial Computable General Equilibrium (SCGE) framework are developed for other sectors like the transport sector cf. Ivanova et. al. (2006), Vold & Hansen (2008) and Sundberg, M. (2008). These models are aggregated on the energy side, but provide useful insight and motivation for further modelling. Our aim is therefore to develop a SCGE multi-regional model, with appropriate details of the energy sector, taking into account price behaviour and capacities in production and final demand sectors. In this presentation the emphasis will be on the multiregional economic model.