Global analysis with ETSAP-TIAM

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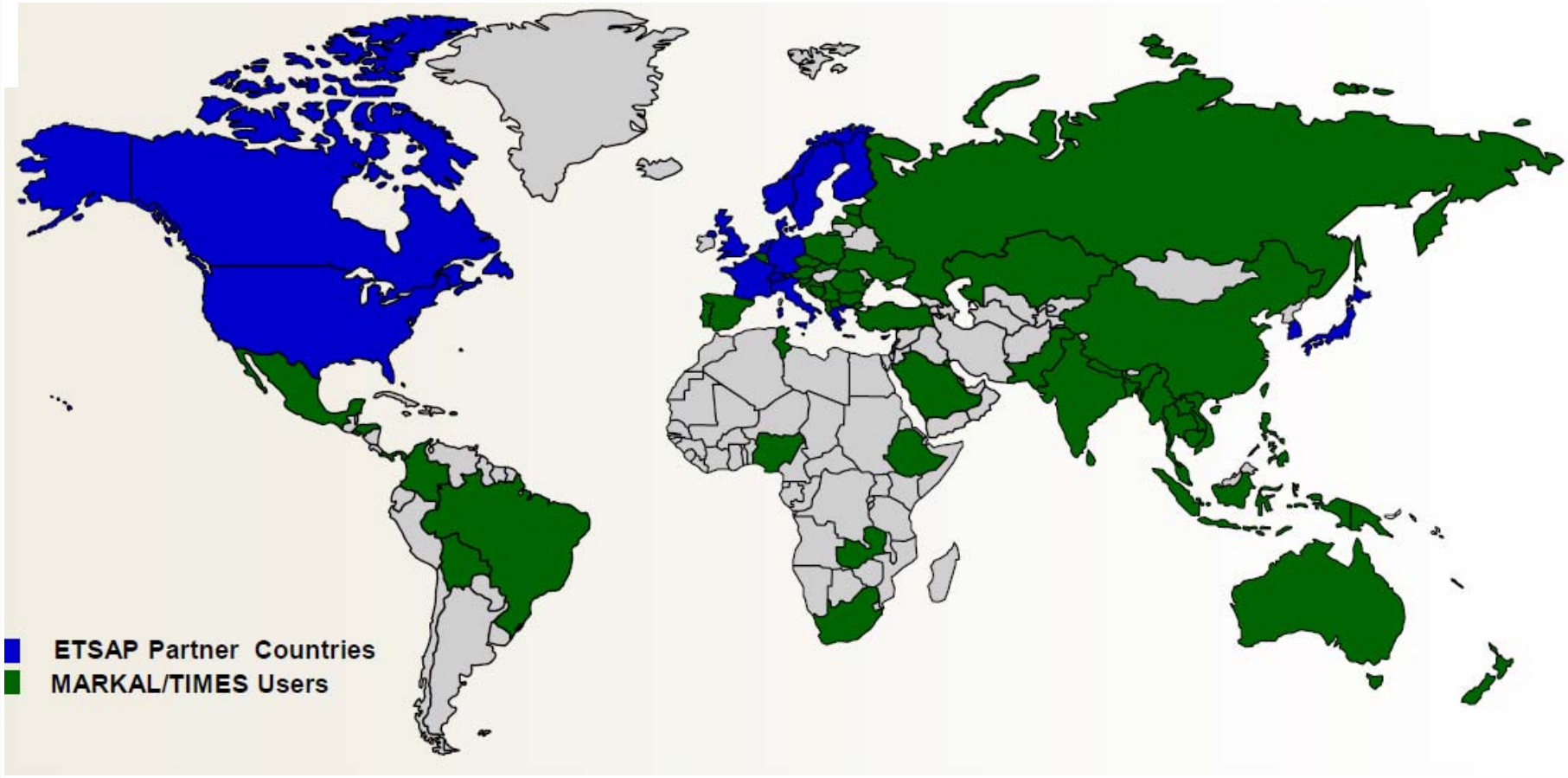
ETSAP-TIAM

- Global TIMES model (2005 – 2100)
- Bottom-up optimization model of the energy system

TIMES

- Developed by the Energy Technology System Program (ETSAP), an implementing agreement of the International Energy Agency (IEA)
- IFE is applying the ETSAP models since the end of the 70's
- The models are widely used around the world for both local, national, regional and global studies
  - Used of individuals and teams in nearly 70 countries

ETSAP model users

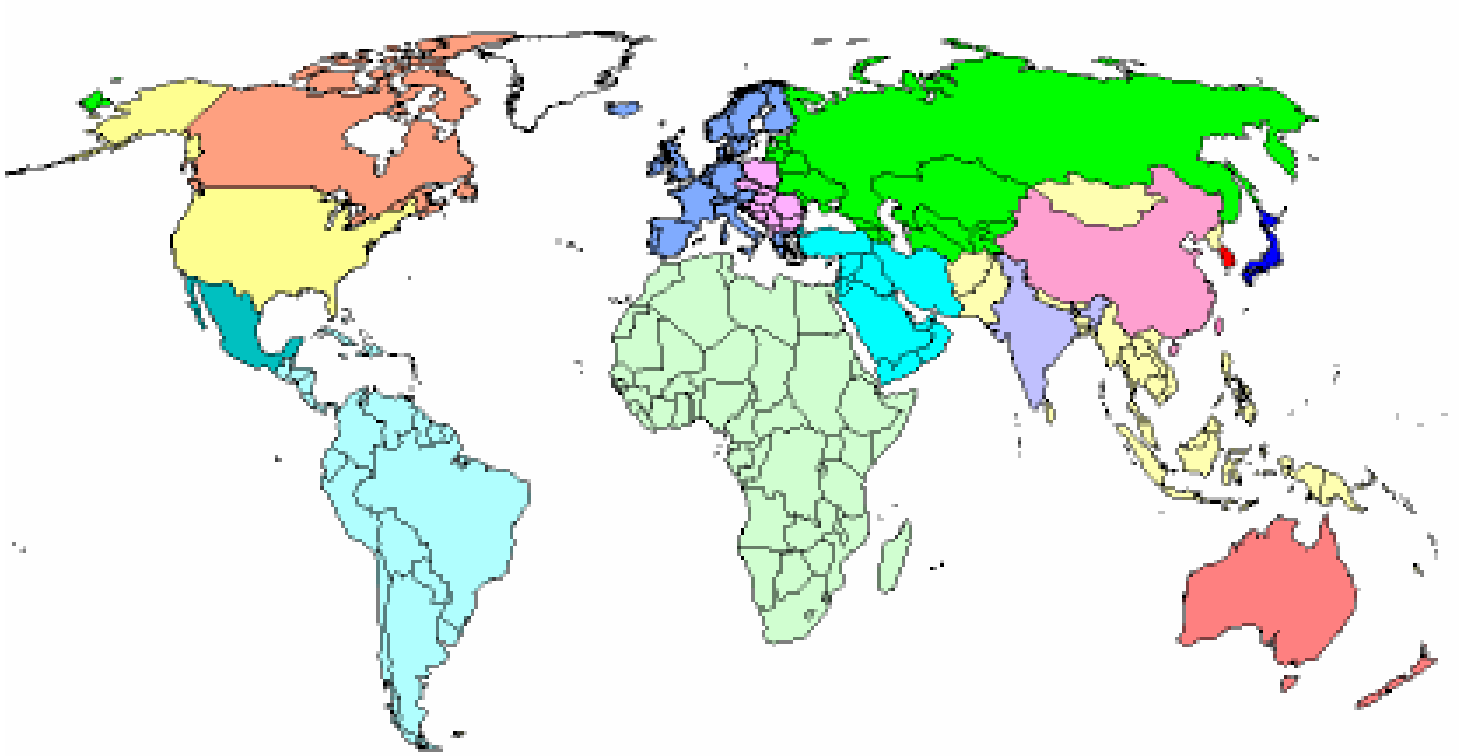


ETSAP-TIAM

- 15 regions
- Technology rich model
  - Supply, transformation and demand
  - Demand driven
  - Endogenous energy prices and investments
  - Trade of oil, oil products, LNG, natural gas and electricity between regions
- End use demand sectors: Agriculture, Transport, Industry, Residential and Commercial
- Model extensions
  - Climate module
  - Endogenous technology learning
  - Stochastic modelling

ETSAP-TIAM

Africa, Australia + New Zealand, Canada, Central and South America, China, Eastern Europe, Former Soviet Union, India, Japan, Mexico, Middle-East, Other Developing Asia, South Korea, United States, Western Europe



ETSAP-TIAM

- Continuously updated and further developed
  - Financed by the ETSAP and other projects
  - Meetings twice a year
  - The model group consist of 8 ETSAP members, including IFE
  - Model documentation
- Modelling tool in CENSES
  - Can be useful for CenSES partners!
- Collaboration with SINTEF
  - ETSAP-TIAM comparison with GCAM
  - Model differences and model strengths

ETSAP-TIAM

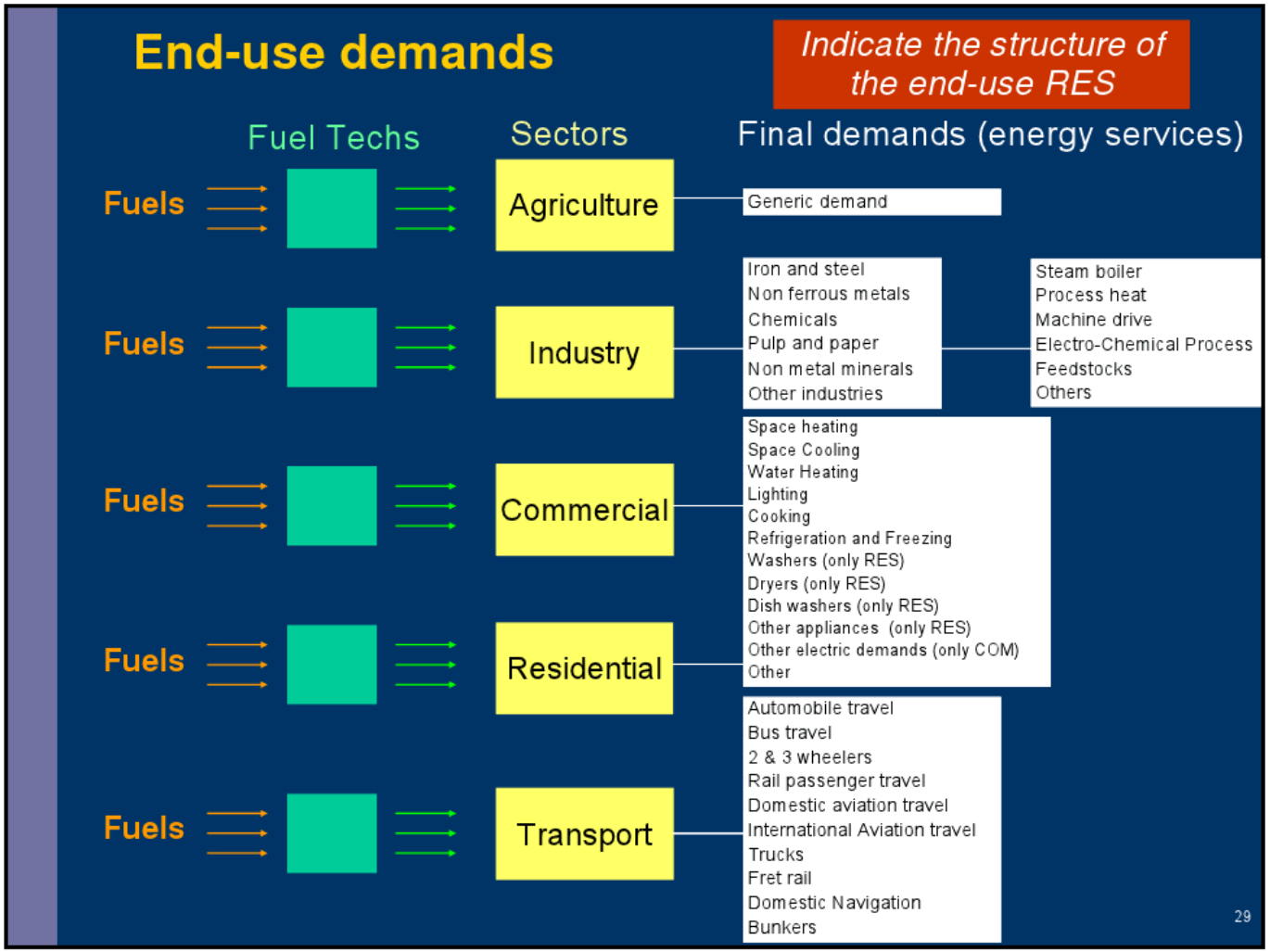
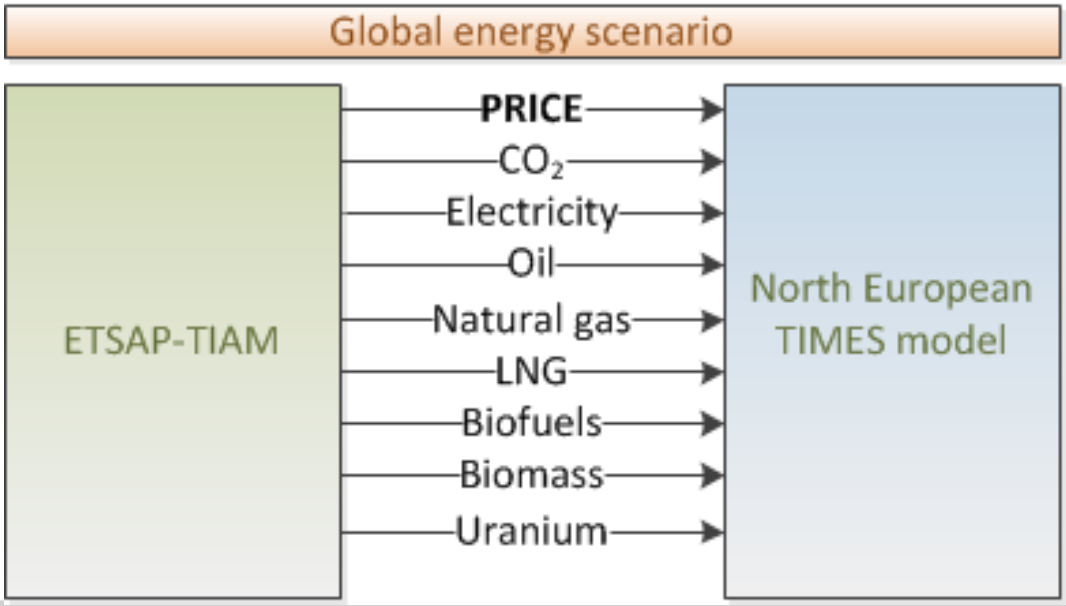


Figure: REACCESS, 2008

Example ETSAP-TIAM projects

- The Norwegian energy system in a European context
  - Project period 2011 – 2014
  - Research project at IFE, PhD at NTNU
  - Link Norwegian and North European analysis with ETSAP-TIAM

How will the different global energy scenarios affect Norway and the North European region



Example TIAM projects

- Is a 2 degrees Celsius warming achievable under high uncertainty? (Labriet et al, 2008)
- OPEC Oil Pricing Strategies in a Climate Regime: a Two-Level Optimization Approach in an Integrated Assessment Model (Loulou et al, 2008)
- The Future Role of Fusion Power: Endogenous Technological Learning in a TIMES Model of an Energy System (Baumann, 2008)
- Implementing water allocation in the TIAM-FR energy model (Bouckaert et al, 2010)
- REACCESS (Risk of Energy Availability: Common Corridors for Europe Supply Security)

Concluding remarks

- Norway is not an isolated energy island!
- ETSAP-TIAM is a suitable tool to analyse different global scenarios
- Global problem = global solution
- ETSAP-TIAM is useful for CenSES & CenSES is useful to ETSAP-TIAM
- More information on:
  - http://www.iea-etsap.org
  - http://www.iea-etsap.org/web/applicationGlobal.asp

Thank you for your attention!

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