

# Genesis of TIAM (TIMES Integrated Assessment Model)

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## From MARKAL to TIMES

- **1996-1997:**
  - TIMES concepts (MARKAL + EFOM + new features)
  - TIMES equations (Informal ETSAP group)
- **1998-2003:**
  - GAMS code
  - Testing of code, some country models (VTT, IER, KUL)
- **2004-2005:**
  - VEDA interface for TIMES
  - First Global TIMES model (EFDA)
  - Several Country models, NEEDS
  - Climate module
- **2005-2006:**
  - Full documentation
  - ETSAP in EMF-22, stochastic programming
  - RES-2020, etc.

## MARKAL/TIMES Global models

- Initial proposal by AK & RL to ETSAP at ETSAP meeting in 1998...
- **SAGE** at USDOE-EIA: 2000-2003 and on: Global, myopic MARKAL + Market share algorithm
- **IEA-ETP** project: 2001-2003 and on: global MARKAL with focus on technology, environmental issues
- **EFDA**: 2004 and on: First global TIMES model: focus on technology, environment, very long term (2100)
- ETSAP's **TIAM**: 2004-2006: elaborated from previous modeling experience. Focus on technology, energy trade, link with macroeconomy (GEM-E3), global environmental issues (GHG, climate module), very long term (2100)

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## TIAM

- ETSAP sponsored, plus support from Canadian Research Council.
- Joint work by Canadian team, VTT (Finland), IER (Germany), ETSAP's Head (GCT)
- Recent Developments (since 2004):
  - Carbon Sequestration
  - Other GHG Gases: emissions and abatement options for N<sub>2</sub>O and CH<sub>4</sub>
  - VEDA interface v.2.3
  - Review and enhancement of energy resources
  - Climate Module
  - Stochastic Programming

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## Applications of TIAM

- EMF-22: Climate Stabilization policies (2004-2006) *Labriet et al, 2006*
- EMF-22: Transition Policies (2007)
- Analysis of Nuclear energy in climate scenarios (Canada) *Vaillancourt et al, 2006*
- TOCSIN (European Commission FP6): Focus on DC's --China and India: 2007-2009
- French Ministry of Ecology: Focus on oil markets: 2006-2008