



## Myopic TIMES version: Concept and first results

Uwe Remme, Markus Blesl

Institut für Energiewirtschaft und Rationelle Energieanwendung, Universität Stuttgart

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## Overview

- Motivation
- Myopic variants
- Prototype: example results for different foresight levels with TIAM
- Implementation issues still to be done / Further ideas

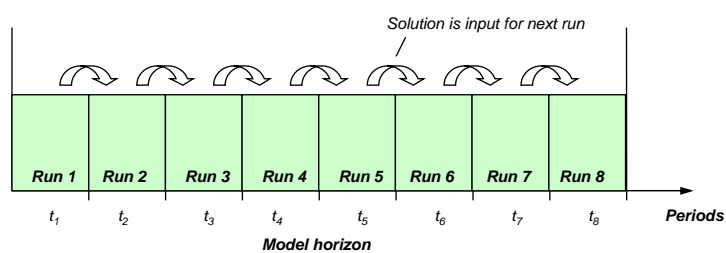


## Motivation

- Variants of handling the future in models:
  - i. Perfect foresight (clairvoyance):
    1. Decisions today are influenced by the future, which is assumed to be fully known today over the entire model horizon
    2. Future means:
      - Information, which can be certain, e.g.: announced, binding future GHG targets
      - Information, which is by nature uncertain, e.g.: price, energy demand development
      -
  - ii. Myopic view:
    1. Decisions today only depend on the past (and no or only limited knowledge of the future)
- Analysis questions with myopic TIMES version:
  - i. Evaluating long-term vs. short-term strategies/behaviour with respect to
    1. known policy goals, e.g. GHG targets, by comparing clairvoyant and myopic results
    2. Inter-temporal restrictions in the energy system, e.g. limited fossil resources
  - ii. Improving solvability of large models by repeated solution of smaller models (myopic version as intermediate step for developing a decomposition method by period)



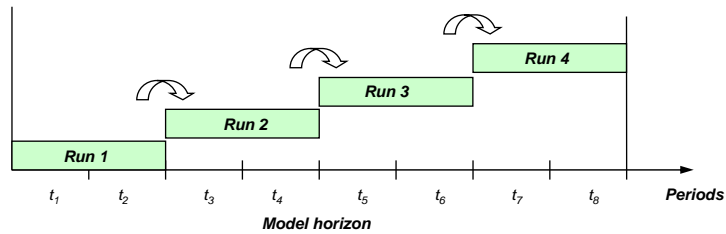
## Standard myopic approach



- Model is solved successively for each period
- Knowledge of the future is limited to one period
- Implicit assumption: no changes to current period, conditions (demand, prices etc.) in the future will be the same as today
- Solutions of the previous runs (e.g. new installed capacity) are input data for the current run



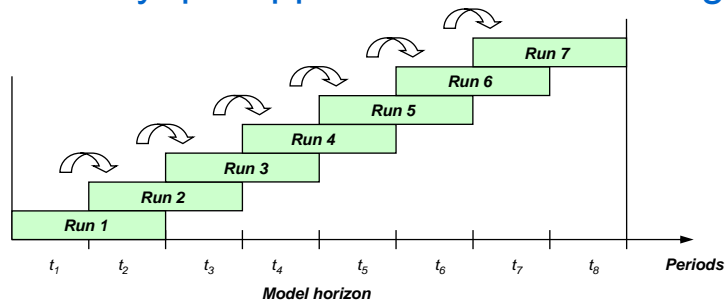
## Myopic approach: greater foresight



- Knowledge of the future is limited to two periods
- Drawback:
  - i. first period of each model run has foresight of two periods
  - ii. Second period of each model run has only foresight of one period.
- Solution: Overlapping model runs

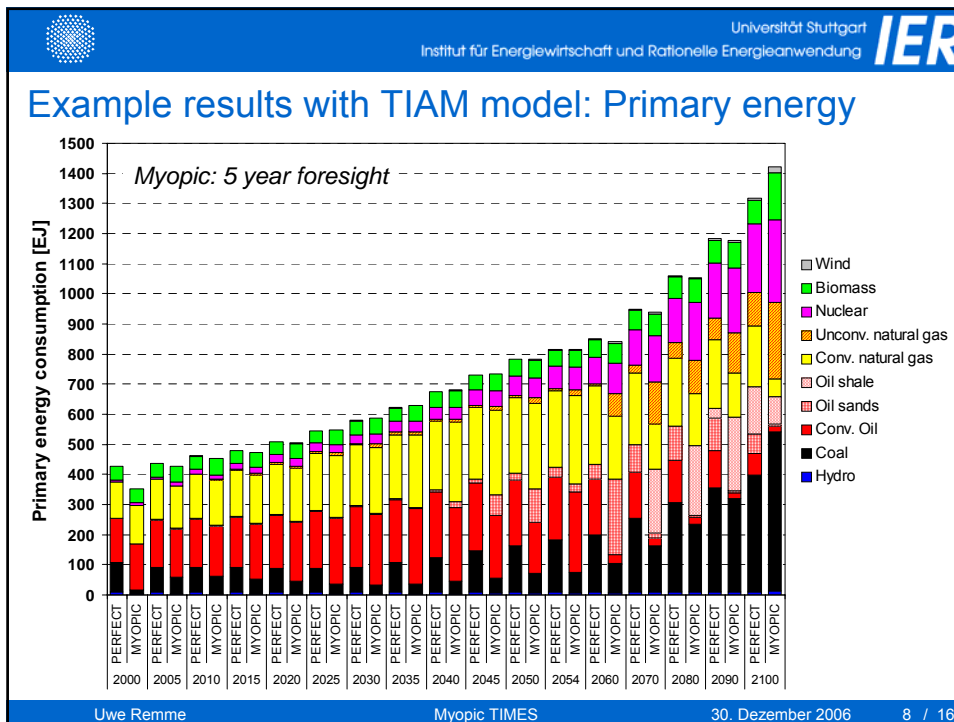
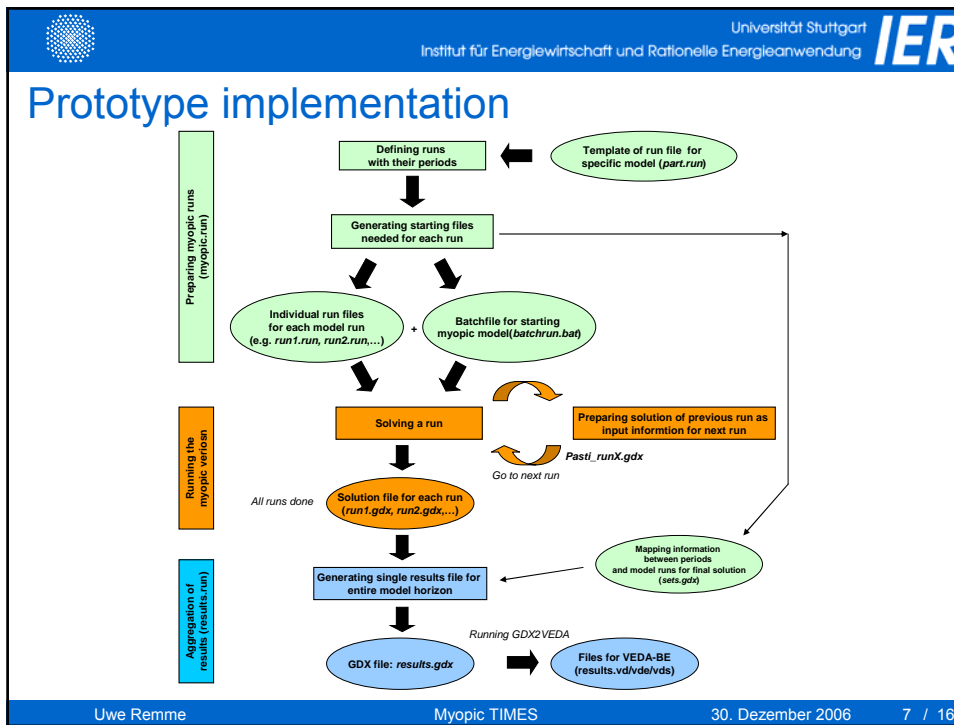


## Modified myopic approach: Limited foresight



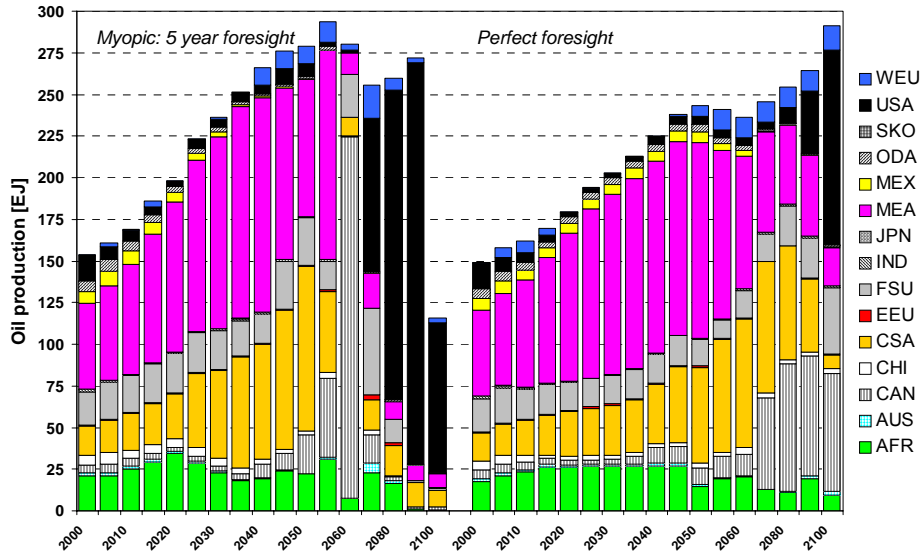
- Known is not only the current period, but also some future periods: limited foresight
- Periods of model runs overlap
- Solution of past runs as input information for current run



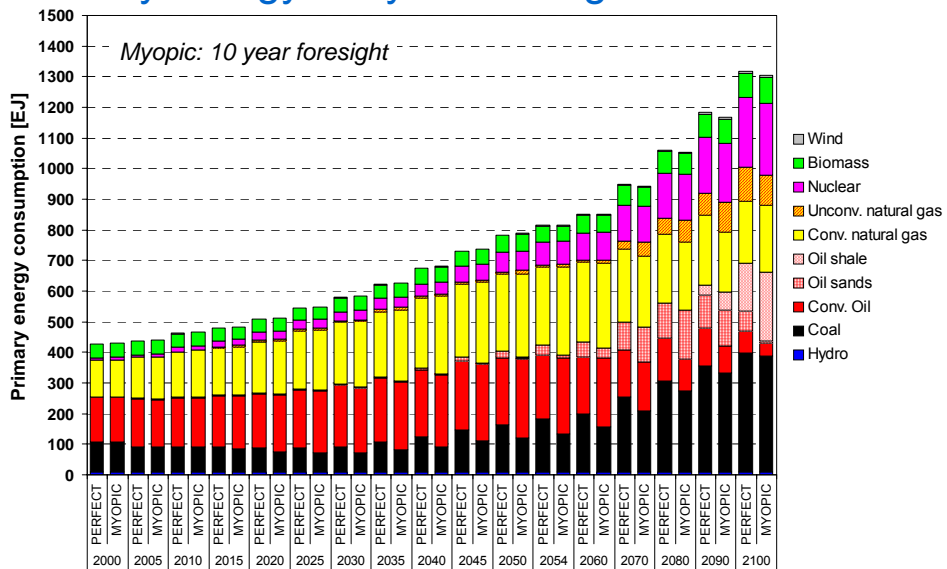




### Example results with TIAM model: Oil production



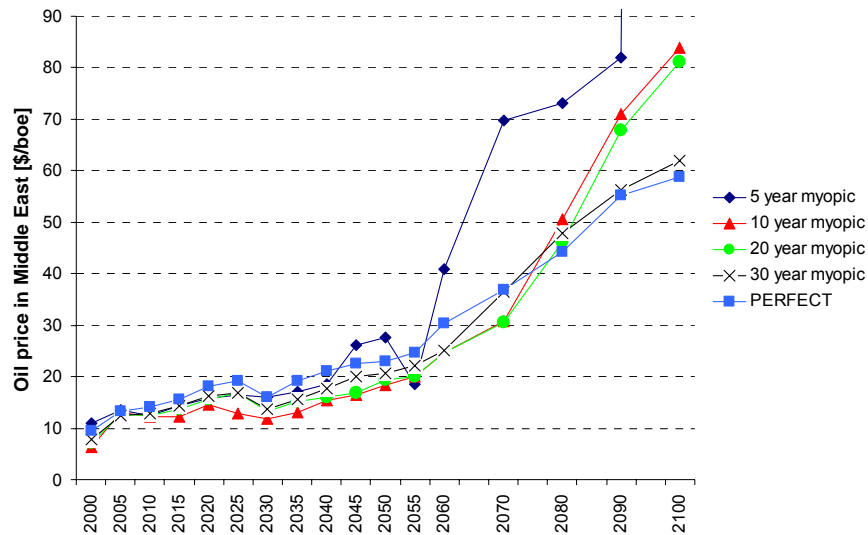
### Primary energy: 10 year foresight







## Shadow price of oil

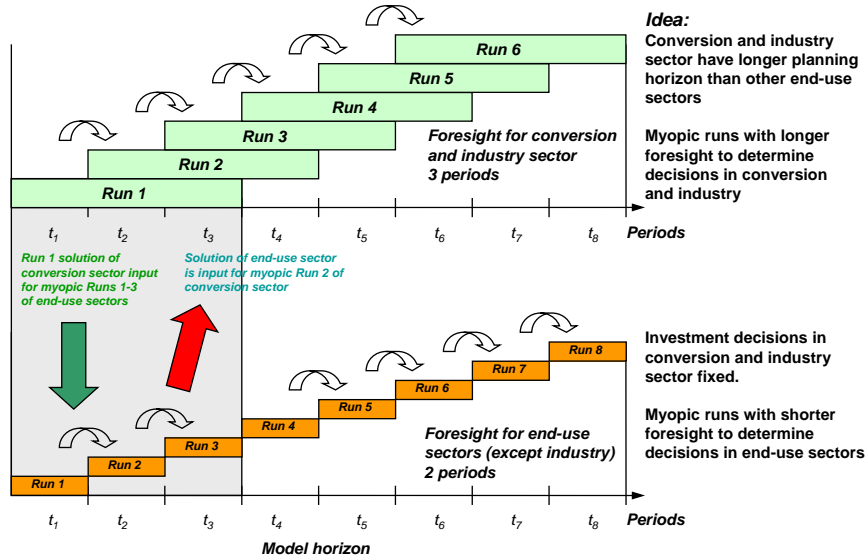


## Remaining implementation issues to be done

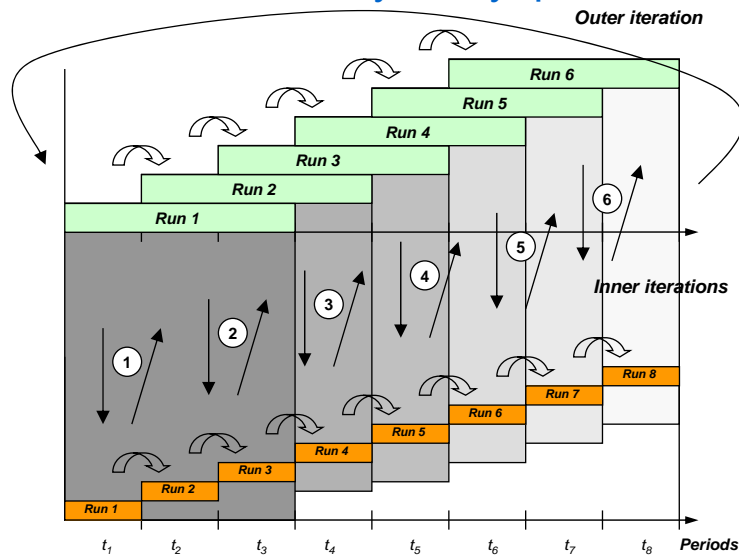
- Included inter-temporal constraints so far:
  1. Capacity transfer between model runs
  2. Cumulative user constraints (not all variables)
  3. Dynamic user constraints (not all variables)
- To be done:
  - i. Considering all possible variables in user constraint variants
  - ii. Cumulative commodity bounds
  - iii. Inter-temporal storage (stockpiling)
  - iv. ETL (i.e. external calculation of investment cost reduction based on capacity development)



## Further ideas: Hierachy of myopic runs



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## Illustration of problem matrix

