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PBL Netherlands Environmental Assessment Agency

# Taking stock of the ADVANCE transport models

Overview of our transport models and indication of modeling ambitions

19-11-2013 | Oreane Y. Edelenbosch



## ADVANCE demand modeling

- IAMs tend to have significantly **more detail on the supply side** than on the demand side
- Many models achieve the largest reductions through energy supply changes, but still energy demand stays significant.
- GEA, EMF27 and other MIPs emphasize the importance of efficiency for achieving 2°C.

### 2 ADVANCE WPs focussing on energy demand modelling

- End use and energy service demand (WP2)
- Heterogeneity, behaviour and consumer choices (WP3)



Taking stock of our models..

## Stock taking exercise

**11 models** have participated:

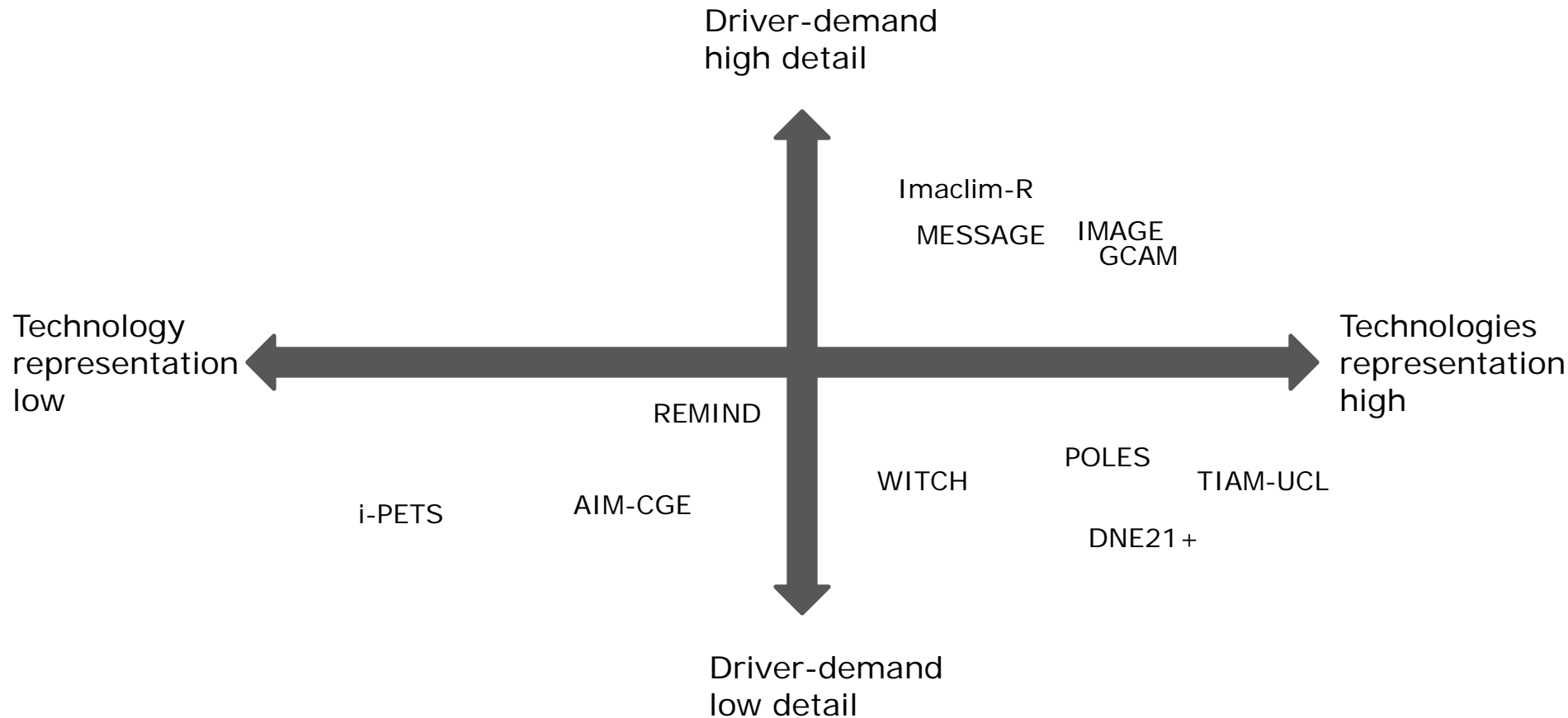
TIAM-UCL, IMAGE, Imaclim-R, MESSAGE, REMIND, GCAM, AIM-CGE, DNE 21+, WITCH, POLES and iPETS

Method: qualitative questions on drivers, literature, technologies, modes, interrelations, boundaries, behavior, heterogeneity...

Zoom in briefly on **the most apparent differences**



# First impression





## Large variety in our models

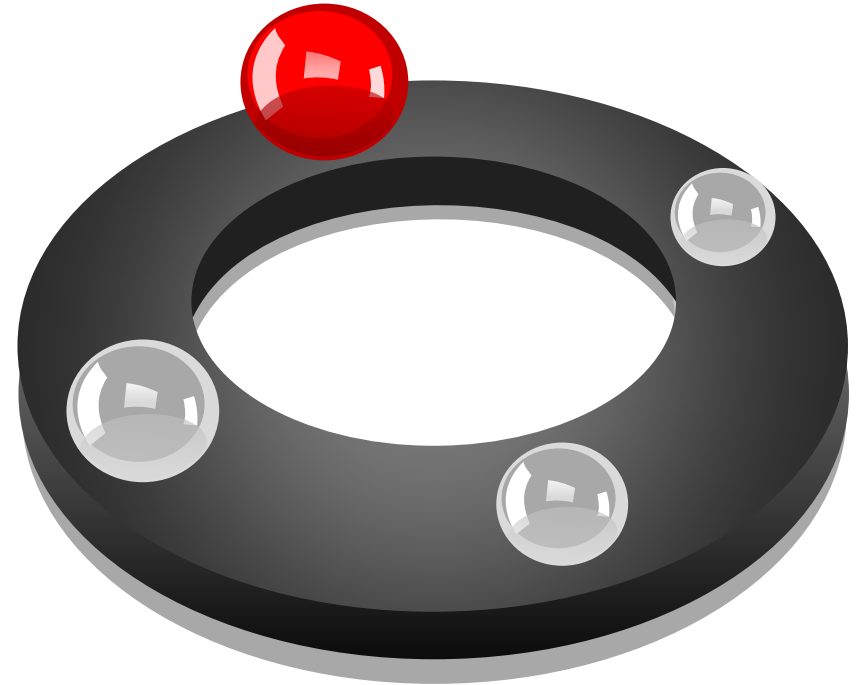
- **Relationship between drivers and demand**
  - Household utility maximization under constraint of revenues and time spent
  - Linear relationship with respect to GDP
  - Multinomial Logit taking into account time, cost, preference, non energy cost, speed, fuel price
  - CES function
  - Leontief function combined with vehicle ownership
- **Amount and characteristics of technologies, modes**
  - Energy efficiency -exogeneous, endogeneous
  - Costs
- **Distribution between modes, technologies**
  - fixed distribution, multinomial logit, CES function



Ambitions..

## Technology representation

- REMIND/WITCH: increase modes and representation
- IMAGE: improve airplane types
- WITCH/REMIND/IMAGE: endogenous investment into vehicle efficiency
- AIM-CGE: include technological aspects
- WITCH/IMAGE: representation 2 wheeled/3 wheeled and different sized LDVs

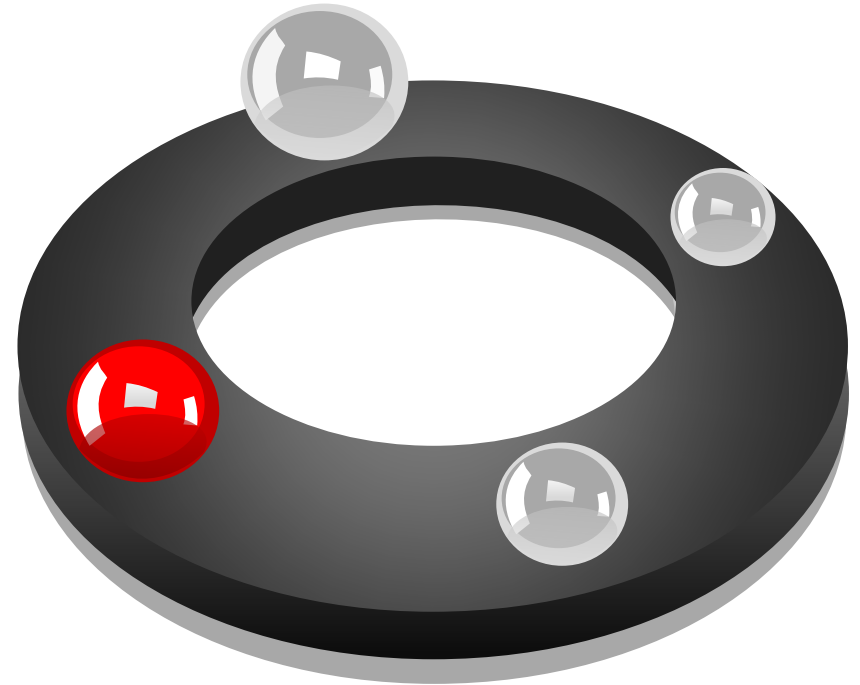






## Data

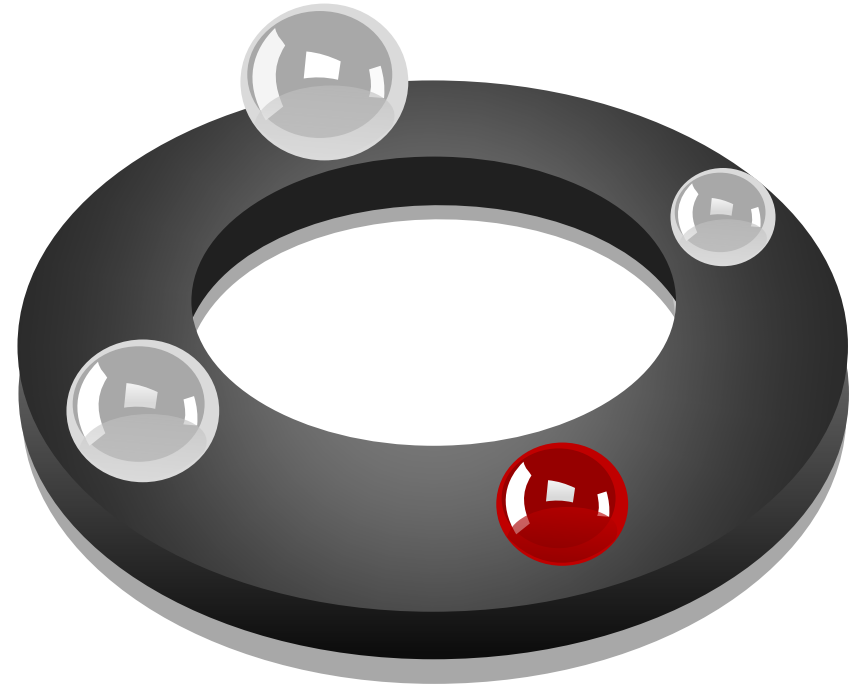
- MESSAGE: improve historical and base year calibration
- IMAGE: improve technology cost data in freight sector





## Behavior/ Heterogeneity

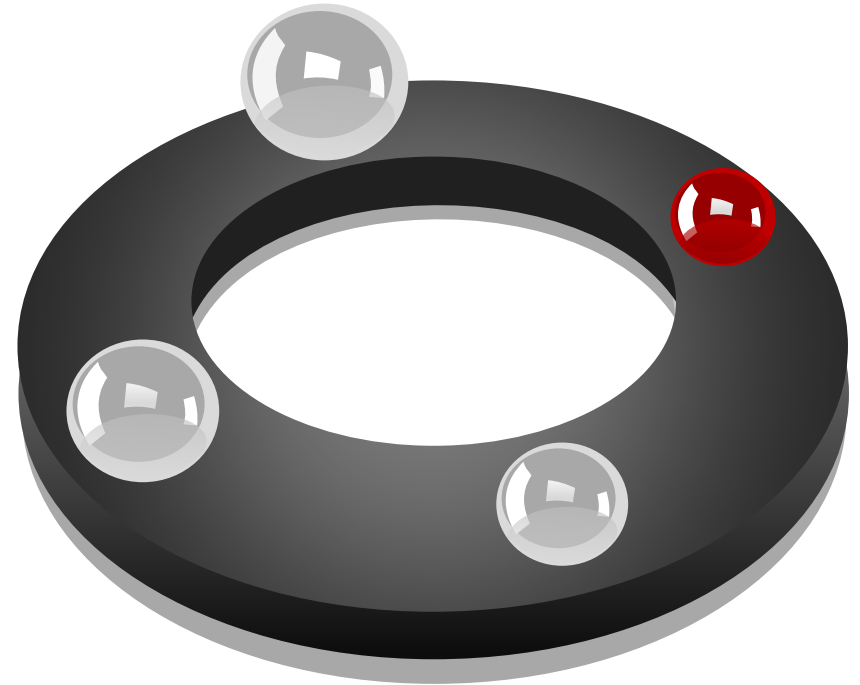
- TIAM-UCL: segregating by rural/urban
- WITCH: allow switching between public and private
- MESSAGE/GCAM: Includes consumer behavioral parameters
- MESSAGE/GCAM: taking into account non-cost considerations





## Infrastructure

- Imaclim-R: including infrastructure development and in particular its costs





Thank you for your attention.