

# GRAPE model development - recent topics -

Atsushi KUROSAWA  
The Institute of Applied Energy

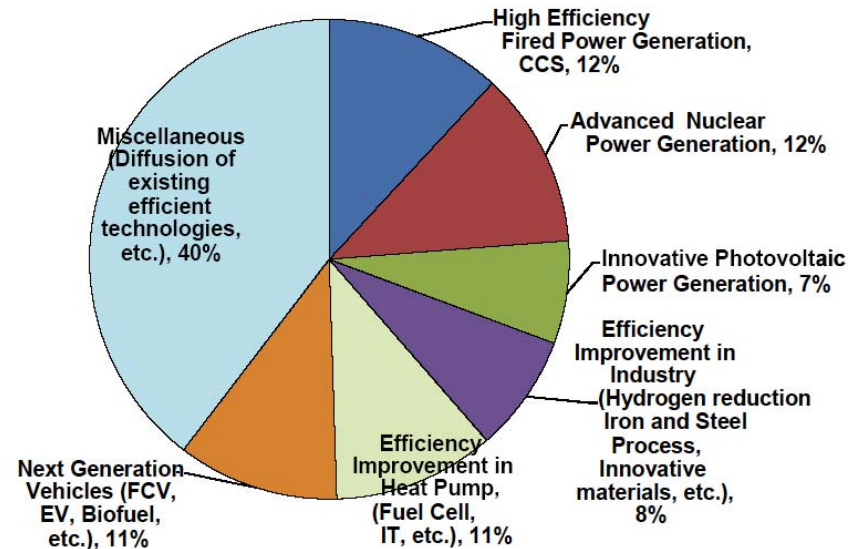
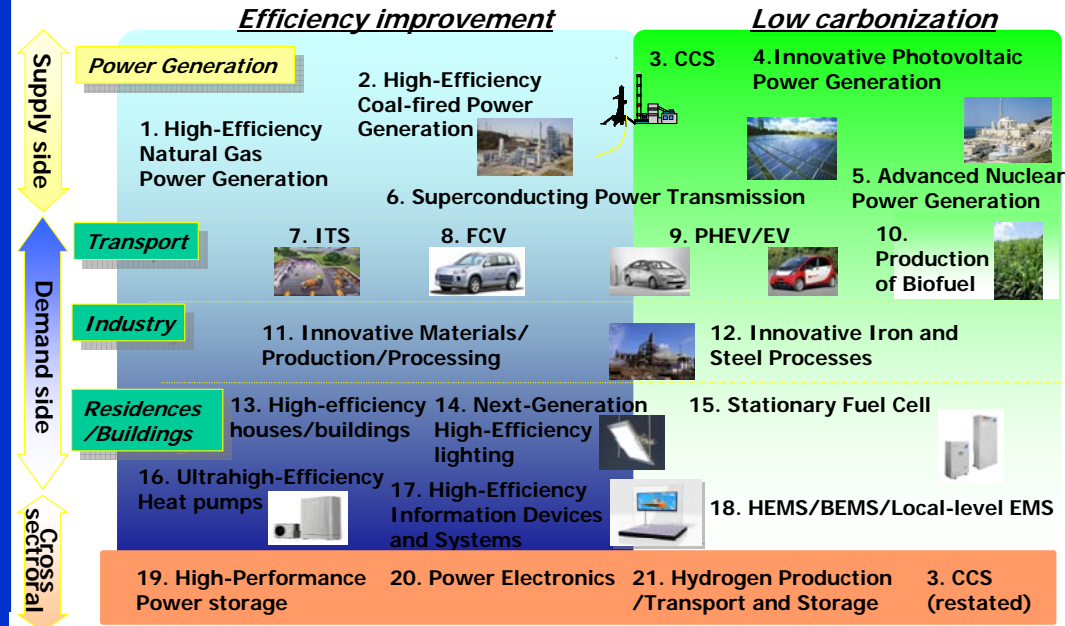
Integrated Assessment Modeling Consortium  
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# Innovative Energy Technology Program

- \*Identified 21 energy technologies to be focused.
- \*Each tech. roadmaps with milestones on performance.
- \*Int'l cooperation to accelerate innovative tech. RD&D.
- \*Included in the proposal for G8 Summit in June 2008.
- \*Details available at <http://www.iae.or.jp/etm.html>
- welcome your comments

**Global 50% Energy CO2 Reduction wrt Current Level - Tech. Portfolio -**

## Identifying Key Innovative Energy Technologies in Key Sectors: 21 candidates



(Figure 9) Contribution of Innovative Energy Technologies for the 50 % Emission Reduction in 2050  
Source: An estimation by the Institute of Applied Energy

## Other Developments

- ✓ Water (preliminary)
  - Limited supply. Omnipresence of resources. Agriculture water demand will dominate.
  - Agr. water demand depends on crops (esp. rice)
  - Some regions should start desalination in future?
  - Water recycle (esp. industries)
  
- ✓ Agriculture and landuse
  - Disaggregation of crops
  - linkage w water submodel
  
- ✓ Climate
  - Integration of 1-D carbon cycle and energy balance (i.e. radiation, diffusion, advection, etc.) based on ISAM(A. Jain, UIUC) .

# IAM&CMC handshake and harmonization

## Questions:

Climate and CO<sub>2</sub> feedbacks included and reported? Are they consistent?

High CO<sub>2</sub> conc. & RF

- Large differences

Low CO<sub>2</sub> con. & RF

- Small differences

- Needs negative CO<sub>2</sub> flux for stabilization

# Modeling Challenges

- ✓ Space / Downscaling - Needs guidance
  - Common methodologies?
  - Open tools?
- ✓ Temporal resolution
  - Fine step needed for short run simulation?
- ✓ Short term reality
  - Energy supply price, Regional climate policy
  - Should we provide short term scenarios also?
- ✓ Uncertainty and transparency
  - Science
  - Socioeconomy
    - Key drivers such as population and GDP  
(incl. income gap convergence assumed or not)
    - Burden sharing scheme should be included or not?