the Economics of Technologies to Combat Global Warming

Workshop on Climate Change Impacts and Integrated Assessment (CCI/IA)

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From Modeling to Policy Implementation

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Key points

- To achieve substantial GHGs reduction, it is essential not only to develop and deploy technologies, but also to reform social structures based on long-term plans.
- To analyse the effectiveness of such policy plans, several different kinds of modules/ approaches are required.
- We have developed mid-term national scale integrated assessment models to support to make policy plans to achieve low carbon society.

Comprehensive modeling for LCS (Low Carbon Society) study: Two stages and three model groups of LCS's study:

Stage 1: Design of a Low Carbon Society

1. Creation of narrative storylines of future Low Carbon Societies
2. Description of sector-wise details of the future LCSs.
3. Quantification of the Macro economic and social aspects of the LCSs.
4. Identification of effective policy measures and packaging them

Stage two : Putting them together and making it happen

1. Design of policy roadmaps toward the Low Carbon Society
2. Feasibility analysis of the roadmaps considering uncertainties involved in each policy option
3. Analysis of robustness of the roadmap caused by societal, economical and institutional acceptability and uncertainties

Group 1: Element models;

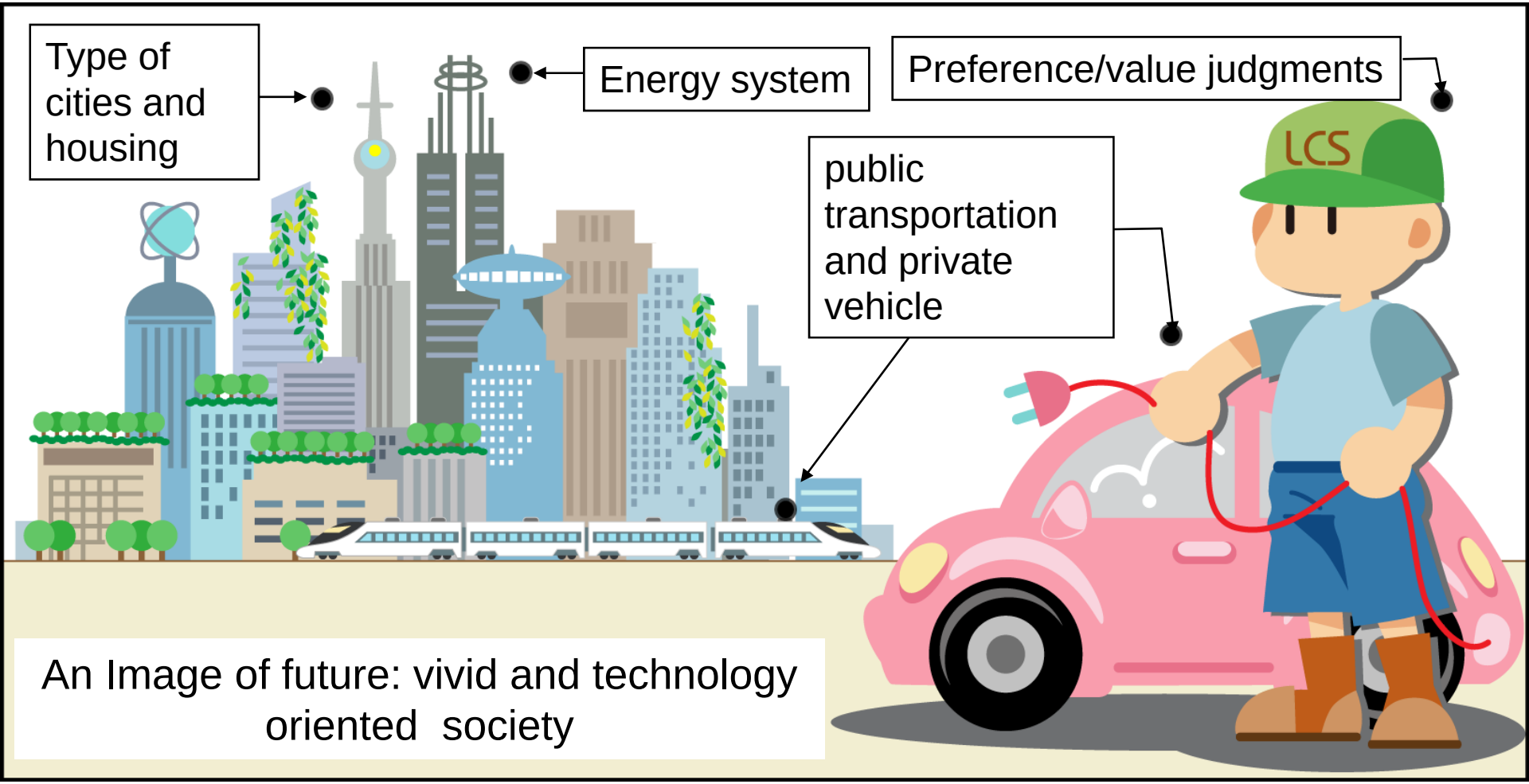
1) Snapshot models;
   - Quasi steady Computable General Equilibrium (CGE) model
   - Energy technology bottom-up models
   - Energy supply model
   - Household production/lifestyle model
   - Transportation demand model

2) Transition models;
   - Population and household model
   - Building dynamics model
   - Econometric type macro-economy model

Group 2: Extended Snapshot Tool (ESS)

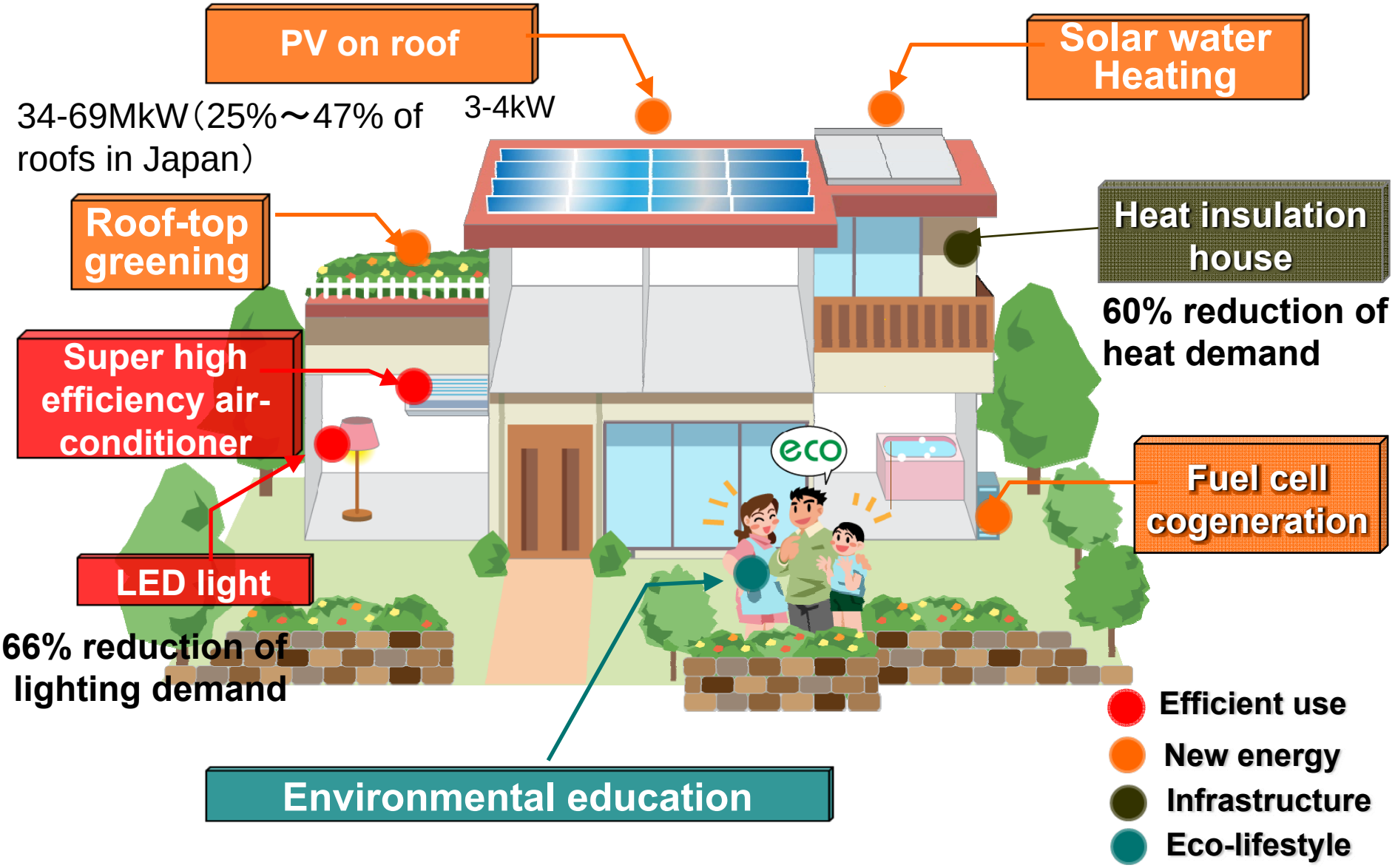
Group 3: Backcasting Model for transient control (BCM)

Creation of narrative storylines of future Low Carbon Societies



An example of description of sector-wise details of the future LCSs.

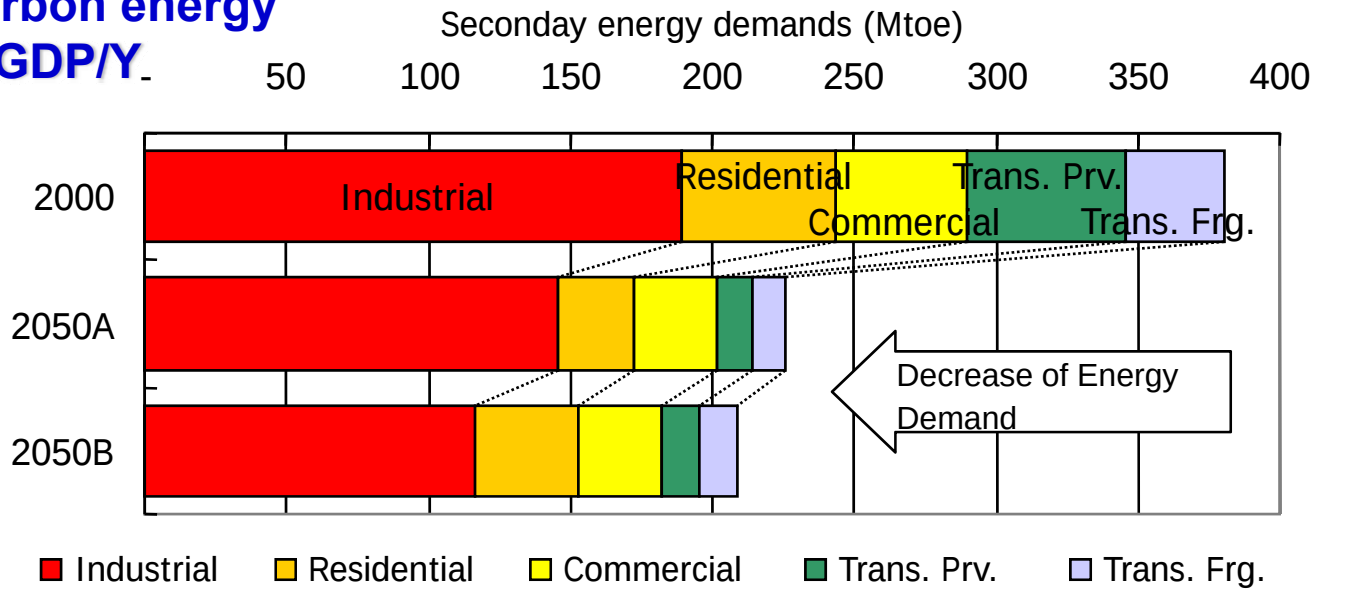
Comfortable and Green Built Environment



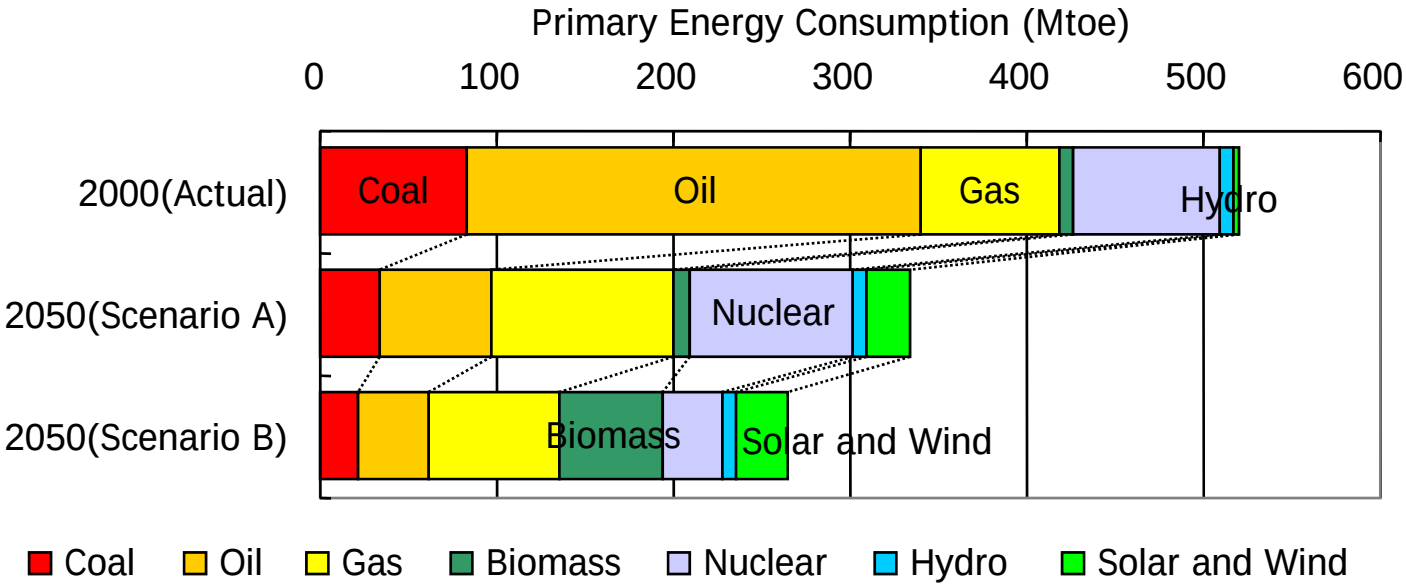
70% reduction feasible in Japan:
Combination of demand side energy reduction ＋low carbon energy
Direct cost: 1% of GDP/Y

“But it is not realized without suitable policies”

Final energy demands



Primary energy supply

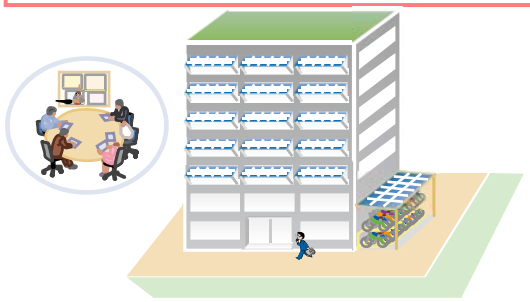


12. Low carbon society leadership

Citizens understand that low-carbon society promotes safe and cozy life, and undertake various actions towards that end.

1. Comfortable & green built environment

Keep warm/cool air in the building by active solar system and by changing building structure.



2. Anytime, anywhere appropriate appliances

Rental services relieve the burden of initial cost of high efficiency equipments, and promote service supply independent from manufacture.

11. Labeling to encourage smart and rational choices

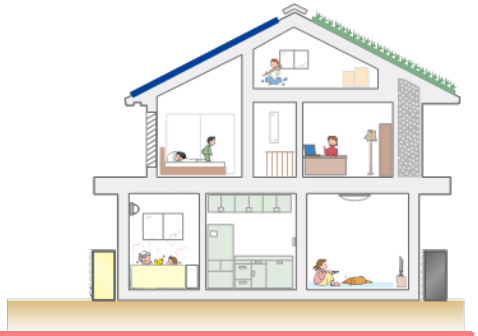
Disclosing the amount of CO2 emission makes consumers select low-carbon products in affordable way.

3. Promoting Seasonal Local Food

Consumers select low-carbon seasonal food and can get the information about farm producers.

10. Next generation fuels

Simultaneous supply of heat and electricity by fuel cell.



4. Sustainable building materials

Actively use of wood feedstock and wood manufactures.

9. Local renewable resources for local demand

Active selection of regional solar/wind energies

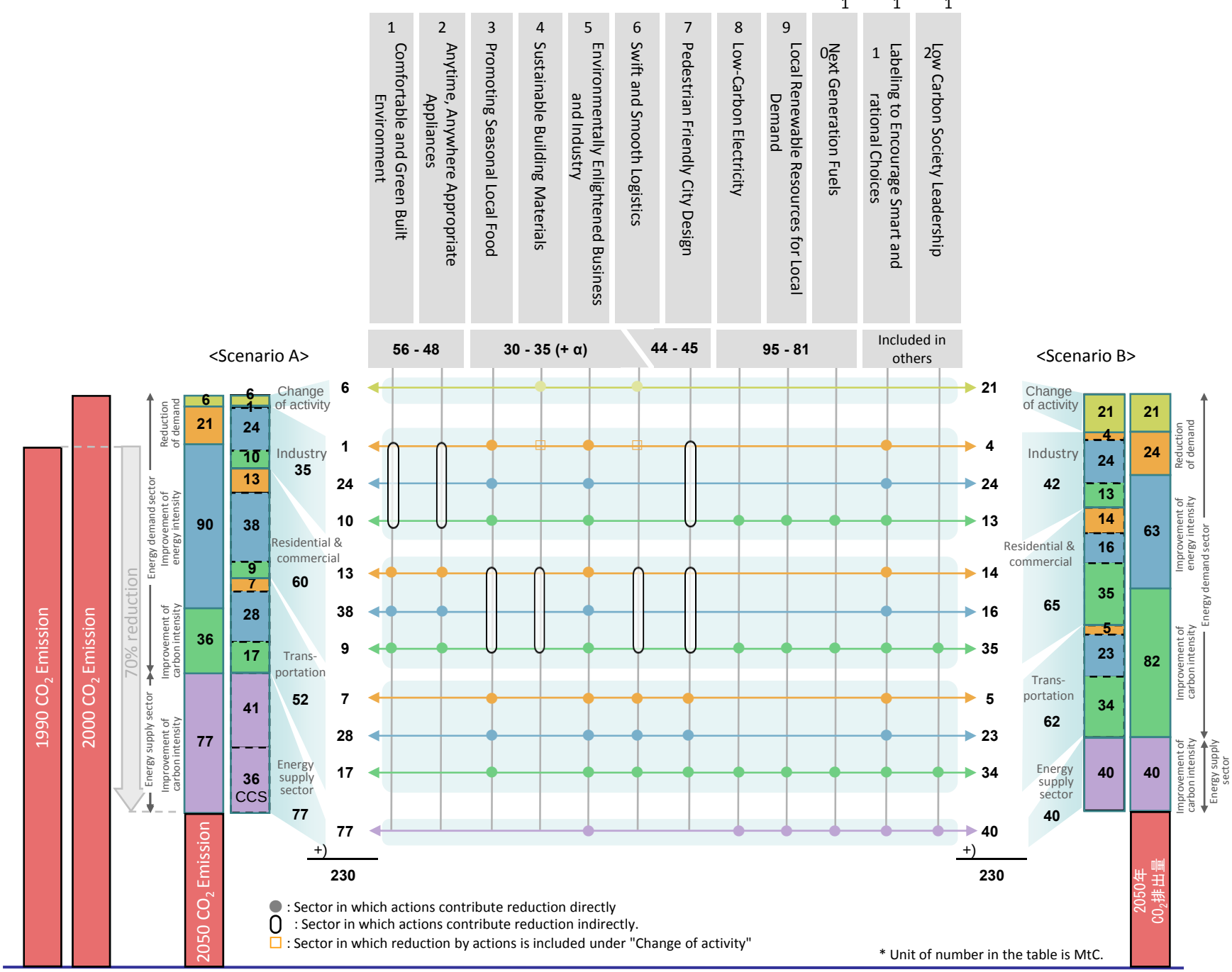
8. Low-carbon electricity

Selection of low-carbon electricity such as renewable/nuclear energy and thermal power with CCS.

5. Environmentally enlightened business and industry

Change of office space design and use fully to low-carbon style.

Actions for low-carbon homes and offices



Role of a dozen actions to reduce CO_2 emissions

Remarks

- Deep cut of GHG emissions could be possible, but it requires strong policy will to make it happen.
- To examine when and how innovations should be implemented is indispensable to realize Low Carbon Society.
- Mid-term national scale integrated assessment models could support:
  - Creating concrete image of future world and policy targets
  - Backcasting from the future world and identifying required policy intervention and investments

Thank you.