Extended Snapshot Tool

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Questions

- How much will we emit GHGs in future?
- How does it related to socio-economic development?
- How much can we reduce emissions from baseline?
- What kind of LCS measures shall we apply?
- Which sector/measure will be most effective?

What is ExSS? (1)

ExSS describes;

- Socio-economic activity
- Energy consumption
- Power generation
- Technology diffusion
- GHG emissions

Population
Household
Economic development
Industrial structure
Transport
Building & Land use

in a future year.

What is ExSS? (2)

- A static model consists of simultaneous equations with about 6000 variables
- GAMS program
- Input and output files are Excel
- Extendable to Agriculture, Forestry, Land-use change, Waste disposal, Air/Water Pollution, etc.

Estimation flow

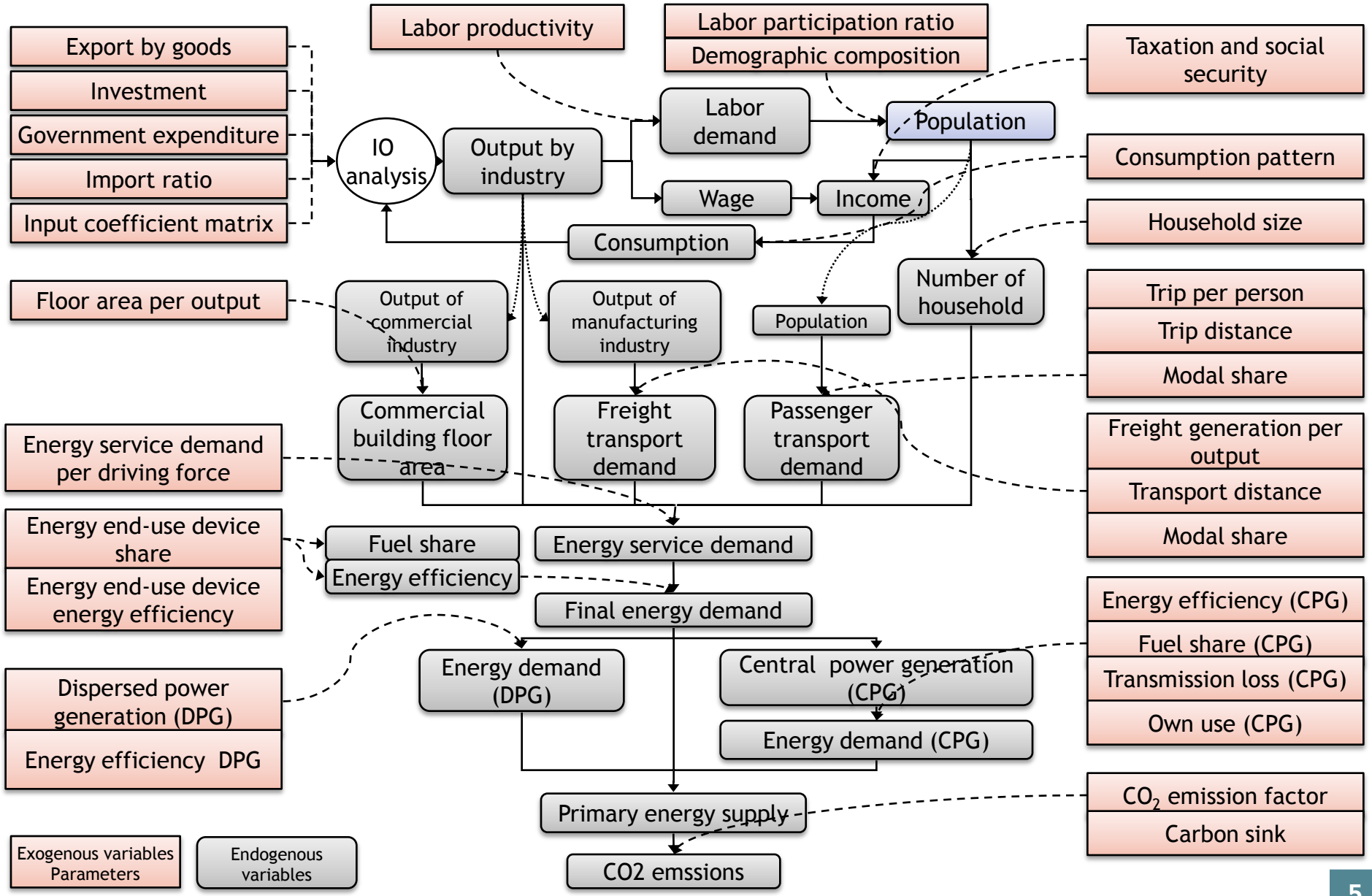
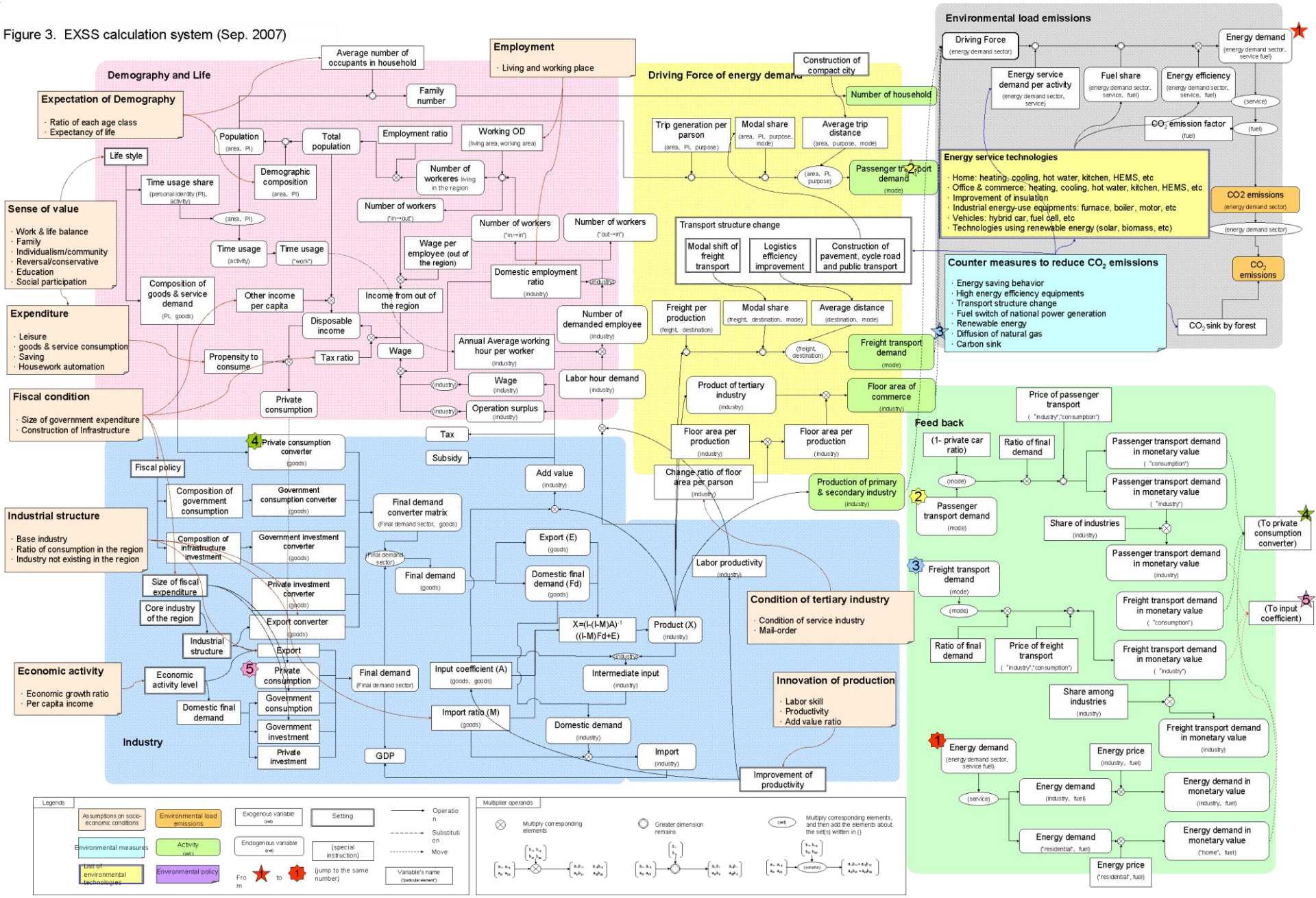
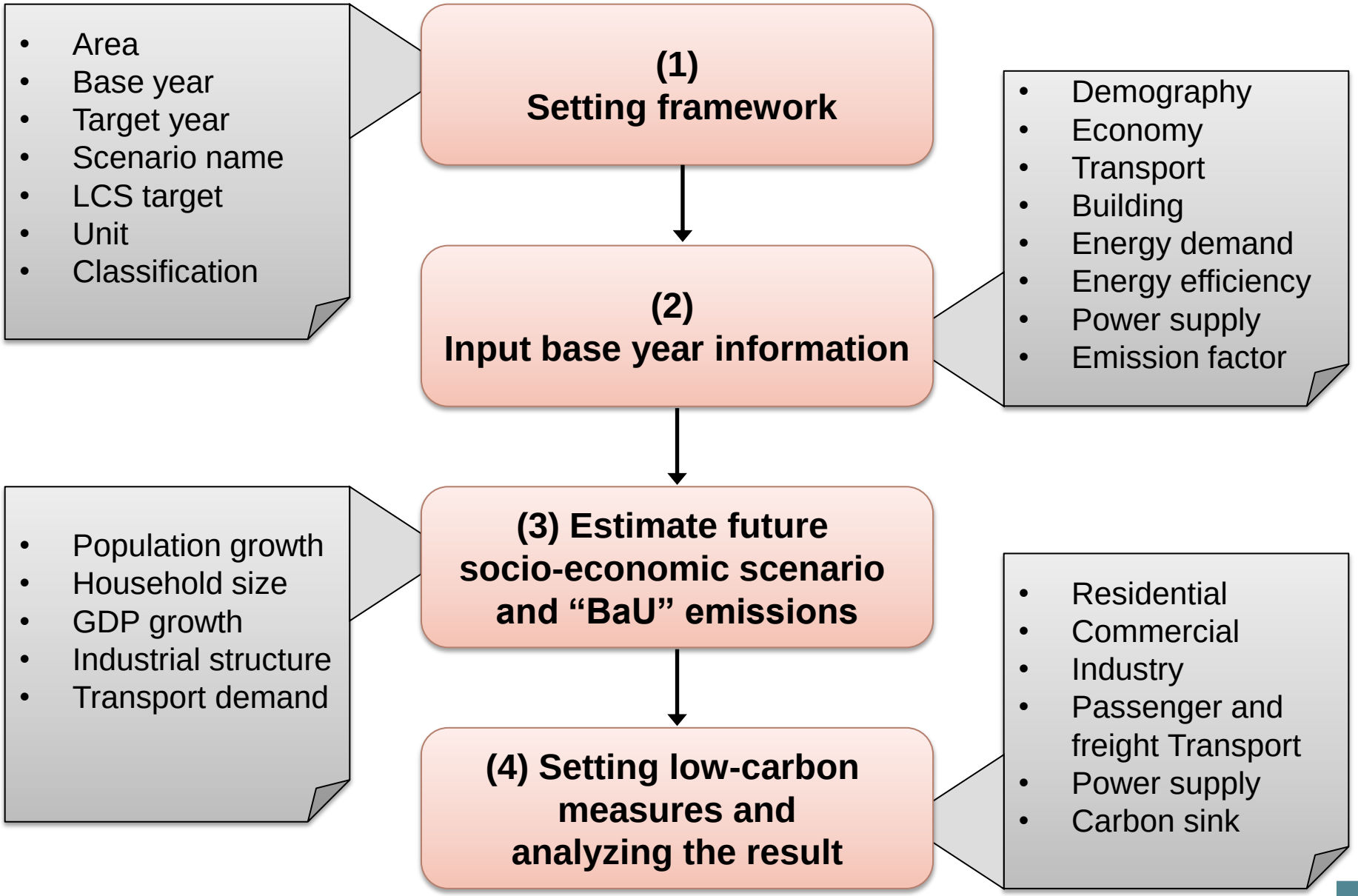


Figure 3. EXSS calculation system (Sep. 2007)



Four Steps


(1)
Setting framework
Area
Base year
Target year
Scenario name
LCS target
Unit
Classification
(2)
Input base year information
Demography
Economy
Transport
Building
Energy demand
Energy efficiency
Power supply
Emission factor
(3) Estimate future socio-economic scenario and “BaU” emissions
Population growth
Household size
GDP growth
Industrial structure
Transport demand
(4) Setting low-carbon measures and analyzing the result
Residential
Commercial
Industry
Passenger and freight Transport
Power supply
Carbon sink

Necessary information

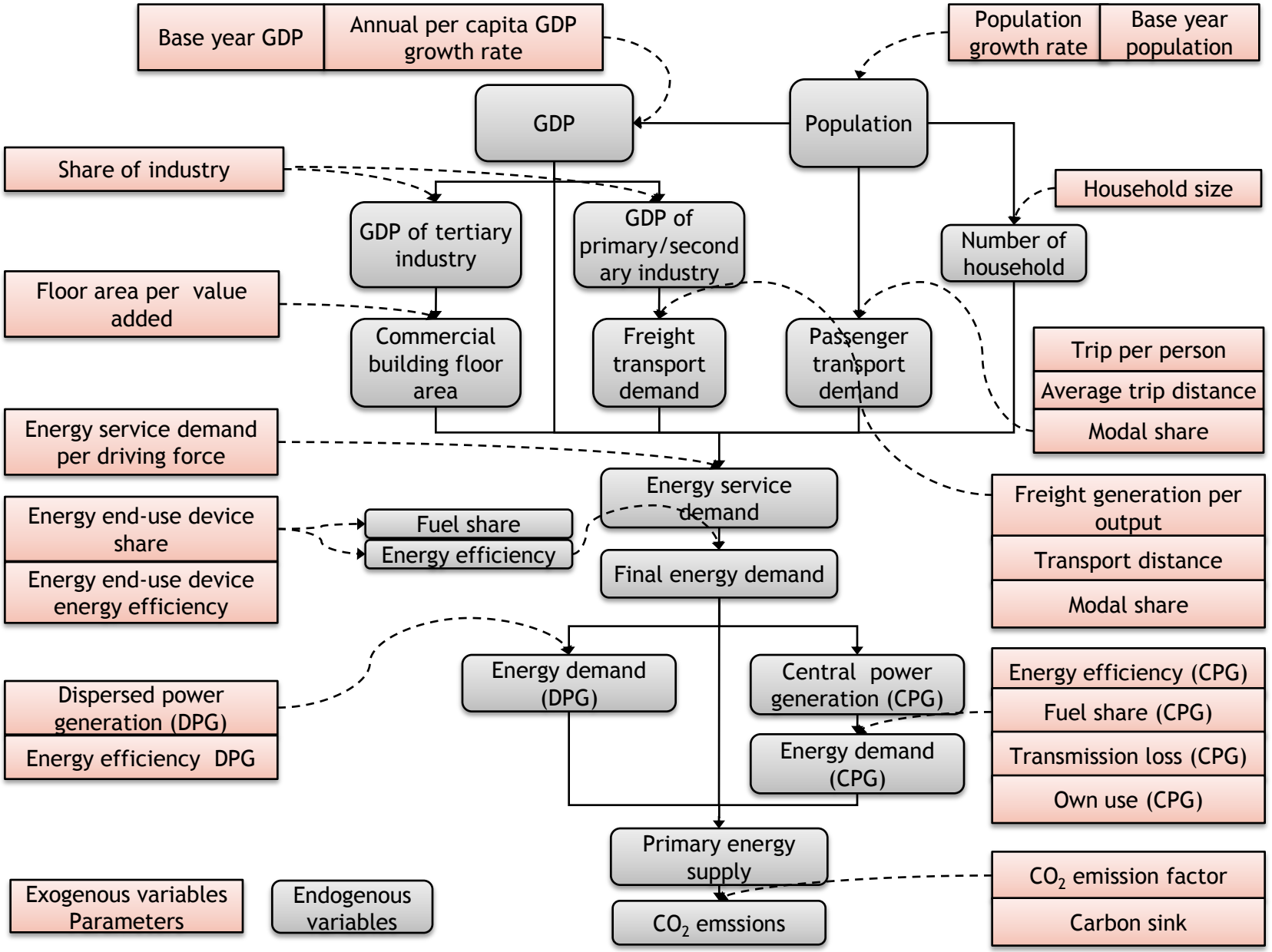
- Base year data
  - Population and Household
  - Input Output table (or, regional economic accounting)
  - Transport demand (Passenger & Freight)
  - Building
  - Energy demand
  - Energy supply
  - etc

- Reference for future scenario
  - Population projection
  - Economic projection / planning
  - Transport planning
  - Energy strategy
  - Potential of renewable energy
  - etc

ExSS Demo Version

- Simplified version of ExSS
- Similar structure with full version
- An Excel file
- For demonstration and training
  (Restricted number of sectors and measures)

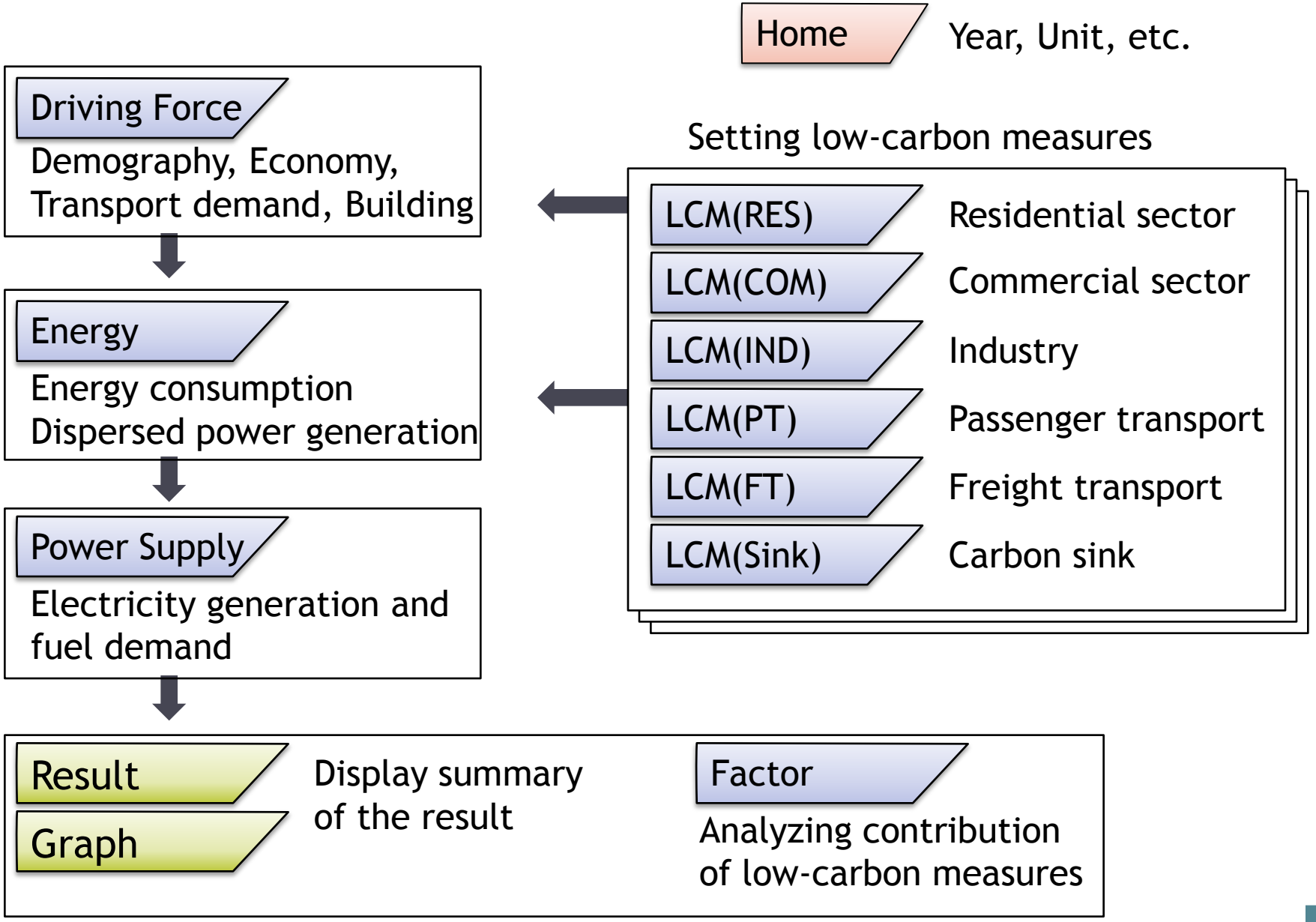
Structure of ExSS Demo Version



Today,

- Using ExSS Demo Version
- Input future parameters based on socio-economic assumptions
- Estimate BaU (business as usual) emissions
- Introduce low-carbon measures to achieve a LCS target (-50% from BaU)
- Q&A

Structure of Worksheets



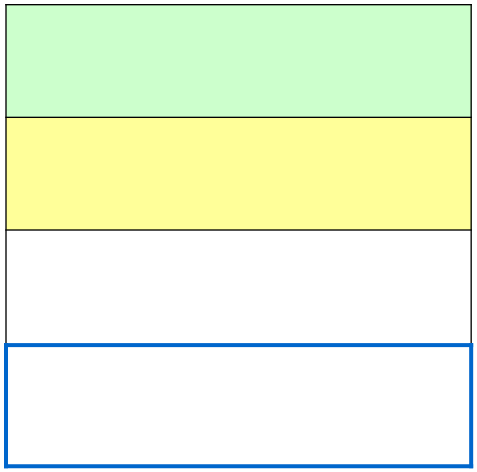
Exercise

- Blank_ExSS_DEMO_V2_1.xls
  - No data has been input
  - Users can input own data according to the users' manual

- Sample01_ExSS_DEMO_V2_1.xls
  - A hypothetical country: Neverland
  - No future scenario

- Sample02_ExSS_DEMO_V2_1.xls
  - Smple1 + future scenarios (BaU & CM)

Cells



Frame of tables

Automatically calculated

Base year data (to be input)

Future scenario (to be input)

Neverland

- In 2005,
  - Population 10 million
  - Household 3 million
  - GDP 38,000 million $ (per capita GDP 3800$)
  - Passenger transport 75738 Mill.Pass-km
  - Freight transport 80 Mill.t-km
  - Final energy demand 4990 ktoe
  - CO2 emissions 20368 $ktCO_2$ (per capita 2.04 tCO_2)

The future scenario (BaU)

Driving Force

- Population growth 1.5%/year
- Household size 3 person/household
- GDP growth 5%/year
- Industrial structure:
    - Primary industries -15%
    - Metal & Machinery +1%
    - Other manufacturing +2%
    - Construction +2%
    - Wholesale & Retail +5%
    - Services +5%

The future scenario (BaU)

Driving Force

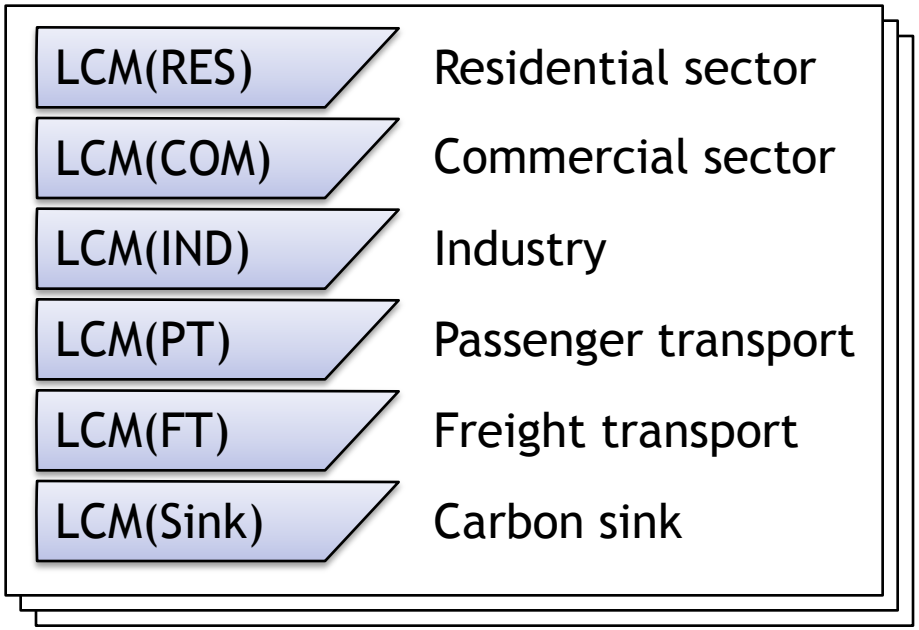
- Trip generation 3 trip/person/day
- Modal share
  - Bicycle & Walk 20%
  - Vehicle 50%
  - Bus 20%
  - Rail 10%

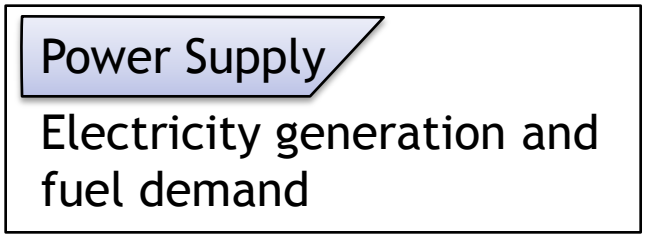
Energy

- Energy service demand
  - Residential x3
  - Commercial x2

Low-carbon measures

- Introduce low-carbon measures
- Emission target: 50% reduction from BaU





Check the result

Result

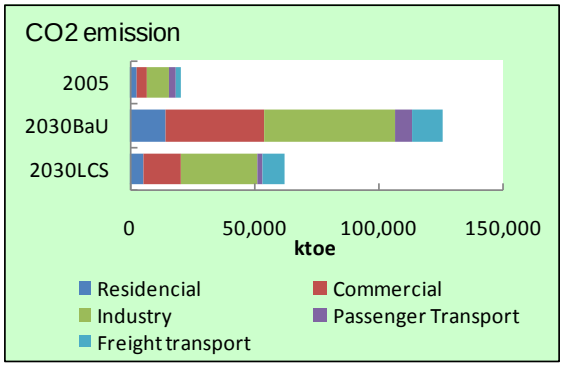
Socioeconomic Indicators

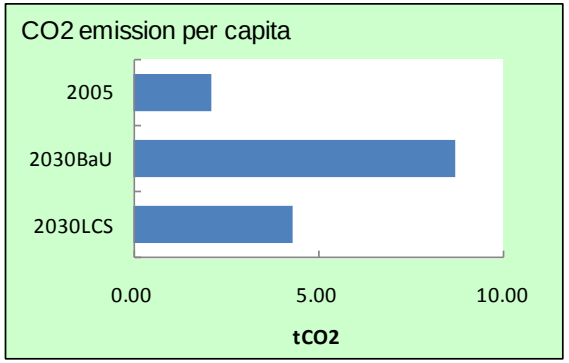
	2005	2030BaU	2030LCS		T/B 2030BaU	T/B 2030LCS	2030LCS / 2030BaU
Population	10000000	14509454	14509454		1.45	1.45	1.00
GDP	38000	186710	186710	Mill.$	4.91	4.91	1.00
Production in each industry				Mill.$			
Primary industry	9000	16214	16214	Mill.$	1.80	1.80	1.00
Secondary industry	24000	142194	142194	Mill.$	5.92	5.92	1.00
Tertiary industry	5000	28301	28301	Mill.$	5.66	5.66	1.00
Pasenger transport demand	75738	173178	149346	Mill.pass-km	2.29	1.97	0.86
Freight transport demand	74	364	392	Mill.t-km	4.91	5.29	1.08
Floor area of commercial buildings	8000	45282	45282	km2	5.66	5.66	1.00

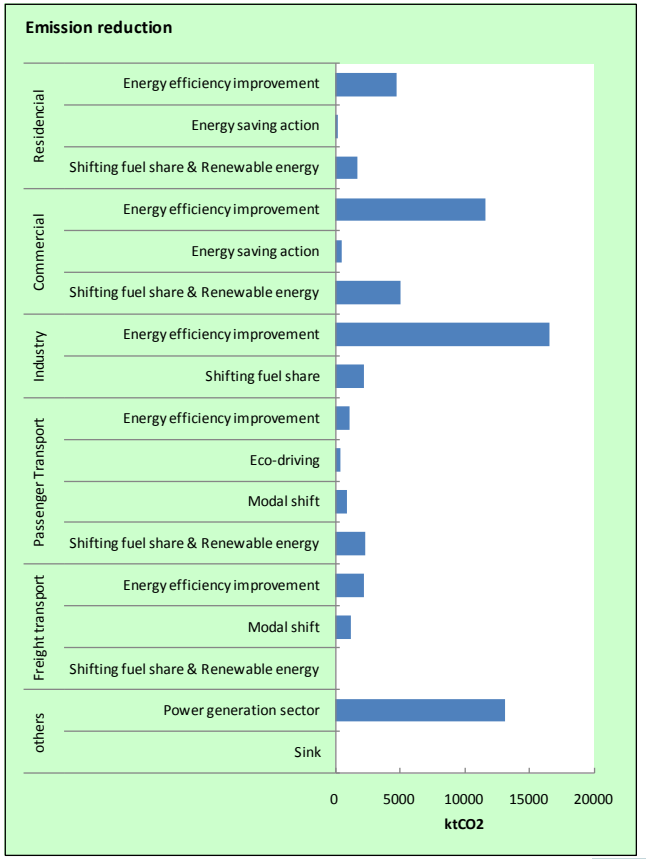
CO2 emission

	2005	2030BaU	2030LCS		T/B 2030BaU	T/B 2030LCS	2030LCS / 2030BaU
Residencial	3,012	14,567	5,399	ktCO2	4.84	1.79	0.37
Commercial	3,466	39,232	15,075	ktCO2	11.32	4.35	0.38
Industry	9,239	52,945	30,924	ktCO2	5.73	3.35	0.58
Passenger Transport	2,523	6,751	1,929	ktCO2	2.68	0.76	0.29
Freight transport	2,562	12,590	8,936	ktCO2	4.91	3.49	0.71
Sink			0				
(Total)	20,802	126,084	62,263		6.06	2.99	0.49
Emission intencity (CO2/GDP)	0.55	0.68	0.33	ktCO2/Mill.$	1.23	0.61	0.49

Graph







- Thank you!