

Introduction to the KEEI-EGMS (Energy and GHG Modeling System of KEEI)

Energy Demand and Supply Research Division

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1. Overview of KEEI-EGMS

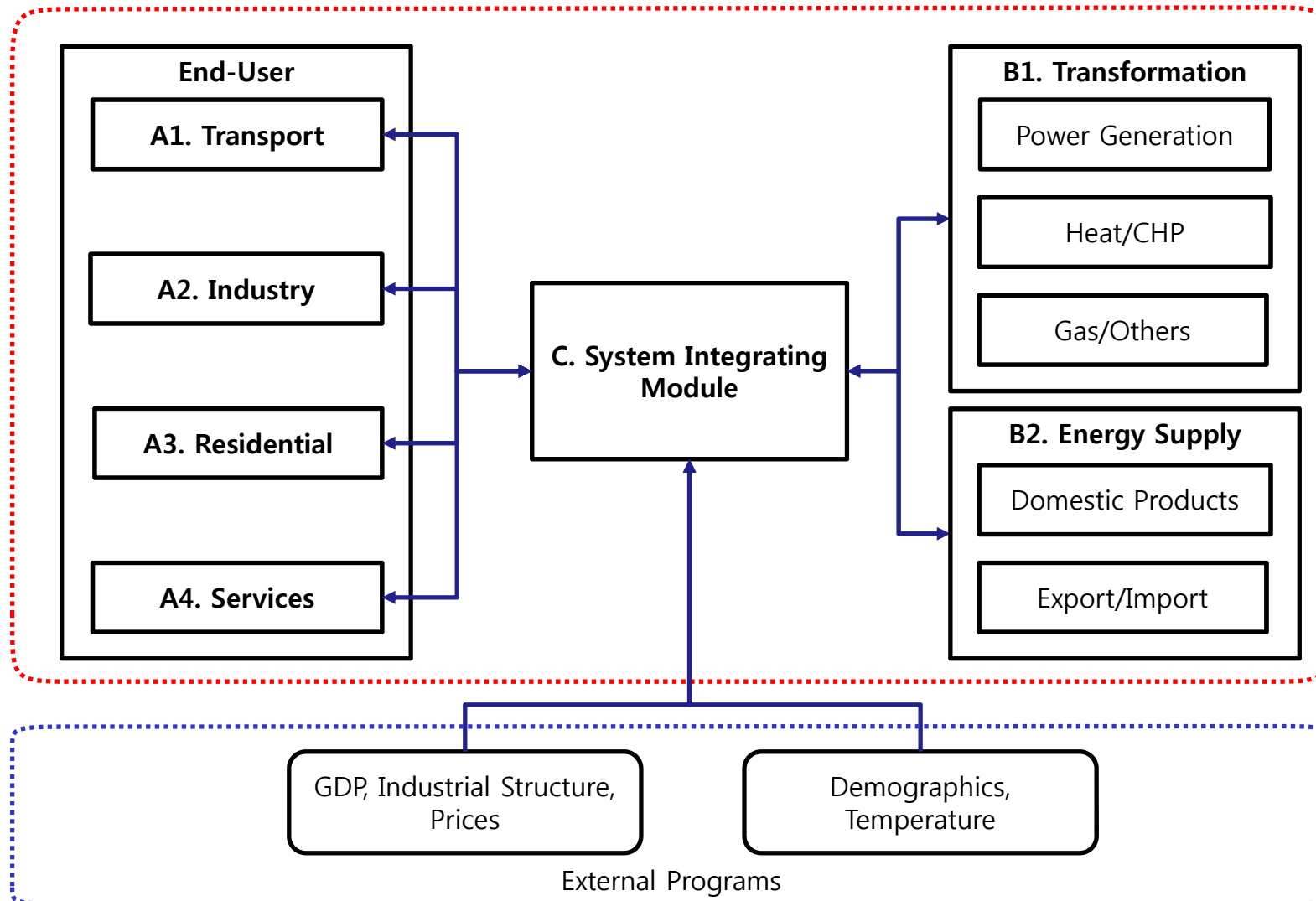
The KEEI-EGMS is

- a medium-scale mathematical system.
- to project energy supply and demand over the next 20 years.
- designed to generate detailed sector-by-sector outlooks of Korea.
- consisting of six main modules: end-user sectors(transport, industry, residential and services); transformation sector; supply sector.

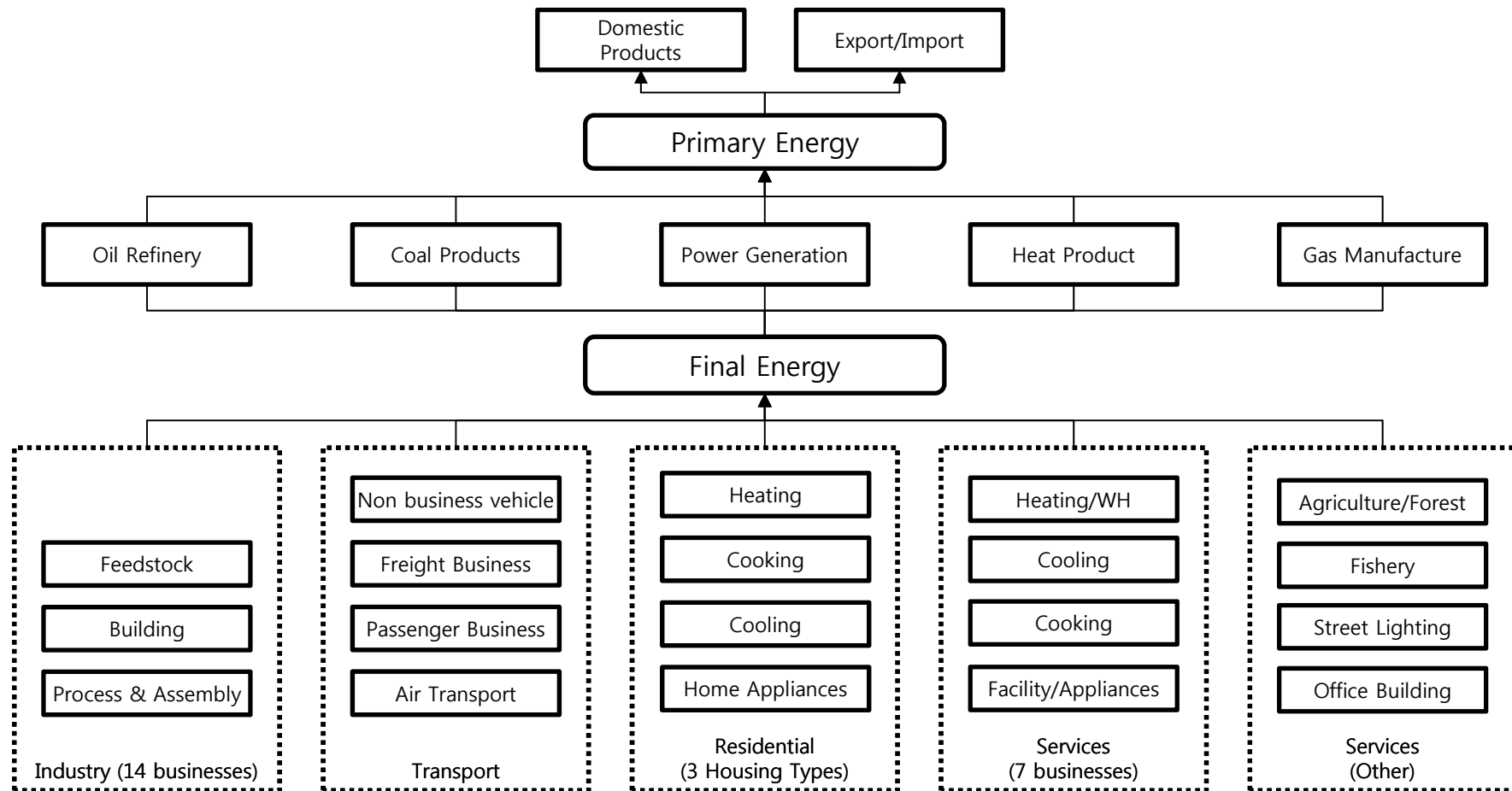
The current KEEI-EGMS is designed to analyze:

- National energy prospects
- GHG emissions from energy use
- Effects of policy and technological changes

2. Model Structure and Technical Aspects



Bottom-up type of projection



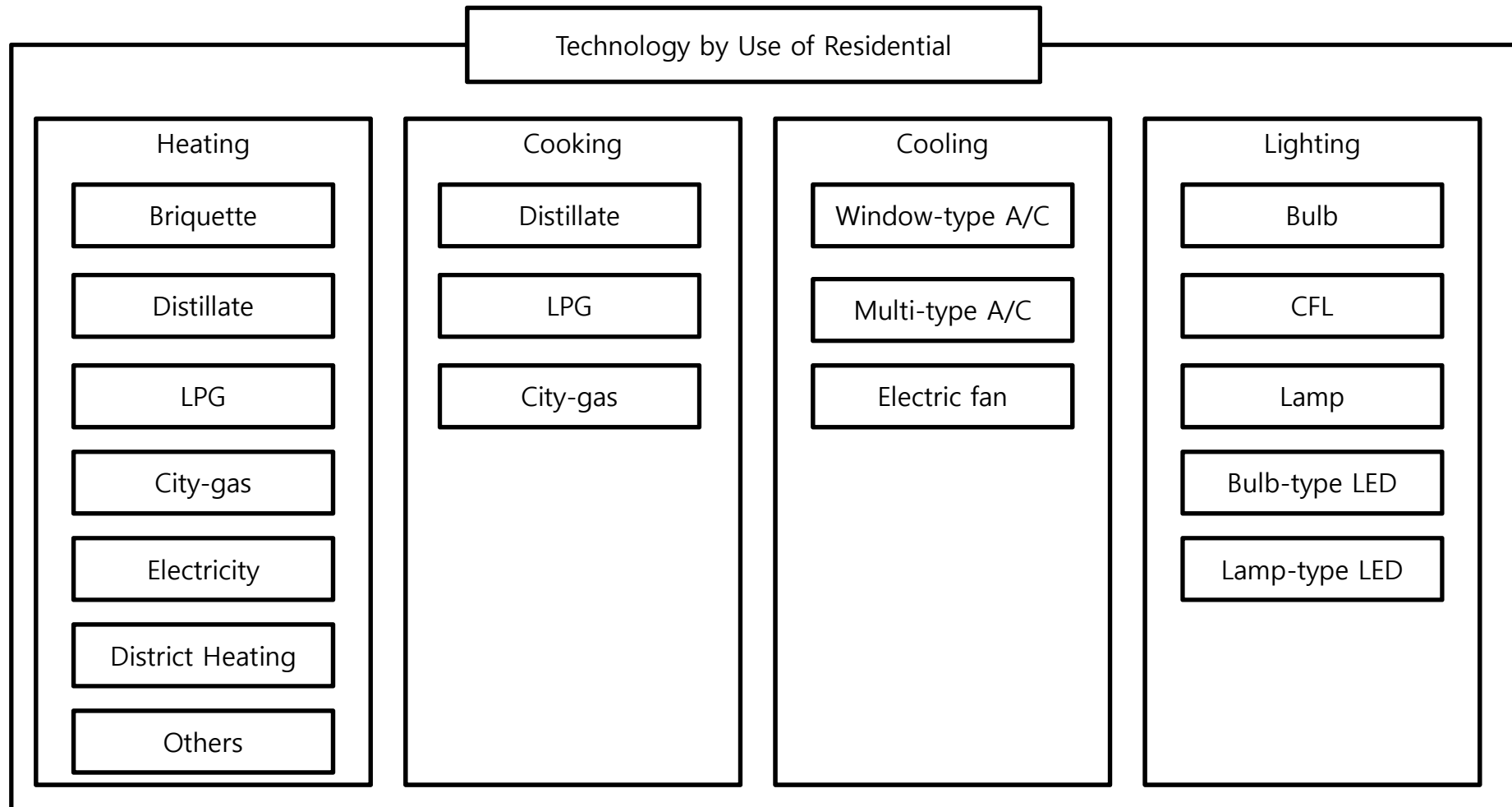
Industry classification

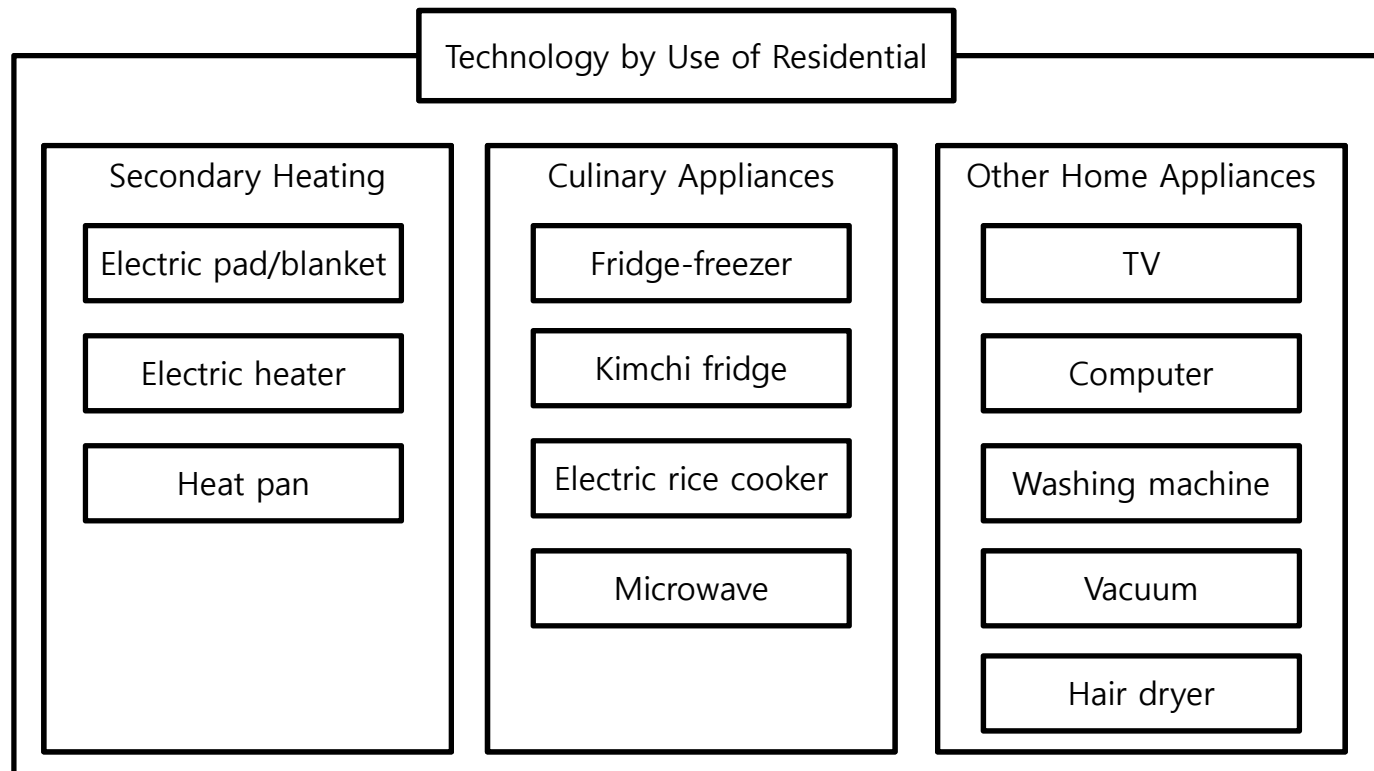
KEEI-EGMS	KSIC-9
General Process Industry	
Food and tobacco	10, 11, 12
Textile and leather	13, 14, 15
Wood and wood products	16
Paper, pulp and print	17, 18
Non-ferrous metals	242, 243
Machinery	25, 26, 27, 28, 29
Transport equipment	30, 31
Other manufacture and non-specified	32, 33
Construction	41, 42
Mining and Quarrying	06, 07, 08
Special Process Industry	
Chemical and petrochemical	20, 21, 22
Oil refineries	19
Iron and Steel	241, 243
Non-metallic minerals	23

Transport mode

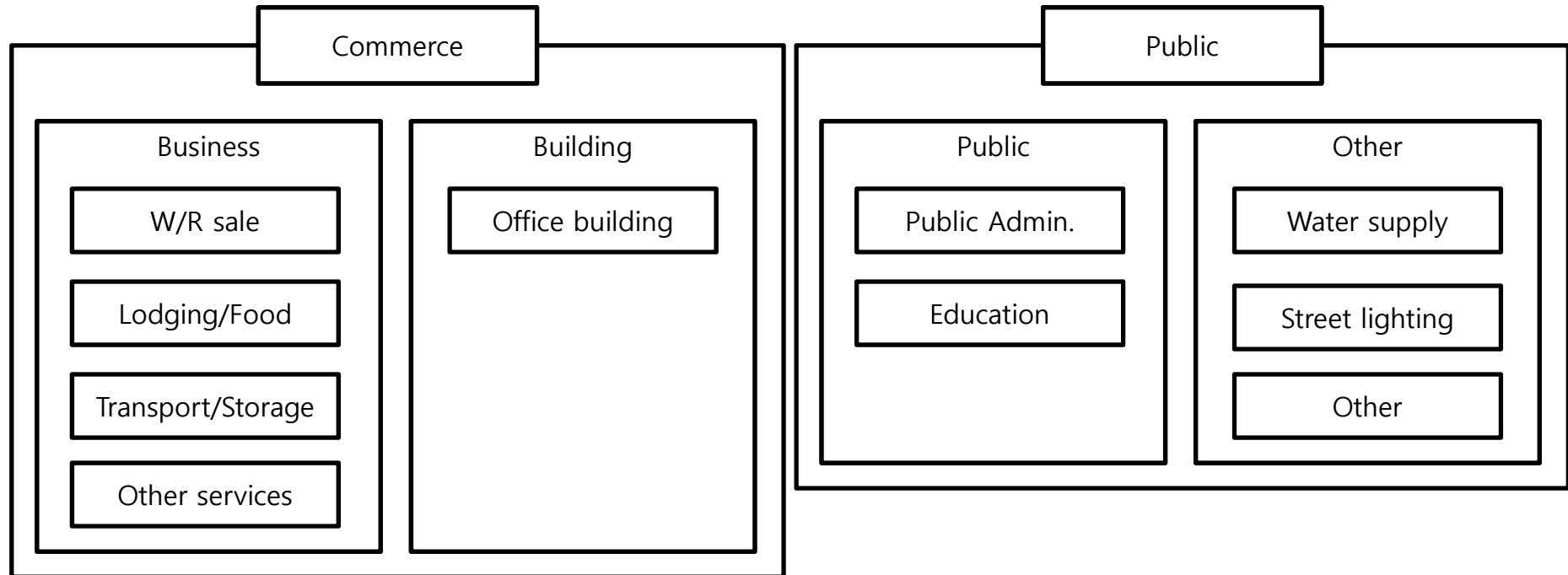
	Road	Rail	Aviation	Navigation
Non-business	Passenger vehicle Freight vehicle Bus Biz. passenger vehicle			
Freight business	Freight vehicle	Freight railway		Domestic /International
Aviation			Domestic /International	
Passenger business	Intra-city bus Taxi Express bus	Subway KTX Passenger railway		Domestic /International

Facility and equipment of residential

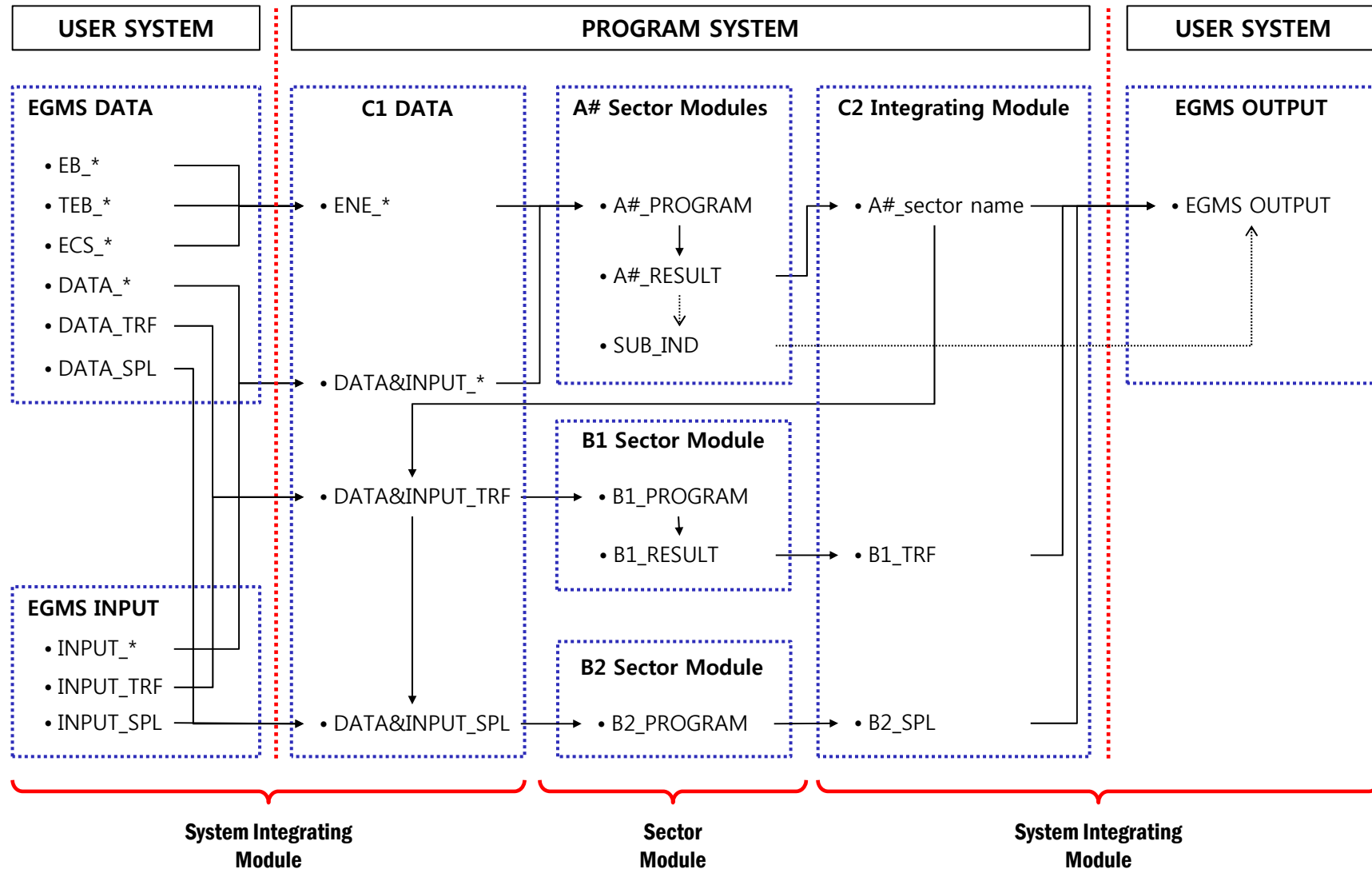




Services classification



Computational Flow



Fundamental relation

- Energy Demand of end-user = activity level X UEC(Unit Energy Consumption)



- Transport
 - Private vehicle stock by fuel type
 - Business freight by mode
 - Business passenger travel by mode
- Industry
 - Value added by industry
 - Output of key products
- Residential
 - Housing stock by building type
 - Home appliances stock
- Services
 - Value added by business
 - Floor space



- Fuel efficiency of vehicle
- Current technology
- Best available technology
- Shell integrity (insulation)
- Boiler efficiency
- Home appliance's energy efficiency
- Home appliance usage
- Energy prices
- Household income
- Population per household
- HDD/CDD

Fundamental relation

- ED of transformation sector = TEP X plant efficiency



Final energy demand

Load structure

Transmission and distribution loss

Auxiliary use by plant

Plant capacity



Energy efficiency by plant

3. Data Sources

Huge quantities of data on economics and energy variables

- Energy balance (of Korean format) and IEA energy balance
 - KEEI
- Energy consumption survey
 - KEEI, KEMCO, KPX
- Economic statistics
 - BOK, Statistics Korea
- Additional data from a wide range of external sources
 - Population and Housing Census of Statistics Korea
 - Economics Census of Statistics Korea
 - Statistical Yearbook of MOLIT (Ministry of Land, Infra. and Transport)

Major assumptions for long-term energy outlook

- Annual growth rate of GDP
 - KDI (Korea Development Institute)
- Industrial structure
 - KIET (Korea Institute for Industrial Economics and Trade)
- Population
 - Statistics Korea
- International oil price
 - IEA, US DOE/EIA

Thank you!

