Development of the National Reference Energy System by the Statistics of Energy in Korea

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ENERGY POLICY MODELING TEAM

SUNG HUN KIM

AJOU UNIVERSITY

OVERVIEW

1. Introduction
2. Development of Energy Reference System
3. Statistics of Energy in Korea
4. Data of Supply & Consumption
5. RES in Korea

1. INTRODUCTION

Background

- Government of South Korea has set the target of 30% GHG reduction from BAU by 2020
- Korea is planning to implement the emission trading in 2015 as the law enacted Framework Act on Low Carbon, Green Growth
- Analysis of GHG Reduction in Domestic Industrial and Power sectors by Using TIMES Model (Steel, Chemical, cement, paper, power.. 17 sectors)

1. INTRODUCTION

Goal

- Development of Reference Energy System which is the basic foundation of TIMES Model
- Support the analysis of GHG reduction by TIMES model
- The Construction of Korea Energy Technology Data Base for Analysis

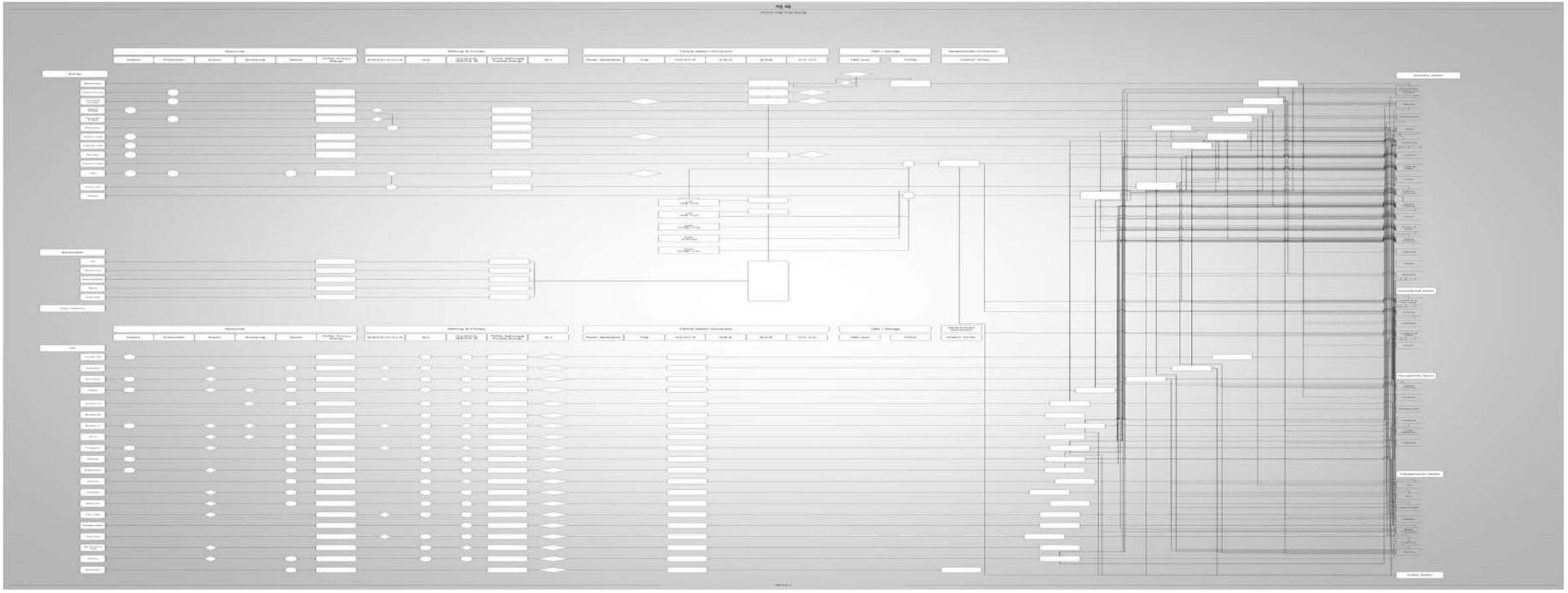
2. DEVELOPMENT OF ENERGY REFERENCE SYSTEM

Reference Energy System (RES)

- Defines the configuration and interrelationship of the supply of Secondary energy by converting energy from primary energy to final energy use ranging from the flow of energy in the energy system
- The balance between energy supply and demand in order to derive the optimum design point
- The RES model to be presented to the optimal energy system networks selects a combination of choices which can minimize the total system cost required for planning the whole duration under constraints

2. DEVELOPMENT OF ENERGY REFERENCE SYSTEM

Reference Energy System (Korea version)



2. DEVELOPMENT OF ENERGY REFERENCE SYSTEM

- To understand the flow and structure of the energy system as a whole
- The cooperation of the statistical data supply and demand by sector
- Complete the RES after Review and Adjustment

[Figure 1] Flowchart for RES

2. DEVELOPMENT OF ENERGY REFERENCE SYSTEM

Structure of Energy System in Korea and Set up the Classification of System

- Total Energy Production and Consumption in Korea

Classification and Analysis Energy System Structure of Korea (Domestic Production, Conversion and Process, supply of secondary Energy, Final Consumption)

- Final Consumption consists of Five Sectors: Industry/ Household/ Commercial/ Transportation/ Public

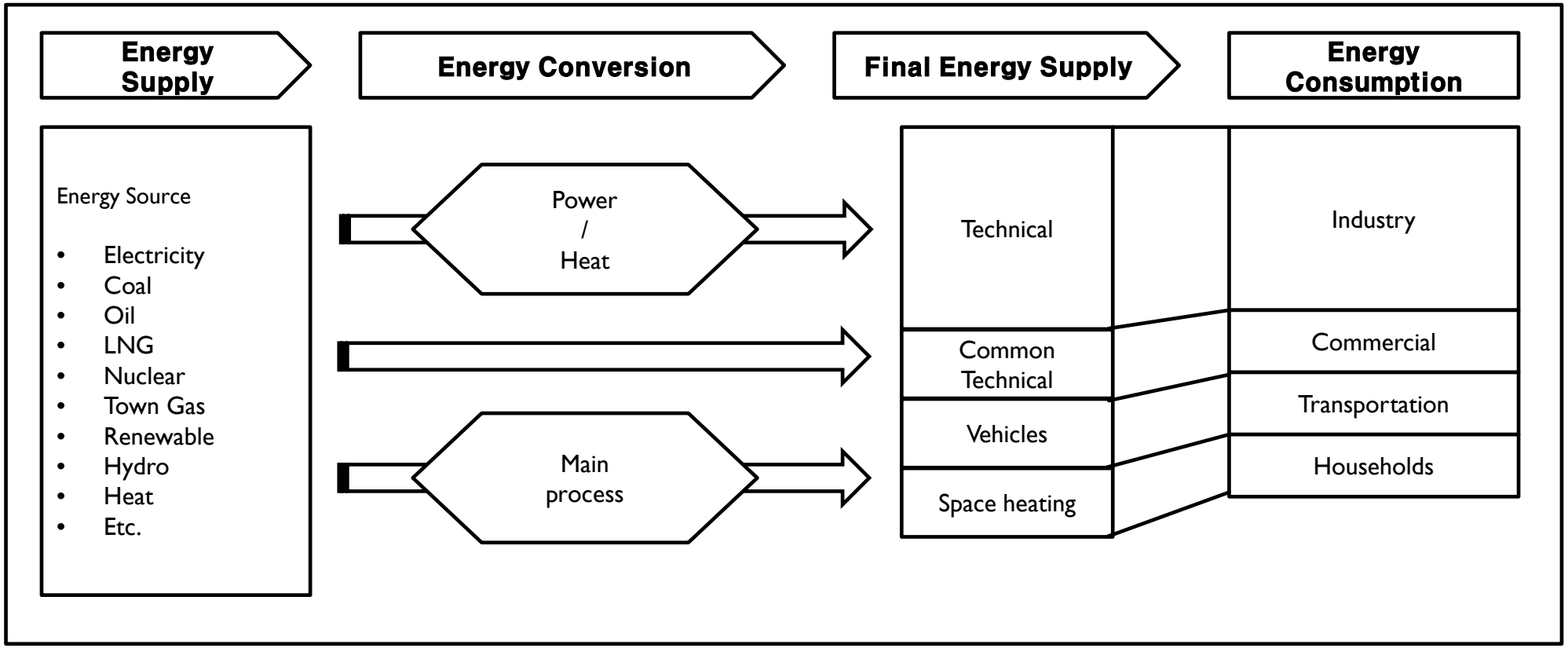
Grouped according to the End use technic in sectors

- Industry Sectors includes Chemical, Cement, Steel, Paper, Glass, etc.

Considering the mass balance for Perform analysis of process, Classified as a common technology

2. DEVELOPMENT OF ENERGY REFERENCE SYSTEM

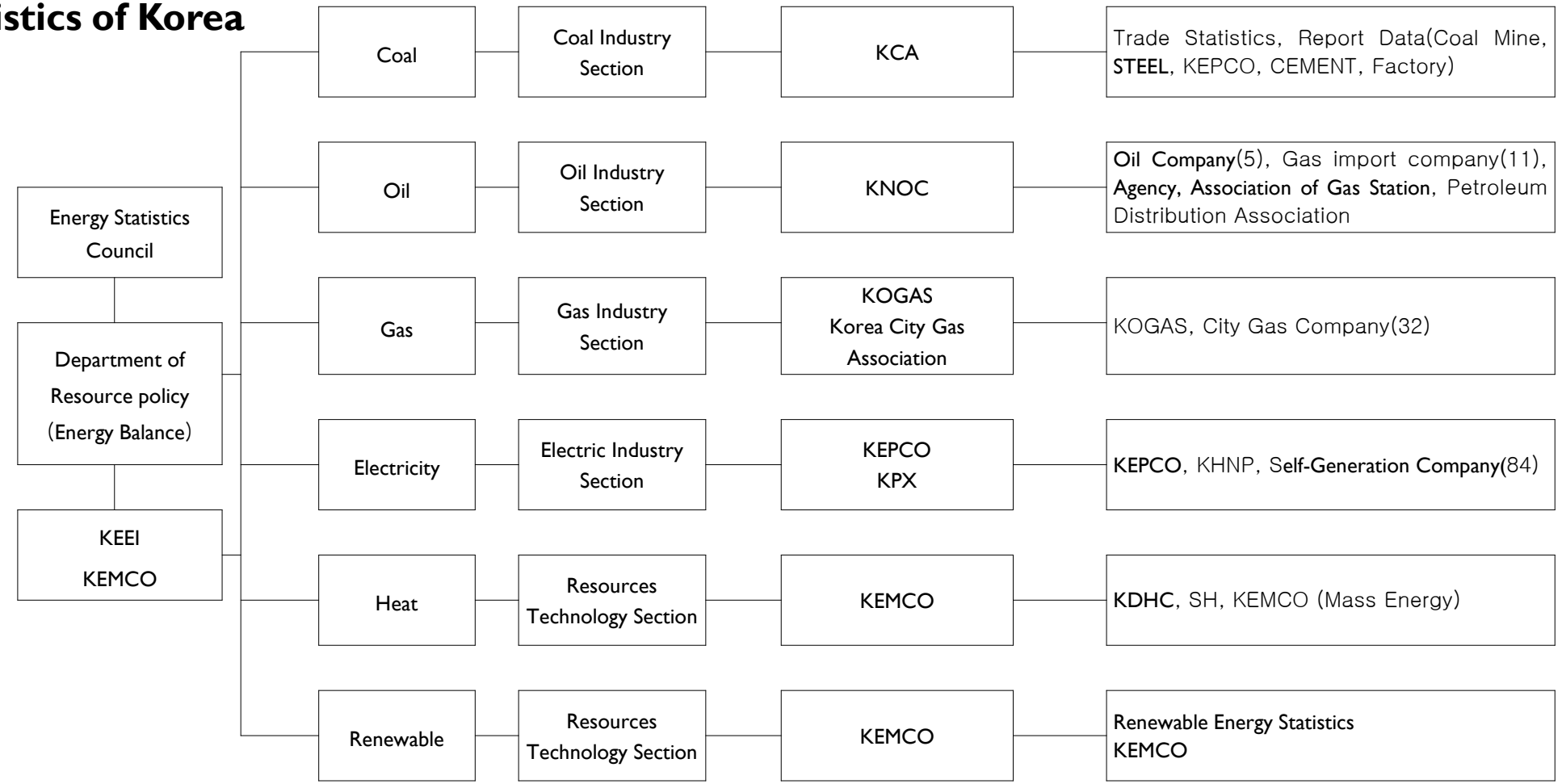
Structure of Energy System in Korea and Set up the classification of System



[Figure 2] Energy System of Korea

3. STATISTICS OF ENERGY IN KOREA

Energy Statistics of Korea



3. STATISTICS OF ENERGY IN KOREA

Energy Statistics of Korea

- Variable Energy Source Statistics
- Each Energy Corporation

Category	Compiled by	Name of Statistics	publish Period	Survey method
Supply	Korea National Oil Corporation	Oil Supply and Demand Statistics	Month, Year	Survey, Report
Supply	Korea Gas Corporation	Gas Supply and Demand Statistics	Month, Year	Report
Supply	Korea Coal Corportation	briquet supply status report	quarter	Report
Supply	Korea Coal Association	Coal Supply and Demand Statistics	Year	Survey
Supply	Korea Power Exchange	Power Market Statistics	Year	Report
Supply	Korea Energy management Corportation	Mass energy Handbook	Year	Report
Supply	Korea City gas Association	City Gas Statistics	Month, Year	Report
Supply	Korea Power Exchange	Research for the self-generation	Year	Survey
Supply	Korea Energy management Corportation	New& Renewable Energy Statistics	Year	Survey
Supply	Korea Energy Economics Institute	Yearbook of Energy Statistics	Year	Report
Supply	Korea Electric Power Corporation	Statistics of Electric Power in Korea	Month, Year	Report
Consumtion	Korea Energy Economics Institute	Energy Consumption Survey	3 Year	Survey
Consumtion	Korea Power Exchange	Household electricity Consumption survey	2 Year	Survey

3. STATISTICS OF ENERGY IN KOREA

Energy Supply Data

- The Supply Analysis of Energy flow is based on the Yearbook of Energy Statistics from Korea Energy Economics Institute
- Sub Data is used to Electricity, Gas, Oil, Coal related in many Energy corporation

3. STATISTICS OF ENERGY IN KOREA

Energy Consumption Data

- The Consumption Analysis of Energy flow is based on the Energy Consumption Survey from Korea Energy Economics Institute
- Sub Data is used to Household Electricity Consumption survey

4.DATA OF **SUPPLY & CONSUMPTION**

Adjustment between Supply & Consumption

- Statistics Characteristic of Energy Flow in Korea

  (Dependence on Energy Import is almost 96% in Korea , the measure of supply is clearly research by supplier)

- The Supply Data is more reliable than Consumption Data

- Analysis to Energy flow of Consumption from primary supply

- Using various Energy Statistics and Professional view of Energy Specialists

4. DATA OF **SUPPLY & CONSUMPTION**

Adjustment between Supply & Consumption

- In 2010, Total Primary Energy Supply 10,231 PJ and Total Final Energy Supply 7,329 PJ

- Each Energy Sources of supply

  Coal 3,010 PJ, Oil 3,965 PJ, LNG 1,631 PJ, Nuclear 1,312. PJ, Peat and other 253 PJ, Hydro 57 PJ

- Consumption of Final Energy 6,432 PJ

  By Sectors Industry 3,051 PJ, Transportation 1,927 PJ, Commercial 571 PJ, Households 763 PJ, Public 119 PJ

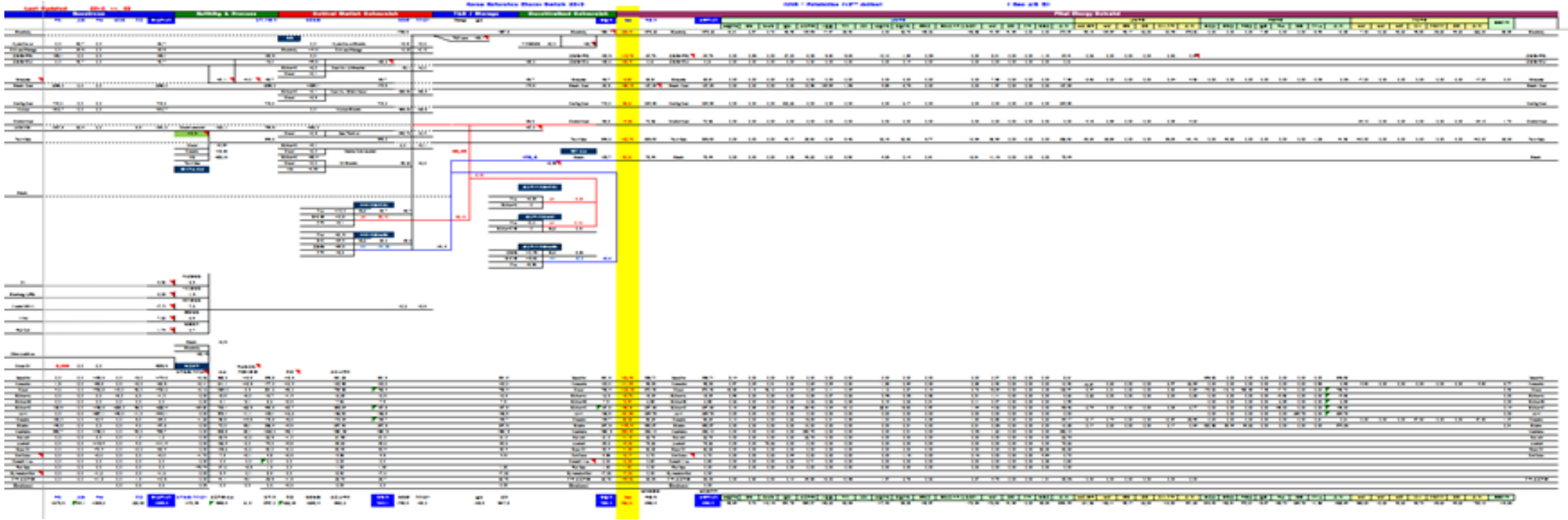
- The Gap between Final Energy Supply and Consumption is 896 PJ, Supply is higher than Consumption almost 12%

[Unit PJ] : 10^{15} J

5. RES IN KOREA

Complete Reference Energy System

- Review and Consider the mistakes
- Check the Data Flows about each Energy Sources



[Figure 3] Reference Energy System in Korea by 2010

THANK YOU FOR YOUR KIND ATTENTION