Reshaping Transport System for Green Growth in Korea

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· Introduction

► Government's strong will to lead green growth

- President's pledge for Low Carbon Green Growth
- National Green Growth Strategy

► Transport needs special care for GHG emissions & Energy consumption

► Main polices for Green Growth in Transport

- conversion to energy-efficient transport mode
- encouragement of walking and cycling
- promotion of green transport technology
- provision of supporting measures for low-carbon green transport

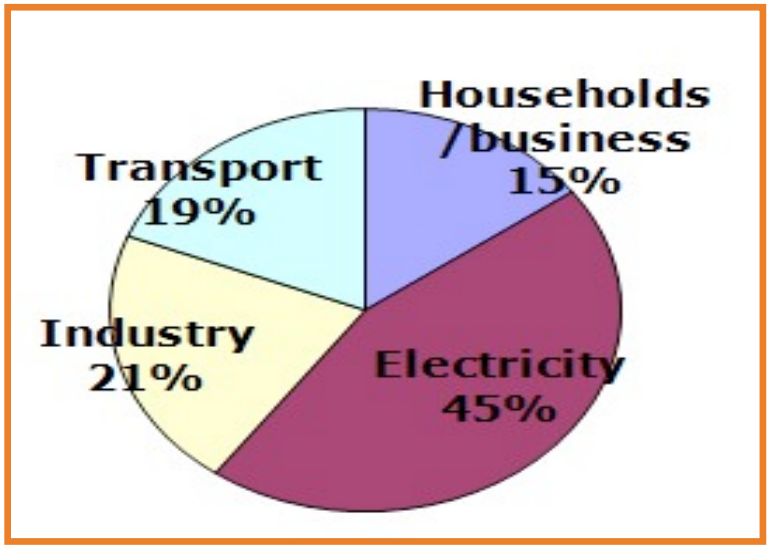
· Energy use and GHG emission in Transport

	Population (million)	GDP (billion 2000$)	Energy prod. (Mtoe)	Net imports (Mtoe)	TPES (Mtoe)	Emissions(b) (Mt of)	TPES/pop (toe/capital)	TPES/GDP (toe/000200$)	t/pop (t /capital)	t/GDP (kg /2000$)
UK	60.53	1,684.7	186.62	49.15	231.13	536.48	3.82	0.14	8.86	0.32
France	63.20	1,468.3	137.02	140.22	272.67	377.49	4.31	0.19	5.97	0.26
Germany	82.37	2,011.2	136.76	215.56	348.56	823.46	4.23	0.17	10.00	0.41
USA	299.83	11,265.2	1,654.23	730.44	2,320.70	5,696.77	7.74	0.21	19.00	0.51
Japan	127.76	5,087.1	101.07	431.11	527.56	1,212.70	4.13	0.10	9.49	0.24
Korea	48.30	671.30	43.73	185.92	216.50	476.10	4.48	0.32	9.86	0.71

- **Relatively high energy consumption**
  - 4.48 TOE/head (2005)
- **Relatively high CO_2 emission**
  - 9.86 ton/head (2005)

→Good potential to reduce energy and CO_2 emission

· Energy use and GHG emission in Transport



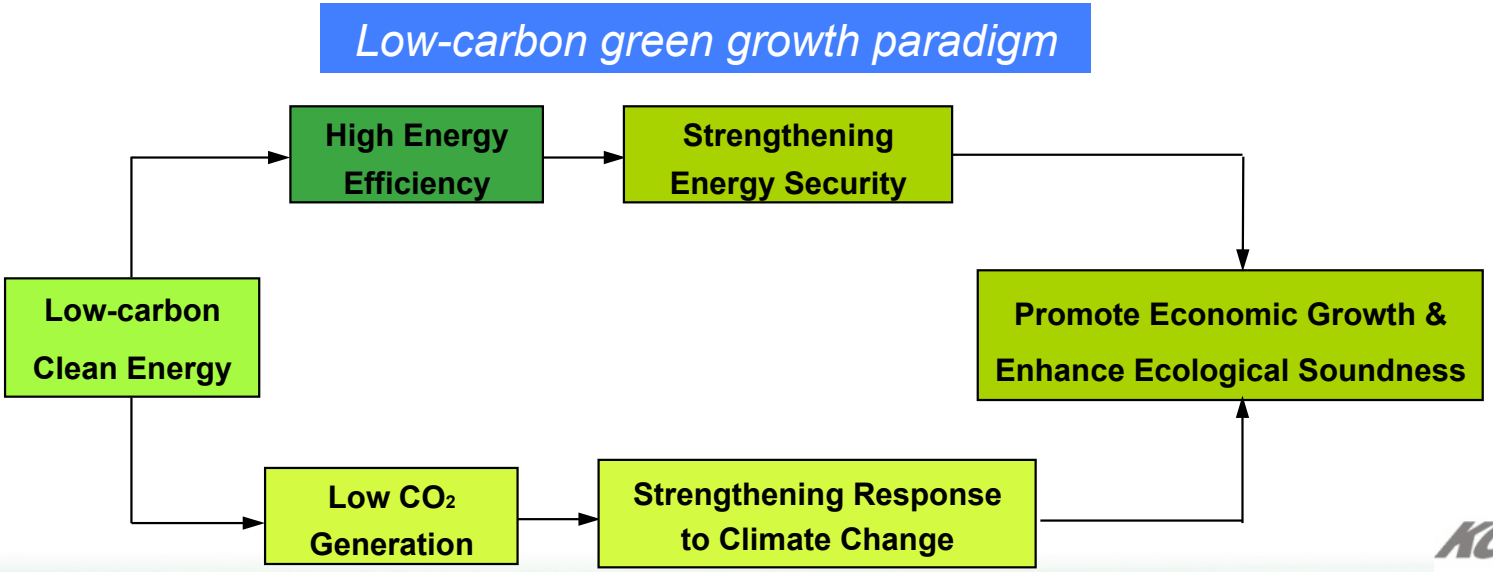
<CO_2 emissions by sectors in Korea>

► Transport explains 19% of total CO_2 emission

· Government's Pledge for Green Growth

► Memorandum speech on 60th anniversary of national foundation day

- A new national vision: 'Low-Carbon, Green Growth'
- Sustainable growth which helps reduce greenhouse gas emission
- Positive development circle



· Government's Pledge for Green Growth

► Unavoidable national vision

- Korea is vulnerable to global climate change
- Escape from energy dependency on fossil fuels is crucial
  : 97% of total energy is imported accounting for 32.5% of total expenditure
- GG is a new growth engine to boost economy

► Presidential Committee on Green Growth

- PM level: Coordinator of interests between relevant ministries
- Execution of the Basic Law for Low-Carbon Green Growth

· The Basic Law for Low-Carbon Green Growth

► 65 Articles for guiding general policies for LCGG

► Some transport related policies

- Promotion of environmentally-friendly vehicles (Article 47)

- Promotion of eco-friendly transport system in national scope (Article 52)

- Formation of low-carbon transport system (Article 54)
  : Setting a target for greenhouse gas emission in transport sector
  : Promotion of railway oriented national trunk transport network
  : Extending public transport provision
  : Setting up a modal split target
  : Facilitating domestic maritime transport
  : Application of transport demand management measures (congestion charge, exclusive bus lanes, and Intelligent Transport System)

· National Green Growth Strategy (July 2009)

► National Green Growth Strategy in 10 areas

- Reduction of greenhouse gas emission
- Achieving energy independence
- Capacity building for climate change
- Development of green technology as a new growth engine
- Encouragement of green industry
- Promotion of high value industry
- Laying foundation for green economy
- Development of green land and transport
- Green renovation in daily life
- Leading green growth in the globe

► Transport is not fully addressed

- Regarded as a subordinate sector of land development
- Neglected interaction between transport and land use
- But, emphasized bicycles in a separate chapter

The Law for Sustainable Transport and Logistics Development

► Guides for sustainable transport in 52 Articles (in force Dec. 2009)

► Most core ideas in the Basic Law are embedded

- Sustainable transport and logistics development plans (Article 7, 9)
- Designation of sustainable transport and logistics areas (Article 12)
- Evaluation of sustainable transport performance measures (Article 14)
- Monitoring reduction in greenhouse gas emission (Article 16)
- Setting up reasonable modal split target (Article 19)
- Management of heavy goods vehicles (Article 20)
- Assistance of modal shift (Articles 21, 22)
- Adjustment of transport and logistics charge (Article 25)
- Promotion of environmentally-friendly transport technology (Article 27)
- Encouragement of environmentally-friendly transport mode (Article 28)
- Integration of transport and land use planning (Article 29)
- Restriction of car use (Article 30)
- Non-motorized transport mode (Articles 31, 32, 33)
- Assistance of inter-modal transport facilities (Article 34)
- Walking environment improvement plan (Articles 37, 38, 39, and 40)
- Special management areas (Articles 41, 42, 43, 44, 45)
- Promotion of eco-driving (Article 48)

· Reshaping Transport System

► Focus on road transport

- About 19 per cent of total CO_2 emissions
- Among them 80 per cent stems from roads

► Main goals

- To reduce car use and to promote efficient cars
- Maintaining safe, fast, and convenient transport service

► Four categories

- Conversion to energy-efficient transport mode
- Encouragement of walking and cycling
- Promotion of green transport technology
- Provision of supporting measures for low-carbon green transport

· Conversion to energy-efficient transport mode (1)

► Railway Improvement

- Expansion of railway network
  : high speed railway extension increase: 238km to 363km by 2012
- Increase of cruise speed and frequency
  : Alignment improvement to accommodate 200-230 km/h speed
- Electrification of railways
- Introduction of Light Rail Transits

► Bus Improvement

- More application of Bus Rapid Transit
  : less than 8 stops along routes
- Interoperability of transport card
  : 'One Card All Pass'

· Conversion to energy-efficient transport mode (2)

► Better connection and transfer

- Transit Centre Improvement
- Connecting railways to/from seaports, airports, and industrial complex

► Modal shift target by 2012

- passengers: 55% (public transport)
- freights: 8%→15% (railway) 18%→ 22% (coastal shipping)

: subsidies for freight transporters to encourage railway

· Encouragement of walking and cycling (1)

► Pre-requisite for promotion of public transport use

► Substitution for car use

- 44% travels less than 5km by car in Seoul (cycling is competitive)
- 11% travels less than 1km by car in Seoul (walking is competitive)

► Measures for pedestrians

- More designation of Pedestrian Priority Zone
  : travel speed limit (30km/h)
  : traffic calming measures
  : parking is prohibited except designated areas
- Nationwide walking environment survey
- 'Day of Pedestrians'

· Encouragement of walking and cycling (2)

► Measures for bicyclists

- Extension of bicycle network as 3,114km by 2018
- 'Road Diet' to secure bicycle space on the roads
- Bicycle rack within trains and buses
- Promotion of 'public bike' or 'bike-sharing'

► Integration of land use and transport

- High density development near KTX (high-speed railway) stations
  : To reduce the number of unnecessary car trips
  : To shorten travel distance
  : Better environments for walking and cycling
- Promotion of Public Transport Only Zone

· Promotion of green transport technology

► Four types of environmentally-friendly cars

- Hybrid cars: getting cheaper but environmentally-friendly by half
- Bio-fuel cars: some side-effects
- Electric vehicles: low mileage and long recharging time
- Hydrogen cars: needs more time to application

► New business

- Stations for electric vehicles and hydrogen cars
  : battery charging or replacement
  : hydrogen fueling points

► Government's role

- To give affirmative signals to a market to foster new business
- To set safety standards for hybrid, electric, and hydrogen cars
- Amendment of laws to promote alternative cars
- Promotion of new transport modes including PRT

· Supporting measures for low-carbon green transport

► Monitoring system of greenhouse gas emission

- To feedback measures for GHG emission reduction
- Designation of a special treatment zone

► Education of eco-driving

- Eco-driving simulators
- Installments of fuel efficiency indicator

► Reinforcement of transport demand management

- Congestion charge
- Restriction on total traffic volumes
- Reduction in parking areas

· Some consideration points for Green Growth in Transport (1)

► What is an optimal modal split rate?

- It depends on service of public transport
- It depends on walking and cycling environments
- It varies over cities and difficult to quantify

► What is a desirable target of GHG emission in transport sector?

- Needs analysis on emission reduction effects by each measure
- Needs sophisticated transport models

  : England uses National Transport Model

  : Transport models for regions and cities need to be developed

· Some consideration points for Green Growth in Transport (2)

► Can public transport substitute for private cars in effect?

- Provided better bus service so far but congestion is still prevalent
- People cannot give up merits of cars: privacy, short access distance and time
- How about make an environment where cars are not favoured to use

: increase of parking cost, reduction in parking areas, allocation of road space to buses, cyclists, and pedestrians

: it is much effective and cheaper than improving public transport

► What if all cars become environmentally-friendly?

- We will lose a good excuse for restricting car use
- Motorists will require better environment for cars
- Balance between private cars and public transport is still important

: Environmental externalties can be removed but congestion is unavoidable

· Some consideration points for Green Growth in Transport (2)

► Congestion charge vs. Parking fee increase

- Both aims at reducing externalities by car use

  : No more free use (pay as much as you drive)

  : Fuel tax does not work well once people get accustomed (Rebound Effect)

- What is better?

  : Acceptability by the public or politicians

  : Implementation costs

- Why do we stick to difficult and impractical option?

- Various Parking fee options need to be devised

  : by time of days (peak/non-peak)

  : by areas (CBD/suburbs)

  : by duration (hour/day)

- The income need to be invested for betterment of public transport

· Some consideration points for Green Growth in Transport (2)

► **Technology Improvement (fuel efficiency)vs. Behaviour Change (less car use)**

- Both needs to be considered for Green Growth in Transport
- What will be preferred?

  : Instant effects

  : Reliable measurement or monitoring (reduction target)

  : Easy implementation

- *Evidence of history*

  : Bus improvement reduces subway customers and vice versa)

- Continuous efforts for behaviour change need to be addressed

  : Education on benefit of walking and cycling

  : Cars need to pay marginal social costs

· Some consideration points for Green Growth in Transport (2)

► **Tasks of transport planners, engineers, and economists**

- Avoid, Shift, and Improve

  : Classification of various transport measures for ASI

  : Analysis on measures in term of: timing, cost, impact power, acceptability…

- Co-benefit of transport measures

  : Quantification models of co-benefits (accident costs, congestion costs, environmental costs) for each measure

Thank You!