Transport Policies in Wrong Direction and Climate Change Impact: Korean Cases Study

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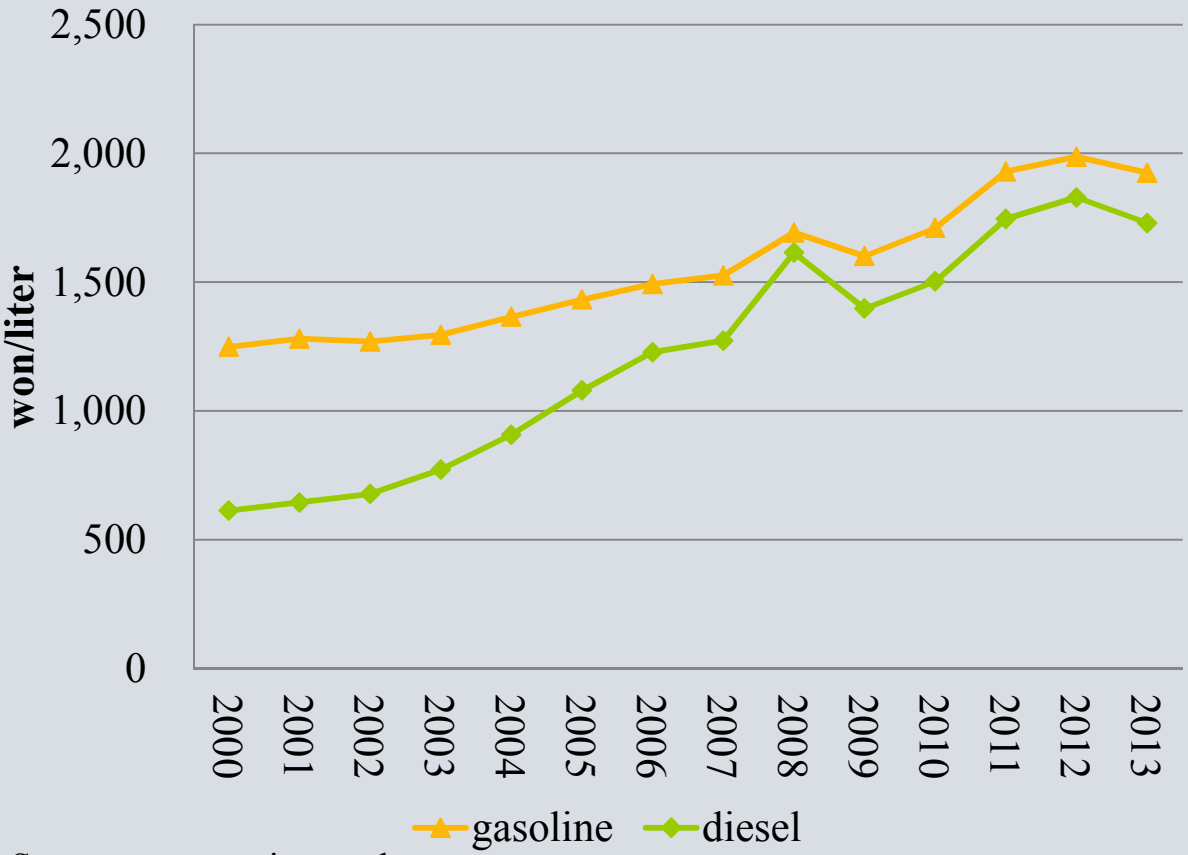
I. Background

Soaring Domestic Gas Price



Source : www.opinet.co.kr

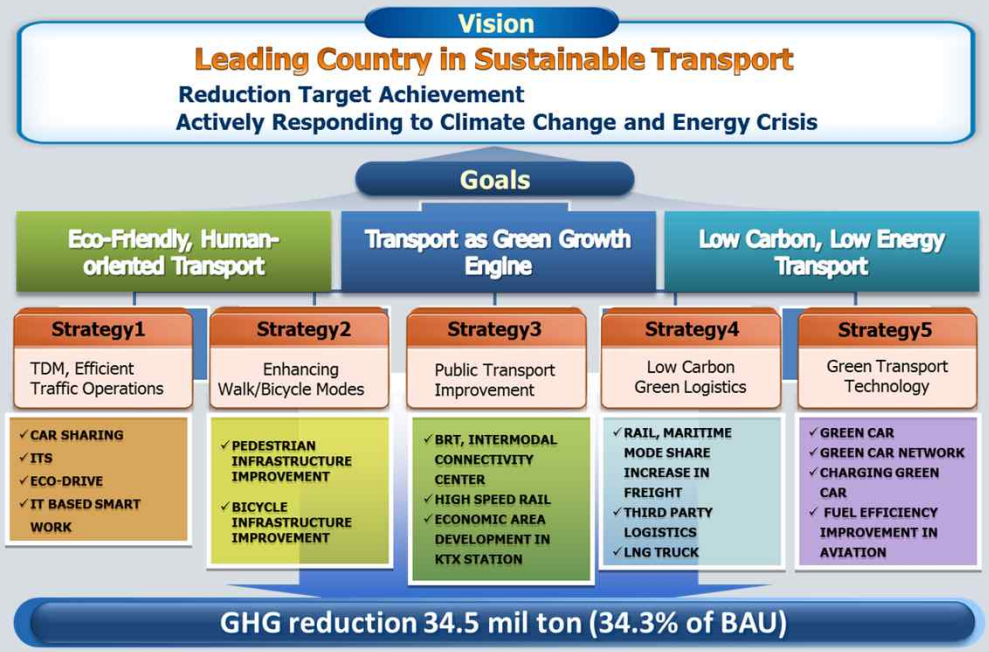
8th largest oil importer in the world

High dependency on imported oil !

I. Background

National and International GHG Reduction Effort

- **Strong national vision to reduce transport GHG emission**
  - reduction target 34% of BAU in 2020
- **New international GHG reduction agreement coming (Durban Platform)**
- **Transport accounting for 13% of national GHG emission**



Transport price policies in good direction ?

II. Car Property Tax

Car Property Tax Scheme

Before 2011

Engine size	Tax rate, won /cc
< 800cc	80
< 1,000cc	100
< 1,600cc	140
< 2,000cc	200
>= 2,000cc	220

Since 2011

Engine size	Tax rate, won /cc
< 1,000cc	80
< 1,600cc	140
>= 1,600cc	200

- **International trade agreement simplifying taxing scheme**
- **Mid-size car owner shifting to big-size car**

Note: 1,000 won roughly equals to $1

II. Car Property Tax

Car Value and Fuel Economy in Market

Car type	Price, mil won	Fuel economy, km/l
BMW 5 series 2,000cc gasoline	70	12
Hyundae Sonata 2,000cc gasoline	25	12
Toyota Prius 1,800cc gasoline hybrid	35	21

Source: http://auto.daum.net

- **Originally property tax assuming value proportional to engine size**
- **Now, the tax neither property tax nor environmental protection or GHG emission penalty**

II. Car Property Tax

UK like Car Tax Scenario and Effect (Hwang and Kim, 2010)

CO2 (g/km)	#car (1,000)	Tax rate, won /year/veh	CO2 reduction(ton/yr)	Env' benefit(mil won/yr)
< 130	536	0	13,161	412
< 150	1,173	69,912	39,069	1,224
< 175	2,996	134,446	284,285	8,906
< 200	3,782	201,669	745,772	23,364
<225	2,684	268,892	653,374	20,469
<250	1,048	403,338	333,215	54,375
=>250	262	537,784	189,611	3,806
sum	12,483		2,258,487	112,556

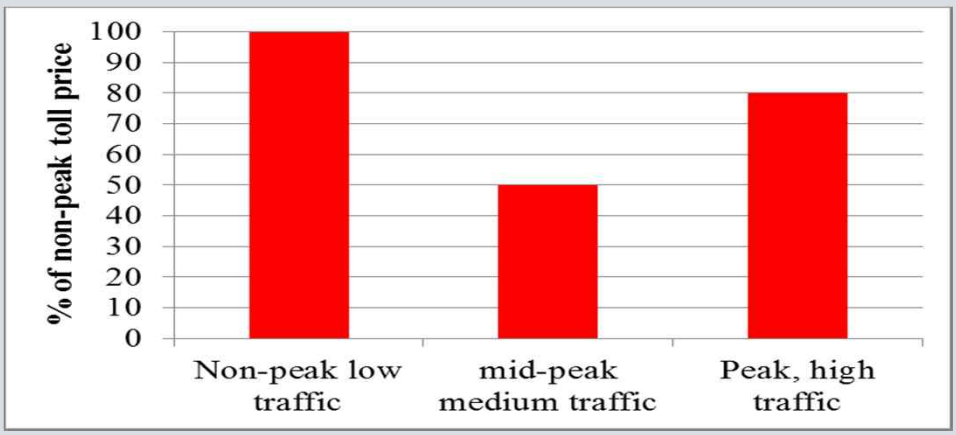
- **Tax revenue decrease by 350 billion won**
- **GHG decrease by 2.3 million ton (2.8% of road sector total)**
- **Benefit from reduced environment external cost 156 billion won (including carbon reduction benefit*)**
- **Short term tax loss adjustable in implementation stage**

* 2010 carbon price applied

III. Toll Discount in Peak Time

National Freeway Toll Discount Scheme

Time of Day	Discount rate	Trip length	Vehicle type
To work, 05:00 – 07:00	50%	< 20km	Car Van 2-axle truck
To home, 20:00–22:00			
To work, 07:00 – 09:00	20%		
To home, 18:00–20:00			



- **Price not based on demand**
- **Revenue loss 240 billion won, CO2 increase 84,000 ton per year**

Note: Non-peak toll 1,300 won – 1,900 won

III. Toll Discount in Peak Time

History of Toll Discount Implementation

- Left wing party (1998-2007) lost office by allegedly poor national economy
- Right wing party new in office introduced the discount to boost economy and help low income class commuter
- But peak time freeway is operated in close-to-capacity condition – low elasticity to price
- Commuters' average saving per month is only around 20,000 won
- Low income class commutes by public transport
- Discount only loses revenue for further investment

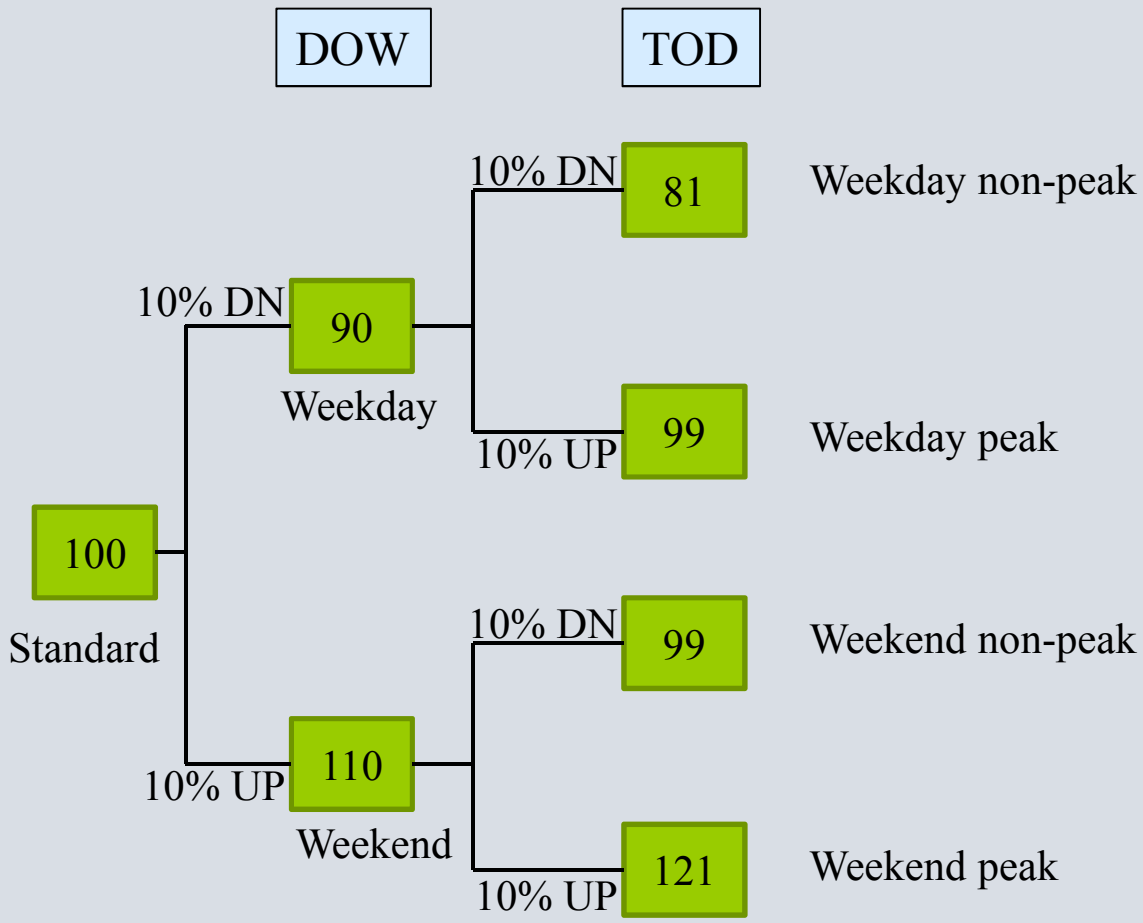
III. Toll Discount in Peak Time

Survey by Han (2009)

- **Freeway toll 10% increase in peak and decrease in other TOD**
  - **33% of weekday trip shifting to other mode/time/route**
  - **45% of weekend trip shifting to other mode/time/route**
- **44.8% Seoul residents yes for toll level change based on demand (or peak high, non-peak low)**
- **69.7 % Seoul – Cunchun freeway (one of most crowded) users yes for the change**

III. Toll Discount in Peak Time

Toll Scheme Suggestion by Han (2009)



IV. Fuel Subsidy

Fuel Subsidy Implementation History

- As of 2000. 07 price of gasoline : diesel : LPG=100 : 47 : 26 by low tax rate on diesel and LPG under philosophy that diesel and LPG for business
- # of diesel and LPG private car increase causing tax revenue loss
- 1st and 2nd energy tax reform (2001-2007) set price of gasoline : diesel : LPG=100 : 85 : 50
- To make up revenue loss of truck, bus, taxi operators, subsidy to them so that tax level set to 2001 (born as temporary subsidy but lasting)
- Fund from local tax on fuel sale at gas station

IV. Fuel Subsidy

Fuel Subsidy Effect and Criticism (Lee and Kang 2007, Gweon et al. 2012)

- **Beneficial for low income truck and taxi operators (gini coefficient decrease after implementation)**
- **Fraud application for subsidy**
- **Competitiveness of rail shipping down**
- **Consigner to order shipping taking advantage of subsidy due to low shipping cost**
- **No good for improving efficiency of logistics system**
- **Long term suggestion**
  - **Increase fare and shipping fee so that operators not depend on government subsidy**
  - **→ Logistics system efficiency improves to make cost down**

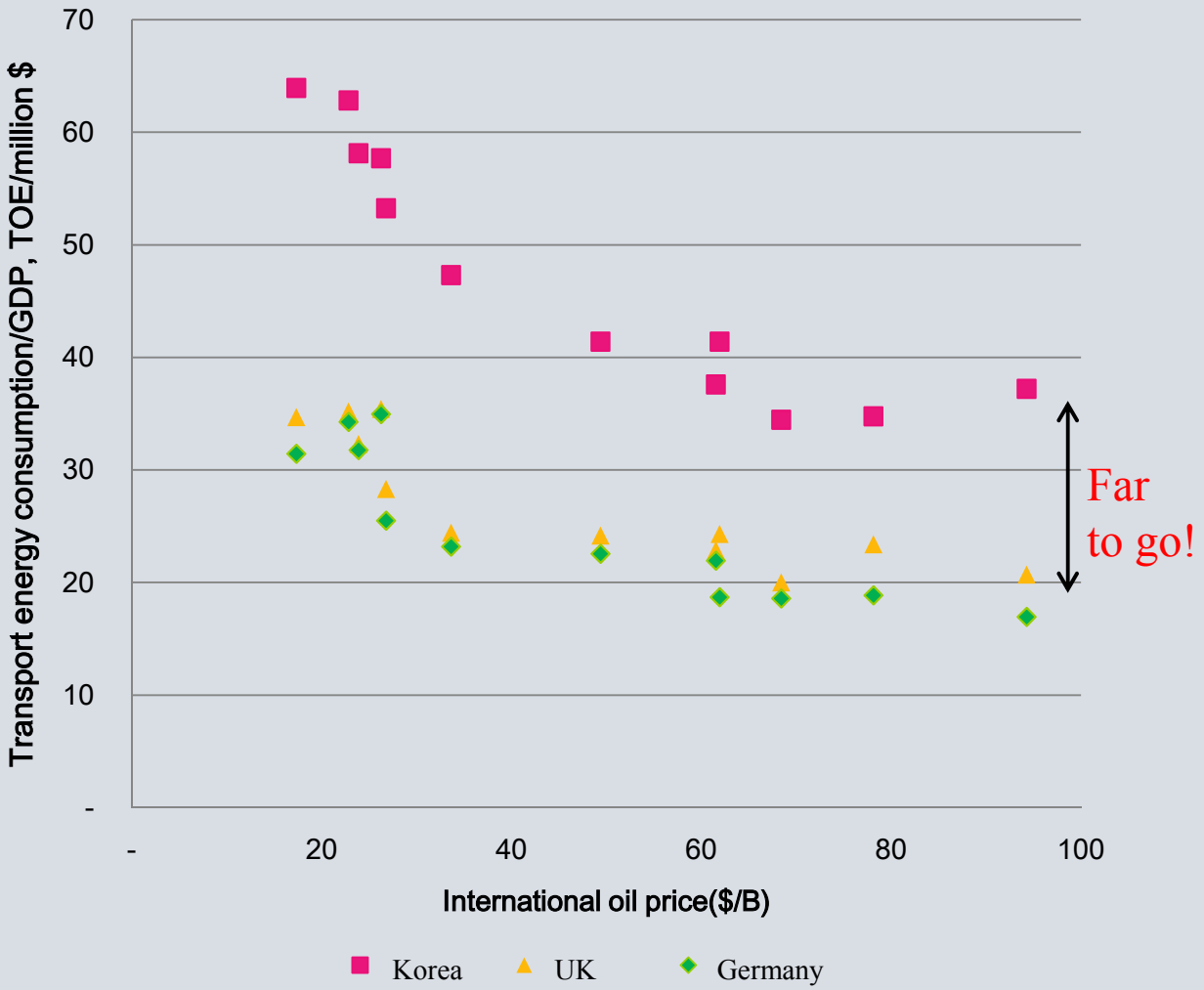
V. Wrap-Up

Summary and Discussion

- Car property tax based on engine size, peak time toll discount, and fuel subsidy not good to improve energy efficiency of national transport system
- Policies in wrong direction born for many reasons
- Price policies once implemented, hard to correct or redirect due to political resistance
- Make political leadership aware of long term social loss by short term political benefit

V. Wrap-Up

Transport Energy Efficiency International Comparison



Data source : http://data.worldbank.org/indicator, www.opinet.co.kr

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