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Energy Tax Initiative in Taiwan: Issues and Perspectives

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電子報

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編者的話

發展再生能源為台灣當前因應全球變遷及非核家園的主要策略。根據《能源白皮書》（2002）第四篇，再生能源發展將依各類再生能源技術發展成熟度，分短、中、長三階段推動。此外，在2005年第二次全國能源會議及2006年國家永續發展會議中，亦均對再生能源發展目標提出建議。綜合言之，台灣未來期望藉由「再生能源發展方案」及「再生能源發展條例」的執行，有效排除推動障礙，並合理反映能源利用之外部成本，帶動國內再生能源相關產業發展，營造永續經營環境，致力達成再生能源發展目標。.....

專題分析

1.台灣發展生質柴油的技術創新
2.中國生質柴油產業發展戰略思考
3.台灣稻作農家農地轉作能源作物的意願分析

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編輯政策

* 本刊以溫室氣體減量之政策及其經濟問題為重點，每月定期發行，當月刊登之文稿截稿日期為前一月的15日。本刊資料檢索網站：http://ghg.tier.org.tw。
* 本刊歡迎關心溫室氣體減量議題之各界先進賢達踴躍賜稿(包括專題分析、時事評論、政策動態報導、研究成果、出席國內外會議心得等)，亦歡迎讀者就本刊相關議題發表讀後建言或心得。專題分析稿件每篇以不超過6000字為原則，其餘不拘。

Outlines

- About the Energy Tax Act
- The Issues
- The Perspectives
- Concluding remarks

Legislation Objectives of the Energy Tax Act in Taiwan

- To induce energy saving
- To stabilize energy supply
- To enhance energy efficiency
- To develop alternative energies and move toward a sustainable society
- To reduce CO_2 emission

Major Characteristics of the Act

- Selected energy products are targeted
- Tax rate is energy-product dependent
- Tax rate increases over time at a fixed amount up to a pre-determined end period
- The revenue is used with priority to eliminate the existing excise tax of the targeted energy products, and the surplus to reduce personal income tax and corporate tax.

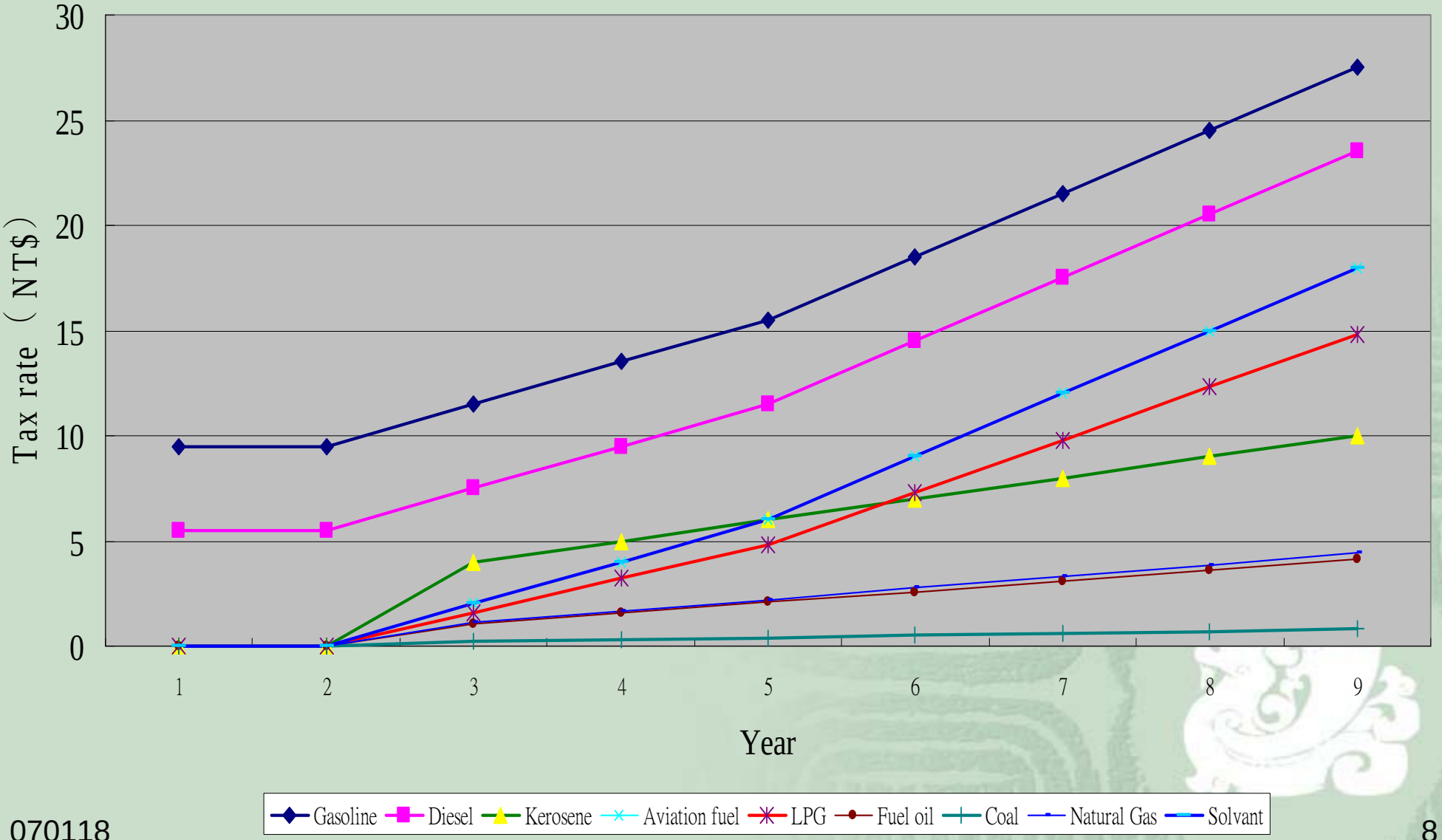
Energy Products to be Taxed

- The energy products covered by the Act include gasoline, diesel, kerosene, aviation gasoline, fuel oil, LPG, natural gas, and coal. (Article 7)
- Ethanol gasoline, biodiesel and other renewable energy shall be taxed in proportion to their content of the taxed energy products.
- All targeted energy products shall be taxed at the time when they are out-of plant or imported.

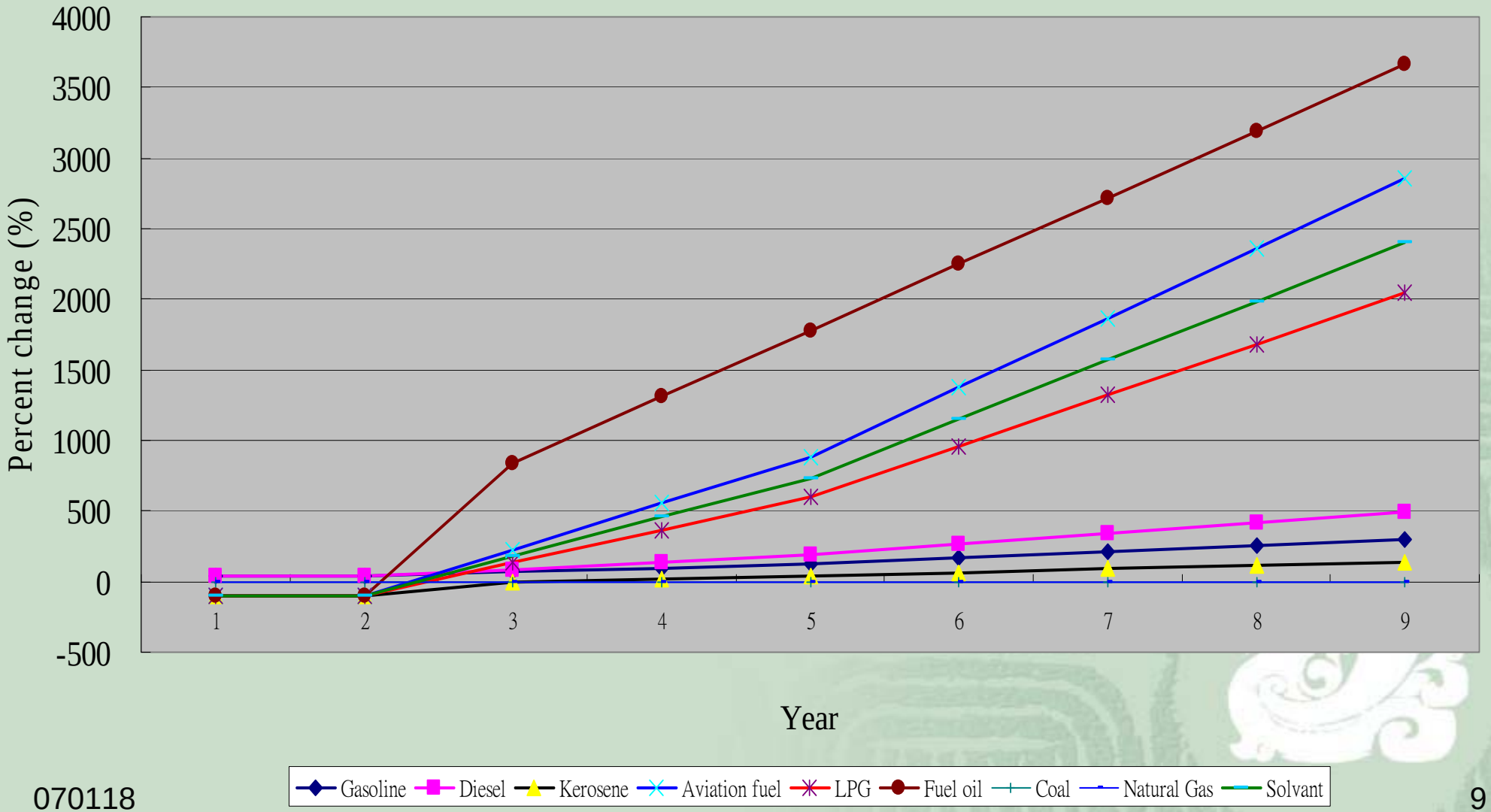
Tax Rates

- For the first year: Under debate and consensus not reached yet.
- The first-year tax rate for each energy product is determined by adding a fixed amount to the existing excise tax. For the following years, the rates increase at the same amount until nine years after the first charging year.
- Taking into account the potential impact on prices and industrial development, the Executive Yan is authorized to adjust the rate as deemed necessary by ±50%.

Tax Rate by Proposed Chen



% Change Relative to the Prevailing Excise Tax Rate



The Tax Rate by Mr. Chen

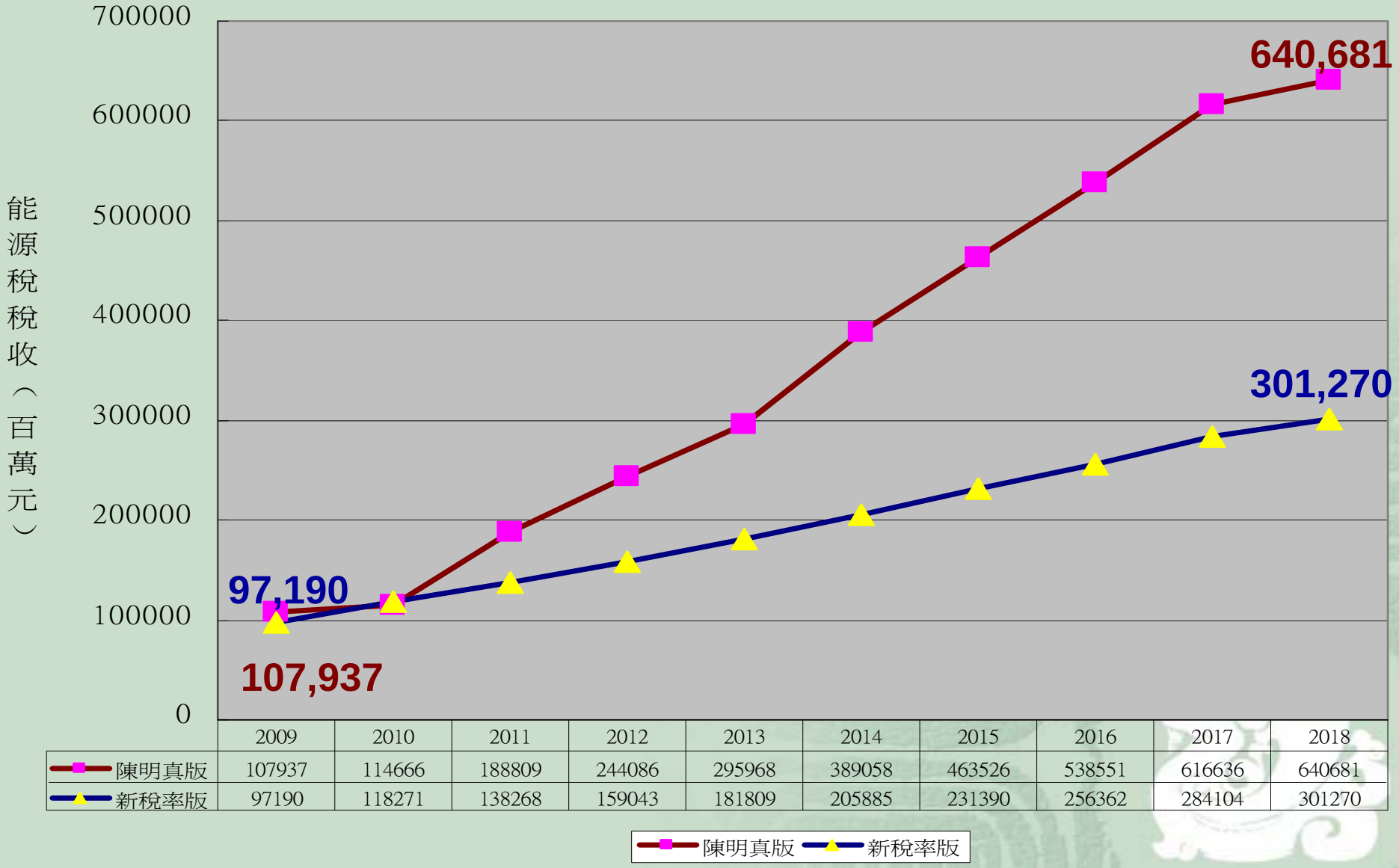
Items/ Year	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gasoline (NT$/*l*)	**9.5**	**9.5**	**11.5**	**13.5**	**15.5**	**18.5**	**21.5**	**24.5**	**27.5**
Diesel (NT$/*l*)	**5.5**	**5.5**	**7.5**	**9.5**	**11.5**	**14.5**	**17.5**	**20.5**	**23.5**
Kerosene (NT$/*l*)	**0**	**0**	**4.0**	**5.0**	**6.0**	**7.0**	**8.0**	**9.0**	**10.0**
Aviation gasoline (NT$/*l*)	**0**	**0**	**2.0**	**4.0**	**6.0**	**9.0**	**12.0**	**15.0**	**18.0**
Solvants (NT$/*l*)	**0**	**0**	**2.0**	**4.0**	**6.0**	**9.0**	**12.0**	**15.0**	**18.0**
LPG (NT$/*kg*)	**0**	**0**	**1.6**	**3.2**	**4.8**	**7.3**	**9.8**	**12.3**	**14.8**
Fuel oil（%）	**0%**	**0%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**	**40%**
Coal（%）	**0%**	**0%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**	**40%**
NG（%）	**0%**	**0%**	**10%**	**15%**	**20%**	**25%**	**30%**	**35%**	**40%**

The Effective Tax Rates in Huang et al. (2006.12)

Implementation year: 2009

Items / Year	Gasoline	Diesel	Kerosene	Aviation gasoline	LPG	Fuel Oil	Coal
	$/L	$/L	$/L	$/L	$/Kg	$/L	$/KG
2009	7.77	3.42	3.48	0.14	0.65	0.51	0.04
2010	8.77	4.22	4.28	0.24	0.65	0.56	0.08
2011	9.77	5.02	5.08	0.34	0.65	0.61	0.12
2012	10.77	5.82	5.88	0.44	0.65	0.66	0.16
2013	11.77	6.62	6.68	0.54	0.65	0.71	0.2
2014	12.77	7.42	7.48	0.64	0.65	0.76	0.24
2015	13.77	8.22	8.28	0.74	0.65	0.81	0.28
2016	14.77	9.02	9.08	0.84	0.65	0.86	0.32
2017	15.77	9.82	9.88	0.94	0.71	0.91	0.36
2018	16.77	10.62	10.68	1.04	0.8	0.96	0.4

Revenues: Chen vs. EN2



	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
陳明真版	107937	114666	188809	244086	295968	389058	463526	538551	616636	640681
新稅率版	97190	118271	138268	159043	181809	205885	231390	256362	284104	301270

The Issues

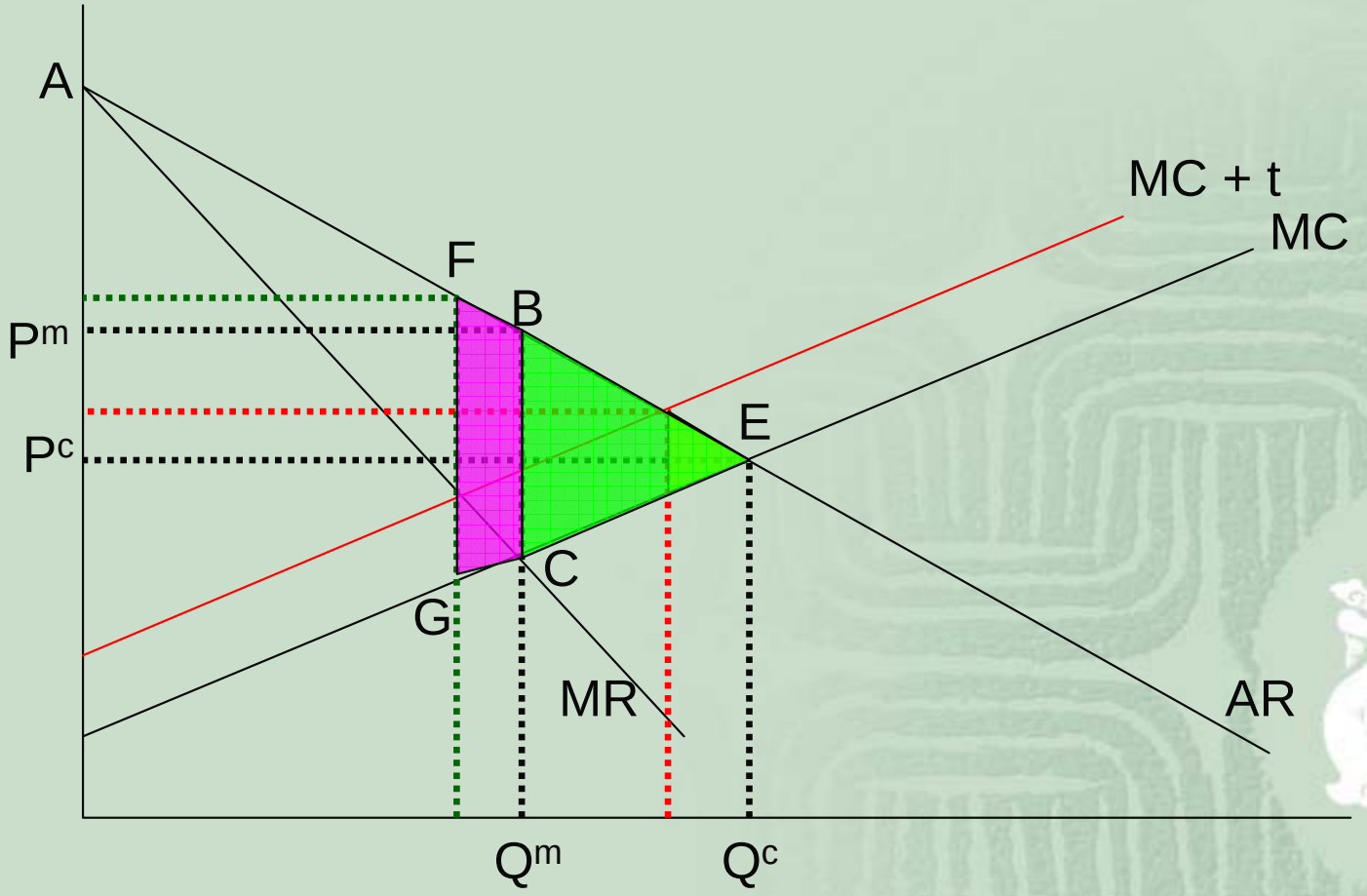
- Rationality of energy tax
- Choice of tax base and the targeted payers
- Determination of the optimal tax rate
- Disposal of tax revenues
- Feasibility of the double dividends
- Efficiency and Equity
- Impact evaluation
- Integration of policy instruments

Rationality of Energy Tax

Objectives	Effectiveness	Alternative instruments
Energy saving	Partial	Energy price
Energy supply	Inadequate	Hedging, stockpiling
Energy efficiency	Partial	Standards, BAT
New energy development	Partial	Subsidy for renewables
Emission reduction	Partial	Carbon tax, C&T
Revenue raising and tax reform	Full	Other resources and environmental fees

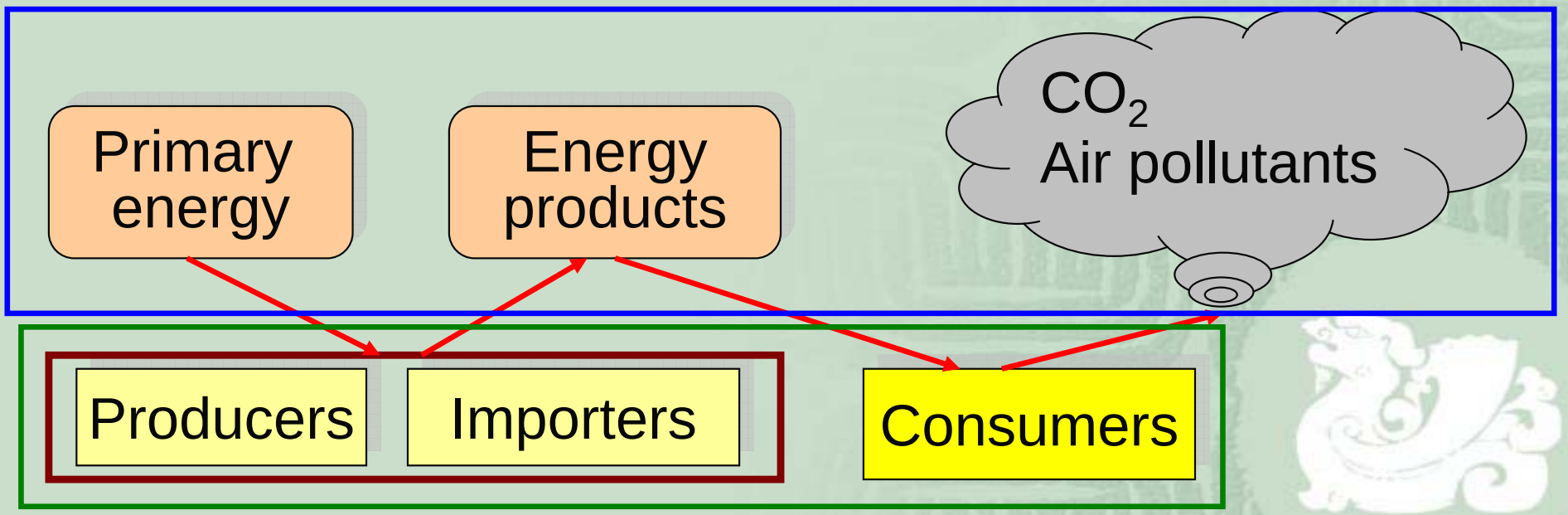
Problems under Imperfect Market

- DWL may increase further
- A tax on monopolist might be inappropriate for emission reduction

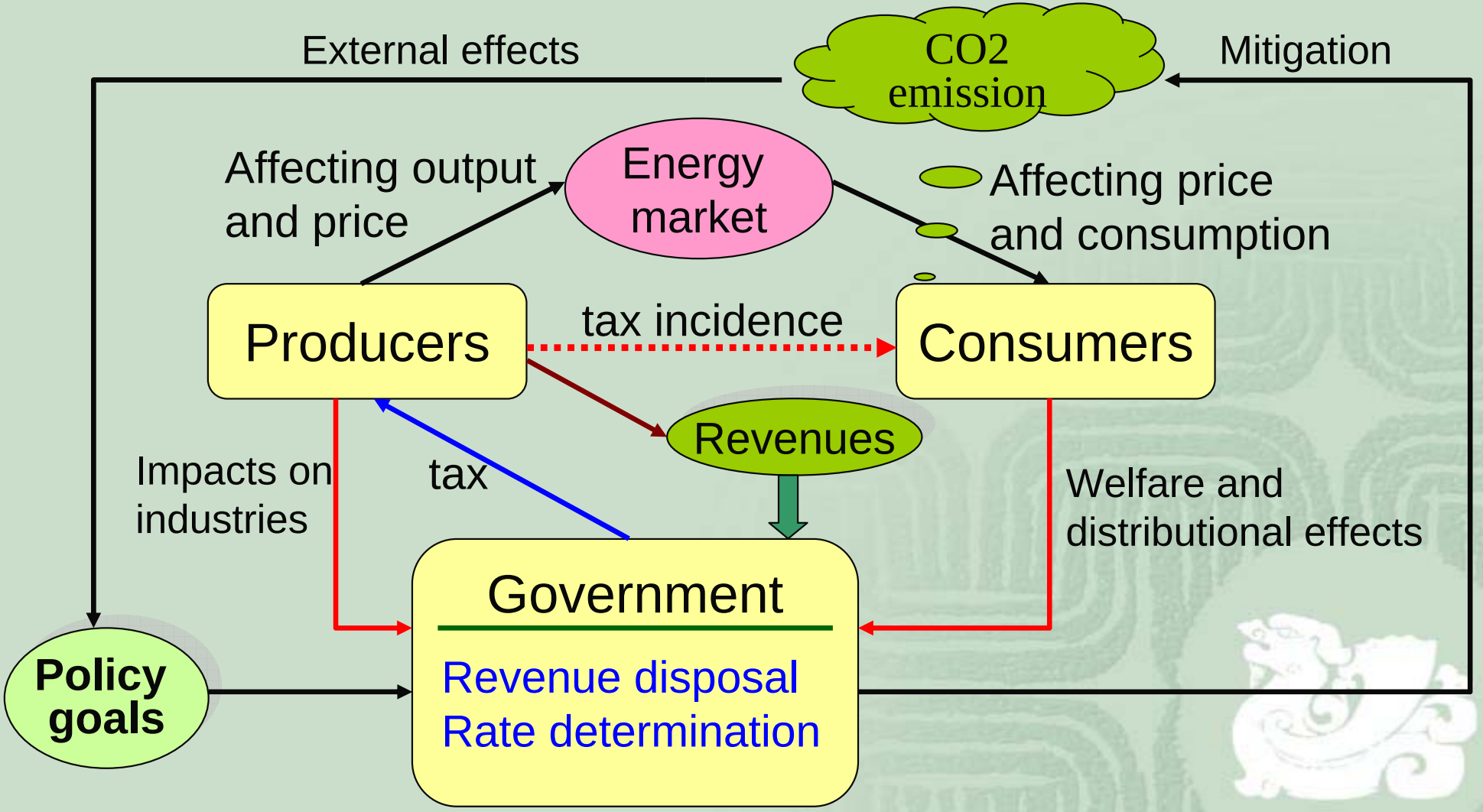


Choice of tax base and the Targeted Payers

- Why energy products?
- Why not consumers or emitters?



Framework for the Optimal Tax Determination

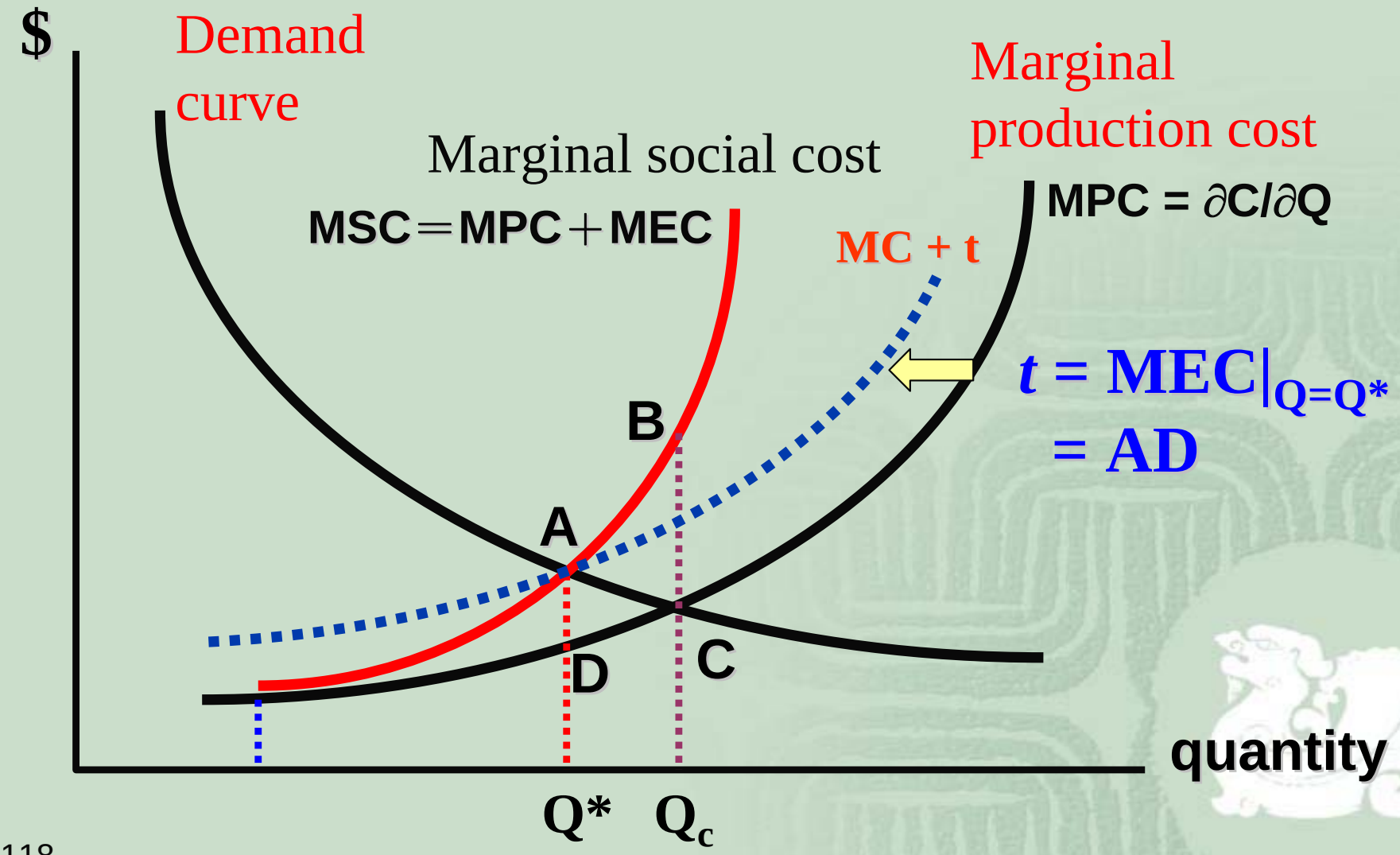


Optimal Energy Tax Rate

- What is the socially optimal tax rate and what are the determinants?
- Are the proposed rates socially optimal?

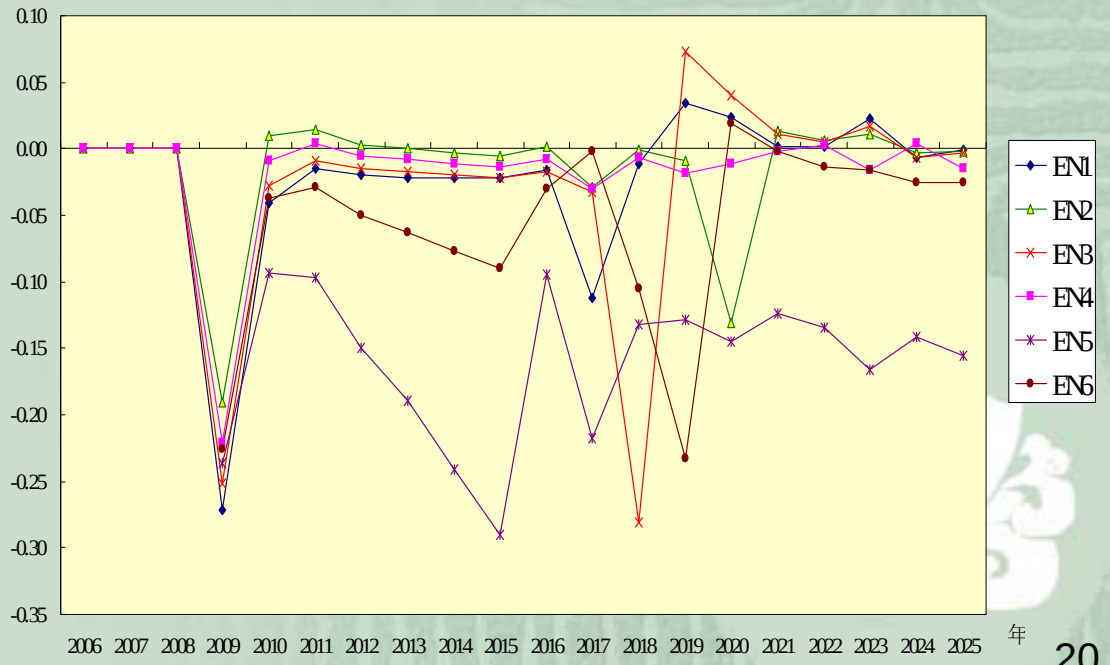
  - Environmental damages of the externalities associated with energy use and their properties
  - Benefits of emission reduction and energy saving and their properties
  - Demand and supply elasticity of energy products
  - Market structure of the taxed energy products
  - Availability of alternative policy instruments

Pigouvian Tax Rate when Environmental Cost Exists



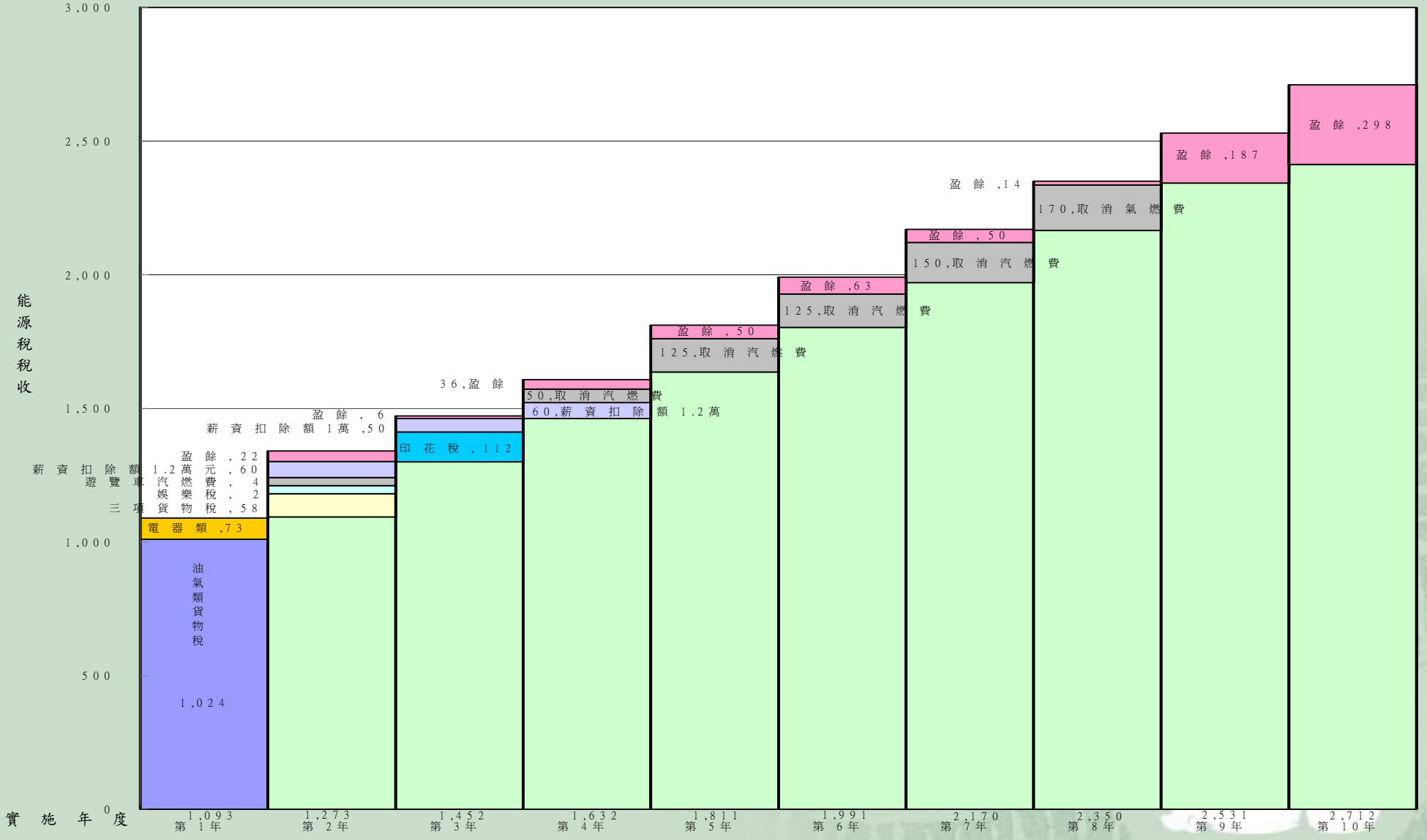
Disposal of Tax Revenues

- The tax interaction effect may outweigh the tax recycling effect in the long run, regardless of the ways of revenue disposal.
- Subsidy to the production cost is preferred to labor income tax substitution for higher efficiency.
- Optimal disposal depends on the weights of various policy goals.



Executive Yuan's Proposal(95.10.20)

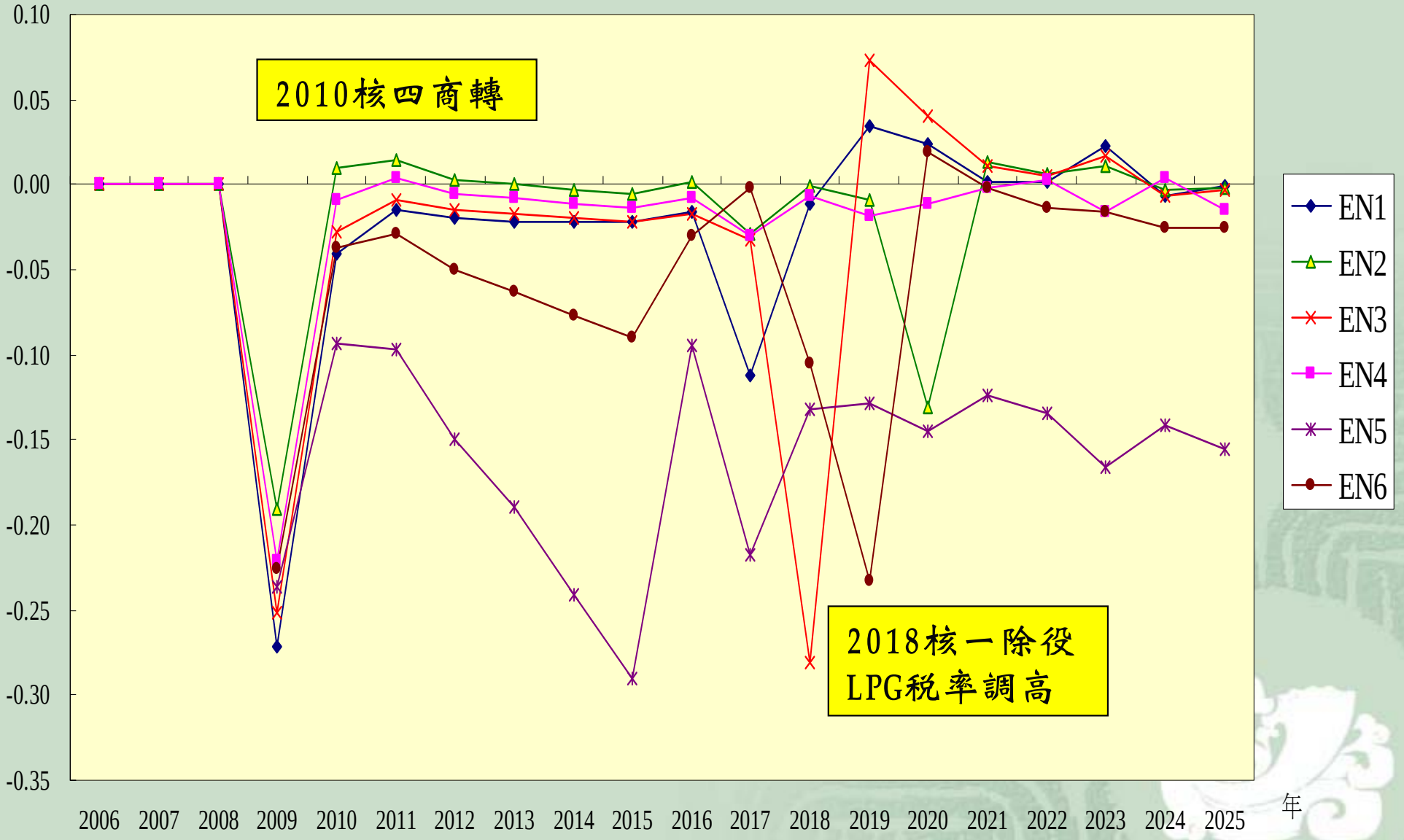
單位：億元



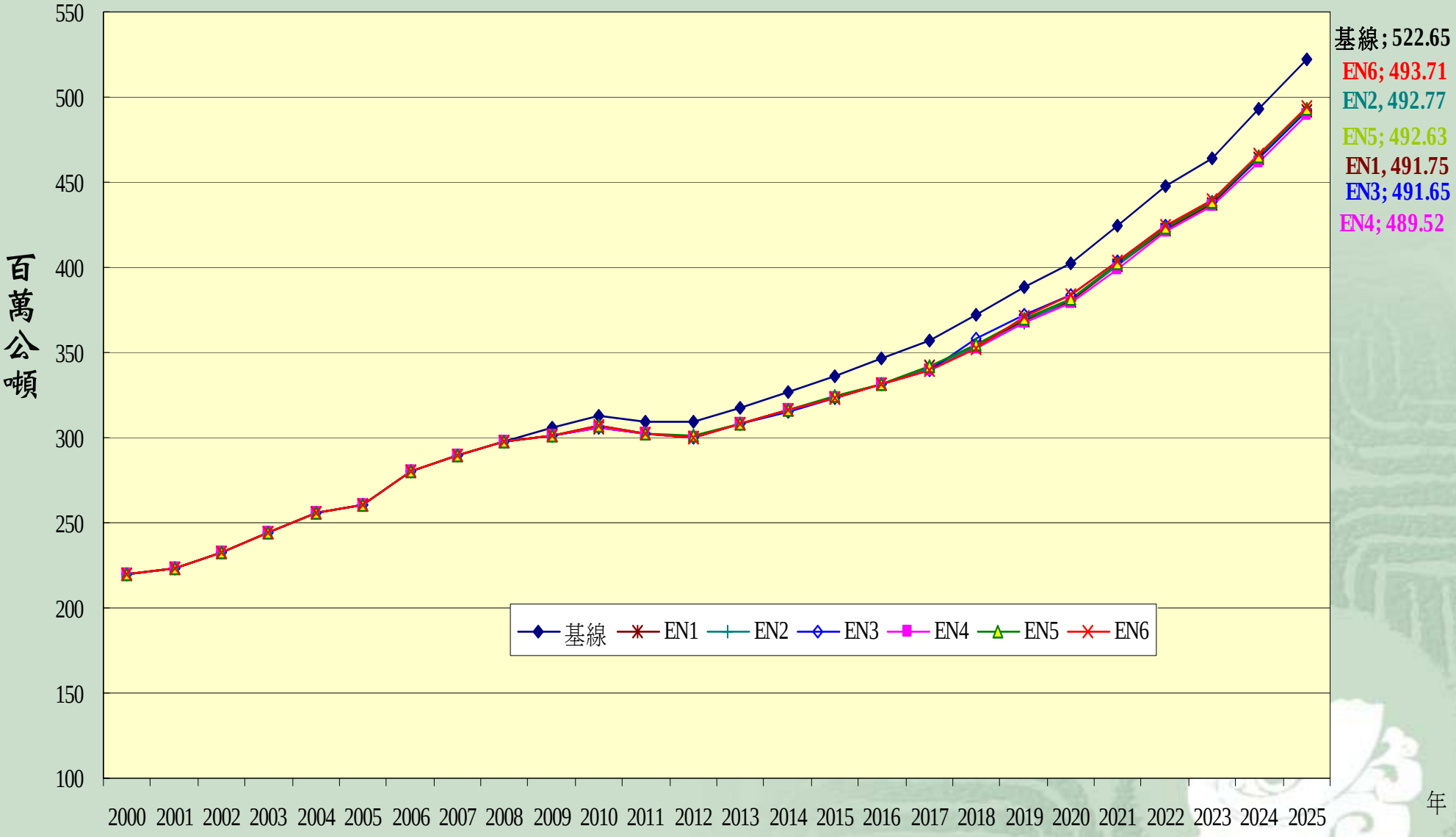
Scenarios in Huang et al.（2006.12）

- EN1: Revenue not recycled
- EN2: The net revenue used to subsidize the firm's OTHER COSTS.(Production cost.
- EN3: The net revenue used to subsidize personal income tax and corporate income tax.
- EN4: 50% for reducing OTHER COSTS and 50% for reducing personal income tax.
- EN5: The net revenue used for removing the excise tax of other taxed items.
- EN6: Following the way of disposal initiated by the Executive Yuan (2006.10.20).

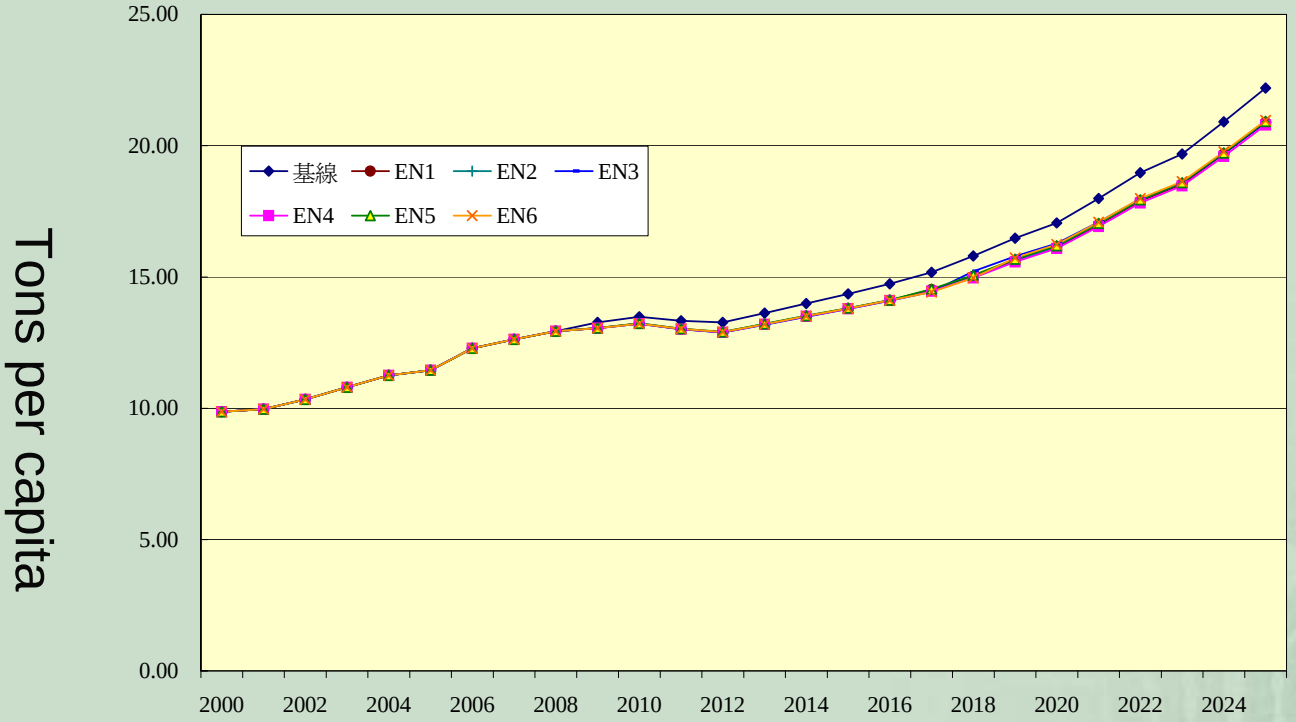
Impact on GDP Growth Rate



CO_2 Emission



CO2 Emission per capita



Average: 2009-2018	**14.1**	**-0.469**	**-0.469**	**-0.465**	**-0.482**	**-0.450**	**-0.480**
Average: 2009-2025	**16.1**	**-0.719**	**-0.708**	**-0.685**	**-0.756**	**-0.688**	**-0.686**

Feasibility of the Double Dividends

- Energy tax revenue is simply a transfer payment from tax payers to the government. Efficiency of public fund allocation may not be as good as the private allocation.
- Double dividends, while negligible in the long run, could possibly occur only in the short run with particular conditions. The tax rate and the size of the revenue do matter.
- The shift of the tax base from energy products to emission would favor the feasibility of the double dividends.
- Energy tax is neither a necessary nor a sufficient condition for the development of new energy.

Efficiency and Equity

- Energy tax is not the most effective instrument for CO_2 emission control, although it encourages energy saving.
- Tax exemption is less efficient than tax-and-redistribution.
- The distributional effect on consumer tends to be regressive.
- Equity achieved through subsidizing the lower income groups will be at the cost of efficiency.

Impact Evaluation

- Adequate decision criteria should be clear for wiser policy making.
- Regulatory impact analysis deserves more attention.
- Selection of proper tools for impact evaluation is essential.
- Phasing-out of uncompetitive technologies and innovation of the newly emerging technologies should be taken into account.

Integration of Policy Instruments

- Alternative policy instruments, such as energy price, cap-and-trade, subsidy for renewables, regulatory standards, etc., must be integrated and harmonized.
  - Rationalization of energy price
  - Emission fees of air pollutants
  - Charges for Energy Fund
  - Cap-and-trade
  - Standards and BACT wrt CO_2 control
  - Subsidies
  - EIA

Concluding Remarks

- Failure to realize double dividends does not imply that the energy tax is not justifiable as it may result from the divergence of the proposed tax rate from the socially optimal level.
- Energy tax is not the most effective instrument for CO_2 emission control, although it encourages energy saving and emission reduction.
- Cost effectiveness of the energy tax should be evaluated and compared with alternative instruments.
- Adequate integration with energy prices and cap-and-trade is warranted for policy harmonization.