

# Taxe parafiscale ou remboursé

Pourquoi rembourser une taxe??

PRIX	DROITS	REGLES	AUTRES
Taxe Carbone	Dr. de Propriété	Normes techniques	Divulg. d'informat.
Subvention	Permis négociable	Normes d'efficacité	Eco-Labels AOC
Licence Prélevement	Certificat vert	Interdiction	Accords volontaires
Redevance remboursé	Propriété commune	Zonage	Regulation bancaire
Consigne		Appel d'offre Public	Reglement de litiges





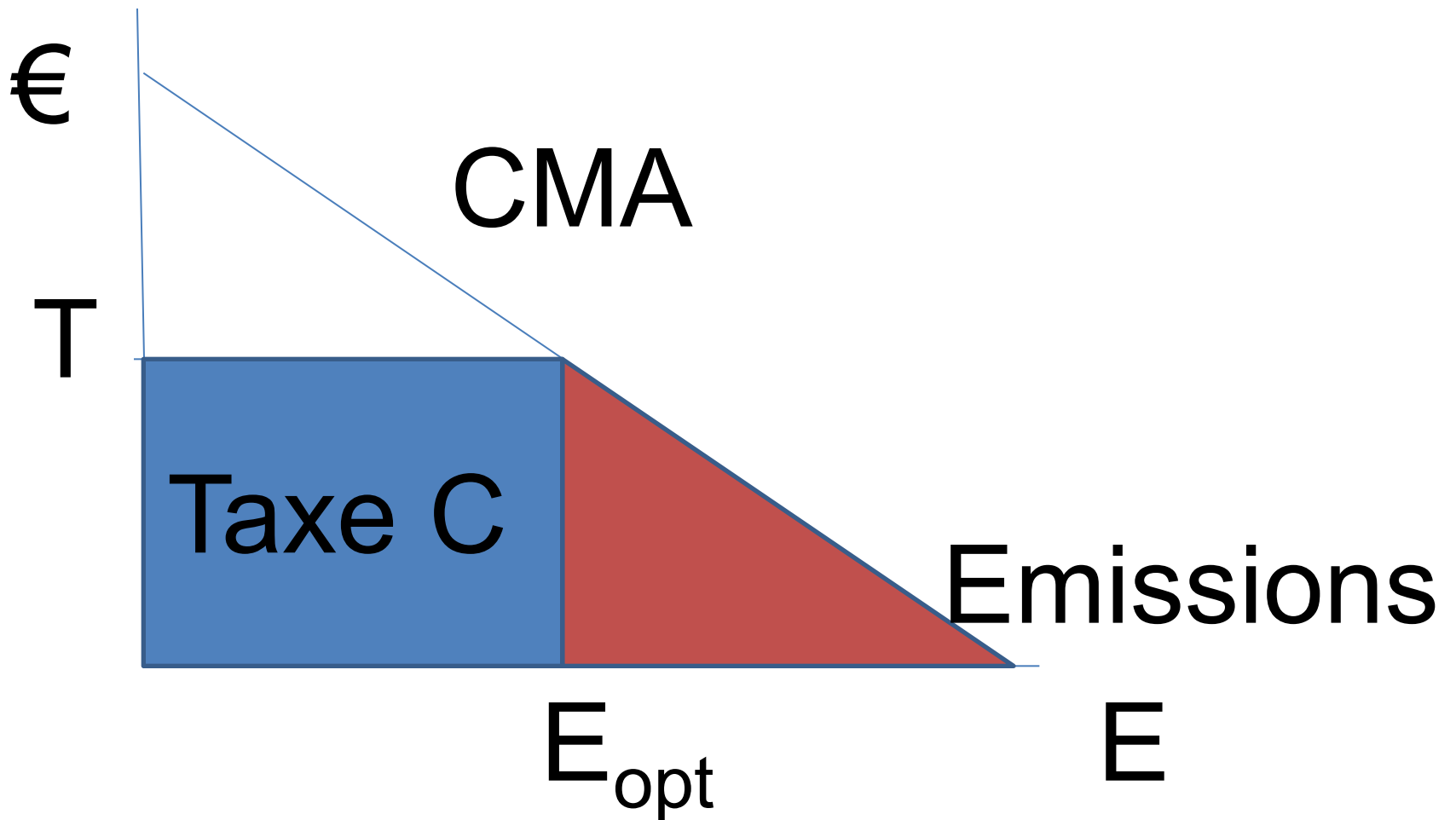


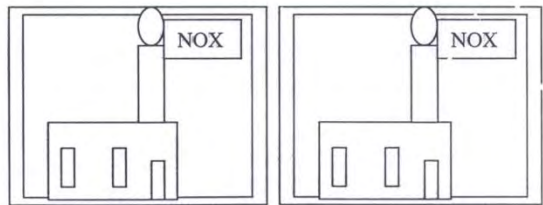
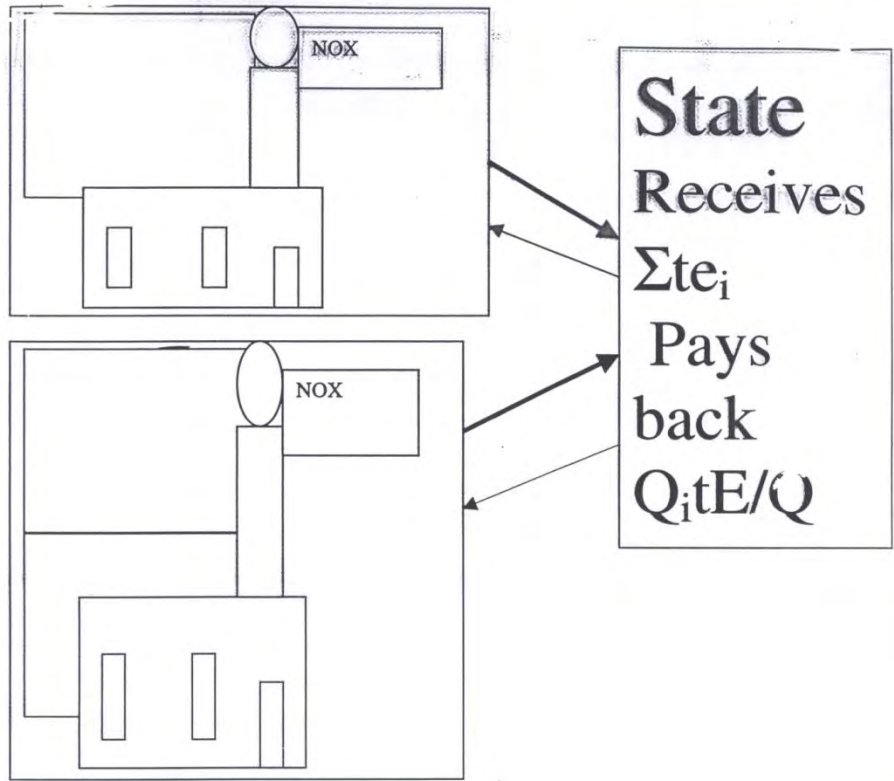
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# Economie d'une taxe





Small companies too small to warrant monitoring, measurement and other costs.

# Administration REP: 0,5%

r	Verksamhet	Produktionsenhet	NOX	MWh	FEE	REFUND	Net Fee		Panntyp
7	Kraft- och	Panna 3	123421	593335	4936840	5532128	-595288		Brännare
7	Kraft- och	Panna 4	411219	2338216	16448760	21801023	-5352263		Brännare
8	Massa- oc	Barkpanna	103440	274082	4137600	2555482	1582118		Roster
9	Massa- oc	SMW	129394	466200	5175760	4346749	829011		Brännare
10	Kemiindus	Heater 3	21227	54668	849080	509713	339367		Brännare
10	Kemiindus	Ångpanna	24292	74090	<b>971680</b>	<b>690799</b>	<b>280881</b>		Brännare
11	Kemiindus	Panna 3	37976	204991	1519040	1911292	-392252		Brännare
12	Kraft- och	HVP 2844	29251	129964	1170040	1211756	-41716		Roster
12	Kraft- och	HVP 3344	19476	110656	779040	1031733	-252693		CFB
13	Avfallsförbr	P1	38494	60373	1539760	562905	976855		CFB
13	Avfallsförbr	P2	31262	51737	1250480	482385	768095		
14	Avfallsförbr	P6	41387	82562	1655480	769790	885690		Rörlig roste
19	Kraft- och	HVCB2	33628	155008	1345120	1445261	-100141		Brännare
32	Avfallsförbr	P1	78790	241099	3151600	2247955	903645		Rörlig roste
32	Avfallsförbr	P4	59554	416740	2382160	3885594	-1503434		Rörlig roste
			<b>SUMS</b>	<b>5253721</b>	<b>47312440</b>	<b>48984565</b>	<b>0</b>		
				Refund:	<b>9,005511</b>				
				SEK/MWh					

# Comment ça marche?

	Emission	Taxe	Product	Remboursement.
A	10		180	
B	20		220	
C	36		260	
Total	61		660	



	Emission	Taxe	Product	Remboursem.
A	10	50	180	
B	20	100	220	
C	36	180	260	
Total	61	330	660	

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Total	61	330	660	0,5

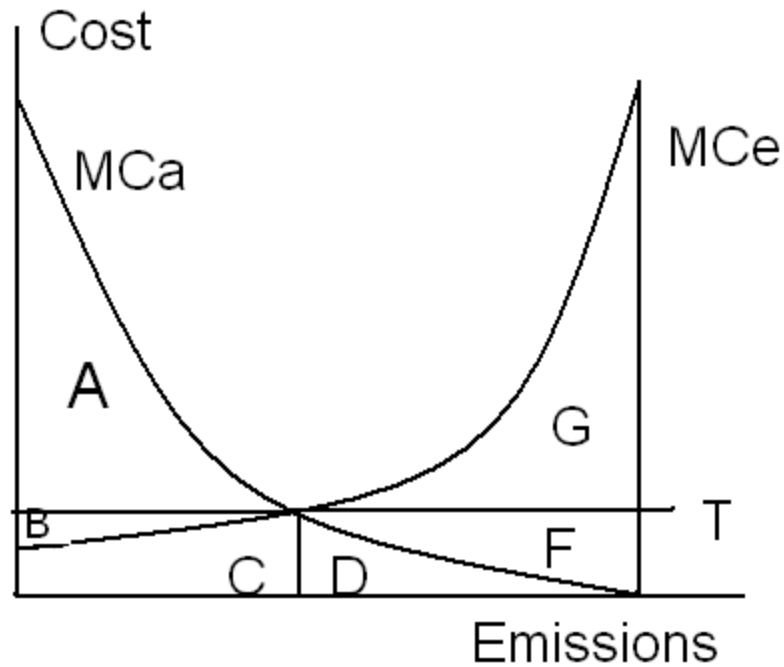
# Effet Lobbying

	Emission	Taxe	Product	Remboursem.
A	10	50	180	90 😊
B	20	100	220	110 😊
C	36	180	260	130 ;)
Total	61	330	660	0,5

# Il y a toujours un effet incitatif

	Emission	Taxe	Product	Remboursem.
A	10	50	180	90
B	19	95	220	110
C	36	180	260	130
Total	61	330	660	0,5

# The Distribution of Costs

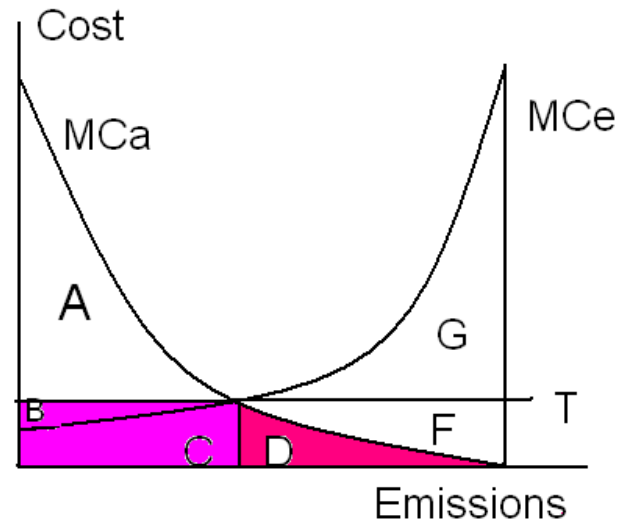
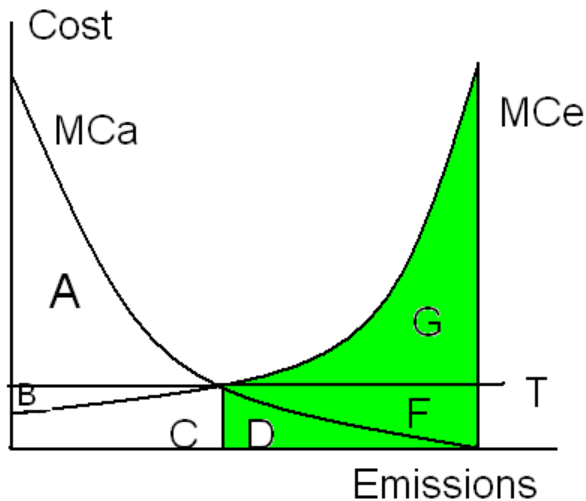




# The Distribution of Costs

- Benefits for the environment  $D+F+G$

- Costs of Abatement  $D$
- Tax: extra cost  $B+C$



	<i>Rights to the environment</i>				
	<i>Poluter (absolute)</i>		<i>Poluter (relative)</i>	<i>Mixed</i>	<i>Victim (PPP)</i>
	<i>(1)</i>	<i>(2)</i>	<i>(3)</i>	<i>(4)</i>	<i>(5)</i>
<b>Burden of costs</b>					
BENEF. Environm	<b>D + F + G</b>		<b>D + F + G</b>		
Polluter costs	<b>F</b>	<b>0</b>	<b>-D</b>	<b>-C-D</b>	<b>-B-C-D</b>
Societ y	<b>-D-F</b>	<b>-D</b>	<b>0</b>	<b>C</b>	<b>B+C</b>

<i>Ownership rights to the environment</i>				
	<i>Polluter (absolute)</i>	<i>Polluter Rights</i>	<i>Polluter by virtue of prod</i>	<i>Society PPP</i>
	(1)	(2)	(3)	(4)
<i>Type of instrument</i>				
<b>Q-type</b>	Free permits w. buyback	Grandfather Permits	Output allocation P	Auction Permits
<b>P-type</b>	Pure subsidy	TWA/ Tax- Subs	REP	<b>Tax</b>

# Abatement NOx, REP Experience en Suède

# Pluie Acide en Suède

- Suède (+Norway...) plus touché
- Sensitivité des écosystèmes extrême  
← (granite)
- Taxes Soufre très élevés
- Soufre is  $>€3/\text{kg S}$
- (This is  $€1.5 /\text{kg SO}_2$ )
- France:  $€ 0.3$
- US Permits  $€ 0.1$

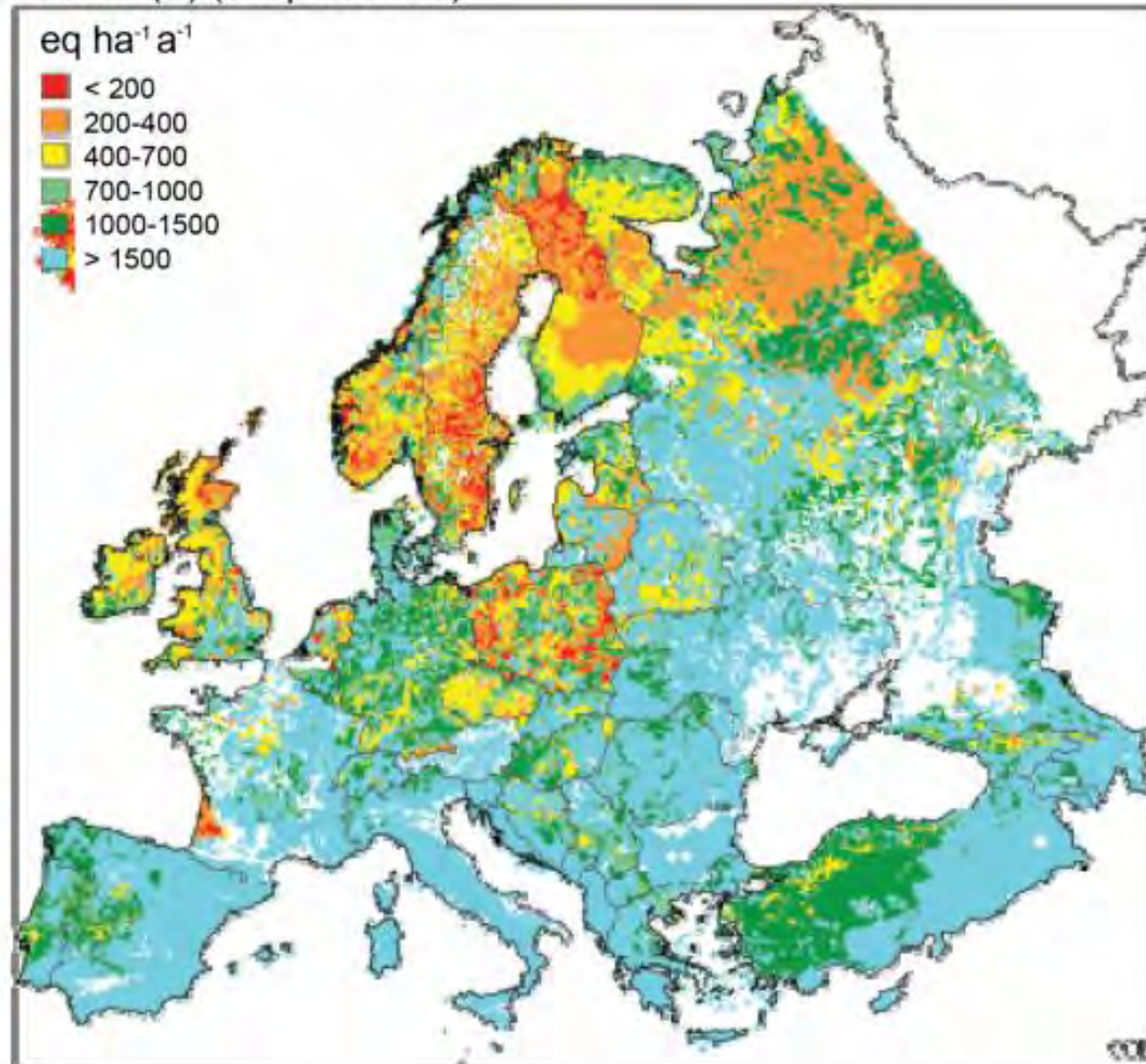


# Sensitivity of ecosystems to pH

CLmax (S) (5th percentile)

eq ha<sup>-1</sup> a<sup>-1</sup>

- < 200
- 200-400
- 400-700
- 700-1000
- 1000-1500
- > 1500



2,667

# **Acid Rain Retirement Fund**

2,667

## **Clean Air Certificate**

*This certifies that the Acid Rain Retirement Fund  
will purchase and retire approximately 2,667 pounds of air  
pollution on behalf of*

**Thomas Sterner**

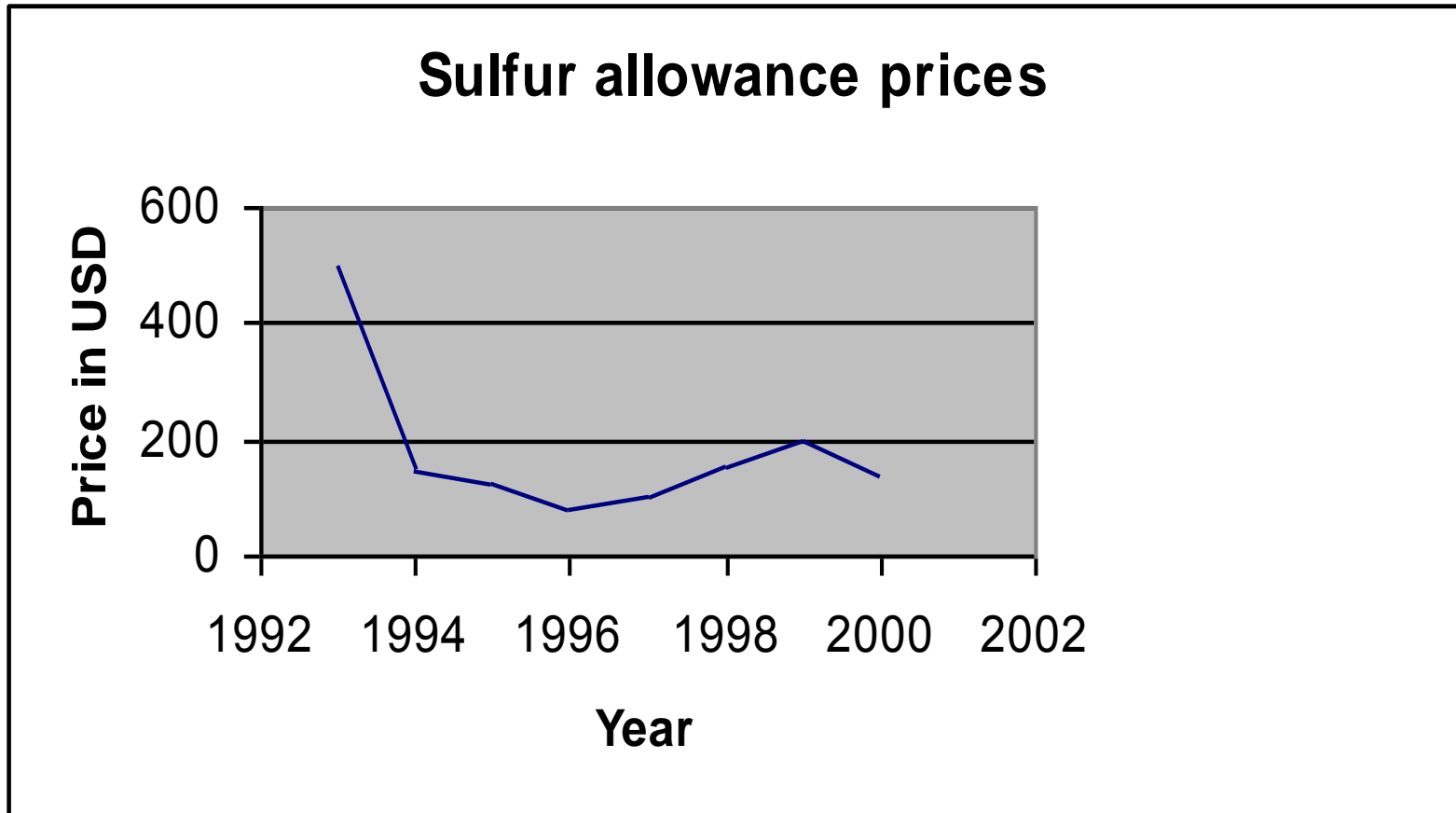
*The Acid Rain Retirement Fund is dedicated  
to increasing environmental education  
and reducing acid rain  
to improve our environment.*



*Brian Anderson*  
Acid Rain Retirement Fund  
P.O. Box 10272  
Portland, Maine 04104



# Price of permits: much lower than estimate of 1000 \$

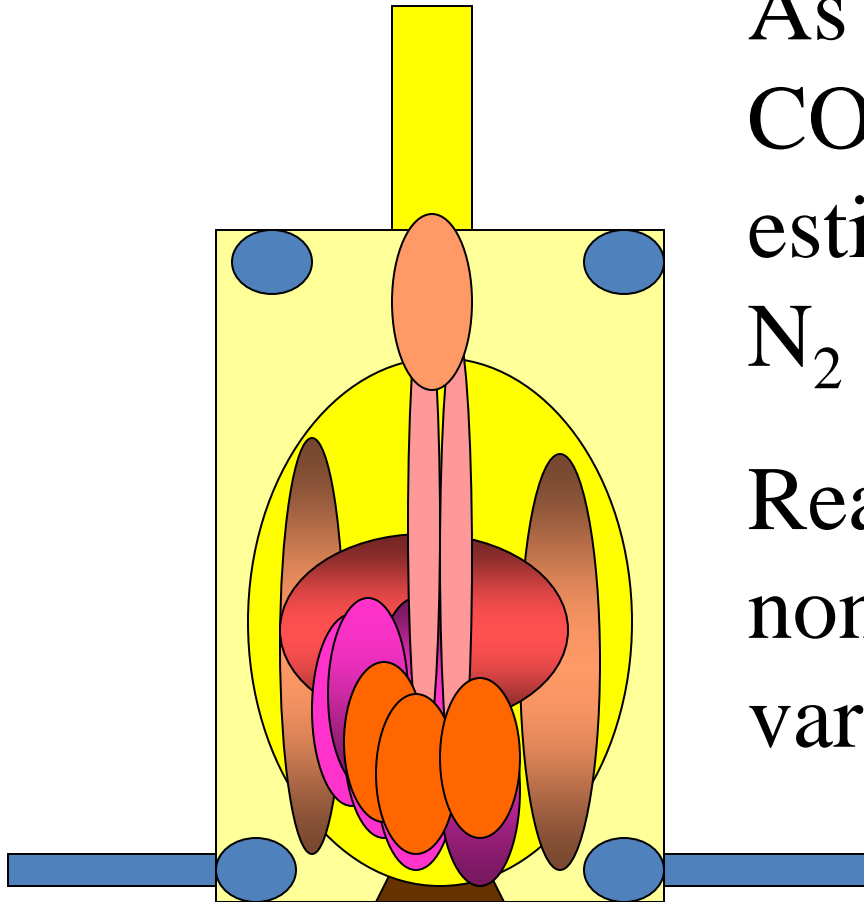


*Comparez taxe suédois 4000 \$/t*

# Swedish Acid Policy S

Country	E/cap 97 kgs/cap	1980→97
Sweden	8	-86%
Germany	16	-80%
USA	65	-26%

# Technicalities of NO<sub>x</sub>

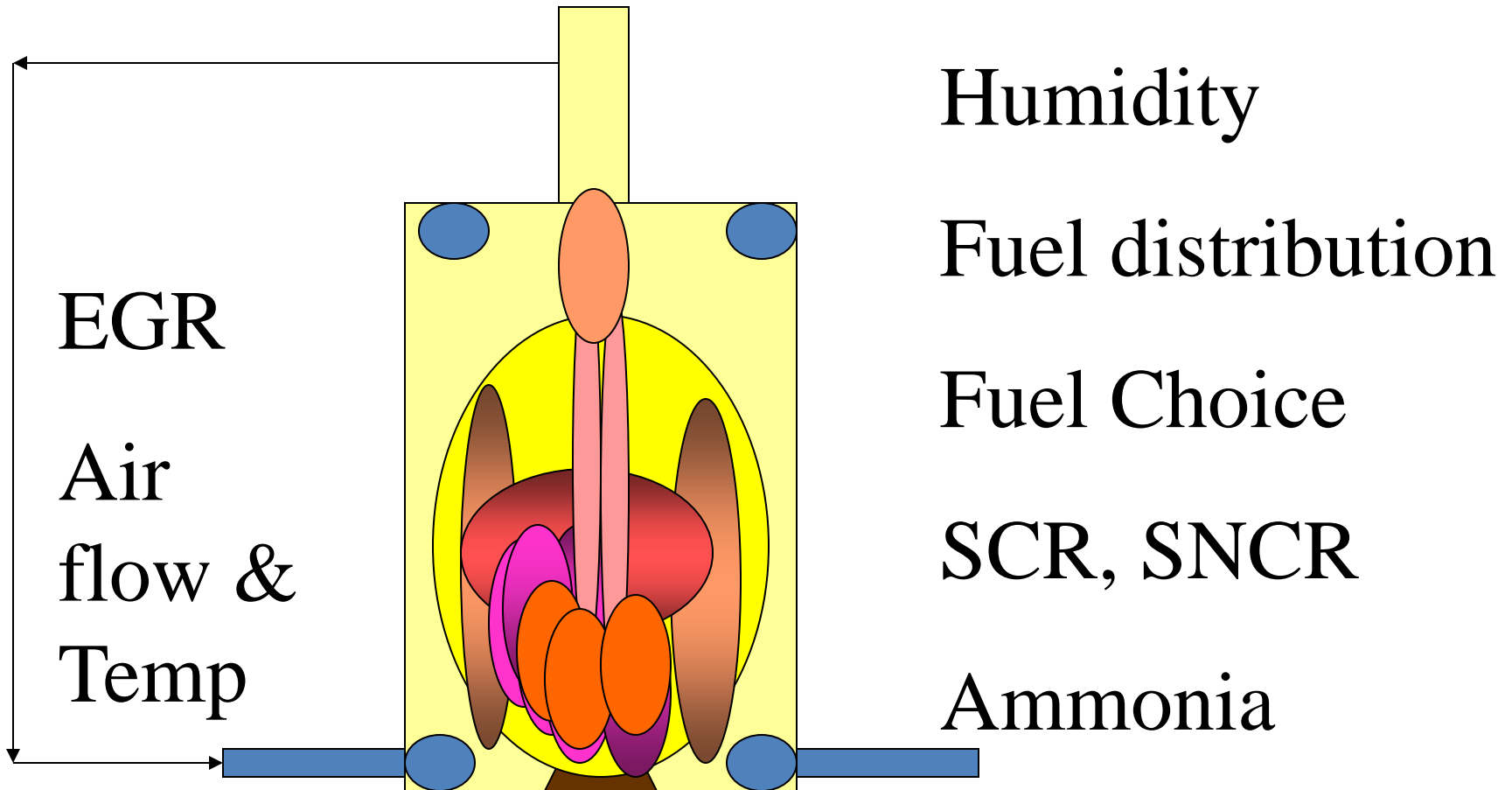


As distinct from SO<sub>x</sub>  
CO<sub>2</sub>, NO<sub>x</sub> not easy to  
estimate. Formed by  
N<sub>2</sub> and O<sub>2</sub> in air.

Reaction very  
nonlinear in T which  
varies in furnace.



# Abatement of Nox



# Le rôle de la mesure

- de nombreuses études de cas
- Ingénieurs "essaient" mesures
- Impossible de calculer l' effet .
- Fine Tuning très important
- Mesurer nécessaire pour les ingénieurs

# REP

- Each company pays 5 €/kg
- Money refunded to same industries
- *Don't get back what you paid!*
- Refund= output share in total fees
- Much like a tax: Lets explore differences
- Tax has 4 effects: Techn./ Price/ Budgetary
- (and tax interaction)

# Economics of REPs (comp. Tax)

$$Pq_i - c_i(q_i, a_i) - Te_i(q_i, a_i) + \sigma_i T[\Sigma_i e_i(q_i, a_i)]$$

$q$  output,  $c$  prod cost,  $a$  abat.  $Te$  charge,  $\sigma$  share and  $\sigma T \Sigma e$  is the refund.

$$c'_a = -Te'_a (1 - \sigma_i)$$

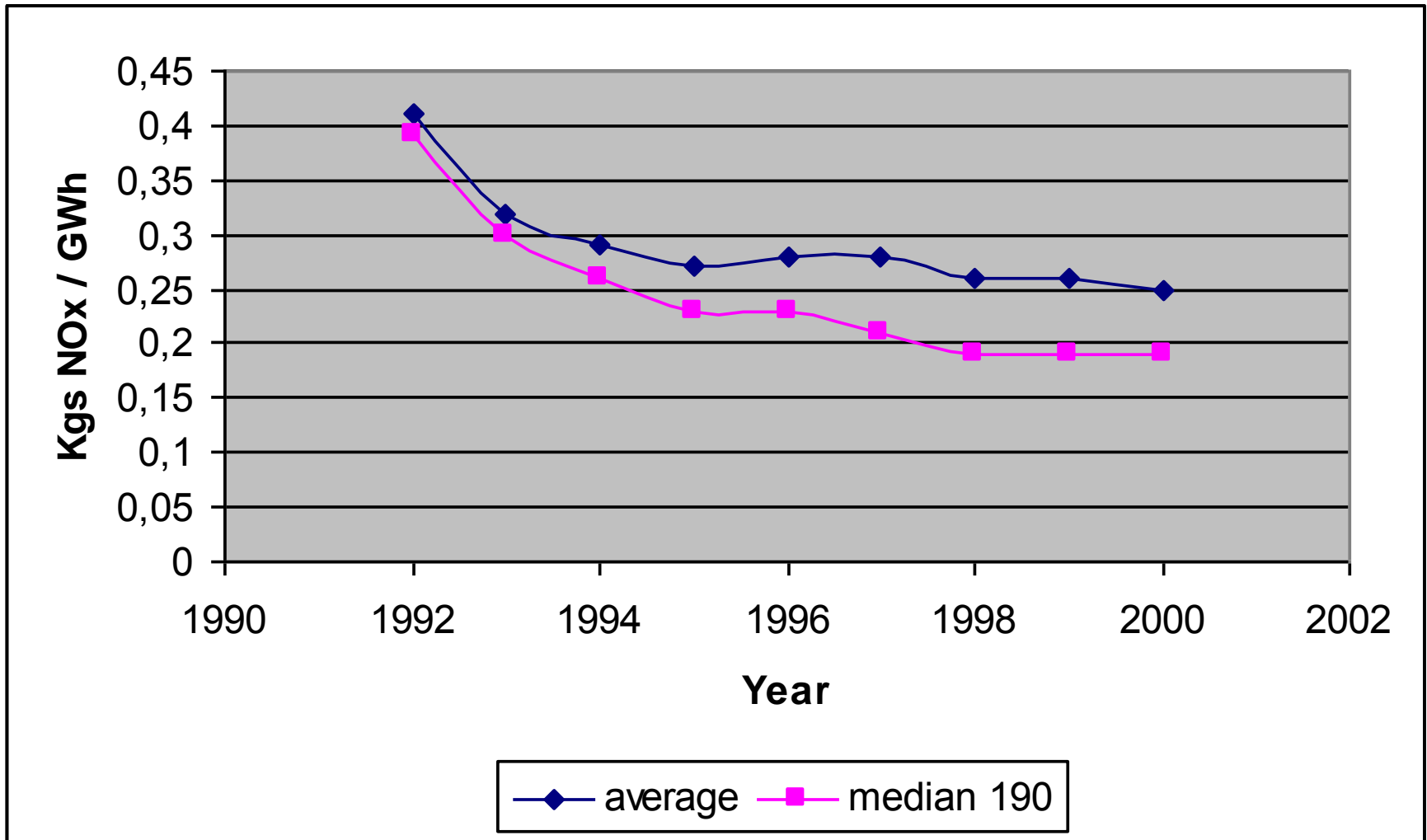
$$P = c'_q + Te'_q (1 - \sigma_i) - T(E/Q)(1 - \sigma_i)$$

# Conclusions

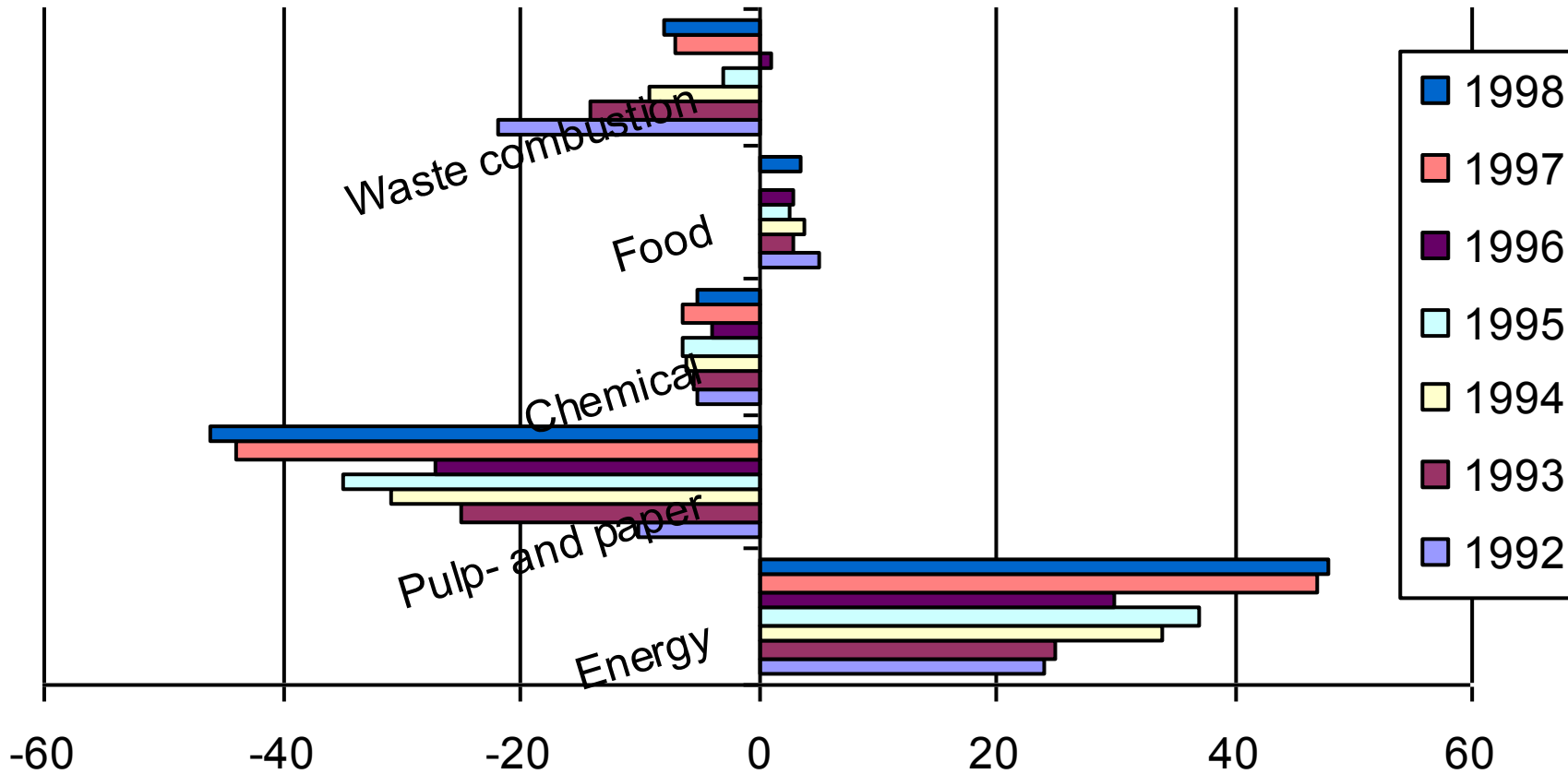
- Incitation abatement les memes
- Paiement moyen = 0 --> Effet prix absent
- Aucun effet competitivité,
- Moins de faillites
- Faisabilité superieur --> avec T élevé
- Lobby contre la taxe impuissante



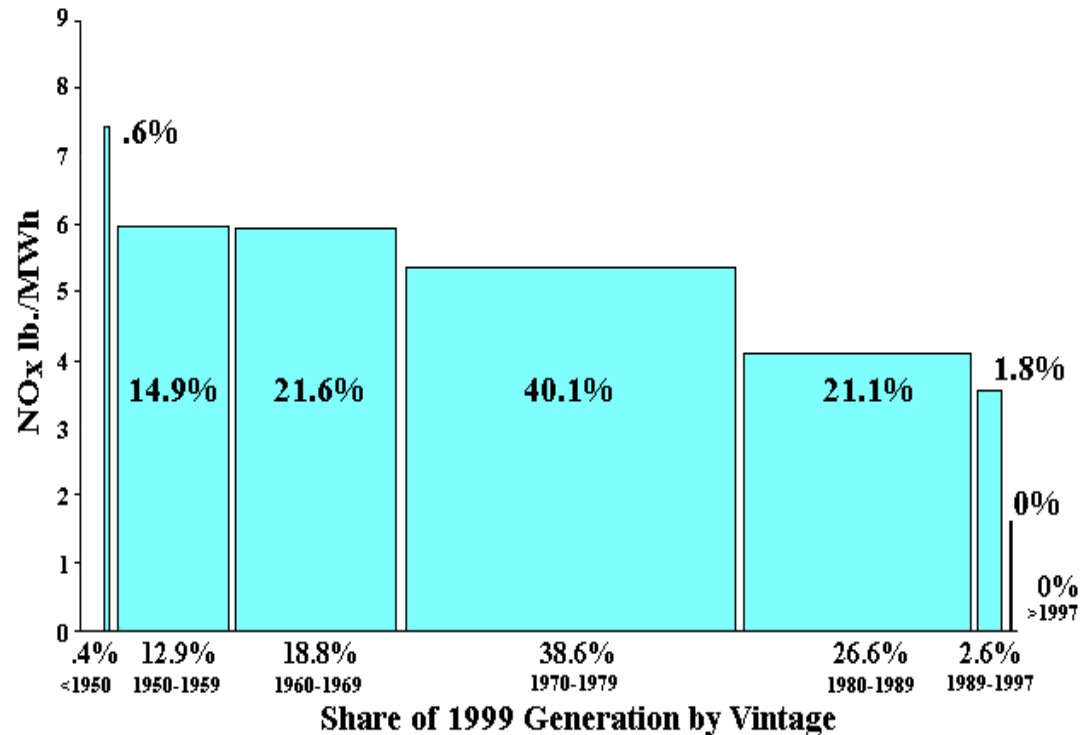
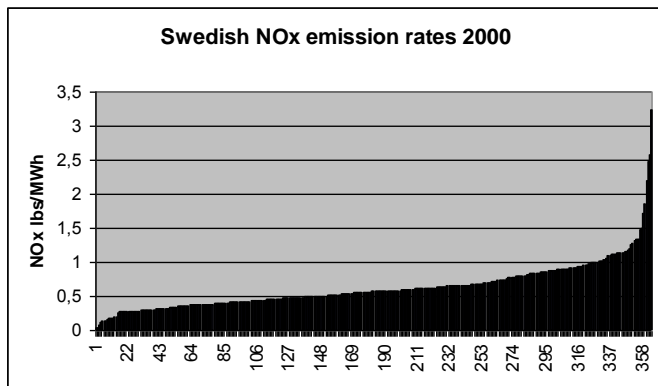
# Lower emission coefficients



# Distribution of net fees



# Comparison em. Coeff Sweden/US

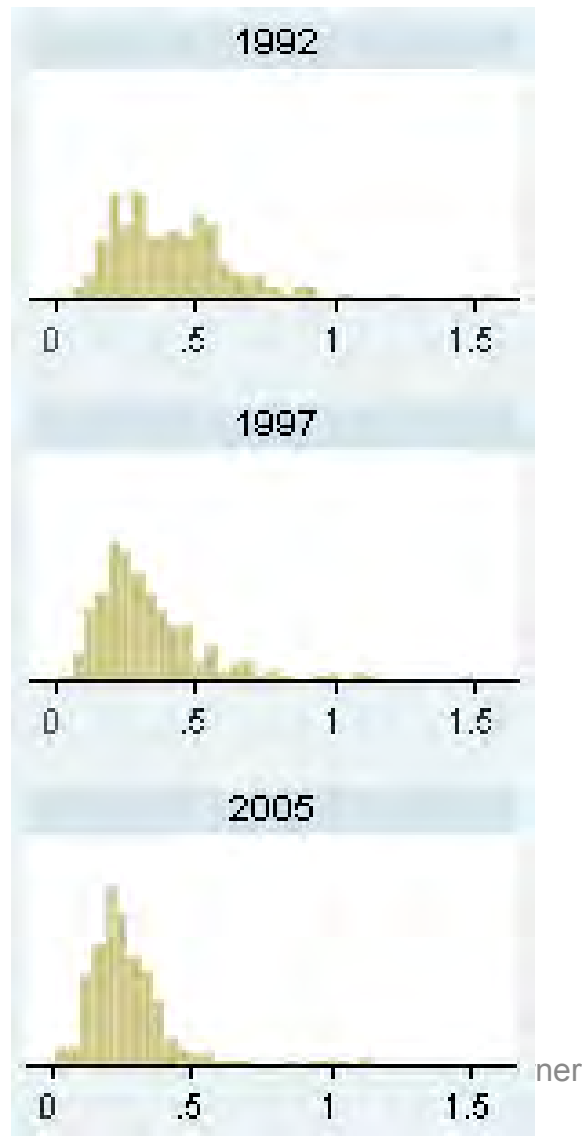


NB A possible correction factor would be 90/40 for efficiency

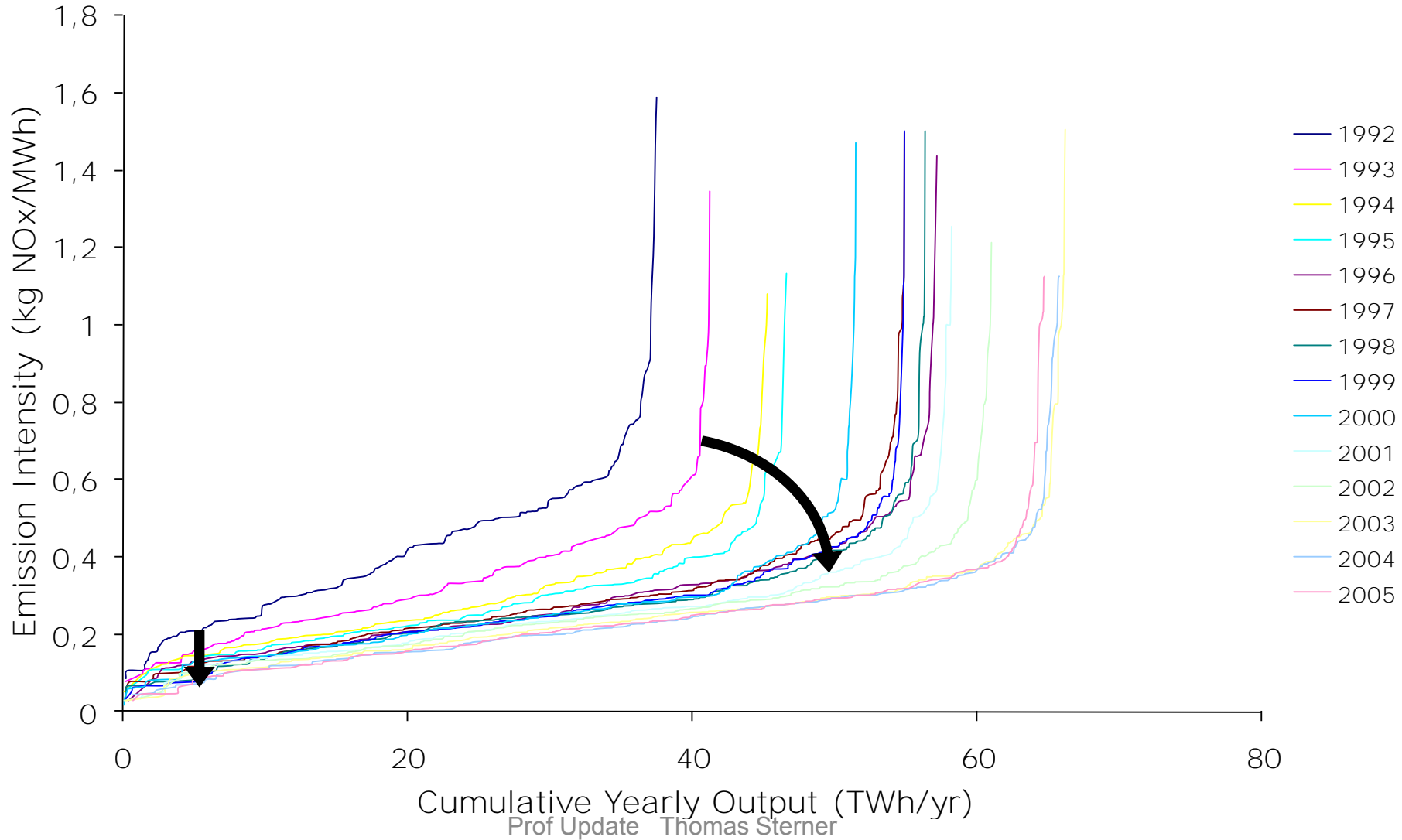
# NOX

- *“The Swedish retrofitted unit, in contrast, demonstrates that  $NO_x$  levels well below the Swedish standard (and also below the German or United States standards) are achievable. ... The Swedish regulatory system, incorporating an economic incentive, clearly motivates [the Swedish plant] to achieve minimal  $NO_x$  rates rather than just comply with the applicable emission standard.” [p. 37].*

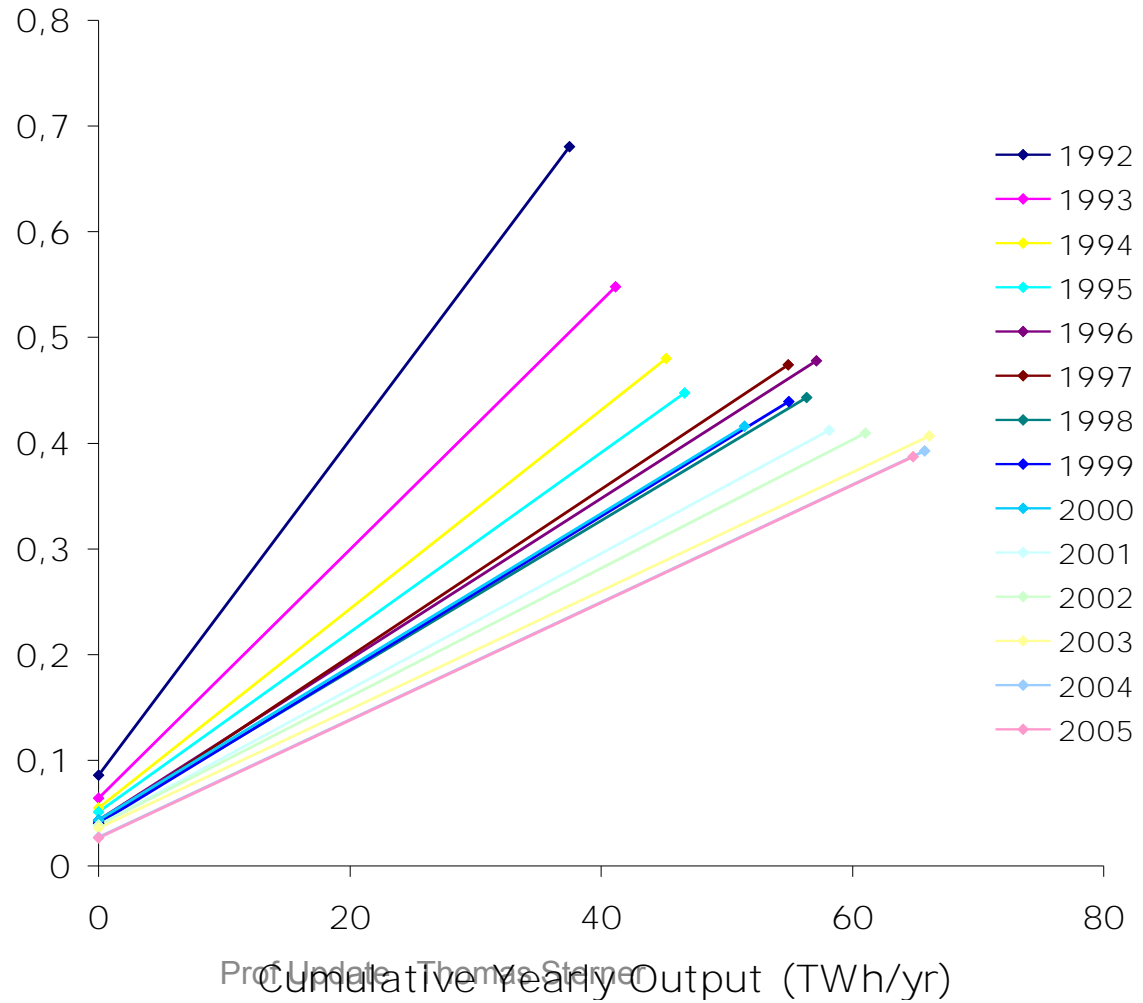
# Emission coeff distributions



# Emission histograms

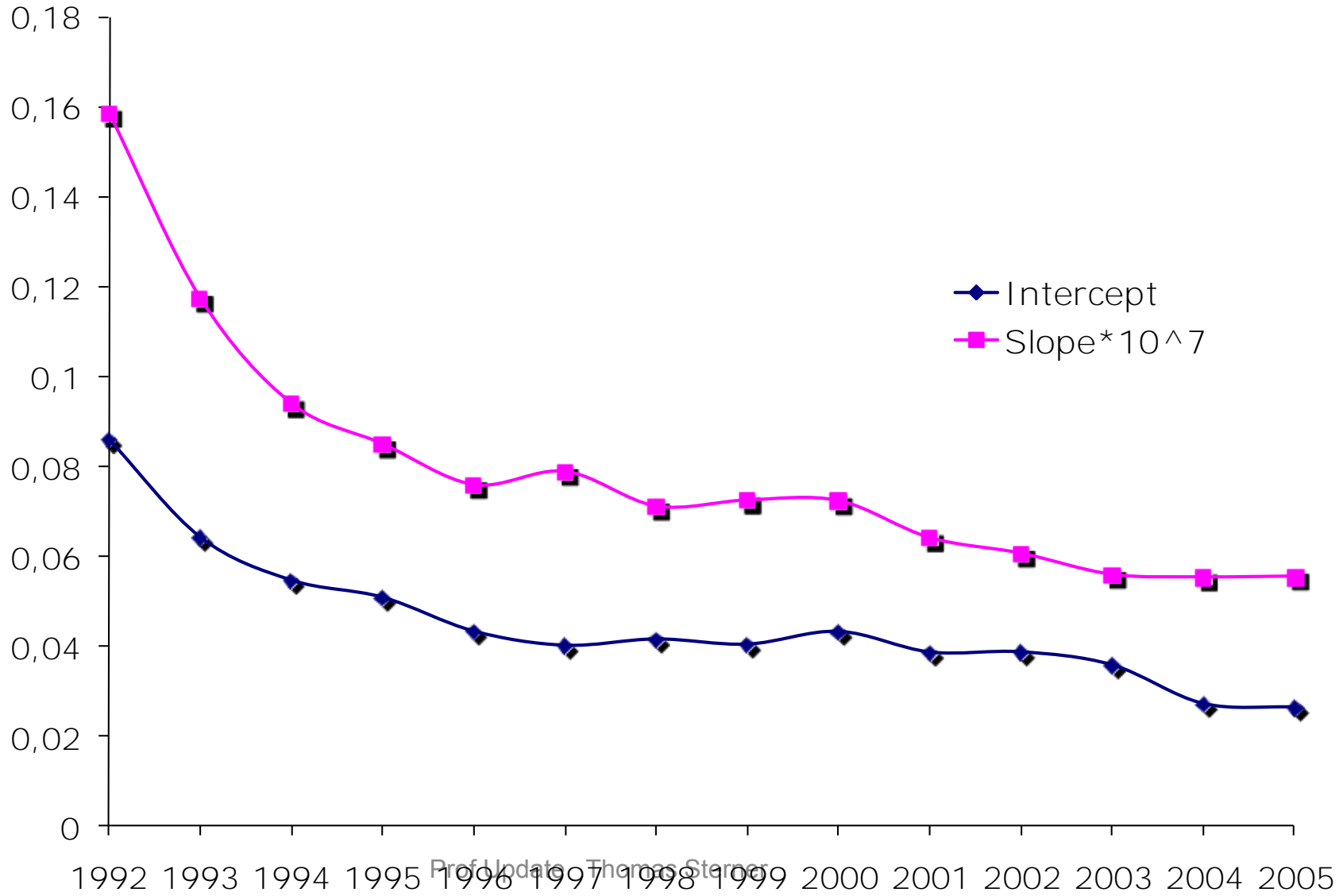


# Innovation and Diffusion



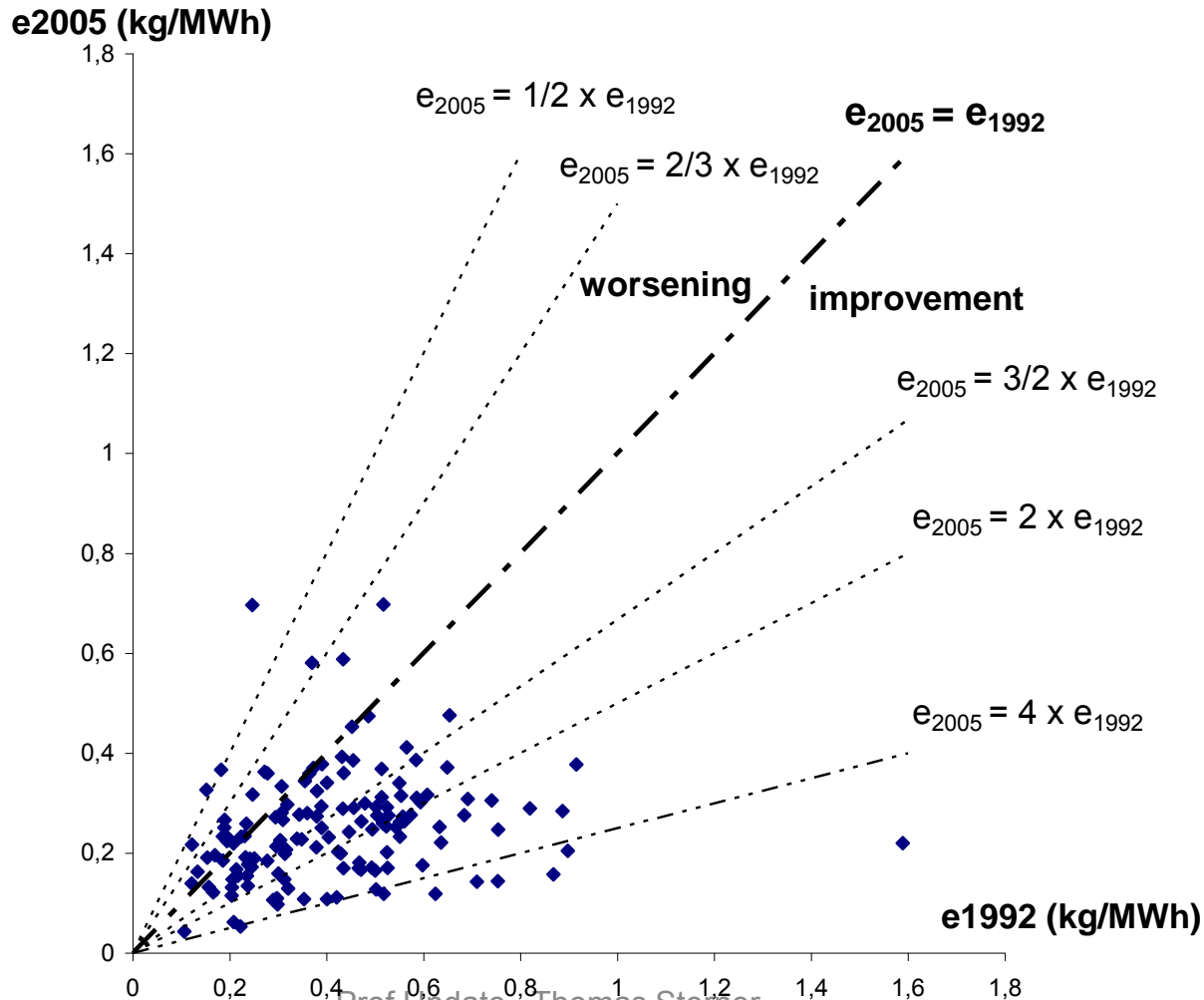
# Innov/Diffusion

kg NO<sub>x</sub>/MWh



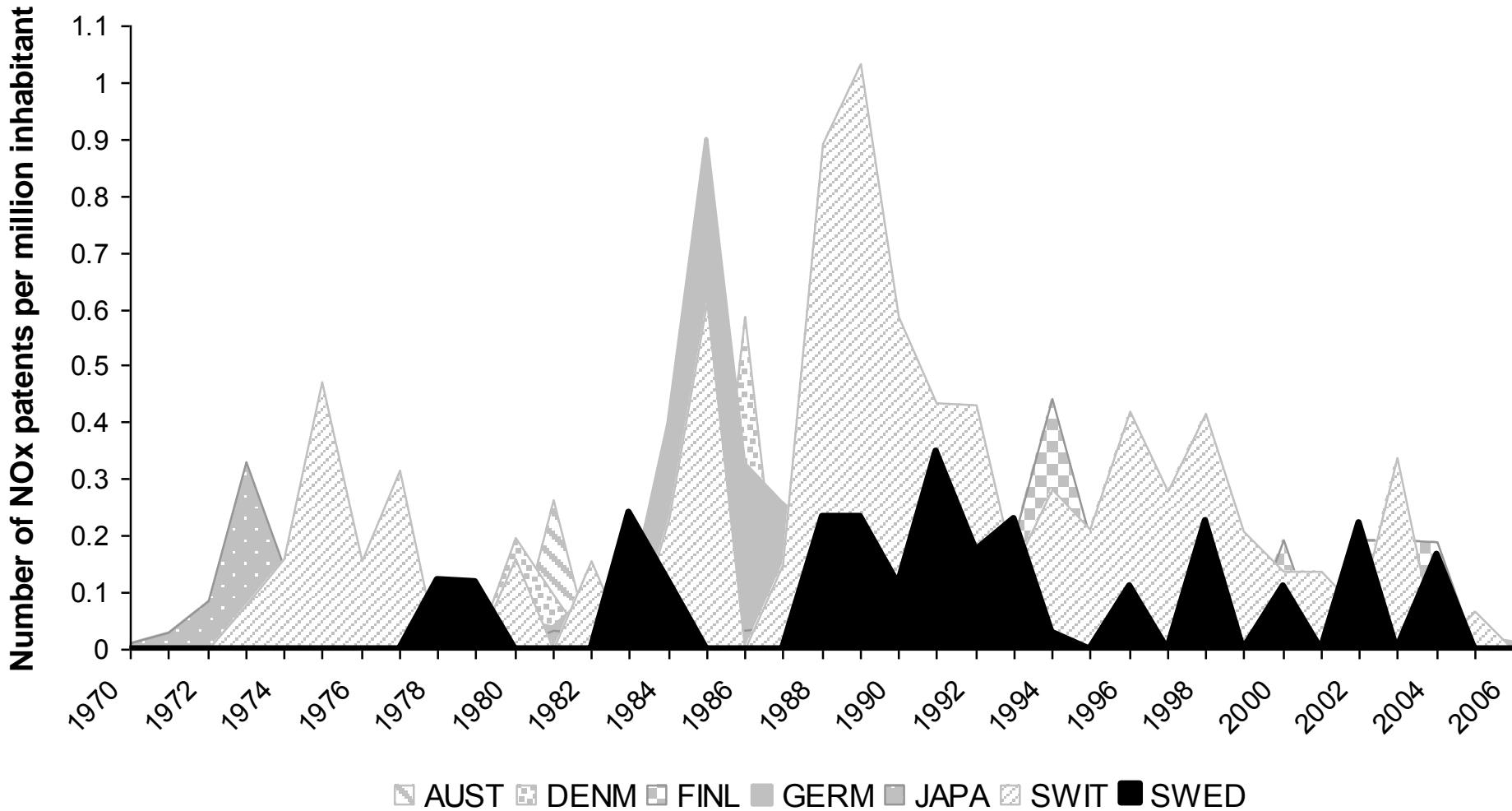


# Individual plant behaviour



Series1  
Series2  
Series3  
Series4  
Series5  
Series6  
Series7  
Linear  
)Series2(  
Linear  
\Series3/

# Patents / Mcap.



## Bonus Malus 2014

Emission de CO2 g/km	Montant en 2013	Montant en 2014
< 20	-7000	-6300
21 à 50	-5000	-4000
51 à 60	-4500	
61 à 90	-550	-150
91 à 105	-200	0
106 à 130	0	0
131 à 135	0	150
136 à 140	100	250
141 à 145	300	500
146 à 150	400	900
151 à 155	1000	1600
156 à 175	1500	2200
176 à 180	2000	3000
181 à 185	2600	3600
186 à 190	3000	4000
191 à 200	5000	6500
> 200	6000	8000

# Pourquoi rembourser?

- Parceque les pollueurs sont puissants
- Permet tax plus élevé
- Crée des incitations au monitoring
- Permet cibler plants (p e grands)
- Equivalent à permis gratuits
- Mieux pour cas de olipopole, economie ouvert

# Pourquoi PAS rembourser?

- L'état a besoin de revenues
- Mieux que otre taxes
- Utiliser les fonds pour compenser les pauvres
- Raisons ideologiques?

# Systeme Noruegien

- Gothenburg Protocol: Reduir emissions NO<sub>x</sub> <156 kt/yr by 2010 (179 in 2008).
- Taxe 2007: 16,14 NOK/kg NO<sub>x</sub>
- *1/1 2008 NO<sub>x</sub> Fund* (run by the business) ***Firms in Fund exempted from tax.***

# Norway's NO<sub>x</sub> Fund

- -11 NOK /kg NO<sub>x</sub> industrie pétrolière
  - 4 NOK /kg NO<sub>x</sub> Autres industries.

Après sollicitude le Fund finance 75% de couts

Daglig leder Geir Høibye i NOx-fondet har hittil mottatt 66 søknader om støtte





# Mainly Ships, oil riggs...



The screenshot shows a web browser window with several tabs open, including 'Recent - Google Drive', 'ostfondue 2012', 'Copy of ostfondue 2', and 'The NOx Fund'. The address bar shows the URL <https://www.nho.no/Prosjekter-og-programmer/NOx-fondet/The-NOx-fund/>. Below the address bar, there is a translation prompt: 'This page is in Norwegian' with a dropdown menu, and buttons for 'Translate' and 'Nope'. The NHO logo is visible in the top left corner of the page content, followed by navigation links: 'Maler og veiledere', 'Politikk og analyse', 'Lønn og tariff', 'Prosjekt og program', 'Bli medlem', and 'Om NHO'. A breadcrumb trail reads: 'NHO - Næringslivets Hovedorganisasjon > Prosjekt og program > NOx-fondet > The NOx Fund'. The main content area features a large image of a ship's funnel on the left and the title 'The NOx Fund' on the right. Below the title, a paragraph explains the fund's purpose: 'Reduced NOx emissions are the primary objective of the Environmental Agreement relating to NOx and the Business Sector's NOx Fund. The Fund is a cooperative effort where Participant enterprises may apply for financial support for NOx reducing measures. Payments made to the Fund shall replace the governmental NOx tax for Participant enterprises. The NOx fund is established by 15 cooperating business organisations.'

NHO

Maler og veiledere    Politikk og analyse    Lønn og tariff    Prosjekt og program    Bli medlem    Om NHO

NHO - Næringslivets Hovedorganisasjon > Prosjekt og program > NOx-fondet > The NOx Fund

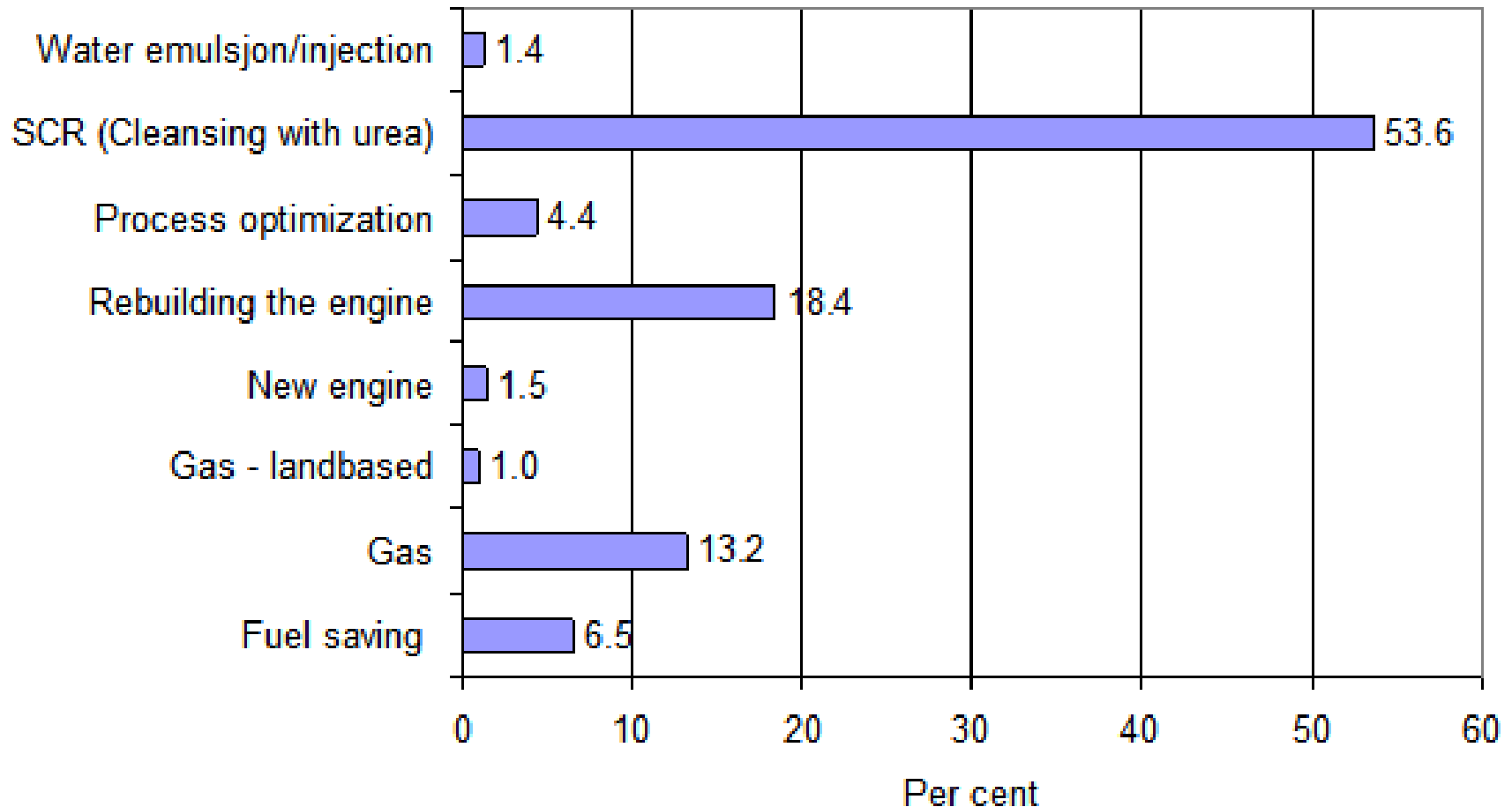


## The NOx Fund

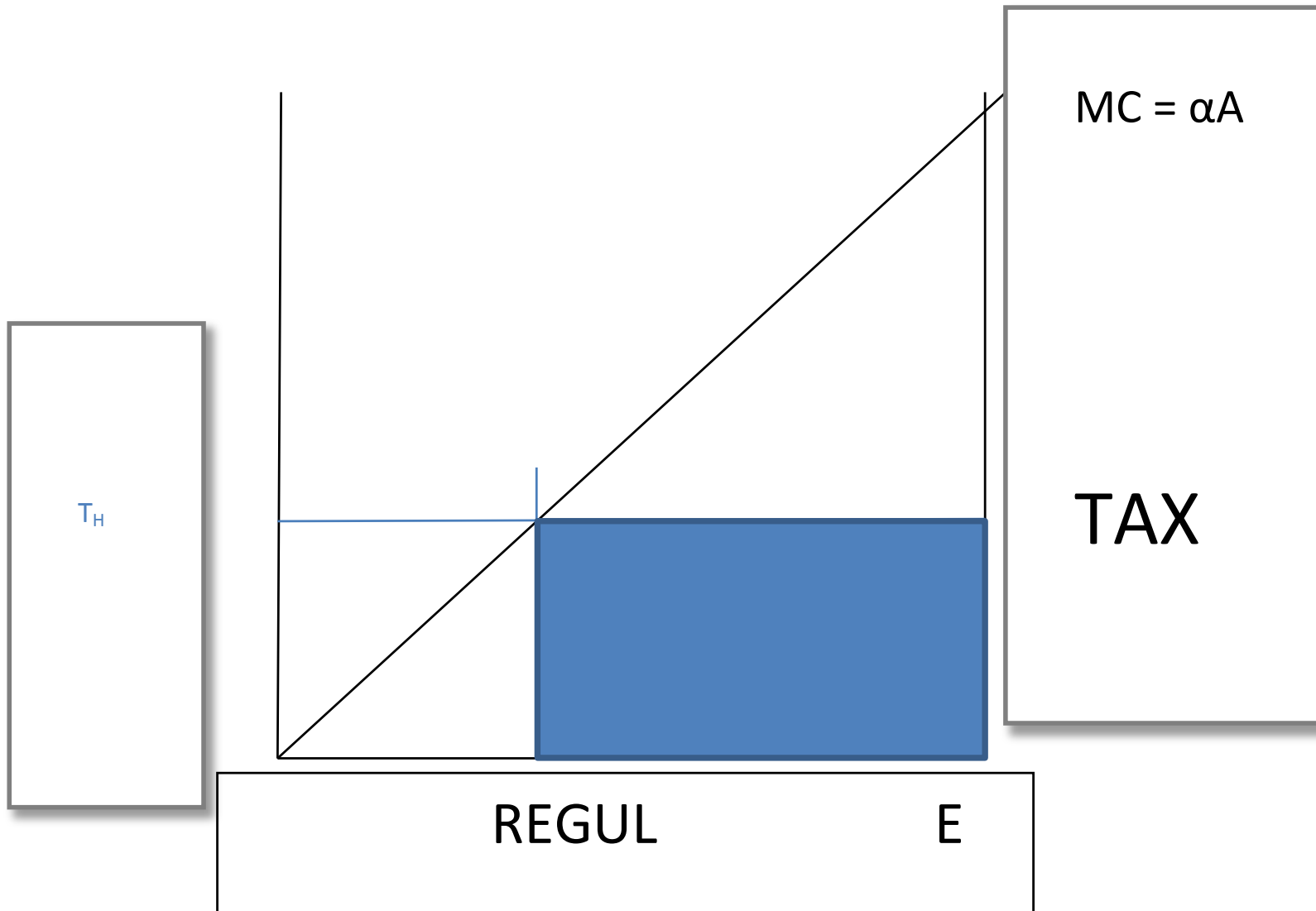
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# Main Investments

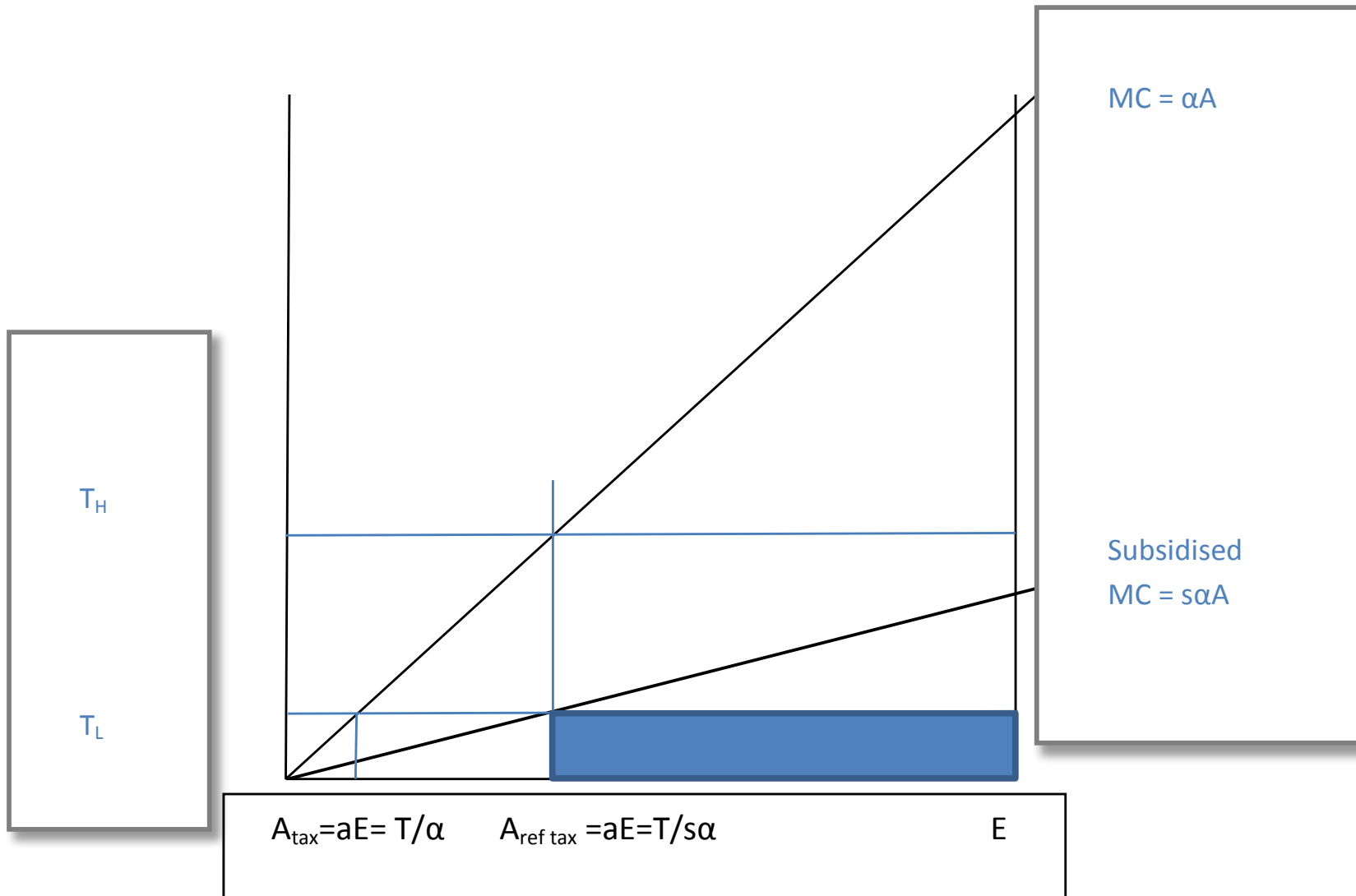
Type of investment - share of emission reduction



If high tax needed then big tax revenues (good or bad?)



# Fees used to finance subsidy



# Output based Refunding (OB):

$$\pi_i = p_i q_i - c_i(q_i) - A_i - te_i(q_i, A_i) + \sigma_i tE. \quad (1)$$

$$\sigma_i = \frac{q_i}{Q}. \quad (2)$$

**EB**  $\pi_i = p_i q_i - c_i(q_i) - (1-s)A_i - te_i(q_i, A_i), \quad (8)$

problematic that  $s$  endogenous; (9) necessary for budget constraint:

$$s = \frac{tE}{A}, \quad (9)$$

# Le Seminaire

- Mon ami et collègue Jean-Pierre Ponsard  
Parlera des allocations gratuits de permis.

Le lien entre les deux sujets c'est que ce sont des instruments équivalents.

Les mêmes facteurs de faisabilité affectent les choix. C'est finalement question d'acheter de l'appui ou apaiser la résistance contre ces idées

# Choix d'instruments selon critère de distribution de paiement

	Polleur	Mix	Société
Q	Nettoyage public <u>Permis</u> gratuit.	Acc. Vol (Permis)	Permis aux enchères
P	Subvent.	Taxe + subv <b>REP</b>	<u>Taxe</u>

# Merci

- Thomas Sterner
- Prochaine seminaire:
- Vendredi Prochaise sur **Le Prix de l'Avenir !**



# PROPERTIES OF REP

- Similar to tax on excess pollution
- Or tax-subsidy
- Useful when output effect **not** wanted
- Small open economy (competitiveness issues)
- Targetting of only some industries
- Compact lobby of powerful polluters
- Oligopoly (see Requate and Gersbach)