

14.0 SUMMARY TABLES OF TIER 2 TAXES AND CHARGES

This chapter presents a synthetic summary, across the nine taxes and charges analysed in Tier 2. The summary tables present – where possible - synthetic information on the application of the tax and the effect on price and costs, the subsequent impacts on the internal market, competition and employment, as well as the effect of the tax on the environment.

The Application of the Tax and the effect on price and costs

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Table E1: Point of Application of the Tax - "Taxable Event"

MS			MS			MS		
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	All combustion plants producing greater than 50GWh useful energy, threshold lowered to 40 GWh 1996, 25 GWh 1997	E (Galic ia)	NO _x emissions assessed through direct measurement of emissions or through the use of emission factors supplemented by some form of inspection	F	NO _x emissions from power plants (>20MW) and waste incineration facilities (combustion greater than 3 tonnes per hour). Also, plants with excessive emissions (>150 tonnes per annum). Levied on measured quantities or declared emissions. Most plants do not measure emissions		
2) Water Abstraction Charges	NL	Groundwater: extraction by water works or other entities (industry, agriculture) Water companies do monitoring and other abstractors carry out self-monitoring	DK	Piped water at delivery (m ³) (mainly households but some enterprises)	E	On water price. The water regulation levy subjects all those holding water use rights who benefit from regulation waterworks of surface and groundwater as well as right holders who use specific infrastructures.		
3) Waste Water Charges	DK	Direct Discharges of BOD, Phosphorus (P), Nitrogen (N) to surface waters (on basis of monitoring of discharges or according to a table of hydraulic discharge standard values)	NL	Discharges to surface water of COD, Nitrogen, and 8 metals or heavy metals (discharge to sewage covered as well as direct discharges) – monitoring is done by dischargers	D	Direct dischargers of COD, P, N and 7 other including 6Heavy metals and organic halogens		
4) Pesticides Taxes/Charges	S	On manufacturers and importers based on active ingredient	DK	On retail price and import where imported for own use	B	On retail price		
5) Mineral Surpluses and Fertiliser	NL	Since 1998: tax on Nitrogen-surplus and P2O5-surplus per hectare – based on mineral accounts	FIN	1976 till 1994: first per kg of fertiliser, later per kg N and per kg P in the fertiliser	S	Manufactured and imported fertiliser, on basis of N and P content		
	A	1986 till 1994: retail price of fertiliser on basis of N, P2O5 and K2O content of fertiliser						
6) Landfill taxes	F	Licensed/unlicensed Landfill site operator pays the tax on all household, municipal and mixed industrial (inert) waste.	UK	Licensed landfill operator pays the tax when (all) waste enters the site	A	Landfill operator is responsible for the payment of the tax on all waste disposed at a licensed landfill site or exported.		

MS			MS		MS	
7) Aggregates tax	DK	Tax on amount commercially extracted and imported. Materials for export exempt.	S	Tax falls due when the gravel is either sold or used within the business Any company that requires a permit for exploiting a site must pay the tax.	UK	4 taxable events: Physical removal from the site where it was extracted; sale to another person; use for construction purposes; or mixing with anything which is not chargeable aggregate or water.
8) Packaging Taxes	FIN	Container filler or importer, when product released for consumption	DK	Fillers, packers and importers of taxable products categories	S	Manufacture or import (not clear whether paid by the container manufacturer or the producer of the final drink)
9) Batteries Taxes	I	On retail price. Specific tax	B	On retail price. Specific tax	HU	Charge levied on battery according to weight

Tax/Charge as a % of the price of the taxed good (or element) or service.

Table E2: Direct Sectors Affected

	MS	Sector and extent of burden *	MS	Sector and extent of burden *	MS	Sector and extent of burden *
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	All large power plants– pulp- and paper sector faces largest net cost of the refunded tax, with incineration and chemicals sector Energy producers and food sector are net winners.	E (Gal.)	Not known	F	Heat and power sector (power station and waste incineration plants) and some production plants, with high levels of emissions
2) Water Abstraction Charges	NL	Water companies, Industry and agriculture	DK	Households and selected businesses	E	Households in urban areas Irrigation co-operatives?
3) Waste Water Charges	DK	Sewage treatment plants, Industry and dwellings not connected to sewer	NL	Sewage treatment plants, municipal treatment, Industry	D	Sewage treatment plants Industry
4) Pesticides Taxes/Charges	S	Agriculture and pesticide manufacturers and importers	DK	Agriculture and pesticide manufacturers and importers	B	Eco-tax: potentially wood industry and households; New Pesticides charge: Agriculture only
5) Mineral Surpluses and Fertiliser	NL	Agricultural sector: till 2001 pig and poultry farms and dairy farms with > 2.5 cow equivalent units per ha. From 2001 on: all agricultural farms	FIN	Agricultural sector and fertiliser industry	S	Agricultural sector and fertiliser industry
	A	Agricultural sector and fertiliser industry				
6) Landfill taxes	F	Recycling Industry: 0.3% Incinerator operators Municipalities and waste producers	UK	All sectors producing waste	A	All sectors producing waste
7) Aggregates tax	DK	Construction / road building / glass industry. Very little difference in burden between sectors.	S	Construction / road building / glass industries	UK	Construction / road building
8) Packaging Taxes	FIN	Soft and Alcoholic Drink producers and importers	DK	Fillers and importers of containers	S	All drink producers and importers, except milk.
9) Batteries Taxes	I	Consumer Battery Industry	B	Consumer Battery Industry	HU	Consumer Battery Industry

Table E3: Tax / Charge Rates

MS			MS		MS	
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	40.000 SEK (4.430 EUR)/t	E (Gal.)	5000 Ptas/t (1001-50,000 t) 5,500 Ptas/t (>50,000 t)	F	150 FF (22,9 EUR)/t (1991-95) 180 FF (27.4 EUR)/t (1996-)
2) Water Abstraction Charges	NL	Water companies 0.34 NLG (0.15 EUR)/m ³ Industry / agriculture 0.17 (0.08 EUR)NLG/m ³ Infiltrated groundwater 0.055 NLG (0.025 EUR)/m ³	DK	1 DKK (0.13 EUR)/m ³ 1994 5 DKK (0.67 EUR)/m ³ 1998 plus 25% VAT	E	
3) Waste Water Charges	DK	Standard rates: COD: 1,48 EUR/kg N: 2,68 EUR/kg P: 14,77 EUR/kg Heavy metals: No charge	NL	State waters 65NLG (29 EUR)/pollution unit Waterboards: average 82 NLG (37 EUR) per pollution unit, Standard rates for state waters: COD: 0,59 EUR/kg Mercury, cadmium, arsenic: 294 EUR/kg Copper, zinc, lead etc. 29,50 EUR/kg	D	70 DM / standard unit translates into the following standard rates: COD: 0,72 EUR/kg N: 1,43 EUR/kg P: 11,93 EUR/kg Mercury: 1790 EUR/kg Cadmium: 358 EUR/kg Chromium, nickel, lead: 72 EUR/kg
4) Pesticides Taxes/Charges	S	4 SEK (0,44 EUR)/kg active ingredients (a.i.) (1984) 8 SEK (0,88 EUR) /kg a.i. (1988) 20 SEK (2,2 EUR) /kg a.i. (1994)	DK	Insecticides 54% of retail price; fungicides, herbicides and growth regulators 33%; microbiological agents: 3% of wholesale price.	B	Eco-tax: 10BEF (0,25 EUR)/g toxic a.i. (5 a.i.s) - 2 BEF (0,05 EUR)/g a.i. for less toxic a.i.s (never implemented) New Charge: 0.1 BEF (0,0025 EUR)/g a.i. (same a.i.'s)

	MS		MS		MS	
5) Mineral Surpluses and Fertiliser	NL	1998: Nitrogen (N): 1.50 NLG (EUR 0.68)/kg Phosphorus (P ₂ O ₅): 2.50 NLG (EUR 1.13)/kg 2000: 1.50 NLG (EUR 0.68)/kg N 5.00 NLG. (EUR 2.27)/kg P ₂ O ₅	FIN	1976-1992: Nitrogen/phosphorus (N/P): FIM 0.04 – 0.60 (EUR 0.006 / 0.09)/ kg P/N 1993-94: FIM 2.90 (EUR 0.44)/kg P/N	S	1985-1988: N: 30 ore (0.033 EUR)/kg ; P: 30 ore/kg 1988-1992: 60 ore (0.066 EUR)/kg N: 120 ore (0.13 EUR)/kg P Jan 1994 – tax on P abolished Nov 1994 – tax on N : 180 ore (0.19 EUR)/kg
	A	1986: Nitrogen: ATS 3.5 (EUR 0.25)/kg Phosphorus (P ₂ O ₅): ATS 2.0 (EUR 0.15)/kg Potassium (K ₂ O): ATS 1.0 (EUR 0.07)/kg			1991 till 1994: ATS 6.5 (EUR 0.47)/kg ATS 3.5 (EUR 0.25)/kg P ₂ O ₅ ATS 1.9 (EUR 0.13)/kg K ₂ O	
6) Landfill taxes	F	1993-4: 20 FF (EUR 3.05)/t 1995-7: 25 FF (EUR 3.81)/t 1998: 40 FF (EUR 6.1)/t 1999: 60 FF (EUR 9.15)/t	UK	Inert Waste: £2 (approx. EUR 3)/t Active Waste: £7 (approx. EUR 10.5)/t (1996) £10 (approx. EUR 16)/t (1999) £11/t (approx. EUR 18) (2000)	A	Rates are complex. As at 2000,: Landfills not state of the art: Demolition waste: 100ATS (EUR 7.27)/t Excavated soil : 100ATS/tonne Waste according to Annex. 1 600 (EUR 43.89) ATS/t Other waste: 600ATS/t <i>State of the art:</i> Demolition waste 100 ATS/t Residual waste 200 (EUR 14.41) ATS/t Mass waste 300 (EUR 21.8) ATS/t
7) Aggregates tax	DK	5 DKK (0.67 EUR)/m ³	S	SEK 5 (EUR 0.5674)/t of natural gravel	UK	£1.60 (EUR 2.55)/t

	MS		MS		MS	
8) Packaging Taxes	FIN	4 FIM/litre on disposed (0.67 EUR/l) 1 FIM/litre on recycled (0.17 EUR/l) 0 FIM/l on refilled	DK	0.75 – 30 DKK (EUR 0.1 – 4.0)/kg of packaging material (weight based) 0.15 – 3.2 DKK (EUR 0.02 – 0.43)/container (volume based) 10 - 22 DKK (EUR 1.34 – 2.95)/kg paper or plastic carrier bags	S	1984 –1993 0.08 SEK (EUR 0.0088) on deposit 0.1 – 0.25 SEK (EUR 0.011 – 0.0277) on non-deposit
9) Batteries Taxes	I	1998: Starting Batteries <9Ah: 400 ITL (EUR 0.21) Starting batteries from 10 - 70 Ah: 1600 ITL (EUR 0.83) Starting batteries > 70 Ah: 3200 ITL (EUR1.97)	B	20 BEF (0.5 EUR) per battery sold (20-30% of sales price)	HU	Batteries filled with electrolyte: HUF 38-45 (EUR 0.14-0.17)/kg between 1995 and 2000; later in 2000 HUF 50 (EUR 0.19)/kg Batteries not filled with electrolyte: HUF 38-63 (EUR 0.14-0.24)/kg between 1995 and 2000; later in 2000 HUF 70 (EUR 0.26)/kg

Table E4: What are the Effects of the Tax/Charge on (Input) Price

	MS	Effect	MS	Effect	MS	Effect
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	Abatement cost plus refunded charge (positive or negative) is less than 1% of total production value of each respective sector.	E (Galia)	Minimal	F	Minimal (Industry bears some small abatement costs, which will not have any measurable effect at the macro level of prices.)
2) Water Abstraction Charges	NL	SMEs and industries:supplied by water works: about 40% price increase Industry with self-extraction of groundwater:about 113% price increase Dutch industry as a whole: 0.03% of turnover, or 0.08% of value added (1996: 0.33% of pre-tax profits) Households: 27% price increase, (against average water tariffs excl. sewage costs) , pay 52% of the tax revenue.	DK	From 1989 to 2000: water bill doubled, from about 12 DKK/m ³ to 25 DKK/m ³ . The water tax is responsible for about half of this increase, while the other half is due to increased water supply tariffs, increased sewage costs and the waste water tax.	E	The levy is set on a case by case basis to recover the infrastructure cost so average values are not very representative. Water prices paid by final users: 1.14 and 0.84 EUR/m ³ in urban areas to 0.29 and 0.12 EUR/m ³ in other areas.
3) Waste Water Charges	DK	1998 revenue from sewage plants accounts for 5% of the total sum of user fees for sewage treatment. Connected industry: cost increase less than 0.01% of the wage sum. Direct dischargers with 70% reduction: additional cost of about 0.2% of turnover. Direct dischargers with 97% reduction: cellulose production is most affected (tax = 0.3% of turnover)	NL	The cost of the levies amounted to 0.3% of sales value, 1% of total value added and 3.9% of net profits in 1996.	D	For indirect dischargers: tax accounts for 2% of sewage bill For public sewage treatment plants which do not comply with the BAT (Best Available Technology) standard: increase in costs by up to 10% of total operating costs. For plants that comply with BAT: tax accounts for 2% of total operating costs

	MS	Effect	MS	Effect	MS	Effect
4) Pesticides Taxes/Charges	S	Tax amounts to 5-8% of pesticide price	DK	Tax as % of retail price: Insecticides: 48% Herbicides/Fungicides: 13-14% Manufacturers / retailers appear to absorb some of the tax =2% value of crop production	B	Not available
5) Mineral Surpluses and Fertiliser	NL	Not applicable: the tax is on nitrate surpluses, not on a product	FIN	Price increase of fertiliser +72% (1992-1994)	S	1984: tax accounts for 10% of fertiliser price 2000: about 20% of the fertiliser price 1994: fertiliser expenditure accounted for 14% of farm income (Gross Added Value)
	A	1987-1989: 10 to 12% price increase (fertiliser). No pass through to food products. Fertiliser expenditure accounted for 8% of farm income (Gross Added Value)				
6) Landfill taxes	F	Landfill price increase (range) Municipal: 6% to 15% Industrial Mixed: 6% to 15%;	UK	Landfill price increase (range) Inert Waste only: 66 to 200% gate fee increase. (accepting also active waste: +36 to 88% gate fee increase) Active Waste only: 35 to 200% gate fee increase	A	Landfill price increase (range) Demolition waste: 3-15% of gate fee Other waste at Best technology landfill: 6 to 12% of gate fee Average: around 5-15% of total disposal costs
7) Aggregates tax	DK	Tax represents between 33 % and 3 % of raw material price (depending on material)	S	Tax accounts for about 10% of raw material price increase	UK	Varies, though a typical raw material price increase might be 30%
8) Packaging Taxes	FIN	It is assumed that cost of the tax is passed through to consumers, e.g. according to retailers, the bottle deposit system costs consumers an additional FIM 400 million (MEUR 67) annually.	DK	No data in % available; no evidence has been found suggesting the extent to which the tax has been passed on to consumers.	S	Not available. Estimated to be small.
9) Batteries Taxes	I	1.7% price surcharge on industrial batteries	B	5% of consumer price	HU	Difficult to estimate. E.g. in the case of car batteries, the product charge is approximately 7-8% of the consumer price.

Table E5: What are the Exemptions to the Tax/Charge

	MS	Exemption	MS	Exemption	MS	Exemption
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	1992-5: Plants producing less than 50GWh useful energy per year. 1996: Plants producing less than 40GWh useful energy per year. 1997: Plants producing less than 25GWh useful energy per year. Non-stationary emissions of NO _x .	E (Gali cia)	The first 1,000 t of emitted NO _x exempted from tax	F	Production plants which emits less than 150 tons NO _x per year and power stations and waste incineration plants below the tax thresholds. All other NO _x emitters (including non-stationary sources).
2) Water Abstraction Charges	NL	Sprinkling and irrigating land Draining of building sites, Small pump capacity Sanitation of polluted groundwater, Emergency extractions (e.g. fire department etc.), Extractions for skating rinks, Draining and mining All surface water abstraction	DK	Farmers Industry	E	Irrigated lands, which do not benefit from Basin Authorities built infrastructures. Most groundwater users Most water users linked to hydroelectric uses that have built and directly paid for the infrastructures Utilities that supply urban water where they have already paid for the infrastructures (75%)
3) Waste Water Charges	DK	97% tax reduction: fish processing , cellulose, sugar beet industries. 70% tax reduction: organic pigments, pectin/vitamins industries. (exempted industries account for 66% of total BOD-discharges, 11% of Nitrogen-discharges and 11% of Phosphorus-discharges)	NL	Subsidies from the levy were given to some industries such as pulp and paper and other industry – these were stopped in 1996	D	Discounts of 50% are awarded to companies respecting Best Available Technology standards. Also, agreement was reached with the pulp and paper industry
4) Pesticides Taxes/Charges	S	Wood preservatives	DK	“old” wholesale charge still remains on pesticides used in the forestry sector and public health (rodenticides etc.).	B	Eco-tax: All Farmers and most pesticides Pesticides charge: Most pesticides
5) Mineral Surpluses and Fertiliser	NL	Arable farms are not included in the system, but they will be from 2001.	FIN	No exemptions	S	No exemptions

	MS	Exemption	MS	Exemption	MS	Exemption
	A	No exemptions				
6) Landfill taxes	F	Owner operated landfill sites Community refuse return Sorting Centres Transfer sites Industrial waste recovery options	UK	Pet cemeteries; Dredging from inland waterways and harbours; Mining and quarrying waste;; Reclamation of contaminated land Backfilling materials for quarries and landfill capping materials and waste from US military bases	A	None
7) Aggregates tax	DK	Extractions for coastal projects Sea floor materials Residual and waste products Top soil and mould Commercial extractions less than 200 m ³ annually.	S	Activities within gravel pits and for aftercare at the site are exempt from the charge. Crushed rock is not taxed	UK	Materials used for similar purposes as aggregates - clay, shale and slate; Minerals (mainly for industrial use) whose extraction necessarily involves the extraction of stone, gravel or sand-anhydrite, ball clay, barytes, calcite, china clay, china stone, fireclay, fluorspar, gypsum, potash, sodium chloride, and talc; and Materials such as coal, metals and peat
8) Packaging Taxes	FIN	Exemptions for refillable containers Reduced charge for containers which are recycled in an approved deposit-refund scheme.	DK	Food. Drinking containers that are part of the deposit refund system are charged on container volume basis rather than packaging weight.	S	Only applied to drinking containers, not other packaged goods. Milk containers exempt from 1973. Paper and card exempt from 1984. Reduced charge for reusable containers.
9) Batteries Taxes	I	No exemptions	B	Batteries that are difficult or dangerous to remove (e.g., those in medical appliances), and those part of a deposit refund scheme are exempt	HU	No product charge for dry batteries

Table E6: Price Elasticities for the product/pollution charged/taxed

	MS	Elasticity	MS	Elasticity	MS	Elasticity
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	N/A.	E (Galicia)	N/A.	F	N/A.
2) Water Abstraction Charges	NL	-0.05 - -0.30	DK	N/A.	E	Agriculture for low-price ranges: -0.06 to -0.12 Agriculture for medium-price ranges: -0.03 to -1.00 See Tier 2 Analysis for more details
3) Waste Water Charges	DK	N/A.	NL	N/A.	D	N/A.
4) Pesticides Taxes/Charges	S	Long Term demand: -0.8	DK	Long Term demand: -0.5	B	Eco-tax: N/A Pesticides charge: N/A
5) Mineral Surpluses and Fertiliser	NL	Not applicable (Tax is not on a product)	FIN	Elasticity of fertiliser: estimated at -0.15 or less	S	Elasticity of fertiliser: between -0.12 and -0.51
	A	Between -0.20 and -0.29				
6) Landfill taxes	F	N/A.	UK	SR -0.07 to -0.015 LR -0.1 to -0.025	A	N/A.
7) Aggregates tax	DK	N/A	S	N/A	UK	-0.21 to -0.35 for sand and gravel and -0.3 to -0.5 for crushed rock
8) Packaging Taxes	FIN	N/A	DK	N/A	S	N/A
9) Batteries Taxes	I	N/A	B	N/A	HU	No exact data, but probably very low

Table E7: Effect on Competition

	MS	Nature, extent of impact, geographic focus of impact	MS	Nature, extent of impact, geographic focus of impact	MS	Nature, extent of impact, geographic focus of impact
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	Revenue neutral overall ('winners' and 'losers' within the energy production sector) Competition effects are small.	E Gal.	Negligible	F	Small, if any. The tax revenue is to a large extent used to subsidise abatement equipment, i.e. redistributed to firms.
2) Water Abstraction Charges	NL	Key issue is within country – competition between industries supplied by water companies as opposed to those abstracting for themselves and those abstracting groundwater and those abstracting surface water (favours the latter)	DK	None – exemptions specified for this reason	E	Agriculture in Spain faces higher irrigation infrastructure and water cost than other "northern irrigated lands"
3) Waste Water Charges	DK	Designed to avoid impact on competition (exemptions), some positive discrimination of waste-water intensive processes	NL	No clear impacts	D	High sewage costs will be levelled out with Urban Waste Water directive;
4) Pesticides Taxes/Charges	S	No significant impact	DK	Reduced incomes at farm level. The tax does disadvantage Danish farmers compared to their EU competitors. However, land tax has been reduced. Potatoes, sugar beets and seed producers most affected by the tax	B	Cheaper wood imports from CEE (not taxed) can affect the Belgian wood preserving industry If tax on agriculture: potatoes/maize/wheat crops mainly.
5) Mineral Surpluses and Fertiliser	NL	No significant impact	FIN	Fertiliser industry faced a decreasing competitiveness. Competitiveness of some export products increased	S	Tax was used for export subsidies. Some revenue is used to support provision of advice Fertiliser industry became less competitive.
	A	Tax was abolished in 1994, before joining the EU (because competition with other EU member states).				

	MS	Nature, extent of impact, geographic focus of impact	MS	Nature, extent of impact, geographic focus of impact	MS	Nature, extent of impact, geographic focus of impact
6) Landfill taxes	F	Competition between local landfill sites,. Increased interest in composting and sorting (resp. + 2% and 5% since 93) but slow progress Increased interest in recycling, but lack of infrastructure and workforce.	UK	Waste is expensive to transport so local oligopolies for disposal. Increased interest in incineration Increased interest in recycling/composting.	A	Competition between local landfill sites, to some extent combated by new legislation. Competition between new high-tech sites and older plants in the interim period until 2004 when state-of-the-art technologies are obligatory
7) Aggregates tax	DK	Concerns over export competition issues and therefore raw materials delivered to foreign countries are not subject to tax.	S	Tends to favour larger producers and crushed rock producers. Reduces competitiveness of exports (they are taxed)	UK	Exemptions to combat expected effects
8) Packaging Taxes	FIN	Not clear; some concerns over competition given the financial cost of entry to the bottle refill systems	DK	Not known yet what the effect on Danish industry may be as the tax is so new.	S	Tax abolished in 1994 with the introduction of EU packaging regulations.
9) Batteries Taxes	I	no obvious effect on competition	B	None	HU	Competitive disadvantage for the domestically produced batteries (imported car batteries are usually not filled with electrolytes)

This is based largely on anecdotal evidence and stakeholder consultation views expressed. This will clearly be linked to the share of tax/charge of sales/turnover, and then linked to understanding of the competitiveness of the market. As a 1% tax as % of revenue will be very significant for certain competitive sectors, where the price increase cannot be passed through to the consumer, but less significant for sectors where there is lesser competition.

Table E8: Impact on Trade

	MS	Type of trade impact; extent	MS	Type of trade impact; extent	MS	Type of trade impact; extent
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	None	E (Galicia)	None.	F	None
2) Water Abstraction Charges	NL	None	DK	None – due to exemptions	E	(See Table E4). On average, small impact. Except on those areas affected by the Tajes Segura Transfer or other recently built infrastructures. Potential important effects in about 1/3 of the total irrigated area of 3 million Has. Production of crops such as maize and beetroot would be affected.
3) Waste Water Charges	DK	Some reduction in use (therefore imports)	NL	No concerns, partly due to recycling of revenues	D	No
4) Pesticides Taxes/Charges	S	None	DK	Current tax level - No significant impact, though maybe greater resort to own purchases from abroad	B	Wood preserving industry: imports from CEE countries, up to 20% cheaper than Belgian treated wood Imports of some pesticides may fall (of the 5 a.i.'s some are not produced in Belgium)
5) Mineral Surpluses and Fertiliser	NL	Small decrease in the amount of animals. Less trade in fertilisers due to less consumption	FIN	Grain market was influenced indirectly, because of the use of revenues for exporting subsidies. Less trade in fertilisers due to less consumption	S	Less trade in fertilisers due to less consumption – most fertiliser is imported. Agriculture affected by price of N.
	A	Grain market was influenced indirectly, because of the use of revenues for exporting subsidies - Less trade in fertilisers due to reduced demand				
6) Landfill taxes	F	Not really traded: Expected to be small; exports of municipal waste in line with the proximity principle	UK	Most waste is low value so not readily traded. Only issue may be at N. Ireland / Ireland border	A	Landfill tax also applies to waste exports so it should reduce waste exports based on cost reductions.

	MS	Type of trade impact; extent	MS	Type of trade impact; extent	MS	Type of trade impact; extent
7) Aggregates tax	DK	Little effect as exports not taxed.	S	Would tend to reduce exports of Swedish gravel.	UK	Not expected to be significant
8) Packaging Taxes	FIN	Exporters are exempt from the tax. Importers need to participate in an approved deposit system to achieve lower rates of tax. Some concern on costs of joining an approved deposit system being higher for small producers (often importers) than for large producers (often domestic).	DK	Tax levied on all importers. Unclear impact though some have complained of the difficulties in getting information on the nature and weight of the packaging used in imported products. Similar to German packaging user charges: may reduce the burden on Danish businesses trading with Germany	S	Not clear as the tax was abolished prior to joining the EU and the state had a monopoly on the import of wines and spirits into Sweden
9) Batteries Taxes	I	No obvious effect on trade	B	Only the batteries sold in Belgium were to be subject to the tax.	HU	Product charge has to be paid on domestically produced and on imported products.

Table E9: Internal Market Effects

	MS	Type and extent of effect	MS	Type and extent of effect	MS	Type and extent of effect
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	None	E (Gal.)	None.	F	None
2) Water Abstraction Charges	NL	None, though some concerns re exemption for agriculture	DK	None – piped water from abroad also taxed (though none imported)	E	Unclear. Literature argues that it is not water prices but the total reference area, quotas and warranty prices of the EU CAP that affects inefficient (in water use terms) crop decisions.
3) Waste Water Charges	DK	None	NL	None – was basis for Commission PPP communication allowing recycling of revenues	D	None
4) Pesticides Taxes/Charges	S	We understand all pesticides used are imported – no impact	DK	Concerns regarding illegal imports of pesticides (owing to price differentials). Also concerns that banned products are imported, but this is not an issue related to the tax.	B	Unclear. Potentially, protection of domestic chemical industry under certain conditions;
5) Mineral Surpluses and Fertiliser	NL	No concerns are raised regarding the effect on the internal market	FIN	Not applicable	S	Probably not affected. There is an issue associated with illegal imports for farmers' own use.
	A	Not applicable				
6) Landfill taxes	F	No intensification in movements across border reported for municipal waste: high transport costs & household waste disposal close to origin (see Tier 2 analysis)	UK	Waste disposed proximate to origin. No effect likely as UK waste disposal costs are low compared to other countries. High transport costs Movement across borders unlikely	A	Tax is also levied on waste exports Waste tax low in comparison to potential transport costs
7) Aggregates tax	DK	No issues arising	S	No restrictions on trade.	UK	None expected

8) Packaging Taxes	FIN	Complaints that the tax favours the refill bottles (which are likely to be domestic based) over recycled containers which are likely to be imported, have not been pursued by the European Commission as the tax rates are considered low.	DK	Unlikely impact The related deposit refund system for drinking containers is the source of dispute with the European Commission.	S	Not clear as the tax was abolished prior to joining the EU. During this time the state also had a monopoly on the import of wines and spirits into Sweden
9) Batteries Taxes	I	No obvious effect on Single Market	B	None so far	HU	No obvious effect on Single Market

Include not just concerns of effect of the tax/charge on the environment, but also effect of the internal market/competition effects on the tax.

Table E10: Employment

	MS	Nature of impact, sector affected and extent of affect	MS	Nature of impact, sector affected and extent of affect	MS	Nature of impact, sector affected and extent of affect
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	None attributed	E (Gal.)	None attributed	F	None attributed
2) Water Abstraction Charges	NL	No information	DK	Positive effect, increased demand on water saving appliances, with benefit to sanitary engineering companies	E	Changes in crops (less water and labour intensive) would entail losses in employment from 2% to 71% in the agriculture sector
3) Waste Water Charges	DK	Employment effect of the green tax shift is positive, but just moderately so. Individual effect has not been specified, but revenue recycling is believed to have a substantial employment component	NL	Expected positive effect, revenue recycled for labour intensive investments in sewage treatment and cleaner technology	D	Positive effect, revenue recycled for labour intensive investments in sewage treatment
4) Pesticides Taxes/Charges	S	No information	DK	None known	B	No information
5) Mineral Surpluses and Fertiliser	NL	Estimates only: +700 and –15.400 jobs in agricultural businesses (+0.6 to –13% increase). Related industry: -500 to – 8300 jobs (-0.4 to – 5.9% decrease).	FIN	No information available	S	No information available
	A	Most probably only very small effects. No concerns were raised on the employment impacts and there are no indications that the tax has influenced employment.				

	MS	Nature of impact, sector affected and extent of affect	MS	Nature of impact, sector affected and extent of affect	MS	Nature of impact, sector affected and extent of affect
6) Landfill taxes	F	Some landfill site closures (not quantified) Reduction in social security payment (TGAP scheme): no trust in double dividend by industry; Lower VAT on collection/sorting activities (TGAP): mall positive effect expected; increase in recycling/sorting: small positive effect, no estimates Use of revenue: impact unlikely	UK	Tax only: small positive effect Reduction in social security payments: little effect Use of revenue: some effect through environmental projects / research Increase in recycling: real positive effect	A	No information
7) Aggregates tax	DK	No effects recorded.	S	No information available – suspected to be positive	UK	Believed to have positive effect (ex ante modelling)
8) Packaging Taxes	FIN	Unclear as little work seems to have been done in the area	DK	Unclear as little work seems to have been done in the area	S	Unclear
9) Batteries Taxes	I	Positive employment effect, but no statistics available; probably small effect	B	None so far	HU	No information given

Table E11: Revenue Raised by the product/pollution charge/tax

MS			MS		MS	
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	SEK ~600 million (MEUR ~70). but all revenue is refunded	E (Gal.)	ESP ~2333 million MEUR ~14 .	F	FF ~30 million (1991) -70 million (1998) (MEUR ~4.6-10.8).
2) Water Abstraction Charges	NL	360 million NLG (MEUR163.4) (expected in 2000)	DK	1600 million DKK (MEUR 214) (1998-99)	E	1997 6,290m Pesetas (MEUR 37.8)
3) Waste Water Charges	DK	310 million DKK (MEUR 41.6) (1998)	NL	1940 million NLG (MEUR 880) (1996)	D	720 million DM (MEUR 368.1) (1998)
4) Pesticides Taxes/Charges	S	38 million SEK (MEUR 4.2) in 1998	DK	302 million DKK (MEUR 40.5) in 1998	B	No information
5) Mineral Surpluses and Fertiliser	NL	Estimate: NLG 16 million per year (MEUR 7.3)	FIN	No data	S	1985: SEK 93 million (MEUR 11) environmental charge 1988: SEK 141 million (MEUR 16) (price regulation charge not included)
	A	1986/'87: MATS 737 (MEUR 54) 1993/'94: MATS 1177 (MEUR 85)				
6) Landfill taxes	F	1997: 906 MFF (MEUR: 138 % GDP: 0.01) 1998: 1837 MFF (MEUR: 280 (% GDP: 0.02)	UK	1998 –99 £335m MEUR 536	A	1997 447.7m ATS (MEUR 32.95)
7) Aggregates tax	DK	1995: 135.718.000 DKK (MEUR 18.2) 1999: 183.498.000 DKK (MEUR 25)	S	144.4 m SEK (MEUR 16.0) (1999)	UK	Estimated £380 million (MEUR 605)

	MS		MS		MS	
8) Packaging Taxes	FIN	69m FIM (MEUR 11.6) 1998	DK	753mDKK (MEUR 101) in 1999 (11 months data)	S	MEUR 13.1 (1992/93)
9) Batteries Taxes	I	NCU 24 billion lira (MEUR 12.4) in 1994	B	1996 PROFIT 64.4MBEF (MEUR 1.6) 1997 PROFIT 28 MBEF (MEUR 0.69) 1998 LOSS 49.4 MBEF (MEUR 1.2) 1997 Higher losses predicted	HU	767.9 MHUF (MEUR 2.90) in 1999

Key: NCU: National Currency Unit (EUR in brackets).

Table E12: Use of Revenue from the product/pollution charge/tax

	MS	Revenue Use	MS	Revenue Use	MS	Revenue Use
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	Refunded to firms on basis of production of useful energy	E (Gal.)	Fund for environmental restoration (5% of revenues) – remainder to general budget	F	Abatement (66%) and monitoring (17%) equipment and R&D (10%)
2) Water Abstraction Charges	NL	General budget	DK	General budget	E	Recovery of costs of water infrastructure
3) Waste Water Charges	DK	General budget, though a substantial sum was devoted to an independent Water Fund, to finance projects which protect groundwater resources	NL	Hypothecated for identification and funding of investments in sewage treatment plants	D	Recycled for investments in sewage treatment plants
4) Pesticides Taxes/Charges	S	Before 1994, used to fund advice and pesticides action programme. After 1994, the advice continued but not all revenue was used (o general budget, but with continuation of the services)	DK	Initially 55% of revenue was used to reduce county land tax, and around 10% was channelled back to farmers via support to organic farming. The remaining 35% of the revenue was used on research and on monitoring of pesticides in the environment.	B	Eco-tax: state budget New Pesticides charge: Used to fund registrations etc.
5) Mineral Surpluses and Fertiliser	NL	General budget	FIN	Export subsidies.	S	Environmental charge: research and environmentally related projects. Since 1994 : state budget, but earmarked for environmental improvements in agriculture. Price regulation tax (abolished at end 1992); costs of exporting grain surplus.
	A	support and promote the grain production sector. Subsidise leguminous crops.				

	MS	Revenue Use	MS	Revenue Use	MS	Revenue Use
6) Landfill taxes	F	Recycled to municipalities (mainly) via funds/investments and to a lesser extent, private (waste) sector & research activities	UK	One-off reduction in NICs. In addition, tax credits used to support environmental projects	A	Clean-up of contaminated sites and recycling to landfill sites for environmental investments
7) Aggregates tax	DK	General budget	S	General budget	UK	Employer NICs reduction and new sustainability fund
8) Packaging Taxes	FIN	National Exchequer	DK	National Exchequer	S	National Exchequer
9) Batteries Taxes	I	Revenue used to finance collection of batteries	B	No information given (the tax was not implemented) 1997 total income of BEBAT: 260 million BEF (6.5MEUR)	HU	Environmental protection

Table E13: Effect on Pollution Emissions / Polluting Product Use

	MS	Nature/extent of impact, poss. linkage to tax/charge	MS	Nature/extent of impact, poss. linkage to tax/charge	MS	Nature/extent of impact, poss. linkage to tax/charge
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	40% reduction (1992 – 1998) 25% reduction due too the instrument (1992-1995). Possibly offset by an increase in N2O, CO and NH3	E (Gal.)	Marginal effect: emissions increased from 1996 to 1999 by approximately 73,000 tons. (this does not mean there has been no incentive or reduction against the counterfactual).	F	No effect attributable to price incentive – ADEME estimates reduction by approximately 56,000 tonnes per year by 1997, due to the use of revenues.
2) Water Abstraction Charges	NL	Estimated reduction in line with elasticity –0.1 – earlier evaluation estimated decline in consumption of 2-12%	DK	13% reduction in water consumption since 1994, also due to campaigns and awareness raising Leakage from water works has decreased from 43 million m ³ in 1993 to 33 million m ³ in 1998	E	Not applicable
3) Waste Water Charges	DK	Decline in discharges from sewage treatment plants by 20-25% (1996-1998), for BOD, P and N. Emissions from industries with direct discharges have increased (15-20% for BOD, P and N). Better compliance by sewage plants but not due to tax only. Slight impact on P-removal, not quantified. I	NL	COD discharges reduced by about 90%se. Net load on surface waters from discharges has been reduced	D	31% decline in industrial wastewater since 1981. Improved compliance with standards (tax linked to these)
4) Pesticides Taxes/Charges	S	Reduced pesticide use (In1994, use was 35% of 1982-5 levels). However, much of this may be due to advice funded by revenue.	DK	Treatment frequency has been reduced by the tax – has fallen by 11% since 1994-1996.	B	Evidence that diuron consumption by national railways fell by 25% in 1996 Small “self limitation effect” (threat of the tax)
5) Mineral Surpluses and Fertiliser	NL	Not yet empirical data available. Research estimates: surplus –15% to –75%. Reduction in fertiliser use: 20 to 30%	FIN	11-22% decrease in fertiliser use between the 1980s and the 1990s, due to the increase in the tax at the beginning of the 1990s.	S	The tax probably reduced the use of fertiliser-N by 15 to 20% in 1991/92. Nitrate use continues to fall (N tax tripled at end 1994)

	MS	Nature/extent of impact, poss. linkage to tax/charge	MS	Nature/extent of impact, poss. linkage to tax/charge	MS	Nature/extent of impact, poss. linkage to tax/charge
	A	1986: use of fertiliser-N decreased by 15% (without an increase in price of fertiliser!). 1987-94: -0.8% per year fertiliser use. Probably partly due to price, partly to information from extension services				
6) Landfill taxes	F	No existing monitoring of environmental impact of the tax. No significant decrease in total HW / Mixed Industrial waste arisings but some landfill sites closure. No evidence of improved environmental standards on landfill sites and no significant threat to illegal sites.	UK	Waste data available is of very poor quality (availability has improved since tax introduction) Evidence suggests that active waste arisings have not been affected by the charge, but that inert waste volumes have fallen quite considerably. Some increase in recycling	A	Waste data only available up to 1996; no obvious impact on total masses of primary waste. Landfilled household waste fell from 75 to 45% (1988-96). Much of this may be due to recycling initiatives however and requirements to source separate organic fractions.
7) Aggregates tax	DK	90% of all demolition materials are now recycled This is probably due to the waste tax and new environmental thinking on behalf of the companies involved	S	Some effect (possibly) – though this seems to be in line with pre-established trend	UK	Slight reduction in demand estimated – also increase in recycling
8) Packaging Taxes	FIN	Much higher levels of recycling of cans Support for the existing refill system Very few non-deposit one way containers for drinks are used	DK	Not clear yet, tax has only been in place for 1 year.	S	Difficult to assess the impact of the tax in absence of the deposit refund system.
9) Batteries Taxes	I	+24% in batteries collection rate: between 1991 and 1998. In 1991, 134,000 tonnes of batteries collected by battery recycling consortium COBAT, while in 1998, 166,500 tonnes were collected	B	The 1996 to 1999 collection targets were met: 65.7% of used batteries were collected and recycled in 1999 by the battery industry (BEBAT non-profit organisation)	HU	No data available.

Table E14: Effect of Tax/Charge on technological/technique change

	MS	Nature and extent of impact	MS	Nature and extent of impact	MS	Nature and extent of impact
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	Purchases of new abatement technology, and, of big importance, learning by doing at plant level (trimming and operational adjustments)	E (Gal.)	we believe the price incentive is too small to have promoted widespread adoption of abatement techniques.	F	The price incentive to abate is probably too small, and the revenue recycling may make emitters reluctant to purchase their own abatement equipment. 82% of revenue is spent on abatement technology and monitoring equipment.
2) Water Abstraction Charges	NL	Not known, though water-saving investments are believed to have been made. Households are metered and this does ensure the tax plays an incentive role both in industry and households.	DK	Development of water-saving appliances such as low-flush water closets.	E	Some technological impacts on industry in urban areas and agricultural areas; likely impact on substitution of types of irrigated crops, towards dry agriculture and abandonment of land.
3) Waste Water Charges	DK	No information given; evidence suggests that the technical guidelines in the Plan for the Aquatic Environment had an impact.	NL	Development of cleaner technology in several important industries	D	Greater investment to ensure adherence to standards
4) Pesticides Taxes/Charges	S	Effect of tax has been limited – effects may have occurred attributable to the advisory services funded by the charge (before 1994), and then the tax.	DK	Reductions in use – revenue also supports organic farming and research into pesticides	B	No information – none expected owing to narrow range of products targeted – key change would be switching from one a.i. to another
5) Mineral Surpluses and Fertiliser	NL	A lot of technological change has occurred in order to increase nitrogen use efficiency	FIN	No information available	S	Probably greater use of manure, compost and leguminous crops in rotations
	A	Tax was used to subsidise leguminous crops, resulting in 6% extra reduction of N-use. Increased production of leguminous crops, better utilisation of manure, reduction in excessive use of fertilisers and improved extension services				

	MS	Nature and extent of impact	MS	Nature and extent of impact	MS	Nature and extent of impact
6) Landfill taxes	F	Incentive for industry to minimise “mixed waste” to reduce their cost Incentive for municipalities to develop sorting and recycling programmes. Potentially, some of the illegal dump sites shut down	UK	Increase in industrial waste minimisation initiative Boost to the development of aggregates recycling industry and onsite reuse on C&D waste. Increased innovation in the waste industry	A	The tax has different bands for sites with/without state-of-the-art technology. Evidence suggests that older plants will have a competitive advantage in the interim period (all sites are obliged to have state-of-the-art technology by 2004).
7) Aggregates tax	DK	Greater recycling of construction materials	S	Increased use of other materials (crushed rock, recycled materials)	UK	Changes in construction methods to reduce wastes / increase recycling
8) Packaging Taxes	FIN	Development of a new deposit system for drinks cans.	DK	Not clear yet. The current tax does not encourage product switching. The intention to switch to LCA based rates in the future should encourage more switching of packaging materials.	S	Not clear that the tax has stimulated any technical change
9) Batteries Taxes	I	No information given	B	In 1985 the alkaline batteries accounted for 75% of the mercury in batteries in Europe and only 31% in 1990	HU	???

Table E15: Administrative Burden of Tax (if data available)

	MS		MS		MS	
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	Administrative cost is 0.3% of revenues collected, Metering costs (equipment acceptable to SEPA) are estimated at approximately 3% of total charge paid.	E (Gal.)	Not known.	F	6% of revenues collected.
2) Water Abstraction Charges	NL	No quantitative data	DK	Minor – metering was already in place in many houses	E	Costs of the administration of this tax are not identified, as separate from the general O+M costs of Basin Authorities.
3) Waste Water Charges	DK	The Tax and Customs Agency assessed the administrative requirements to be 4 staff and 0.5 mill. DKK (67.000 EUR).	NL	Considered to be very small	D	In 1982 several Länder spent about 50 per cent of the revenue on administration. In the mid-1980s reduction to 25-30%. In the 1990s: about 10% (e.g. 10,6% or 76 million DM (MEUR 38,9) in 1998).
4) Pesticides Taxes/Charges	S	Around 0.01% of the total pesticide tax revenues	DK	Minor	B	For all eco-taxes 1996: 60 M BEF EUR: 1.5 M No information on funds spent on eco-tax
5) Mineral Surpluses and Fertiliser	NL	NLG 53.3 million per year (EUR 24.2 million) plus admin costs of farmers	FIN	Small	S	Approximately 0.8% of the tax revenues (SEK 0.5 million)
	A	0.7 - 1% of the tax = ATS 10 million (EUR 0.7 million)				
6) Landfill taxes	F	Not communicated	UK	Of order £2 million	A	Considered to be small
7) Aggregates tax	DK	Seen as small. In 1989 the cost was estimated to 752,000 DKR for the implementation of the tax and 1,135,000 DKR for the annual operation.	S	SEK 3.5 million	UK	£2 million in first year, £1 million per annum after

8) Packaging Taxes	FIN	The Ministry of Finance and the industry body responsible for running the new deposit system for cans consider that the cost of the tax is low	DK	Customs invested 1.9 MDKK in information and technology systems. Annual 1999 operating cost was 0,2 MDKK and an additional 5 person years of effort	S	Not communicated
9) Batteries Taxes	I	Unclear	B	Unclear, BEBAT leads to smaller burden than ecotax	HU	A maximum 6.5% of the revenue can be used for the administrative costs. -Unclear burden

Table E16: Effectiveness of Tax

	MS	Effectiveness, and alternative instrument	MS	Effectiveness, and alternative instrument	MS	Effectiveness, and alternative instrument
1) Nitrogen Oxides (NO _x) Taxes and Charges	S	Very powerful mechanism for emissions reduction. Many plants are also subject to local regulations.	E (Gal.)	Unlikely to be strong incentive	F	No real incentive from the tax – effectiveness is limited as the net effect is that firms pay into a fund for monitoring and abatement distributed by the state.
2) Water Abstraction Charges	NL	Limited environmental effect, because of exemptions	DK	Consumption fell by 26% between 1989 and 1998 (half of this reduction before the tax) Leakage from water works decreased by 23% (1993-1998)	E	The revenue raising effectiveness of the water regulation levy is low. Low effectiveness of the collection system (62.1% of estimated revenue in 1997).
3) Waste Water Charges	DK	Municipal sewage treatment plants are most affected; their discharges declined, while industries discharges increased (1996-1998) Supplementary role in improvement of compliance	NL	net load on surface waters from discharges has been reduced by 90% (1970-1996) Gross organic discharges from industry in 1996 were reduced to 12% of the amount in 1970	D	Main effect: impact on compliance with standards. Also a more general incentive to reduce discharges liable to the tax (discharge from industry in the western part fell by 31% between 1981 and 1995)
4) Pesticides Taxes/Charges	S	Impact: financing of instruments such as advisory services, and research and development 2% reduction in use expected	DK	Not as effective as desired; Sales of active ingredients dropped by 40% between 1981 and 1996 (this is not only due to the tax)	B	Not available (tax not implemented)
5) Mineral Surpluses and Fertiliser	NL	Anticipated reduction in fertiliser use of more than 20%. Small reduction of manure production.	FIN	11% reduction in fertiliser use Sweden: 10 to 20% reduction in fertiliser use.	S	Some impact on the use of commercial fertiliser, but main effect financing of action programs leading to a decrease in intensive use.
	A	2.5% reduction of fertiliser use				
6) Landfill taxes	F	Not measured. Criticisms made on the effective use of the Fund (revenue recycling) + related monitoring	UK	Increase in recycling and composting Impact hardly quantifiable because of difficult data situation	A	Little evidence to suggest that the tax has had an impact in reducing waste.

	MS	Effectiveness, and alternative instrument	MS	Effectiveness, and alternative instrument	MS	Effectiveness, and alternative instrument
7) Aggregates tax	DK	Probably very little effect on the extraction of raw materials, but increased use of recycled construction materials.(90% of all demolition materials are now recycled)	S	Unclear	UK	Problematic data situation, but some evidence that no or hardly any increase in recycling
8) Packaging Taxes	FIN	Effective in stimulating the creation of deposit based recycling system for drinks cans.	DK	Not clear yet, tax has only been in place for 2 years	S	Effective at raising revenue. Abolition would suggest that the tax was not as effective as may be desired.
9) Batteries Taxes	I	Almost 95% separate collection (1998 and 1999) From the 166500 tonnes of batteries collected in 1999, 90000 tonnes of recycled lead have been reclaimed, almost 35% of national demand.	B	N/A (not implemented)	HU	Potential positive impact on waste management

