REGULATORY IMPACT ASSESSMENT FOR IMPLEMENTING THE WASTE INCINERATION REGULATIONS IN SCOTLAND

1. TITLE

The title of this Regulatory Impact Assessment (RIA) is the ***Regulatory Impact Assessment for introducing the Waste Incineration Regulations in Scotland.***

2. PURPOSE AND INTENDED EFFECT

The Waste Incineration (Scotland) Regulations 2003 (**the regulations**) will implement strict regulatory controls on most waste incinerators and co-incinerators (where waste is used as a fuel or is disposed of at a plant where energy generation or production of material products is the main purpose). The regulations comply with the EU Directive on Waste Incineration (WID) (2000/76/EC). They will be enforced by the Scottish Environment Protection Agency (SEPA).

The regulations set stringent requirements that will apply to all **new** incinerators from 28 December 2002 and to all **existing** installations from 28 December 2005. The regulations, together with forthcoming associated directions to SEPA, specify air emission limits which must not be exceeded. They also set requirements concerning normal and abnormal operating conditions, water discharges from cleaning exhaust gases, ash recycling, plant control and monitoring, and public access to information. The regulations also require all incinerators and co-incinerators to have continuous monitors for certain pollutants. These requirements have been developed to reflect the ability of incineration plants to more cost effectively achieve high standards of emission control in comparison to the 1980s.

This RIA is concerned with the introduction of the regulations and consequential transposition into legislation in Scotland of WID. It updates previous Regulatory and Environmental Impact Assessments (REIAs) undertaken by ENTEC at the draft Directive stages[1]. There are several references throughout the RIA to the impact on the UK. Bearing in mind the proportion of UK plants affected by WID located in Scotland, the Scottish Executive believes the RIA nevertheless provides appropriate advice on the likely affect of the regulations on Scottish businesses. The draft RIA formed an integral part of a consultation paper issued in August 2002 setting out options and proposals for implementing WID into legislation.

To implement WID the Executive has decided to use the Pollution Prevention and Control Act 1999 to make appropriate amendments to the Pollution Prevention and Control (Scotland) Regulations 2000, SSI 2000 No 323 (PPC), the regime that implements the Integrated Pollution Prevention and Control (IPPC) Directive (96/61/EC). PPC applies an integrated environmental approach to the permitting and regulation of a range of industrial activities, including some incinerators. WID has much in common with PPC, notably in requiring incinerator operators to apply for a permit with conditions to ensure that pollution is prevented, or controlled where that is not possible.

[1] Five Regulatory and Environmental Impact Assessments were undertaken on the proposed Waste Incineration Directive by ENTEC on behalf of the then Department of the Environment, Transport and the Regions.

The key objectives of the regulations are to contribute to the protection of human health and the environment. It is basically technical in nature and it extends the scope of existing EC measures to combat the pollution of air, water and land caused by the incineration of wastes not covered by the Hazardous Waste Incineration Directive (HWID) and the Municipal Waste Incineration Directive (MWID).

The principal additional measures introduced by the regulations and associated directions are:

- the prescription of operating conditions including gas residence time and temperature;
- incinerator/co-incinerator application requirements (for example, minimising both the volume and the hazardousness of residues);
- setting emission limit values for a range of parameters to air and water;
- specifying level of incineration required (by setting conditions, such as total organic carbon in the residue);
- defining the control and monitoring requirements; and
- requiring certain reporting.

In practical terms, these measures will mean that many incinerator operators will have to meet emission limits tighter than those in existence at present, and engage in monitoring not currently carried out. There will therefore be substantial additional capital and revenue costs for some operators to meet the new requirements (see section 8).

3. BUSINESS SECTORS AFFECTED

The regulations cover virtually all waste incineration and co-incineration plants. A number of plants are, however, specifically excluded, e.g. plants treating only vegetable waste from agriculture, forestry and certain food processes; certain fibrous vegetable waste; wood waste; cork waste; radioactive waste; certain animal carcasses; and waste resulting from the exploration for oil and gas resources.

The incineration sector covered by the regulations can be divided into three process groups: waste incinerators (for example municipal waste incinerators), waste combustion (for example waste oil burners) and co-incineration plant (for example cement kilns burning waste solvents). Table 1 below gives a list of the individual sectors within these process groups. Further details on what is covered can be found in the August 2002 consultation paper.

The existing degree of compliance with WID varies considerably from one sector to another and also between the different requirements This was investigated in the ENTEC REIAs and the evidence for it can clearly be seen in the wide range of costs in table 1 below.

For the air emission limit values, there is already a high level of compliance, and many processes are expected to comply fully under existing controls (for example municipal waste incinerators meeting the 0.1ng/m^3 dioxin limit). Full compliance with the air emissions *monitoring*, operating controls and residue monitoring requirements is generally lower, whilst compliance with the spillage containment requirement is variable. The requirements covering waste-water will apply to only a limited number of sites.

Table 1 Summary of WID incinerator and co-incinerator compliance costs (including the costs of monitoring and abatement). Costs are based on those in ENTEC's final REIA report in 1998 prices, unless otherwise flagged (see note 4 below).

Main process group	Sector	Total No of incinerators	Compliance cost for typical businesses (£kpa)	Total estimated costs (£kpa)
Waste Incineration	Municipal waste	2	29 to 350	145 to 200
	Clinical waste	5	28 to 52	130
	Sewage sludge	2	35 to 210	280 to 300
	Other waste	6	36 to 131	150
	Animal remains	15	40 to 380	85 to 760 (Note 1)
Waste oil	Waste oil burners	144 (Note 2)	0.8	9 (Note 4)
Combustion	Roadstone coating	30	20 (Note 5)	255 (Note 5)
Combustion	Wood burning	2 (Note 3)	0	0
	Paper burning	2	30	20
Co-	Cement / lime kiln burning waste	1 (Note 4)	160 to 1,100	data unavailable
Incineration	Power generation	3	data unavailable	data unavailable
Total		212	0 to 1,100	1074 to 1824

Note 1 The lower figure applies if the Directive covers incineration of rendered remains only (this is dependant on on-going EU negotiations on the Animal By-products Regulation).
Note 2 It is estimated that 90% of these processes are garages which burn approximately 2 tonnes per annum of waste mineral oil
Note 3 Wood burning processes in the furniture manufacturing sector are believed mainly to burn untreated wood and are excluded from WID control by Article 2(a)(iv)
Note 4 Costs implications for individual plants are likely to vary significantly depending on the degree of technical improvements that would be required to comply with the regulations. It is likely that many operators will opt for alternative solutions (e.g. collection).

Note 5 Estimated costs by trade association or the regulators (2002 prices).

Currently it is estimated that between 170 and 210 million tonnes of waste are produced each year in the UK, by households, commerce and industry (including demolition and construction waste). Less than 4% of this waste is incinerated. The majority (58%) goes to landfill and the remainder is recycled or recovered.

The regulations will impact on waste producers, operators of incinerators and co-incinerators and waste disposal authorities. It will also impact on the Executive and SEPA.

The direct impact of the regulations on charities, voluntary organisations and businesses, as waste producers, will be through increased costs for waste management and disposal, including increased transport costs where wastes must be transported to treatment facilities. This will provide a further incentive to re-use and recycle or otherwise minimise waste arisings.

4. RISK ASSESSMENT

The incineration of waste can give rise to emissions of a wide range of pollutants which can lead to adverse effects. For releases to air these include: dioxins and furans, heavy metals, sulphur dioxide, nitrogen oxides and particulates. Table 2 below shows the reductions in UK emissions per annum expected from implementing the regulations. Table 3 shows the human health benefits, reductions in acute effects have been quantified for ozone (from NOx), SO_2 and particulates (including secondary particulates). Other benefits that have been quantified and valued include reductions in crop damage due to ozone; reductions in building damage caused by SO_2 and reductions in soiling due to particulates.

Table 2 The reductions in UK emissions per annum (pa) to air expected from implementation of WID (data from ENTEC final REIA).

Pollutant	Reduction in UK emissions
Nox	2264 tpa
SO_2	1042 to 1086 tpa
Particulates	141 to 173 tpa
HCl	293 to 307 tpa
CO	78 tpa
14 Dioxins	15 0.5 g pa
16 Mercury	17 65 kg pa
18 Cadmium /Thallium	19 20 kg pa

For releases to water these include: dioxins and furans, heavy metals and suspended solids. In addition, the landfilling of incineration residues can contribute toxic materials, especially heavy metals, to leachate.

The increased cost of waste disposal may cause unscrupulous waste producers and waste management contractors to dispose of waste through illegal routes with subsequent damage to the environment. However, it is possible that it may encourage waste diversion to an option higher up the waste hierarchy, such as recycling or re-use.

For industry, there are risks that meeting the requirements of WID will be so great that certain operators will cease to use incineration plant. The impact on industry competition is explored below.

For the Executive, not implementing WID would almost certainly precipitate infraction proceedings by the European Commission which could eventually lead to substantial fines on a daily basis until the infraction had been remedied.

Table 3 Human health benefits and reductions in crop damage/ building damage expected from implementation of WID (data from ENTEC final REIA).

Pollutant	**Human health benefits (acute effects)**		**Reduction in crop damage (1998 Prices)**	**Reduction in buildings damage (1998 Prices)**	**Reduction in soiling (1998 Prices)**
	Numbers of deaths not brought forward	Numbers of respiratory hospital admissions avoided or not brought forward			
Ozone (from NOx)	0.7 pa	0.9 pa	£833k pa	-	-
SO_2	5 pa	6 pa	-	£470k to £491k pa	-
Particulates	0.2 to 0.3 pa	0.4 to 0.5 pa	-	-	£32k to £39k pa
TOTAL	6 pa	7 pa	£833k pa	£470k to £491k pa	£32k to £39k pa

5. OPTIONS

This RIA focuses on the additional costs and benefits of implementing WID after companies have met existing UK commitments. The majority of UK processes covered by the regulations are required to apply Best Available Techniques Not Entailing Excessive Cost (BATNEEC) to minimise and render harmless emissions, in accordance with the Environmental Protection Act 1990. This regime is being subsumed by the PPC Regulations and the similar requirement for Best Available Techniques (BAT) to be used.

There is little scope for modifying WID's requirements, and not much more for adapting them to specific circumstances. However, the Executive believes that the PPC Regulations provide a very good platform on which to base WID. Three options for transposing WID were considered:

Option No 1: Do nothing: the Directive is not implemented. Incinerators and co-incinerators continue to be regulated under existing regimes. This represents the base case of business, as usual, against which all other options are compared.

Option No 2: Extend the PPC Part A (multi media control) regime to encompass all WID plant, removing the requirements of PPC for site survey and surrender for non-IPPC plant.

Option No 3: Separate out incinerators from other PPC activities and apply the WID requirements to them, then apply the IPPC Directive requirements where required.

Issues of equity and fairness

As stated above, the majority of processes covered by WID are already required to apply BATNEEC to minimise and render harmless emissions, in accordance with the

Environmental Protection Act 1990. However, because WID has onerous emission limits and monitoring requirements, it is quite likely that operators of small incinerators will withdraw from the sector. This will result in loss of income to these operators. Also, many small incinerators are associated with a company's business (for example, an incinerator owned by a garage and used for the disposal of used car engine oil). In this case, the loss of a plant may increase waste, transport and disposal costs.

The additional cost of waste management resulting from implementation of WID will generally be reflected back to the waste producers through the disposal charges levied by the waste management service provider. This is consistent with the polluter pays principle, and provides an incentive for the waste producer to reuse or recycle their waste, or otherwise minimise waste production.

The increased cost of waste disposal may cause unscrupulous waste producers and waste management contractors to dispose of waste through illegal routes. Responsibility and costs for removing such tipped wastes generally falls on the local authority or the landowner as an inequitable burden. The principal option for countering would be more pro-active monitoring of the waste duty of care by SEPA.

6. COMPETITION

An initial competition assessment has been carried out using the "competition filter" developed by the Office of Fair Trading[2]. This consists in addressing, in relation to the markets affected, nine standard questions covering market share, differential effects upon firms operating in each sector, effect upon market structure and choices, set-up and ongoing costs for new firms, and the nature of technological change.

Three broad markets are affected by the regulations. One is the market for incineration *per se*, which features two broad types of operator: (i) those who provide incineration services on a commercial basis, catering for a range of wastes from a variety of sources and sectors; and (ii) those who incinerate particular types of waste directly arising from either their own wider operations in a particular sector or from other operators in the particular sector.

The second is for waste management in general. In this, incineration takes its place alongside other disposal techniques such as landfill or chemical treatment, with customers for waste disposal being able to chose (within tight, existing regulatory constraints) their method of disposal or recovery.

The third broad market affected by the regulations is that for the manufacture and supply of incineration equipment. In practice, that encompasses sensitive monitoring equipment and massive heavy engineering items like boilers and conveyor belts.

In the initial assessment which has been carried out, these three broad markets have been considered through the medium of the 18 sectors listed in Table 1. The overall conclusion indicates that competitive impact from the implementation of the regulations and associated directions is unlikely. In any event, the scope for adjusting the regulations and directions is

[2] *Guidelines for Competition Assessment –a guide for policy makers completing regulatory impact assessments,* February 2002 (OFT355).

severely limited because they are almost exclusively concerned with complying with the requirements of the Directive which cannot be changed at Member State level.

7. BENEFITS

The main potential benefits from compliance with the regulations will result from reductions in air emissions of several pollutants including NOx, SO_2 particulates and HCl. These reductions will enable the avoidance of environmental damage that would otherwise have occurred. The types of environmental benefits due to reductions in the key pollutants of interest are shown in Table 4 (air emissions) and Table 5 (waste water discharges).

Table 4 Benefits from reducing air emissions

Pollutant	Benefit
SO_2 (excl. secondary particulates)	Health – reduction in acute mortality and morbidity
	Health – reduction in chronic mortality and morbidity
	Reduction in damage to buildings
	Reduction in damage to crops
	Reduction in damage to forestry
	Reduction in damage to natural vegetation
	Reduction in damage to aquatic ecosystems and fisheries
	Improvement in visibility
NO_x (excl. secondary particulates)	Health – reduction in acute mortality and morbidity
	Health – reduction in chronic mortality & morbidity
	Reduction in damage to buildings
	Reduction in damage to forestry
	Reduction in damage to natural vegetation
	Reduction in damage to aquatic ecosystems and fisheries
Ozone (from NO_x, VOCs & sunlight)	Health – reduction in acute mortality and morbidity
	Health – reduction in chronic mortality and morbidity
	Reduction in damage to crops
Particulates (inc secondary particulates)	Health – reduction in acute mortality and morbidity
	Health – reduction in chronic mortality & morbidity
	Reduction in soiling
	Improvement in visibility
HCl	Health - reduction in acute morbidity
	Health - reduction in acute morbidity
	Reduction in damage to forestry
	Reduction in damage to natural vegetation
	Reduction in damage to aquatic ecosystems and fisheries
Dioxins and furans	Health - reduction in carcinogenic and non-carcinogenic adverse health effects
Heavy metals	Health - reduction in carcinogenic and non-carcinogenic adverse health effects

Table 5 Benefits from reducing waste water discharges

Pollutant	Benefit
Dioxins and furans	Health - reduction in carcinogenic and non-carcinogenic adverse health effects
	Reduction in damage to aquatic ecosystems and fisheries
Heavy metals	Health - reduction in carcinogenic and non-carcinogenic adverse health effects
	Reduction in damage to aquatic ecosystems and fisheries
Suspended solids	Reduction in undissolved toxic compounds e.g. heavy metals and dioxins
	Reduction in damage to aquatic ecosystems and fisheries

Other benefits of complying with the regulations, in addition to current pollution control requirements, will result from:

- Spillage containment - Improved containment of spillages and firewater run-off will lead to a reduced risk of contaminating surface waters, ground waters and land.

- Air and waste water emissions monitoring - More extensive monitoring of air emissions and waste water discharges will enable non-conformances to be more quickly identified and rectified.

- Operational controls - Automatic (hence faster) action to stop waste feed in the event of an exceedance in emission limit values - thus reducing the scale of pollution incidents.

- Residue testing - More extensive testing of residues prior to disposal or recycling, with emphasis on the total soluble fraction and heavy metals soluble fraction. This will help to reduce the environmental risks due to leachate.

- Installation of more modern plant likely to lead to less likelihood of smoke or odour nuisance.

- Increased employment in pollution abatement industry.

As well as benefits for the UK, several of the pollutants covered by the regulations are transboundary air pollutants including persistent organic pollutants (e.g. dioxins), acid gases (e.g. SO_2 and NOx), heavy metals and particulates. The impacts of air and water emissions on the North Sea would be reduced and, in addition, there would be benefits to the UK environment of emission reductions being made by other EU member states.

Option No 1 of not implementing the regulations, and therefore the Directive, is not regarded as a viable option, since failure to implement WID in a timely and appropriate fashion would almost certainly precipitate infraction proceedings by the European Commission and ultimately fines.

Option No 2 extends the PPC Part A regime to encompass all WID plant. The PPC regime is kept relatively simple, adding the technical requirements of the Directive. There would however, be some additional costs associated with complying with elements of the PPC regime which are not required by WID. The most significant of these relate to site surveys in connection with eventual permit surrender: this requirement has therefore been disapplied.

Option No 3 separates out incinerators from other PPC activities and applies the WID requirements to them, then additionally applies the IPPC Directive's requirements to those that require it. This would provide clarity as to how both the IPPC Directive and the WID had been applied, but that would need to be balanced against the probable confusion amongst operators and regulators who would have to comply with overlapping requirements.

For the disposal of non-hazardous waste at the place of its production and the recovery of non-hazardous waste, WID appears to allow the exemptions regime allowed under the Waste Framework Directive to continue. Any incinerator would nevertheless still need to be subjected to the requirements of WID.

Quantification of benefits

Option 1 is estimated to have no impact on the incinerator industry but is likely to result in infraction proceedings by the Commission with the ultimate possibility of fines of £60,000 per day until compliance is achieved.

Option 2 places additional requirements on incinerators above that required by WID. The Executive believes there is not likely to be a noticeable additional cost to operators, as the potentially expensive site survey requirement has been disapplied from those WID plant that are non-IPPC Directive plant.

Option 3 would ensure the Executive is seen to have met its requirement to implement WID. There would, however, be additional costs to operators, SEPA and potentially the Executive, in understanding the complexity of the regulatory regime. It potentially provides operators with some reduction in regulation costs compared with Option 2 but it could increase regulators' costs relative to their current costs and therefore reflect these increased costs back to operators.

Option 2 is the one pursued in the regulations and associated directions.

8. COMPLIANCE COSTS FOR BUSINESSES

For each sector covered by the regulations a summary of the estimated additional compliance costs for a typical business and the total sector costs are shown in table 1. The regulations will apply to existing plant from 2006, and costs are likely to be incurred from 2005 or 2006. Each quoted cost represents our best mid-range estimate. The total costs are estimated to range from £1.1m pa to £1.9m pa. The costs to individual businesses are estimated to range from £0k pa to £1,100k pa, but they are mainly in the range £30k pa to £300k pa.

To determine the cost of capital a discount rate of 6% has been assumed and a useful life for capital equipment of 15 years, which is considered a reasonable assumption for abatement plant for waste combustion/incineration processes. This gives an equivalent annualisation factor of 0.10. This factor, when multiplied by the non recurring (capital) cost of the equipment, gives the equivalent annual cost of the future annual depreciation charge of the equipment and the cost of borrowing money to finance the project.

Total compliance cost

The difference between regulatory Options 2 and 3 is likely to be small compared to the other costs of implementing WID's requirements. Table 1 gives a summary of compliance costs; it does not cost the differences between implementation under Option 2 and 3.

Uncertainty

A degree of uncertainty is inevitable in an exercise such as this and several trade bodies have expressed concern that the data in the table does not put the costs of WID compliance high enough. Overall, the degree of uncertainty attached to the cost estimates is considered to be in the region of +/- 50%.

In practice, the relatively long compliance timescale for existing plants, which will cover considerable capital renewal towards more effective pollution control measures, will tend to reduce the additional compliance costs as firms move towards meeting WID compliance between the time the Directive was finalised on 4 December 2000 and its compliance date of 28 December 2005 for existing plants.

9. IMPACT ON SMALL BUSINESSES

The cost impact on small waste producers will be through increased disposal costs, which will provide further stimulus to reuse, recycle or otherwise minimise waste production. This stimulus may result in significant savings to the company. Alternatively, the company may wish to bear the additional cost of disposal. It is important to note that these additional costs are a direct consequence of the Directive's requirements, and will not be influenced by the option chosen for its implementation.

It is considered likely that small scale incineration plant operators will withdraw from the sector or, where caught by the regulations as a co-incinerator, will move to use an alternative non-waste fuel. However, the Directive has several exemptions, as stated above. This means that many small plants will continue to operate without the need to comply with the regulations (for example small, on-farm straw combustors or certain animal carcass incinerators).

10. OTHER COMPLIANCE COSTS

SEPA will be required to recover its full regulatory costs of implementing and enforcing the regulations from those whom it regulates. A charging scheme to achieve this will be developed in due course. For the purposes of this RIA, it is assumed that processing an application for, and maintaining, a PPC/WID permit for an incinerator or co-incinerator will require only slightly more effort than currently required in drafting a typical PPC permit and that, consequently, SEPA's charge levels will not be significantly different to those for PPC permits.

11. ENFORCEMENT

SEPA will be the enforcing authority in respect of all installations in Scotland covered by the regulations, irrespective of whether they are classified as Part A or Part B activities under PPC. The enforcement provisions for Part A and Part B installations are the same. Some operators will be brought within PPC's regulatory controls as a consequence of the regulations and will, therefore, be subject to PPC's enforcement provisions for the first time.

12. MONITORING AND REVIEW

The new regulations and their interaction with the PPC regime will be kept under review, taking account of, amongst other things, experience of the practical operation of the regulations and feedback from SEPA and the operators of incinerators and co-incineration plants.

13. CONSULTATION

A number of representative businesses were consulted for views and costings prior to this RIA being prepared. The draft RIA formed part of a consultation on the implementation of WID between August and November 2002. A wide range of trade associations and interested organisations were consulted. All consultation responses submitted to the Scottish Executive were considered prior to any decisions being taken on how to implement WID.

14. SUMMARY

The onerous nature of WID means that it has requirements which will, inevitably, add to the cost of waste incineration. The choice of regulatory options for its implementation do not significantly affect these costs. Additional regulatory costs will largely be recovered from the waste producers, reflecting the polluter pays principle, and will provide a further incentive to waste producers to reuse, recycle or otherwise minimise their waste production.

DECLARATION

I have read the Regulatory Impact Assessment and I am satisfied that the balance between cost and benefit is the right one in the circumstances.

Signed by the
responsible Minister ---

Date of signing ---

Date of Regulatory Impact Assessment: 6 March 2003

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