

12. Risk Assessment

One might reasonably expect that, when the decision to build an incinerator is made, all the above information would be carefully taken into account. Sadly this is not necessarily the case. Directors of Public Health, who usually have little knowledge of environmental health, are asked to write an IPPC (Integrated Pollution Prevention and Control) Application Report and give their opinion on the health risks from the proposed incinerator. Typically this decision is based on an inexact method called risk assessment. They tend to rely almost exclusively on this type of assessment and often have little understanding of its limitations.

Risk assessment is a method developed for engineering but is very poor for assessing the complexities of human health. Typically it involves estimating the risk to health of just 20 out of the hundreds of different pollutants emitted by incinerators.

There are a host of problems with this type of assessment, lack of accurate data on pollutants, lack of toxicological data on the majority of chemicals, the fact that an increasing proportion of people react to low levels of chemicals, the fact that in the real world pollutants come in mixtures and can have damaging synergistic effects, the fact that the foetus and breast-fed baby take in 50 times more pollutants than adults relative to their weight, and that there is virtually no toxicological data on the effect of these pollutants on either the foetus or the baby.

Further problems are that many pollutants have no safe thresholds so there can be no safe level. Indeed some pollutants are more dangerous at low concentrations than high (see section 11). In fact, it is impossible to assess risk when the toxic effects of 88-90% of chemicals and pollutants are unknown (254), particularly in relationship to birth and developmental defects. This type of assessment contains a value judgement about what is an acceptable level of risk (255). For instance what is an acceptable number of birth defects and who is it acceptable to?

Risk assessment usually involves “modelling” – which uses an estimation of exposure data, rather than actual exposure data, to assess the impacts of pollutants and their likely distribution. These reports are typically produced by the polluter.

Unfortunately modelling has a 30% confidence level – this means this technique has only a 30% chance of accurately predicting the ground level concentrations of pollutants - in other words less accurate than tossing a coin. Different models give very different results.

In addition, present modelling methods seriously underestimate the levels of pollutants. In particular, modelling almost never takes into account secondary particulates formed as the products of combustion rise up the stack. These secondary particulates can easily double the total volume of particulates (see section 2.1). Modelling produces the illusion of a scientific knowledge and a certainty that is entirely unjustified as modelling itself is imprecise and it is based on substantial scientific uncertainty and limited scientific data. It produces a mass of complex mathematical data, which implies unjustified precision, and it is difficult for people not familiar with the mathematics to disentangle the inaccuracies. It is often treated by regulators and Directors of Public Health as if it was an accurate assessment (256). In spite of these severe limitations it is extensively used.

These risks assessments have almost always concluded that incinerators are safe which flies in the face of epidemiological data which shows the opposite. It also flies in the face of the history of chemical use. The latter is littered with examples of chemicals once said to be safe which were later found to have devastating and unanticipated effects, often beyond the worst case scenario (eg DDT, PCBs, CFCs) (see section 7.2).