

I am shocked at the decision to grant a draft permit to Covanta to build an incinerator in Rookery South Pit in Marston Vale, Bedfordshire.

I write from a background of a deep concern with the long-standing failure of government and its agencies to address the problem of air quality estimated to cause the deaths of 40,000 annually in the UK. There has been a similar failure to conserve the natural environment, where there is, for example, massive loss of birds and other wildlife. The UK is now one of the “most nature-depleted countries in the world with more than one in seven species facing extinction and more than half in decline,” according to the State of Nature 2016 report. A decline in pollinators of the order of 30% in a decade has also been claimed. Defra and its scientific advisors seemed to ally with the agro-chemical industry in opposing the moratorium on neonicotinoid pesticides and rejecting the application of the precautionary principle; now the weight of evidence points increasingly to the dangers of these pesticides.

It is right for concerned citizens to question the decisions of government and their regulatory agencies, including occasions when these seem to be in the interests of corporations.

A major potential health hazard: UFPs

The dangers of Ultra Fine Particles (UFPs), also known as nanoparticles, are very great, as well those posed by Fine Particles of the order of 2.5 microns and Coarse Particles around 10 microns. UFPs may be of the order of 0.1 microns, or even smaller, acting as an “aerosol” under pressure. It is known that although those may form only a very small fraction of the mass of emissions from incinerators, they are huge in numbers. They have a huge surface area in relation to their mass and collectively offer an immense surface area. They have very high orders of reactivity and it is known that other substances such as metals may also develop high reactivity in contact with such small particles. Thus metals, and molecules from chemicals of many kinds, including dioxins and furans, become attached to the UFPs on a vast scale.

A very large proportion of UFPs will pass through the filter bags in an incinerator. The efficiency of the bags for particles of 2.5 microns has been estimated at between 5 and 30%. For UFPs, the abatement is likely to be very slight, i.e. UFPs will readily escape in the emissions in enormous numbers.

“Not only do a high proportion of the UFPs escape the filters, but they are chemically reactive and carry a wide range of products of incomplete combustion and adsorbed metals with them. The subsequent direct uptake of these respirable particles and the ready transfer from the lungs into the blood stream may be part of the reason that traditional toxicology is at a loss to explain the level of impacts for such apparently low exposures.” (Professor Vyvyan Howard [=VH] in his Statement of Evidence concerning the Proposed Ringaskiddy Waste-to-Energy Facility, p. 30, 4.13)

It has been shown that UFPs can be readily absorbed by the linings of the innermost parts of the lungs, thence into the blood stream, and on into tissues all over the body, penetrating even the blood brain barrier. Women may be more at risk than men. They receive a greater dose than men in the head and tracheobronchial regions, for example.

Very young children may be endangered, even when in the womb – indeed we fear increasingly that it is life at its earliest stages of development that may be most vulnerable to chemical pollution with possible epigenetic switching effects. Concern may be especially great about the development of children’s lungs and their immune systems.

The old and the sick may also be at higher risk.

“Out of over 11 million known chemicals, about 100,000 are being produced on industrial scale and about 1,000-2,000 new chemical entities are being introduced each year [97]. Any of these industrial chemicals may be disposed of by incineration and there is a near infinite number of possible combustion and incomplete combustion products that may be emitted either as particulate matter or by adsorption onto or reaction on the surface of particulates.” (VH, p.25, 4.5)

Nano-materials are being industrially produced on an ever-greater scale and incorporated into industrial products that may end up in incinerators. Equally, biochemical research points increasingly to “cocktail” effects that may result through multiplication in combination, not just additively.

Because of the very small size UFPs may remain suspended in the air, or deposit in a slower manner than larger particles. Thus, the pollution effect may be in the immediate vicinity of the incinerator, or further afield, even into the environment at large.

Research into UFPs and their possible effects has been undertaken, but this is a very complex field, with the outcomes unknown. There have been no satisfactory replies to the concerns raised about the technology and its polluting emissions as regards the effects of UFPs on human health.

Similar concern can be voiced over unknown possible harm to other species, animal and plant. As yet, we know not what we do.

“The Twenty-fourth Report of the Royal Commission on Environmental Pollution, Chemicals in Products: Safeguarding the Environment and Human Health, pointed out that the historical record is replete with unexpected toxicological impacts arising following the use of anthropogenic chemicals. The Royal Commission emphasized that whilst we have learnt a great deal from some of the early episodes we may still be caught unawares, as witnessed with the emergence of a large number of different endocrine disrupting chemicals during the 1980s and 1990s.” (VH, p.31, section 5.) These chemicals were at least understood, which is not the case with UFPs, Professor Howard comments, and he maintains this position, I gather.

Current standards applied to licensing of incinerators are based on mass of particles emitted; however, this in itself constitutes a real danger.

“The adverse effects on health of particulate matter (PM) are especially well documented. There is no evidence of a safe level of exposure or a threshold below which no adverse health effects occur.” (WHO report Review of evidence on health aspects of air pollution – REVIHAAP Project – 2013 p.1)

What we have here is a speculative chemistry experiment in which a giant crucible produces all sorts of possible chemicals in micro form spewed out into the environment, when we cannot determine, or have not yet determined, what the effects will be on both human beings and other animals and plants: possibly limited, alternatively calamitous. To re-iterate, there is no safe level of exposure that can be established at present.

Your stated aim is to grant “No permit if it is likely to cause significant pollution to the environment, or harm people's health”. In the Environment Agency booklet distributed at the Draft Permit Consultation in the Forest Centre on 20th Sept 2017, you offer headline principles: “We are the Environment Agency...We are working to make your environment cleaner and healthier.”

Since that is so I urge that the Precautionary Principle be applied, and Covanta denied the permit that it seeks.

A dubious consensus

The Decision document accepts the modelling and conclusions from Covanta that all is well as regards rates of pollution. You seek to present a consensus of the well-informed. Expert opinion is reviewed (Decision document p.40ff) such as Public Health England, the FSA and COMEAP (Committee on Medical Effects of Air Pollution), with a section devoted to particulates (pp. 46 - 47). "It is highly unlikely that there will be detectable effects from a particular incinerator on local infant mortality". Adverse reports such as those from Greenpeace and the British Society for Ecological Medicine are largely dismissed. Your general position is expressed by the advice from HPA (now PHE), that "modern, well run municipal waste incinerators are not a significant risk to public health" (p.42).

However, the position statements on which you rely generally date from the first decade of the 21st century, no later than 2010, and mostly earlier than this (with HPA offering an apparent holding re-statement).

A more recent major study presents great cause for concern rather than benign re-assurance such as you offer.

García-Pérez, J., et al. (2013). "Cancer mortality in towns in the vicinity of incinerators and installations for the recovery or disposal of hazardous waste." It includes most of the incinerators in Spain, with these findings:

"Excess cancer mortality (BYM model: relative risk, 95% credible interval) was detected in the total population residing in the vicinity of these installations as a whole (1.06, 1.04–1.09), and, principally, in the vicinity of incinerators (1.09, 1.01–1.18) and scrap metal/end-of-life vehicle handling facilities, in particular (1.04, 1.00–1.09). Special mention should be made of the results for tumors of the pleura (1.71, 1.34–2.14), stomach (1.18, 1.10–1.27), liver (1.18, 1.06–1.30), kidney (1.14, 1.04–1.23), ovary (1.14, 1.05–1.23), lung (1.10, 1.05–1.15), leukemia (1.10, 1.03–1.17), colon–rectum (1.08, 1.03–1.13) and bladder (1.08, 1.01–1.16) in the vicinity of all such installations. Conclusions: Our results support the hypothesis of a statistically significant increase in the risk of dying from cancer in towns near incinerators and installations for the recovery or disposal of hazardous waste." [Reported in UKWIN]

According to "Waste incineration and adverse birth and neonatal outcomes: a systematic review" (Ashworth DC, Elliott P, Toledano MB., 2014): "...we identified a number of higher quality studies reporting significant positive relationships with broad groups of congenital anomalies, warranting further investigation. Future studies should address the identified limitations in order to help improve our understanding of any potential adverse birth outcomes associated with incineration, particularly focussing on broad groups of anomalies, to inform risk assessment and waste policy." [Reported in UKWIN]

I suggest that your position should change towards recognition of disturbing contrary evidence, and that again the precautionary principle should be applied.

"Well run"?

There is a considerable body of evidence that incinerators are inherently troubled, with a highly questionable record of reliability and safety.

DR Adam Bostock is quoted by UKWIN as stating:

“Continuously low emissions can only be achieved if the technology is reliable, well maintained, and operated effectively by well trained staff at all times. It also requires a continuous waste stream that has a suitable calorific value, and low levels of problem substances that promote pollutant emissions...A critical failure of the combustion control or emissions abatement technology could lead to unusually high emission rates. Similarly, incorrect operation of the plant or an accident could result in unusually high emission rates. Further, it is accepted that during the commissioning of a new incinerator plant that emissions will be unusually high over this period.”

As one example, according to UKWIN, Waste Recycling Group (WRG), owners of Nottingham’s Eastcroft incinerator, has received a series of warnings from the Environment Agency (EA). The repeated warnings culminated in The EA writing to the Company Secretary of WRG alleging that the owners have committed pollution offences.

Covanta, as you acknowledge, has been subject to prosecutions and fines, paying \$355,000 in 2009 and \$400,00 again in 2011 in for failures in Connecticut that resulted in excessive dioxin levels (Times Union. <http://www.timesunion.com/local/article/Covanta-seeking-N-Y-renewable-nod-pays-1921269.php>) Bedfordshire Against Covanta Incinerator (BACI) mentions “100 reportable incidents of significance in the last five years” at Covanta’s 41 plants.

The recent incident at the Covanta Poolbeg incinerator underlines an accident-prone nature:

“The hospitalisation of 11 workers following a major incident at Dublin’s new waste incinerator at Poolbeg forced the temporary closure of the plant within days of it coming into operation.

The incinerator is still only at the commissioning stage, but the timing of the incident undermines attempts to reassure local people about the safety of the plant.” (Irish Times 9 June 2017)

You seem to minimise Covanta’s record unduly. You appear to accept its argument that it takes the opportunity to learn from its mistakes, but without presenting evidence that such learning has been successful and led to a reduced number of incidents.

Not local

The Environment Agency booklet distributed at the Draft Permit Consultation in the Forest Centre on 20th Sept 2017, giving “Our position on energy from waste plants”, states the need to develop facilities so that waste is disposed of or treated near to where it is produced.” However, the Covanta incinerator in Marston Vale will require waste to be brought in from many miles away, from as far as Birmingham, it has been suggested. Both local authorities (Central Beds and Bedford), after long sustained opposition to the incinerator, will not be making use of it for waste disposal, I understand. The failure to provide CHP for the local community, which the EA asserts it is “content” with, merely adds to the problem.

Ash as waste

Allied to this are worries over ash. In producing waste ash that constitutes about 20 - 25% of the original waste that has been burnt, incineration is creating another sort of serious problem that the Decision document only partly addresses. Bottom ash remains a health concern. It is agreed that Fly ash, though smaller in quantity, must be classed as toxic. Transporting ash to other sites for disposal, probably landfill, raises the question of accidents, with hazards for human health as well as the environment at large, both on the journey and at destination. If the probability is rated low, the harm could nevertheless be very serious. There remain major questions about whether the ash can or should be used for purposes such as road surfacing or manufacturing concrete blocks. By its very

nature, incineration does not fully address the grave problems of landfill because of the problem of ash.

Wider arguments against the technology proposed for Marston Vale

Overall many very serious arguments have been well advanced against incineration technology:

- 1) Incineration is “end of pipe”: a barrier to the Circular Economy, towards which we should all be moving, with cleaner technology and better manufacturing design that ensures that materials are not incorporated unless they can be re-used or recycled. Incineration inhibits an essential but possible culture shift towards zero waste, except when communities react against it, as at Capannori in Tuscany where almost 85% of municipal waste is now recycled.
- 2) Incineration depresses recycling.
- 3) Incineration wastes finite resources.
- 4) Incineration wastes embedded energy, and is far less efficient in this respect than recycling and composting.
- 5) Incineration exacerbates climate change.
- 6) Incineration overcapacity exists and is harmful.
- 7) Within these statements there are powerful economic considerations against the technology: that it is inherently expensive and “wasteful”, it provides relatively few jobs, it partly disincentives the development of new technology that would enable higher rates of recycling, with intrinsic economic benefits in itself. The damage is long-term because the life-time of the incinerator may be as great as 40 years, exacerbated when clients supplying waste, including local authorities, are locked into long-lasting contracts. Ludwig Kraemer, former waste director for the European Union, is quoted as saying “An incinerator needs to be fed for about twenty to thirty years, and in order to be economic it needs an enormous input from quite a region. So, for twenty to thirty years you stifle innovation, you stifle alternatives, just in order to feed that monster which you build.”

Climate Change

2016 saw average concentrations of CO₂ hit 403.3 parts per million, up from 400ppm in 2015, according to the World Meteorological Organization (WMO).

"It is the largest increase we have ever seen in the 30 years we have had this network," Dr Oksana Tarasova, chief of WMO's global atmosphere watch programme, told BBC News. "The largest increase was in the previous El Niño, in 1997-1998, and it was 2.7ppm; and now it is 3.3ppm. It is also 50% higher than the average of the last 10 years. Last year's increase (2016) was 50% higher than the average of the past 10 years. Researchers say a combination of human activities and the El Niño weather phenomenon drove CO₂ to a level not seen in 800,000 years. Scientists say this risks making global temperature targets largely unattainable.

2017 is likely to among the three hottest years ever in human history.

The world faces the gravest existential crisis. The incinerator will produce large amounts of greenhouse gases, ultra-damaging oxides of nitrogen as well carbon dioxide, with more than one tonne of CO₂ for every tone of waste, according to UKWIN. It is no better than fossil fuel energy production. We should instead ensure that all aspects of our energy production system is zero-carbon, as a matter of national and world emergency, and most of all require this of any new build.

The Environment Agency booklet asserts: "It is our job to look after your environment and make it a better place, not just for you, but for the future generations that will follow us."

I applaud that statement of role and responsibility but suggest that a decision to grant the permit, with the knowledge that we now have, and the lack of full research into the effect of effluvia containing UFPs, may appear morally grotesque to those future generations who will have to bear the costs of our failures.

Please reconsider.

Colin Hall

Secretary of Bedfordshire Climate Change Forum

Though written in a personal capacity