Dear Ms Hall,

I expect that considerable attention will be given by NICNAS to the various aspects of nanomaterials regulation, and, having been involved in previous NICNAS processes on refractory organics, I have confidence that the matter of nanomaterials regulation will be given due consideration in our current market-oriented environment, hopefully to the net benefit of individual consumers, their communities, and both the built and natural environments we depend upon.

I am concerned, however, that no consideration appears to be explicitly given to a life cycle analysis and overall energy budget for individual nanomaterials. Because these materials are treated generally as commercial products, to be primarily regulated by economic patterns of supply and demand, their influence on patterns of energy and materials flow in our environment is not very systematically addressed.

Concerns similar to mine are mentioned in the tabulated summary of public consultation comments, under point 4:

" • Comprehensive lifecycle analysis, including waste phase and risks associated with potential recycling."

But there is no indication that a systematic method of analysis has been or will be considered toward this end.

I draw your attention to two resources which may allow a disciplined analysis of the industrial production of specific nanomaterials, within a proven system of comparing the resources required:

"Environmental Accounting"(1) and "Modeling for All Scales"(2). These texts describe a system for evaluating materials and energy flow and the energy-related environmental impacts of industrial-scale production of materials, in a consistent manner.

The basic assumption of Odum's system of environmental decision making is that production, transport, consumption and disposal of any given material requires energy, and that the energy required for a given material, object or set of objects, to reach a given stage and/or place, can be accounted for, in terms of all the energy required to reach that particular endpoint.

This issue of a life cycle analysis based on the energetics of production, distribution and disposal is separate from other concerns such as nanotoxicity, both acute and chronic, at a range of dose rates. Such considerations on their own justify an immediate moratorium on nanomaterials, as their proliferation appears to be driven mainly by commercial interests rather than any proven indispensability of specific products.

Given that such a moratorium would not be likely without extended public debate, I urge that life cycle energy requirements of specific nanomaterials be determined as precisely as can be achieved, and that such information be easily available as a basis for public consideration of the value of a particular nanomaterial, in addition to its other attributes, prior to any commercial production or distribution. The energy commitment for products of debatable utility may well be a deciding factor in individual cases, particularly where they are the outcome of energy intensive processes (obvious or not), and where they may well serve no more efficaciously than less expensive, less sophisticated and better proven products.

I commend the abovementioned texts as a method of evaluating the energy commitment of commercial, industrial scale production, distribution and disposal of a given nanomaterial.

(1) Odum, H.T (1996) "Environmental Accounting: Emergy and environmental decision making", John Wiley and Sons, Brisbane

(2) Odum, H.T. & Oddum, E.C. (2000) "Modeling for All Scales", Academic Press, Sydney

I have attached my cover sheet to this email. I would have included my comments on a page following the cover sheet, but it was not allowed. I believe it is simplest to print out this email if required, and include its text with the cover sheet. I hope my strategy is satisfactory, I thank you and those who read my submission for their consideration.

Regards,
Robert Rands
[redacted]5