GREEN NANO IN THE US

Category:
Case Studies

One of the first cases for the influential concept of "green nanotechnology" comes from the way in which the US has conceived the relation of technology and sustainable development. *Green nanotechnology: it's easier than you think* is the title of a report published in April 2007 by the Woodrow Wilson Center (WWC), an American think tank. The report represents the outcome of the *Green Nano Initiative* initiated by the WWC and the Pew Charitable Trust. One part of this initiative consisted in organising a series of workshops in 2006 and – in collaboration with the American Chemical Society – the *Nanotechnology and the Environment Symposium.* In the report is a quote from a leading chemist: "Green nanotechnology is a terrific way to do nanotechnology responsibly" (Hutchison in Schmidt 2007: 6). The connection between green chemistry and green nanotechnology comes through clearly at several points in the report – not only in the form of institutional initiatives and individuals involved in both areas, but also in references to certain issues, such as the transfer of precepts from green chemistry to nanotechnology. Here, a model that has already been tried and tested – and that in some respects has been successfully established in society – is transferred to a technology of the future. In the process, the latter is not only provided with a matrix for "responsible innovation", as the phrase goes, but it also benefits from being placed on the solid ground of proven experience – pre-empting the future, as it were, by way of the past. Just as discourse about the future is always simultaneously discourse about all things present, so expectations and fears of the future are a crucial factor in decisions that are made in the present.

Thus green nanotechnology is no longer something radically new or spectacularly unexpected; instead it is located in an already familiar experiential horizon, namely that of established green chemistry. This serves as a means of channelling visions of this emerging technology that are dedicated to the idea of almost limitless potential for change. Researchers assure us that "a strong marriage between nanotechnology and green chemistry/engineering holds the key to building an environmentally sustainable society in the 21st century'" (Schmidt 2007: 7). The bond is further strengthened by the "12 principles of green chemistry" and the "9 principles of the engineering sciences." Accordingly, the precepts for green nanotechnology borrow from green chemistry the economy of atoms and the injunction not to waste atoms, the increase of energy efficiency, avoidance of pollution, and application of the strictest safety standards. These latter principles are at the same time an integral component of the principles of engineering, which also attach great importance to the local embeddedness of product development and production. Worthy of notice is especially the principle that is placed first and ahead of all the others: "Engineer processes and products holistically, use systems analysis and integrate environmental impact assessment tools" (Schmidt 2007: 8).

Products and processes that embody this philosophy include water and air filters, top grade catalytic converters, and solar cells. All these are established "green" products that have rarely been associated with nanotechnologies to date, or at least not directly. The visibility of such "real products" on the market significantly increases trust in the "greening" of nanotechnology. On this point, support is forthcoming also from Barbara Karn from the Environmental Protection Agency and a figurehead for US-American green nanotechnology. According to Karn, iron nanoparticles could be such a real product. These nanoparticles ha- ☛

☞ ve been under development since the mid-1990s and have proved to be far more efficient than any conventional – and thus larger – iron particles in breaking down harmful substances in the soil (such as PCBs and heavy metals). Iron nanoparticles are extremely versatile; they are put to use because of their catalytic and magnetic properties. They are used for the making of synthetic ammonia in the Haber-Bosch process, for hyperthermia as a medical treatment, for magnetic data storage and sensoring technology – and, of course, for soil and water remediation. The fact that iron nanoparticles, of all things, should acquire this symbolic power of the real may seem less than dazzling at first sight, and yet this is precisely what makes them so special. Iron is the most prominent ferromagnetic metal in science and technology and one of those most intensively studied. And in people's everyday experience, too, the metal is well-known – even if not in the form of nanoparticles – so that its use in nanotechnology triggers an association with a familiar area of experience.

It is this "green nano" which, along with green chemistry and green engineering technology, is predicted to have a dazzling future. The close association of "green" and "nano" occurs in the eco-discourse as well as the nano-discourse. While ways are sought in a whole range of sectors to "green up" industry, "green" engineering scientists – in particular, ecotechnologists – are interested in exploiting nanotechnology products and methods. And in doing so, both groups draw on the established discourse of sustainability.

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Links to other Portfolio sheets:

- Green Nanotechnology

Literature: Print & WWW

Schmidt, K. F. (2007). Green Nanotechnology: It's easier than you think. (Washington DC)
www.nanotechproject.org/publications/archive/green_nanotechnology_its_easier_than/