Evaluating the nano *green-hype* and the dematerialization of economy

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A recent *hype* on nanotechnology's expectations has been identified within a complex and wide variety of conceptions among experts and the general public.[1] As a technology that has its foundations on the manipulation of matter at dimensions between a millionth (10^{-6}) and a billionth (10^{-9}) of a meter, it is seen by some as a brand-new disruptive field and, by others, as a body of knowledge and techniques about the same scale formerly part of already existing disciplines such as physics, chemistry, genetic, materials engineering and other such areas. Both perspectives, nonetheless, assume nanotechnology as a technological frontier that, along with biotechnology, information technologies/robotics/ artificial intelligence and cognitive sciences – the so called 'converging technologies' – could be capable, in the long run, of revolutionizing the world and 'human nature' as we know it; either positively or negatively.[2]

It is a context in which complexity and uncertainty are relevant features and in which societal, ethical and/or environmental aspects get more controversial as the stakes in dispute get higher.[3] A reason that seems to explain the stimulus of some stakeholders –mainly governments- to conform a variety of study groups on such implications.

In this context and in particular related to the environmental aspects of nanotechnology, the analysis of the nano-industrial metabolism characteristics, turns out to be a central measurement tool to reasonably dissipate hypes on 'dematerialization of the economy' while, at the same time, it can help to understand the type and the extension of the environmental impacts of nanotechnology (positive or negative). The poster presents a schematization of an environmental evaluation approach of nanomaterials based on an ecological economics and an industrial ecology perspective. It takes into account the (nano)materials and energy flows, as well as the waste and recycle processes. Finally, some recommendations are pointed out.

[1] See: Delgado. Gian Carlo. 'NanoConceptions: A Sociological Insight on Nanotechnology Conceptions.' The Journal of Philosophy, Science and Law.July 1, 2006. Miami, United States.

[2] For some blueprints on 'converging technologies', read: Roco, Mihail C., y Bainbridge, William. Converging Technologies for Improving Human Performance. National Science Foundation. June 2002, US; Nordmann, Alfread (rapporteur). Converging Technologies – Shaping the Future of European Societies. European Commission. Brussels, Belgium., 20004; Bouchard, Raymond. Bio-Systemic Synthesis. Science and Technology Foresight Pilot Project. Report 4. Canadian National Research Council. Canada, June 2003.

[3] This is the main argument that some authors embrace for considering converging technologies' aspects as 'post-normal science' issues and therefore as those in which a new principle is necessary for their evaluation. This is mainly a process where open and extensive debate is a fundamental tool and where precaution is also adopted to confront ignorance, uncertainty and the incapacity to predict technological pitfalls. See: Ravetz, Jerome. Scientific Knowledge and its Social Problems. Oxford University Press. New York, US., 1971; Funtowicz, Silvio y Ravetz, Jerome. Uncertainty and Quality in Science for Policy. Kluwer Academic. London, UK, 1990; Funtowicz, Silvio y Strand, Roger. 'Models of Science and Policy' in Taavik, T., Kjolberg, K., Fenne, M. Genetic Engineering and Genetically Modified Organisms: PrecautionaryApproaches to Risk and Uncertainty. Tapir Akademisk Forlag. Noruega, 2006.