vigeo eiris
Rating

Companies' neglect of the challenges posed by growing use of nanomaterials

OPINION COLUMN

June 2017

vigeo eiris
Rating

The nanomaterials revolution continues without considerable restraint from authorities while CSR challenges are virtually ignored by concerned companies.

This paper seeks to explore the issue of nanomaterials' impacts on human health and the environment, with a focus on sectors where there are evidences of applications in the market. Vigeo Eiris assesses companies' behaviour concerning the risks associated to the use of nanotechnologies and their level of engagement regarding the respect for the fundamental right to health[1].

Vigeo Eiris' key findings

Sectors under assessment display some differences in terms of reporting, but the overall level of transparency remains very low.

Nanomaterials are present today in more than 800 types of products despite there being no consensus from the scientific community on the impact on human health and the environment.

Greater consideration is given by companies to Genetically Modified Organisms (GMOs) than to nanomaterials with regards Product Safety.

Regulations are still at an early stage, with little evidence from authorities of plans to implement a precautionary approach on the use of nanomaterials.

Of the companies that are transparent on the topic, most are only reporting in terms of complying with regulations rather than taking voluntary initiatives to ensure the protection of consumers and employees from the potential adverse effects of these materials.

1 1966, United Nations International Covenant on Economic, Social and Cultural Rights (Article 7)
1948, United Nations Universal Declaration of Human Rights (Article 25).

Introduction

Delivery systems for nutrients, vitamins and drugs, functional foods, aanti-bacterial fabrics for clothing, and even cancer treatments have one thing in common nowadays: the use of nanomaterials. Nanomaterials, which are materials that are extremely small (approximately 10,000 times smaller than the diameter of a human hair)[1], are present virtually everywhere: in foods, beverages, cosmetics, building materials, packaging, healthcare treatments, pharmaceuticals, clothing, and other common goods[2]. As a result, consumers and workers in a large number of sectors are today unwittingly exposed to materials about which science has not yet reached a consensus regarding their safety. For manufacturers, benefits arise because these technologies can enhance or create new properties to materials by altering molecules at small scales. In 2012, the European Commission (EC) estimated the value of the nanomaterials market at EUR 20bn[3].

Nanosciences and nanotechnology have developed applications that can be used across virtually all scientific fields including those of chemistry, biology, physics, materials science, and engineering[4]. To date, it is estimated that more than 800 commercial products are dependent on nanoscale materials and processes. There are two types of nanomaterials: organic (polymer emulsions) and combined organic and inorganic (insoluble metallic compounds). Being the most common, the second group of nanomaterials include Silicon Dioxide (SiO2), Titanium Dioxide (TiO2), Calcium Chloride (CaCl2), Aluminium (Al), Silver (Ag), or Gold (Au).

One of the most commonly used nano-additives in the food sector is Titanium Dioxide (TiO2) or E171, which has a purely aesthetic function since it does not provide flavour or enhance nutrients. It can be used as an anti-dispersant in soups and preparations in powder form or to provide colour. However, E171 is considered to be possibly carcinogenic when inhaled. Other additives of common use at the nanoscale are calcium carbonate (CaCO3), used as an acid corrector or to enhance fluidity, as well as Silicon dioxide-Silica (E551), Aluminium silicate- Kaolin (E559) and Titanium dioxide (P25).

1 "Nanomaterials" – European Commission - 05/08/2016

2 "Benefits and Applications" - National Nanotechnology Initiative – Accessed 12/06/2017

3 "Second regulatory review on Nanomaterials" – European Commission – 03/10/2012

4 "What is Nanotechnology" - National Nanotechnology Initiative – Accessed 12/06/2017

vigeo eiris Rating

Vigeo Eiris review: what are companies doing about nanomaterials?

Vigeo Eiris assessed a sample of 376 companies (between November 2014 and May 2017), from sectors where the use of nanomaterials is most evident: **Food, Luxury Goods & Cosmetics, Health Care Equipment & Services and Pharmaceuticals & Biotechnology.** Our research reviews the companies' commitments to the following criteria: 'Product Safety', 'Information to Customers' and 'Health & Safety'.

While the vast majority of companies do not disclose commitments or measures to address the topic, **there are some differences between the four sectors under review.** For instance, though 15% of companies in the **Luxury Goods & Cosmetics sector** report on commitments to conduct risk assessments related to the use of nanomaterials in their products, only 11% of companies declare that they have conducted such risk assessments. In terms of informing customers of the presence of nanomaterials in final products, only 5% of the companies in this sector communicate on the transparent labelling of nanomaterials. **L'Oréal** reports that it ensures that the use of nanomaterials appears on product packaging. Nevertheless, this measure only appears to be implemented when it is imposed by national legislation, instead of voluntarily.

Other sectors display even lower levels of transparency on the topic. In the **Health Equipment & Services sector, none out of the 111 companies appears to have a commitment to assess the risks associated with nanomaterials.** In addition, no mechanisms are reported to monitor the use of nanomaterials or to protect employees that are in direct contact with these substances.

The situation is also not encouraging in the **Pharmaceuticals & Biotechnology sector** where out of 117 companies, only 3% report at least one measure to address the topic. For instance, **GlaxoSmithKline** states that it monitors employees' exposure to nanotechnologies, particularly nano-titanium dioxide, and provides advice to employees in R&D facilities on handling materials classified as nanoparticles. **AstraZeneca** reports that it actively follows the development of nanotechnology with regards to good practices for handling nano-sized materials. Nevertheless, no company has provided evidence of having put in place labelling of products to indicate the presence of nanomaterials. In this sector, companies are jointly assessed on commitments to ensure product safety in regards to the use of **Genetically Modified Organisms (GMOs) or nanomaterials.** Only 5% of companies appear to have published a position paper on nanotechnology, policies on the handling of these materials or guidelines for the responsible use of nanotechnology. On the other hand, 11% of these companies address the issue of GMOs. While both numbers are very low, **it seems that companies tend to better address challenges linked to GMOs than those related to nanotechnologies**.

Regarding the **Food sector,** where **nanomaterials are mostly present in final products consumed by the public**, only 1% of the 110 companies reviewed commit to conducting risk assessments on the potential impacts of nanomaterials on humans in product packaging and final products. In addition, while 6% of the sector commit to provide transparent labelling of nanomaterials, only 2% appear to have put this into place. For example, **Unilever** states that it is implementing the labelling of cosmetics and foods that contains engineered nanomaterials as required by EU regulations. However, the company stresses that it feels "logos or symbols are less appropriate as experience has shown that their use is often associated with a risk warning and might confuse consumers".

Nanomaterials: a threat to humans and the environment?

The main concern with nanomaterials is the **unknown health and environmental consequences.** A report by the OECD and Allianz, "Opportunities and risks of Nanotechnologies", explains that fine and ultrafine particles[1] resulting from industrial processes and from automobile traffic show a correlation between ambient air concentration and mortality rates. However, the full health effects of ultrafine particles on the respiratory and cardiovascular system are still unknown and require further research.

Ultrafine particles can be absorbed into the human body via the blood stream where they may reach vital organs and result in tissue damage. E171 in particular can reach the bone marrow, ovaries, lymph nodes and nerves[2]. Nanomaterials show different interactions with the human body than materials of a greater size and their effects are not yet fully determined[3]. The EC, which has not yet been able to reach a conclusive definition of nanomaterials , highlights that given the interaction of nanomaterials with proteins and other elements in the human body, their use could generate adverse health effects, alter DNA, and create chromosomal alterations and gene mutations[4]. Human exposure to nanomaterials has been reported to occur more frequently at the production level and with personnel directly involved in nanomaterials research, but exposure is expected to reach an increasing number of consumers in the future.

The regulatory framework for nanomaterials in the European Union and the United States remains at an early stage and mainly focuses on case-by-case assessments. Nevertheless, *EC's regulation No. 1223/2009*, which entered into force on July 11, 2013, includes provisions to oblige cosmetics companies to mention the name of ingredients containing nanomaterials by adding the word «nano» in brackets to the ingredients list on their packaging[5]. **The United States have not adopted similar regulations for the labelling of products.** The EC and the U.S. Environmental Protection Agency (EPA) have made efforts to promote chemical safety assessments for nanomaterials. Under the European REACH regulation , companies will have to submit dossiers before 2018 to register the use of these materials[6]. In the same way, the EPA's Toxic Substances Control Act (TSCA) includes requirements for manufacturers of new nanomaterials to submit "Pre-manufacture notifications" in 2017, with the reported goal of protecting "against unreasonable risks to human health and the environment"[7]. These measures are expected to allow both agencies to collect further information on health and environmental impacts data. However, **neither of these agencies appears to have taken the lead in placing nanomaterials currently available on the market on watch lists or banning the use for those suspected of having the highest risk levels.**

1 Particles smaller than 100 nm in diameter.

2 "The great big question about really tiny materials" – Fortune – 06/03/2015

3 "The great big question about really tiny materials" – Fortune – 06/03/2015

4 "Nanomaterials" – European Commission - 05/08/2016

5 European Commission Regulation No. 1223/2009 - Accessed 12/06/2017

6 "REACH Guidance for nanomaterials published" – ECHA - Accessed 12/06/2017

7 "Control of Nanoscale Materials under the Toxic Substances Control Act" – US Environment Protection Agency – Accessed June 12/06/2017

Conclusion

There appears to be an overall trend of increasing the use of nanomaterials for countless applications. However, most companies seem to leave the potential associated risks unaddressed.

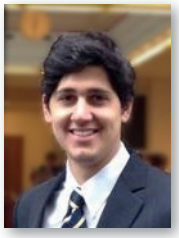
Company responses tend to be limited to abiding by current regulation, (which for the moment do not impose major challenges), instead of undertaking further voluntary disclosures. Although the scientific evidence is inconclusive on the long term effects of nanomaterials on human health and the environment, companies are called upon by NGOs and consumers associations to use precaution when exposing employees and customers to these substances.

Even when no official mechanism to protect the public has been implemented, companies should be transparent about the presence of nanomaterials at production sites and in final products, allowing both employees and consumers to make informed decisions.

Companies neglecting to take a hands-on approach to this topic may find themselves involved in future legal disputes if scientific evidence emerges confirming that nanomaterials indeed have a harmful impact.

This could have an impact on their reputation and damage public trust in them and their products. In addition, there could be other operational impacts, given that companies may have to adapt manufacturing processes and reconfigure ingredients to replace or adapt nanomaterials for substances that are more widely accepted by authorities and the public. Vigeo Eiris will continue to monitor the efforts of companies and the relevant authorities to provide greater clarity on nanomaterial uses and restrictions.

Author:



Carlos Araujo

ESG Analyst and Thematic
Manager for Emerging Issues

This study was witten under the direction of:

Fouad Benseddik

Director of Methods and
Institutional Relations

Valérie Demeure

Head of Thematic Research

For more information:

Press contact: Anita Legrand - anita.legrand@vigeo.com / +33 1 55 82 32 44

General information: Amélie Nun - amelie.nun@vigeo.com / + 33 1 55 82 32 77

vigeo eiris

vigeo eiris *Rating*

vigeo eiris *Enterprise*

Vigeo Eiris is a global provider of environmental, social and governance (ESG) research to investors and public and private corporates. The agency evaluates the level of integration of sustainability factors in the strategy and the operations of organizations and undertakes a risk assessment to assist investors and companies in decision-making.

Vigeo Eiris offers two types of services through separate business units:

- **Vigeo Eiris rating** offers databases, sector-based analyses, ratings, benchmarks and portfolio screening, to serve all ethical and responsible investment strategies.
- **Vigeo Eiris enterprise** assesses organizations of all sizes, listed and not listed companies in order to support them in the integration of ESG criteria into their business functions and strategic operations.

Vigeo Eiris methodologies and rating services adhere to the strictest quality standards and have been certified to the independent ARISTA® standard. Vigeo Eiris is CBI (Climate Bond Initiative) Verifier.

Vigeo Eiris is represented in Paris, London, Boston, Brussels, Casablanca, Milan, Montreal, Santiago, Stockholm and Tokyo. The team is composed of more than 200 experts of 28 nationalities with diversified and complementary skills. Vigeo Eiris has developed the "Vigeo Eiris Global Network" made of 6 research providers (Australia, Brazil, Germany, Japan, Spain and Mexico).

For more information: www.vigeo-eiris.com

Produced and designed by Vigeo SAS