ANSES Opinion
Request No 2019-SA-0157

The Director General

Maisons-Alfort, 24 November 2020

OPINION
of the French Agency for Food, Environmental and Occupational Health & Safety

on "the quality, use and sharing of data declared in the R-Nano register"

ANSES undertakes independent and pluralistic scientific expert assessments.

ANSES primarily ensures environmental, occupational and food safety as well as assessing the potential health risks they may entail.

It also contributes to the protection of the health and welfare of animals, the protection of plant health and the evaluation of the nutritional characteristics of food.

It provides the competent authorities with all necessary information concerning these risks as well as the requisite expertise and scientific and technical support for drafting legislative and statutory provisions and implementing risk management strategies (Article L.1313-1 of the French Public Health Code).

Its opinions are published on its website. This opinion is a translation of the original French version. In the event of any discrepancy or ambiguity the French language text dated 24 November 2020 shall prevail.

1. BACKGROUND AND PURPOSE OF THE REQUEST

The French scheme for declaring nanomaterials was established by an initiative resulting from the Grenelle environmental round table (Commitment 159), implemented through Article 42 of the Grenelle I Act of 3 August 2009 and then Article 185 of the Grenelle II Act of 12 July 2010. This scheme is designed to improve understanding of the nanomaterials placed on the market – along with their volumes and uses – to allow traceability of the sectors in which they are used and to provide the public with better information.

Article 185 of the Grenelle II Act specifies the information to be declared: substance identity, quantities and uses, as well as the identity of the professional users to whom they have been transferred, whether for payment or free of charge. This Article also provides for declaring entities to be asked to submit information on the hazards and exposure arising from these substances, along with data useful for assessing risks to health and the environment.

These provisions' conditions of application were defined by Decree no. 2012-232 of 17 February 2012 on the annual declaration of nanomaterials. The information to be declared was then specified

by the Ministerial Order of 6 August 2012 on the content and conditions of presentation of the declaration, pursuant to Articles R. 523-12 and R. 523-13 of the French Environmental Code.

These texts on mandatory declaration designated two institutional stakeholders, the Ministry of Ecological Transition (in particular the Directorate General for Risk Prevention – DGPR), and the French Agency for Food, Environmental and Occupational Health & Safety (ANSES), which is mandated in Decree no. 2012-232 as the manager of the register of declarations and the data it contains.

In addition to managing the R-Nano register, therefore, ANSES monitors the declared data and makes them available to organisations listed by Decree. It also uses the collected data for its own work to document exposure and assess the risks associated with nanomaterials.

The quality of the declared data, used by ANSES and other public health organisations, determines the accuracy and relevance of all the information, decisions and actions resulting from their use. Besides verifying that declaring entities are fulfilling their regulatory obligations in terms of the information entered, which is the responsibility of the administrative authority in charge of this scheme, a qualitative analysis of the data collected is important to enable their use, in particular for assessing health risks.

In this context, and from the sixth year of declaration (2018) – which ensured that register operation and the number of annual declarations had both reached a stable level, and also that some feedback had been obtained – an overall assessment of the mandatory declaration scheme and the declared data was undertaken. The expert appraisal examined the number, quality and relevance of the collected data and how they were used, as well as the issues, obstacles and legal levers associated with their use and sharing, eight years after the entry into force of mandatory declaration.

This work sought to analyse the R-Nano register's ability to serve the purposes for which it was designed:

- to improve knowledge of nanomaterials, i.e. their identity, the quantities handled, and their different uses and areas of application;
- to ensure the traceability of nanomaterials in France: from the manufacturer or importer through to the distributor serving the last professional user;
- to gather knowledge on nanomaterials for risk assessment and public information purposes.

This comprehensive analysis of the mandatory declaration scheme revealed its strong points, but also some limitations, for which areas of improvement have been suggested.

2. ORGANISATION AND METHODOLOGY OF THE EXPERT APPRAISAL

This expert appraisal falls within the sphere of competence of the Expert Committee (CES) on "Physical agents, new technologies and development areas". It was carried out in accordance with French standard NF X 50-110 "Quality in Expert Appraisals – General Requirements of Competence for Expert Appraisals (May 2003)".

The expert appraisal was integrated into ANSES's work programme and undertaken in response to an internal request. It was conducted in-house, with the scientific support of four expert rapporteurs specialising in nanomaterials (physico-chemistry of materials, characterisation and metrology, toxicology and ecotoxicology).

Several sources of information were used, in order to perform an assessment of the mandatory declaration scheme that was as accurate as possible. For this expert appraisal, ANSES therefore relied on:

- an analysis of the declared data;
- the collected feedback of the various organisations authorised by decree to access the data;
- a research and development agreement (CRD) between ANSES and the Institute of Legal and Philosophical Sciences at the Sorbonne (ISJPS), in order to analyse the different legal systems governing the use and sharing of data from the R-Nano register;
- the scientific literature and ANSES's expert appraisal reports on nanomaterials.

The methodological and scientific aspects of the work were regularly presented to the CES between October 2019 and October 2020. The report produced by the Agency therefore takes into account the contributions of this group's experts. This opinion was adopted by the CES on "Assessment of the risks related to physical agents, new technologies and development areas" on 22 October 2020. This expert appraisal work was therefore conducted by a group of experts with complementary skills.

3. ANALYSIS AND CONCLUSIONS OF THE CES

The assessment of the mandatory declaration scheme was carried out in two main areas:

- assessment of the quality of the declared data: this concerned firstly the primary quality of the register, i.e. the level of information entered in the different required fields, and secondly an assessment of the relevance of the declared data;
- assessment of how the declared data are used: analysis of the various studies carried out in support of risk assessment, mainly by the various organisations designated by decree, the various ANSES entities and the public authorities.

This assessment then enabled the data's usefulness and limitations to be identified according to two themes:

- mandatory declaration of nanomaterials for the purposes of traceability and risk assessment;
- mandatory declaration of nanomaterials for the purposes of public information.

3.1. Assessment of the quality of declared data: poor level of information and limited validity

A total of 52,752 French declarations relating to the fiscal years 2013 to 2017 were included in the analysis.

Level of information in the "Substance identity" section

The results of the analysis showed that at least 60% of the fields concerning the chemical identity of the substance (CAS number, EC number, chemical formula or chemical name) were filled in correctly. On the other hand, the analysis of the information in the fields corresponding to essential parameters for characterisation[1] of the substance according to the ISO/TR 13014 standard[2] showed that very little information on the characterisation of nanomaterials was available.

[1] Primary particle size, state of aggregation/agglomeration and size of aggregates/agglomerates, shape, specific surface area, impurities, crystalline state, surface charge.

[2] FD ISO/TR 13014 (2012) Nanotechnologies – Guidance on physico-chemical characterization of engineered nanoscale materials for toxicologic assessment.

Level of information in the "Quantity" section

The variables entered in the "Quantity" section (quantities produced, imported or distributed) depend on the status of the declaring entity (producer, importer, distributor). The analysis did not examine the quantity produced, as this data item is only mandatory for producers.

- ✓ Quantities imported

Despite the mandatory nature of the information in this field, around 35% of the variables entered contained anomalies.

- ✓ Quantities distributed

The "Quantities distributed" field had been left blank in 78% of the declarations analysed. This absence of declaration may be justifiable, depending on the texts in force. Justification was provided in around 73% of the declarations.

Level of information in the "Uses" section

The intended uses of nanomaterials are described with use descriptors developed by the European Chemicals Agency (ECHA) under the REACh Regulation[3].

The analysis showed that the "Sector of use" descriptor was correctly entered, as was the "Chemical product category", with only a few uninformative statements. This was not the case for the other descriptors ("Process category", "Article category", "Environmental release category"). The analysis results showed that on the whole, these fields were not properly filled in, meaning that the intended uses of the nanomaterials could not be correctly identified.

The results of the analysis showed that the information in the declarations was unsatisfactory and therefore likely to have a major impact on the use of the register data. These results could be due to the following:

- the scheme allows declaring entities to leave certain fields blank, with justification. The analysis of the declarations showed that the declaring entities most often justify the unavailability of the information by explaining that their supplier has not provided them with the data to be declared. ANSES would like to point out that provision of the declaration number is nevertheless a requirement of the regulations;
- poor-quality information entered by stakeholders "upstream" of the distribution chain (both within and outside France) permeates throughout the chain of declaring entities due to the successive importing of information in the declarations. This therefore has a major impact on the quality of data in the register;
- regarding the incorrect entry of use descriptors, the unsuitability and technical nature of the reference standard consulted when describing these uses were often mentioned.

Analysis of the validity of declared data in a sample of declarations

Alongside the level of information in the declarations, the validity of the declared data was analysed based on declarations for two substances: silica and carbon black. These substances were selected because they account for a large tonnage, a multitude of uses and many declarations in R-Nano, as

[3] Regulation (EC) No 1907/206 of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACh)

well as a health concern: carbon black has been classified according to the International Agency for Research on Cancer (IARC)[4].

The analysis of the validity of the data for these declarations showed that:

- the data on the companies' names, addresses and economic activities, and the sectors of use (SU) and chemical product categories (PC) of the substances were valid;
- with the exception of the identifiers (CAS number, EC number, chemical formula or chemical name), the data associated with the section on substance identity were not properly entered (absent or erroneous). In particular:
    - the data[5] on particle size were not properly entered, even though this is one of the key parameters for deciding whether or not the substance in question should be declared;
    - there was frequent confusion between agglomerates and aggregates[6], leading to numerous errors in the information provided. This raises the question of to what extent declaring entities are able to differentiate between these two forms;
    - inconsistencies were observed in the data entered (values entered in the fields "Number of dimensions < 100 nm" and "Shape description"; or specific surface area and average particle size);
    - the "Zeta potential[7]" and "Type of coating" were not provided, despite being essential for risk assessment;
- the analysis of the documents attached to the declarations showed that, in the vast majority of cases, they did not contain any information that could be used to fill in the missing or incomplete data in the form;
- stakeholders whose substances were subject to registration under the REACh Regulation seemed to be more knowledgeable about their substances and had the physico-chemical characterisations needed for their declarations. Generally speaking, declarations in which the REACh registration number was missing were not properly completed.

3.2. Use of declared data

3.2.1. Use of declared data by ANSES in support of health risk assessment and regulatory work

Assessing the risks associated with nanomaterials requires precise knowledge of the hazards they represent, as well as access to data on the exposure to which they may lead. Availability of this information was one of the goals behind establishment of the R-Nano register (see the wording of

[4] In 2019, ANSES published an expert appraisal on air pollution and road traffic in which it pointed out high levels of evidence of adverse health effects for carbon black, organic carbon and ultrafine (nanoscale) particles. Data collected since 2013 have confirmed or strengthened the link between these substances, and respiratory and cardiovascular diseases and premature death.

[5] The list of data required for the identity of the substance, the quantities, uses and customers/users can be found on the register homepage https://www.r-nano.fr/?locale=en.

[6] Aggregate: A set of particles comprising strongly bound or fused particles whose resulting external surface area may be significantly smaller than the sum of the calculated surface areas of each of the components.

Agglomerate: A collection of weakly bound particles, aggregates or a mixture of the two whose resulting outer surface area is similar to the sum of the surface areas of each of the components.

[7] The zeta potential of a particle or nanoparticle in suspension or solution represents the electrical charge due to the ions surrounding it. This charge influences the Coulomb interactions between nanoparticles in an aqueous medium.

Article L.523-2: *The persons [...] shall, at the request of the administrative authority, submit all information available on the hazards of these substances and the exposure to which they may lead, or useful for assessing risks to health and the environment.*); it should be accessible, particularly if information on the substances and their uses was entered properly and is therefore usable.

Data from the R-Nano register has been used as input for the following expert appraisals or regulatory work in support of the public authorities:

- ✓ ANSES expert appraisal on the safety of feminine hygiene products, published in 2017;
- ✓ ANSES expert appraisal on nanomaterials in food products, published in 2020;
- ✓ ANSES expert appraisal on the hazards, exposures and risks associated with crystalline silica, published in 2019;
- ✓ Classification proposal for titanium dioxide[8] submitted by ANSES to the Risk Assessment Committee of the European Chemicals Agency (ECHA-RAC) under the CLP Regulation[9];
- ✓ Support to the supervisory authorities with identifying substances potentially concerned by an update of the REACh registration dossier to take the nanoform(s) into account;
- ✓ In-house work on the presence of nanoparticles in plant protection product.

3.2.2. Use of declared data by public health organisations

On several occasions between 2013 and 2020, ANSES made data available to organisations authorised by decree to access the declared data. Their feedback showed that the data from the R-Nano register were used in several kinds of work in public and occupational health:

- studies to document worker exposure (particularly to titanium dioxide in the construction sector);
- epidemiological studies;
- studies and research on industrial risk control.

The organisations contacted reported difficulties processing the data, some of which had also been observed by ANSES (see §3.1):

- poor physico-chemical characterisation of the substances and errors identified; discrepancies were observed between the data from declarations by industrial companies and the physico-chemical analyses carried out by the organisations accessing the data;
- information essential for assessing substance toxicity – such as the state of the substance[10], any impurities, and the state of the mixture containing the substance – was unusable or even absent;
- errors in the declared quantities were suspected. Indeed, in the case of mixtures, it can be difficult to tell from the declared data whether the value given corresponds to the nanomaterial fraction or the mixture;
- the contact details of the declaring entities were not always accurate or complete;
- the exact addresses of the sites for production/use of nanomaterials were not specified in some cases. This lack of information makes it difficult to trace the sites handling nanomaterials.

[8] In Category 1B as carcinogenic by inhalation.

[9] The CLP Regulation refers to Regulation (EC) No 1272/2008 of the European Parliament on classification, labelling and packaging of substances and mixtures.

[10] The substance may be as is, contained in a mixture without being bound to it, or derived from a material intended to release such a substance under normal or reasonably foreseeable conditions of use.

3.3. Mandatory declaration of nanomaterials for the purposes of traceability and risk assessment

The main contributions

France was a pioneer in setting up this system of annual declarations of nanomaterials , and it is worth highlighting the strengths of the current scheme, despite the intrinsic difficulties and the very gradual mobilisation of the main stakeholders. Indeed, this scheme has made it possible to draw up an inventory of nanomaterials and their use in France, and in particular to:

- identify and geographically locate the entities handling nanomaterials on French territory;
- identify the categories and numbers of substances declared, a minimum value for the overall quantity of substances produced and imported (about 400,000 tonnes per year), the economic activity sectors of the companies (NACE code), the economic sectors in which the substances are used, and the categories of chemicals in which these substances are ultimately contained;
- disseminate information on the presence of nanomaterials within the distribution chain (the supplier's declaration number must always be provided to downstream users);
- identify the European Union countries involved in the distribution chain before the substances are imported into France;
- provide input for risk assessments and data to several organisations, enabling them to carry out their work to improve public health in France (Ineris, INRS, SPF[11]);
- obtain factual data and/or identify substances warranting special attention in risk assessment (e.g. TiO_2).

The limitations

A certain number of limitations, leading to an incomplete description of the use of nanomaterials in France, were identified following this comprehensive analysis of the mandatory declaration system. They are divided into several categories:

- Poor quality data:
  - data essential to the characterisation of nanomaterials were absent or erroneous;
  - the quality of the physico-chemical characterisation of nanomaterials has not improved, despite significant advances in the available methods and knowledge produced in recent years.

- Information that is optional:
  - among the information to be declared (Ministerial Order of 6 August 2012),
    - some has to be provided only if available;
    - but other information has to be communicated at the time of the declaration. However, the Directorate General for Risk Prevention (DGPR) dispenses declaring entities from providing this mandatory information if its absence is justified on the declaration form;
  - the number of exposed workers does not have to be declared;
  - when declaring the quantities of nanomaterials handled, this does not have to be broken down by type of use.

[11] Epinano epidemiological surveillance scheme

- A restricted scope of application for the declaration:
  - some stakeholders are not concerned: the annual declaration does not target all the stakeholders in the nanomaterials transmission chain, as it stops at the last professional user. Nor does it apply to substances exported outside France. Lastly, exemptions for certain stakeholders, which were not provided for in the regulatory texts but were introduced when the register was set up, are systematically renewed each year;
  - the identification of finished products is not provided for in the scheme.

- Reference standards used:
  - the reference standard for describing uses is unsuitable; it is difficult for declaring entities to complete and does not allow the use of nanomaterials in France to be clearly described. The declaration form now enables these entities to enter any information they wish regarding uses, which generates considerable heterogeneity in the declared data.

- Data accessibility:
  - Article 185 of the Grenelle II Act stipulates that the data in the R-Nano register should be accessible to an extended list of monitoring authorities. In addition to this list, there are health and environmental risk assessment organisations, authorised by decree to consult and use these data for risk assessment purposes although limited to the information corresponding to their areas of expertise. Some organisations involved in risk prevention are not authorised to access the declared data; this is notably the case with medical labour inspectors and the High Council for Public Health (HCSP).

3.4. Mandatory declaration of nanomaterials for the purposes of public information

A legal analysis commissioned by ANSES under a research and development agreement (ISJPS, 2020) showed that the data held in the R-Nano database are governed by five series of texts from different legal systems:

- texts on the right of access to administrative documents: as the database is managed by ANSES, anyone wishing to access the data it contains can refer to these texts;
- rules on the right of access to information on the environment[12]: some of the information on the nanomaterials concerns the environment, so the rules on access to administrative documents need to be linked to those on the right of access to information on the environment;
- specific provisions concerning access to the data held in the R-Nano database (Grenelle I and II Acts, Decree no. 2012-232 of 17 February 2012, Decree no. 2012-233 of 17 February 2012, Ministerial Order of 6 August 2012, etc.);
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of

[12] - Aarhus Convention of 25 June 1998 on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters;

- Directive 2003/4/EC of the European Parliament and of the Council of 28 January 2003 on public access to environmental information;

- Article 7 of the French Environmental Charter;

- Articles L. 124-1 *et seq* of the French Environment Code;

- Circular of 11 May 2020 on the implementation of the provisions governing the right of access to information on the environment.

Chemicals (REACh), establishing a European Chemicals Agency, and the regulation making provision to address nanoforms in the REACh Regulation[13];

- texts governing the protection of business secrecy (in particular Act no. 2018-670 of 30 July 2018 on the protection of business secrecy).

The ISJPS report states that:

Of the five categories of data documented in R-Nano, three should, in principle, be accessible: data on substance identity, substance uses, and the identity of the declaring entities. However, business secrecy can always be claimed by the declaring entities. If their request is justified according to the services of the Ministry of the Environment, then the data are considered to be protected.

Under French law, business secrecy is not mentioned among the exceptions to access to information on emissions into the environment. When an information access request relates to information on emissions into the environment, protection of business secrecy shall not constitute valid grounds for refusal. However, it is difficult to identify precisely what information can be qualified as relating to emissions into the environment. In short, if the information requested has a clear link with emissions into the environment, then business secrecy shall not apply. Otherwise, the different interests need to be weighed up.

The analysis also highlighted that the mandatory declaration scheme generally provided a very high level of confidentiality. *Some data should, however, be publicly accessible, as required by law – automatically through publication online or in response to a request for access to information, as the case may be – while others must remain protected.* With regard to data on the identity and uses of nanomaterials, the analysis stated that these should in principle be accessible online in application of the Grenelle II Act; however, the Ministerial Order of 6 August 2012 included a large part of these data in the field of business secrecy. This Ministerial Order does not therefore seem to be in line with the Grenelle II Act on this point.

3.5. CES conclusions and recommendations

This analysis sought to assess the ability of the R-Nano register to serve the objectives of traceability, public information and contribution to risk assessment set by Article 185 of the Grenelle II Act of 12 July 2010. The CES would like to point out various shortcomings, described above, that prevent these data from being fully used for assessing risks associated with nanomaterials, and for ensuring traceability and public information. The recommendations below are mainly addressed to the Agency's supervisory authorities and declaring entities.

Considering in particular:

- the limited information provided in the declarations and the poor quality of their data, especially with regard to the chemical identity and physico-chemical characterisation of the substances;
- the possibility of not entering mandatory data simply by claiming "Information unavailable";
- the lack of verification of the validity of the declared data;

[13] Commission Regulation (EU) 2018/1881 of 3 December 2018 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACh) as regards Annexes I, III, VI, VII, VIII, IX, X, XI, and XII to address nanoforms of substances.

the CES recommends firstly improving data quality, by specifying the causes of poor declarations and raising awareness among declaring entities about their regulatory obligations and the means available to improve the quality of the declared data, by:

- adding new online help materials for the declaration;
- training and informing declaring entities;
- providing guidelines on the choice of the person completing the declaration, e.g. someone with skills in occupational health and safety and/or physico-chemistry;
- meeting certain declaring entities and implementing targeted measures with them: those for whom certain data are missing (quantities, physico-chemical characterisation of the substance, etc.), those who enter erroneous data and the main suppliers with an impact on most of the database;
- precisely identifying the constraints weighing on stakeholders lacking proficiency with regard to the different sections of the declaration form or experiencing difficulties collecting the data to be declared;
- improving information transmission throughout the substance distribution chain (increasing transparency between suppliers and their customers).

The CES recommends changing the administrative conditions for the declaration, in particular:

- increasing the requirements on data to be declared by:
  - reinforcing the data entry requirements under the "Substance identity", "Quantity" and "Uses" sections, and introducing a mandatory requirement to enter certain data such as crystallinity, surface charge and specific surface area;
  - removing the option of entering "Information unavailable";
  - removing "not applicable" from the list of use descriptors;
  - removing declaration exemptions introduced since the scheme entered into force;
- setting up a data verification process with penalties in the event of failure to fulfil regulatory obligations. This would involve:
  - implementing automated checks to minimise the entry of erroneous information;
  - strengthening regular and targeted checks to support declaring entities in the process, and comparing the declared data with actual data from the field;
  - applying penalties to users who do not fulfil their regulatory obligations, as provided for in Article R. 523-21 of the Decree of 17 February 2012, i.e. a maximum fine of 3,000 euros and a daily penalty of 300 euros.

At a later time, the CES recommends:

- requiring additional information in the declaration scheme, and in particular:
  - linking quantities to uses to enable quantification of nanomaterials by type of use. This breakdown appears necessary to enable the exposure of workers and consumers to be assessed;
  - obtaining an estimate of the number of potentially exposed workers;
  - ensuring better identification of the person responsible for monitoring staff health and safety;

- improving traceability by broadening the scope of declarations to include:
  - stakeholders who are not currently targeted by these declarations (distributors of finished products, exporters and simple users who are not distributors), for example, through simplified declarations;
  - substances that were not previously declared because they were not targeted by the Decree of 17 February 2012:
    - nanomaterials for which the nanometric fraction is less than 50% of the particles in number;
    - nanomaterials contained in a material not intended to release them under normal and foreseeable conditions of use.

Considering the advances in available knowledge and methods for the physico-chemical characterisation of substances, the CES also recommends amending the declaration form to take account of new knowledge in the field of physico-chemical characterisation.

Considering the unsuitability of the reference standard for describing uses, which complicates the declaration of uses by entities and results in an incomplete description of the use of nanomaterials in France, the CES recommends assessing the relevance of this reference standard and adapting it if necessary.

Considering the conditions of access to R-Nano data for health organisations, the CES recommends:

- simplifying access to data for all the organisations designated by decree;
- extending data access to public health stakeholders including the HCSP, medical inspectors, and doctors or other professionals responsible for staff health and safety;
- extending access to research organisations for the purpose of assessing human and environmental health risks.

4. AGENCY CONCLUSIONS AND RECOMMENDATIONS

Engineered nanomaterials are used in a wide variety of everyday products (sunscreens, textiles, food, paints, etc.) and concern many industrial sectors such as construction, automobile, packaging, chemicals, the environment, agri-food, energy, cosmetics and health products. The large number of existing substances and the lack of knowledge on the characterisation of their hazards for both humans (toxicological effects) and the environment (ecotoxicological effects), as well as on the exposure associated with their use, constitute major shortcomings in assessing the risks they pose to the environment and human health.

In this context, in accordance with Articles L. 523-1 to L. 523-8 of the Environmental Code, pursuant to the Grenelle II Act of 12 July 2010, the mandatory declaration of manufactured, imported or distributed nanomaterials has been in place since 1 January 2013 in order to gain a better understanding of the nanomaterials on the French market, their volumes and their uses. This approach has been followed according to specific conditions in other countries such as Belgium, Norway, Sweden and Denmark. For its part, the EUON[14], launched by the European Commission (EC) after it had ruled out the idea of a European register, provides only limited information.

At the European level, the EC has adopted specific declaration obligations for chemicals liable to contain nanomaterials. They have been in force since 1 January 2020 within the framework of the REACh Regulation on chemicals.

[14] European Union Observatory for Nanomaterials.

Eight years after mandatory declaration came into force in France, it seemed appropriate for the Agency to characterise the quality and contribution of the declared data in terms of knowledge of exposure and traceability of nanomaterials, in order to issue recommendations to improve the scheme's effectiveness with regard to the objectives defined when it was set up.

As a preamble to this analysis and covering the same period of around a decade, ANSES identified uneven developments in the information needed for understanding the risks associated with the presence of engineered nanomaterials in different fields of use:

- Significant developments in analytical methods for characterising the presence of nanomaterials;
- Slow and much debated regulatory developments in the area of hazard characterisation of substances in nanoparticle form. Among the few classification proposals initiated at the European level, that of TiO_2 as a Category 2 respiratory carcinogen (likely to cause cancer; Category 2 (H351)) agreed by ECHA's Risk Assessment Committee in 2017, has still not been translated into a regulatory framework. To ANSES's knowledge, it is the only agency to have proposed a toxicity reference value (TRV) for a chemical in nanoparticle form (ANSES opinion of 30 January 2019 on the proposal for a chronic respiratory TRV for nanometric titanium dioxide);
- Initiation of methodological work to guide risk assessments towards a "nanospecific" approach (adapted to nanomaterials) when the substances contain a fraction of nanoscale particles (ANSES opinion of 12 May 2020 on nanomaterials in food products);
- Lastly, with regard to uses and exposure, the deployment of several national registers and the adoption of declaration requirements for the REACh Regulation mentioned above.

Besides these scientific and technical points, the Agency also draws attention to the fact that the European Commission has still not formulated a proposal to replace its 2011 recommendation on a definition for characterising nanomaterials, a situation that allows certain stakeholders to avoid taking action with regard to various regulatory obligations.

ANSES endorses the conclusions and recommendations of its Expert Committee on "Physical agents, new technologies and development areas", set out in Section 3 of this opinion.

A useful declaration scheme

Given the uncertainty described above, the mandatory declaration of nanomaterials in the R-Nano register is an invaluable tool in terms of traceability, public information and risk assessment.

The entry into force of the mandatory declaration scheme has enabled an initial review to be drawn up of the identity, uses and quantities of nanomaterials produced, imported and distributed in France, although it was not sufficient to establish an exhaustive picture of their uses. It can currently be used to measure the great diversity of categories of nanomaterials present in France, the non-negligible quantities (more than 400,000 tonnes) produced and imported each year, and the many stakeholders involved.

This improves the transparency of information on the circulation of these substances with regard to the general public. However, the confidentiality associated with most of the declared data, as provided for under business secrecy in the regulations governing the scheme, makes it impossible to publish more detailed analyses based on these data.

Nevertheless, it has been possible to use them to analyse the hazards associated with a sector or use, through the identification of the nanomaterials handled, or to help set up an epidemiological surveillance system (Epinano).

Although the annexes to the REACh Regulation now take the specificity of nanomaterials into account by requiring companies producing or importing nanoforms to provide specific data, ANSES does not consider R-Nano to be a duplication of this regulation. Indeed, under the REACh Regulation, registration dossiers are submitted by consortia or groups of companies, which does not offer the same level of traceability of stakeholders as with R-Nano. Moreover, the tonnage threshold for registration under REACh is much higher than that imposed with the annual declaration in France. An examination carried out by ANSES of the registration dossiers under the REACh Regulation moreover highlighted very few mentions of nanomaterials, whereas the French declaration scheme mentioned more than 300 chemical categories of nanomaterials.

Improvements needed to make the scheme more reliable

- *In terms of data quality and reliability*

The analysis of the declared data showed that the information in the declarations was unsatisfactory, and this has a major impact on the possibilities of using the register data. As they currently stand, the data do not allow the declared substances to be correctly characterised. In the absence of a full and accurate characterisation of these nanoparticle substances, their potential hazards cannot be evaluated as part of a risk assessment. The register therefore currently makes a very limited contribution in this area, due to the large amount of missing or poor-quality data. ANSES believes that the declaring entities should be mobilised, under the aegis of the administrative authority in charge of the register, to find solutions to drastically improve collection of the data listed by the 2012 Ministerial Order. The flexibility granted to these entities when the scheme was first set up now significantly hampers the quality of the data, and the Agency considers that it should be reviewed. In general, the quality of the declared data should be associated with a very high standard.

By way of illustration, adapting the declaration form to the new knowledge acquired, mainly in terms of physico-chemical characterisation, would help improve the quality and homogeneity of the data collected.

Lastly, the absence of a process for verifying the declared data in the register is a major obstacle to their exploitation. Even if the input data are significantly improved by the actions recommended above, it is essential for the register to have a verification process in place to enable their robust use. The Agency stresses that declarations fall under the technical and legal responsibility of the stakeholders designated by the texts. These same texts also provide for sanctions in the event of failure to fulfil declaration obligations. This leads to a question of the checks carried out by the public authorities (e.g. through on-the-spot comparisons of consistency between the data held by economic players and the declared data). For its part, ANSES will consider the methods it could deploy, as manager of the declaration scheme and the R-Nano register, to analyse and verify the technical consistency of the data collected. If it has the necessary resources, the Agency will therefore be able to question declaring entities on any inconsistencies or anomalies detected, in order to improve the quality of the data, or even inform the regulatory authorities.

Once their quality and consistency have been consolidated and improved, these data can be used more effectively and become more valuable for public health agencies and stakeholders in France.

- *In order to achieve more fully the objective of nanomaterial traceability*

One of the objectives of the Grenelle II Act is the traceability of nanomaterials in France. ANSES notes that this cannot be fully achieved as the declaration scheme does not cover professional end users[15]. The guarantee of complete traceability can only be achieved with certainty by including in

[15] Declaration stops at the last professional user. According to Article R523-12 of Decree no. 201-232 of 17 February 2012, a professional user is: *"any person established in the country, other than the manufacturer and importer, who uses, in the*

the texts a requirement regarding the last professional user. It notes that in order to obtain broader traceability, within the current declaration limitations, it would be preferable to remove the exemptions renewed each year for some of the stakeholders.

Furthermore, the complete traceability of substances would require a revision of the declaration threshold for the nanoscale fraction of 50% in number of particles. As a reminder, Decree no. 2012-232 of 17 February 2012 on the annual declaration of nanoparticle substances specifies that the proportion of 50% in number of particles from which nanomaterials must be declared: *may be reduced in specific cases where justified for reasons of environmental protection, public health, safety or competitiveness*. This threshold, based on the European Commission's proposed definition, will be analysed in greater depth as part of ANSES's forthcoming work on the definition of nanomaterials.

Moreover, the transmission of information within the distribution chain should be made more reliable, as it contributes to the overall traceability of nanomaterials and could therefore help improve safety at work.

- *In order to increase information for interested parties and improve the availability of declared data in accordance with the multiple legal requirements*

The strict requirements to ensure confidentiality of the declared data, introduced firstly by the regulatory texts associated with mandatory declaration, and secondly by the administrative authority as part of the register management procedures, limit the possibility of making data and operating results available to the public, or even to certain public stakeholders or organisations not provided for by the texts in force. The experts made various recommendations in this respect. The Ministry of Ecological Transition has also indicated that the decree listing the organisations able to make requests in this regard is currently being revised.

In addition, ANSES commissioned a legal analysis of all the laws and regulations likely to have an impact on the framework of the R-Nano scheme with regard to the disclosure of the data it holds. This analysis identified five applicable legal regimes, whose requirements may be contradictory. Among these antagonisms, the Ministerial Order of 6 August 2012 appears to be at odds with the Grenelle II Act. The result of this analysis raises the question, in view of changes to the texts in the five legal systems and their case law since R-Nano was set up, of the re-examination of the provisions of the Ministerial Order of 6 August 2012, whose current terms govern the confidentiality of declared data. Depending on the review of the text, the division of roles between the Agency and the Ministry with regard to the arrangements for making the declared data available will also need to be clarified.

Declaration is an essential tool for reducing uncertainties about the risks associated with the uses of nanomaterials. In light of the analysis of the declaration scheme set up in France under the Grenelle acts for the environment, important recommendations have been made to improve this scheme and ensure it more fully meets the objectives set by these texts in terms of traceability, information and risk assessment. The completeness and quality of the data collected today are still insufficient to allow their full exploitation in quantitative studies, to assess exposure of the public, workers or the environment to substances containing nanomaterials, or to dynamically feed into an interconnected national environmental health data scheme, as defined in the objectives of the PNSE4.

The Agency also draws the attention of the public authorities to the need to create a definition of nanomaterials, integrating health and safety issues and cutting across the different sectors of use,

course of his professional activities, a nanoparticle substance as is or contained in a mixture without being bound to it or a material intended to release such a substance under normal or reasonably foreseeable conditions of use". An end user who distributes the nanoparticle substances to sales centres, for example, is not concerned by the declaration scheme.

and subject to prior consultation, in line with the new European situation with regard to chemicals, so that it can be incorporated in the different sectoral and/or national regulations.

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KEYWORDS

Nanomatériaux, substances à l'état nanoparticulaire, déclaration annuelle, registre R-nano, traçabilité, transparence, exploitation.

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