Environmental Health at ANSES

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French agency for food, environmental and occupational health & safety

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1. ANSES and its actions in environmental health

According to the World Health Organization, environmental health covers those aspects of human health, including quality of life, which are determined by the physical, chemical, biological, social, psychosocial and aesthetic aspects of our environment. It also relates to policies and practices to manage, reduce, control and prevent environmental factors that may affect the health of present and future generations. It is therefore a very broad concept whose outline is difficult to determine and will vary depending on whether you approach the subject from a public health or an environmental viewpoint, in a sustainable development context.
The environmental health mission entrusted to ANSES primarily entails conducting expert appraisals on the risks related to chemical substances, microorganisms or physical agents found in water, air or soils. Because of its broad area of expertise, ANSES can identify, overall, the risks to which people are exposed through their lifestyles and consumption patterns. This approach is particularly effective in the field of environmental health, since it allows the Agency to assess the risks associated with different environments, including exposure due to food consumption or in the workplace. Specific measures are used to address these aspects, which are not covered directly by this document.

1- Provide expertise on chemicals, their health effects and potential risks to human health

The creation of ANSES has given France an organisation whose leadership on the subject of chemical substances is undeniable: the Agency provides the competent authorities with the expertise and scientific and technical support necessary for the assessment of chemicals and the risks they pose to humans.
As part of the implementation of the European REACh Regulation[1], ANSES proposes to the relevant ministries priorities for the evaluation, authorisation, restriction, classification and labelling of chemicals and compiles dossiers relating to the identified substances in support of the competent French authorities.
As part of the European CLP Regulation[2], it assesses dossiers relating to the classification, packaging and labelling of chemical products.
It is also responsible for evaluating crop treatment products before and after they are placed on the market, establishing maximum residue limits in foodstuffs and assessing biocidal products. In this context, it primarily identifies the risks that these products may pose to humans, animals and the environment.

A major area of activity for the Agency, knowledge of chemicals and their hazards, requires close links between studies undertaken in the areas of "occupational health", "environmental health" and now "food safety". It involves establishing a list of substances that warrant priority expert study and, for each substance of interest, an expert appraisal of:

[1] 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 Chemicals (REACh), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC.
[2] Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006. (CLP: Classification, Labelling, Packaging).

- potential hazards
- uses
- exposed populations
- exposure levels
- potential risks to human health
- existing substitutes

2- Develop benchmarks and reference values

In connection with its work on assessing the health risks associated with chemicals, the Agency is responsible for establishing Toxicity Reference Values (TRVs). TRVs are toxicological indices set by international bodies such as the World Health Organization (WHO), or by authoritative national expert agencies. They enable a relationship to be established between exposure to a given toxic substance and an adverse event or the probability of an adverse effect on health. They therefore make it possible to characterise a risk to human health and are necessary for assessing risks. TRVs form the basis for setting maximum limits, taking into account the routes (oral, inhalation, dermal) and durations of exposure. These limits may have different names: Acceptable Daily Intake (ADI) in the case of daily dietary exposure over a lifetime, Indoor Air Guideline Value (IAGV) when looking at inhalation exposure, etc.
Each year a list of priority substances is added to the Agency's work programme and undergoes a process of collective expert appraisal in order to set the corresponding TRVs.
In the field of environmental health, the Agency is responsible for such tasks as developing IAGVs on which the public authorities can base their decisions when regulating and limiting the health risks related to chemicals in indoor environments.

3- Evaluate the health risks to the population associated with different environments

In this area, the Agency's work focuses primarily on:

- **water**, with the assessment of risks associated with bathing water (pools, spas, swimming in lakes, rivers or the sea, etc.) and new uses of water (reuse of rain water, treated wastewater and grey water), and the development of benchmarks, mainly for assessing dossiers on methods of treating swimming pool water;
- **outdoor air and indoor air**, which involves assessing the risks related to specific substances (wildfires, particles, volatile organic compounds from building materials, etc.) and developing guideline values.

4- Characterise the risks related to physical agents

Electromagnetic fields (EMFs) emitted by mobile telephone equipment or high voltage power lines, noise and ultraviolet radiation are all part of our physical environment. The long-term effects on health and the data on exposure to certain physical agents, including EMFs and mobile telephony, are poorly documented and marked by uncertainty. They warrant research to better characterise the effects and the exposure of populations. Due to scientific controversies on these issues, the Agency includes in its risk assessment process consultations with the various stakeholders and calls on the human and social sciences to better meet the numerous expectations of society.

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5- Increase knowledge on emerging or insufficiently documented risks

The identification of emerging risks, or those for which research efforts are currently being pursued (nanomaterials, endocrine disruptors, very low-frequency fields, environmental allergens, carcinogens from environmental sources, etc.) is based on the ability of surveillance systems to detect the existence of new pollutants or pathogens (or a change in the status of known pollutants or pathogens), the emergence of new at-risk populations, the presence of a risk related to a new technology, etc. Documenting these health risks is essential to better understanding, controlling and anticipating them. This task is shared with all the scientific units and the expert networks of the expert committees and working groups.

Support research in environmental health
The Agency also has a research programming and support mission through the call for research proposals on environmental and occupational health that it issues each year. The selected research themes cover the objectives of national plans in this area.
The 2011 programme was launched on 22 February with support from the French Agency for Environment and Energy Management (ADEME), the National Cancer Institute (INCa) and the French National Agency for Water and Aquatic Environments (ONEMA) under the Plan Ecophyto 2018. More than 6 million euros will be allocated to fund research on the health impact of toxic substances, carcinogenic, mutagenic or reprotoxic substances, airborne particles, environmental asbestos or noise pollution. New this year, funding from a specific tax on transmitters has been allocated to ANSES to fund projects on the health effects of radio frequency emissions. Between 2006 and 2010, 156 projects were supported by these calls for proposals.

2. ANSES and the French National Health & Environment Plan

The second French National Health & Environment Plan (PNSE 2) was adopted by the French Cabinet on 24 June 2009 for the period 2009-2013. The measures it contains have been developed around two key themes:

- reducing exposure responsible for diseases with a severe impact on health (cancers, cardiovascular diseases, respiratory and neurological diseases, etc.)
- reducing environmental inequalities.

The plan is broken down into 58 tangible actions, each with an identified leader, associated partners and monitoring indicators.

ANSES is leading or jointly leading five of these actions:

- **Action 4: Improving knowledge on particles**

While undertaking earlier work, the Agency stressed the importance of improving knowledge of the physico-chemistry of particles. In this context, research projects are ongoing or planned. The objective is ultimately to be able to differentiate the health impact of particles according to their composition and therefore their sources.

- **Action 6: Improve knowledge on exposure to pesticides (plant protection products and biocides), conducted with the Steering Committee of the Observatory on Pesticide Residues (ORP)**

Work by the ORP should enable data on domestic and professional uses of pesticides to be collected and organised, as well as those relating to the presence of pesticide residues in the environment and in products consumed by humans.

- **Action 11: Develop incentives and assistance for the substitution of toxic substances in the workplace and promote the development of alternative procedures, conducted with the Directorate General of Labour** (related to Commitment 137 of the "Grenelle" Environment Round Table)

- Promote assistance for the substitution of these substances, by developing close and regular contact with the relevant partners at national and European level, mainly through information seminars.
- Provide support with monitoring the efficacy of the substitution of CMR 1 and 2 substances in France.
- Produce other teaching tools to help with substitution.
- Analyse the socio-economic limits hindering the efficacy of substitution (understanding the mechanisms and issues), and propose socio-economic analytical tools or indicators that will help establish priorities.

- **Action 54: Strengthen the capacities of scientific expertise in environmental and occupational health**

The Agency is strengthening its ties with European and international organisations, as well as national organisations in the member states of the European Union. It also needs to better understand the processes, the roles of the different players and the evolution of controversies arising during the production of opinions or expert appraisals.

- **Action 58: Develop information tools in environmental and occupational health and measure their impact, with the Ministry of Health / Directorate General of Health**

ANSES develops relationships with associations and trade unions, organises seminars and symposia on topics that meet common concerns and coordinates the outreach committee of the Health & Radiofrequencies Foundation since the latter's missions were transferred to ANSES. It is also expected to contribute to a dialogue on nanotechnologies.

The Agency is also a partner in 21 other actions:

- Action 5: Reduce emissions of six toxic substances in the air and in water (an aspect of Commitment 138a of the Grenelle)
- Action 9: Better manage the quality of indoor air in public places
- Action 12: Reinforce monitoring of occupational exposure
- Action 16: Protect the health and improve the comfort of transport users and workers
- Action 17: Reduce exposure of children, pregnant women and women of childbearing age to the most hazardous substances
- Action 19: Reduce exposure in buildings where children are looked after
- Action 20: Improve the way in which the special susceptibility of children, pregnant women and women of childbearing age is taken into account in expert risk assessments
- Action 29: Reduce levels of certain substances in the aquatic environment
- Action 30: Control the quality of water supplies with respect to health
- Action 31: Ensure sustainable management of water availability
- Action 36: Assess the health impact of different waste management methods
- Action 41: Manage exposure to environmental asbestos
- Action 43: Launch a multi-year biomonitoring programme for the French population coupled with a broader health survey and including the measurement of emerging pollutants
- Action 44: Reinforce consultation on the risks from new technologies
- Action 45: Organise information and consultation on electromagnetic waves
- Action 46: Reinforce regulation, surveillance, expertise and risk prevention with respect to nanomaterials (Commitment 159 of the Grenelle)
- Action 47: Improve knowledge and reduce the risks related to drugs released into the environment (Commitment 103 of the Grenelle)
- Action 48: Stress the importance of environmental and occupational health in the scientific policies of the various research institutions and reinforce the human and financial resources
- Action 49: Organise and coordinate research in environmental and occupational health and strengthen the necessary tools
- Action 51: Increase research on contaminants in the food chain
- Action 57: Educate young people in environmental and occupational health

Finally, the Agency is involved in six actions of the PNSE 2 despite not being a partner:

- **Action 13: Consider the health impact of different modes of transport**

In 2011 ANSES will define the pollutants to be studied in health risk assessments to be conducted in connection with studies on the impact of road infrastructures.

- **Action 22: Prevent Allergies**

In 2011 ANSES will work on a solicited request relating to pollens.

- **Action 24: Improve treatment of diseases potentially caused by environmental factors**

The project entitled "Idiopathic environmental intolerance to electromagnetic fields (IEI EMF)" aims to assess the effectiveness of individual medical treatment of patients with IEI EMF on improving their health, their quality of life and their perception of the exposure.

- **Action 28: Provide effective protection of water resources on the scale of the intake protection areas and supply areas** (Commitment 101 of the Grenelle)

The Agency assesses the health risks related to the installation, maintenance, operation and abandonment of systems for exploiting renewable energy (geothermal, solar panels and wind turbines) in the protection areas of water intakes used for drinking water production.

- **Action 39: Develop tools for determining the health impact of noise**

ANSES is developing indicators for the health effects of noise from transport and other activities, and the associated reference values in the field of noise-related risks.

- **Action 42: Improve the surveillance and alert system**

Under its mission as operator of the RNV3P (National Network of Vigilance and Prevention of Occupational Diseases), the Agency is assisting with the production of surveillance or warning indicators in the field of occupational health. As part of its participation in the toxicovigilance coordination committee (CCTV), and as joint coordinator of a CCTV working group on chemicals, ANSES is contributing to the vigilance system for products intended for humans and to the monitoring of changes in formulations placed on the market and any related adverse reactions.

3. ANSES and the tools it uses in environmental health

The work undertaken in environmental health is intended to draw on all of ANSES's expert appraisal principles and the tools it deploys, while benefiting from synergies resulting from the broadening of the Agency's sphere of competence. Many tools used in this field are therefore shared with others.

Observatory on pesticide residues

The Observatory on Pesticide Residues (ORP) collects, organises and optimises the use of information and results from testing and measurement of pesticide residues in different environments and products consumed by humans.
The early work of this organisation, created in 2001, was mainly devoted to organising a network of partners and producing an inventory of available data on pesticide use and the presence of residues in environments and products. European requirements and those decided by the Grenelle Environment Round Table have now led to an expansion of the ORP's role, while underlining its key mission. The ORP has been commissioned to coordinate the task of defining and establishing initial risk indicators in order to quantify the reduction in the impact of plant protection products on the different environmental compartments and on health. To do this, the ORP will develop a "pesticides" information system for calculating the chosen indicators.

Observatory on substances

In connection with its permanent mission on carcinogenic, mutagenic and reprotoxic substances (CMRs), ANSES is working on the establishment of an observatory on substances, a permanent structure for organising, exploiting, promoting and pooling the different sources of information on chemicals and their use in various industries. Such a system will identify exposed populations and highlight any knowledge gaps both in metrology and toxicity. This tool will also be used to develop an evaluation system to guide primary prevention measures more effectively, identify populations at risk and monitor exposure levels. It will serve as a decision support tool with respect to both risk management and prioritisation of research.

Health & Radiofrequencies outreach committee

True to its commitment regarding openness to stakeholders, the Agency will put in place, by the summer of 2011, a "Health and Radiofrequencies" outreach committee whose mission is to inform the Agency on society's expectations in terms of research, expertise and information on radiofrequencies and health. This committee will include representatives of all the stakeholders (associations, operators and manufacturers, communities, trade unions) and will meet two or three times a year. It is intended to be a forum for exchange, deliberation and information on the scientific issues related to the potential health effects of radiofrequencies and their evaluation.

ERA-ENVHEALTH

In late 2006, with support from the Ministry of Ecology, the Agency developed a plan for a European network designed to bring together the coordinators of national research programmes in environmental health. Selected as part of the FP7 (Seventh Framework Programme for Research and Technological Development), this network, coordinated by ANSES, became operational on 1 September 2008 for a period of 4 years. It brings together 16 partners from 10 countries, and its aim is to establish a lasting collaboration between the different bodies by studying the methods used to support research in environmental health in these various bodies and their results, defining topics for priority work and responding to them through joint activities and calls for transnational research projects.

Observatory on indoor air quality

In order to review current knowledge on exposure to indoor air pollutants and their determinants, the authorities created the Observatory on Indoor Air Quality in 2001, an organisation led by the French Scientific and Technical Centre for Building, with which the Agency has been involved since its inception. In particular, this observatory conducts measurement campaigns to further knowledge in this area and to advise the authorities with the aim of formulating recommendations to improve indoor air quality in the construction sector. The data it collects are mainly used to support work undertaken by ANSES on the definition of indoor air guideline values.

4. ANSES and environmental health: strategic orientations for 2011

1- Endocrine disruptors under the microscope

The Agency is undertaking a major study to respond to a solicited request on the issue of endocrine disruptors. This work, which will span several years, is symbolic of the role played by ANSES in knowledge of chemicals and their hazards.
In 2009, the Ministry of Health requested that AFSSAPS, AFSSA, AFSSET, the InVS and INPES investigate, in their respective fields of expertise, the issue of endocrine disruptors. In addition, INSERM was commissioned to undertake a collective expert appraisal of the effects of substances known as endocrine disruptors by collecting and analysing all the available scientific literature.

On the basis of the substances identified by this expert appraisal as being of concern, due to their toxicity to reproduction and/or their endocrine disruption action, the Agency received a request to:

- rank the substances to be studied as a priority,
- identify the products and items containing reprotoxic or suspected reprotoxic substances (especially endocrine disruptors),
- analyse and, if possible, quantify the routes by which the general population is exposed to these substances. A specific analysis will be carried out for vulnerable populations and people exposed occupationally to these substances, via the use of products intended for the general public,
- conduct a risk/benefit analysis (involving the health benefits claimed for certain products).

One of the ultimate objectives of this study is to identify possible substitutes for any products or substances that may have been shown to pose a health risk, while ensuring that any candidate substitutes identified have undergone risk assessment prior to authorisation.

This joint study will result in a series of risk assessment reports, each one specific to a given substance. It will span several years, beginning in 2011 with a specific report on bisphenol A, then continuing from 2012 with reports on other substances. It will involve international cooperation (particularly with our German and North-American counterparts), with a view to developing new risk assessment methodologies for possible adoption at international level.

2. The REACh Regulation

The REACh Regulation, which came into force on 1 June 2007, aims to ensure a high level of protection of human health and the environment while maintaining the free circulation of substances on the European market. This new regulatory framework stipulates several provisions and obligations for producers and importers of chemicals. In particular, risk management related to chemicals is now the responsibility of the companies which manufacture, import, market or use these substances as part of their activities. They must produce information on the physico-chemical, toxicological and ecotoxicological properties of the substances they manufacture or import, and use these data to assess the hazards and risks in order to formulate recommendations for appropriate risk management measures.
Once the existence of a hazard has been confirmed, the Member States have a number of tools for managing hazards and risks, such as classification and harmonised labelling (including a requirement to display the properties associated with the hazards), the restriction procedure (which may extend to the substance being withdrawn for certain uses) or the authorisation

procedure (in which each use of the substance is assessed before the decision is made to approve it). The aim of the latter is the gradual substitution, within the European Union, of the most hazardous chemicals, particularly substances of great concern such as carcinogenic, mutagenic or reprotoxic substances. Actual decisions have already been taken in this context and three phthalates (DEHP, DBP and BBP[3]) in particular are among the substances subject to authorisation. Their use (all types of uses) will no longer be permitted from January 2015 unless specific authorisation is granted by the European Commission. Until then they are subject to restrictions.

In its role as expert agency supporting the public authorities in the implementation of the Regulation, ANSES proposes priority substances to the relevant Ministries, evaluates them and draws up identification dossiers for substances of concern in order to submit them to the procedures for authorisation, restriction or classification and labelling. Furthermore, ANSES contributes to European expertise through the various committees of the European Chemicals Agency (ECHA).

Last year, the first two European restriction dossiers (lead in jewellery and dimethyl fumarate) under the REACh Regulation were submitted by France to the ECHA, which declared them admissible in July 2010. ANSES undertook the necessary technical expert appraisal for compiling the dossiers, at the request of the Ministries of Sustainable Development, Health and Employment. The restriction may be voted on by Member States as early as September 2011, taking into account the views of the Committees for risk assessment and socio-economic analysis.

In 2011, ANSES will continue its classification and labelling activities, including preparation for the classification of methylmercury or special-purpose fibres. Three identification dossiers for substances of concern (chromates) will be sent to ECHA in August. Finally, ANSES is preparing for the assessment and selection procedure for the 11 substances it will assess from 2012.

3- Water: Sanitation and new uses on the programme in 2011

Competence for assessing health risks related to water was previously shared by the agencies that merged to form ANSES. This area is thus symbolic of the added value created by the merger. A single expert committee bringing together the Agency's expertise on water issues has been created and ensures a cross-cutting view of the studies undertaken. In 2011, the Agency's work in the field of environmental health will mainly concern wastewater treatment and the assessment of risks related to the emergence of new water use practices.

Sanitation

Discharges from collective and individual sanitation systems contain potentially pathogenic microorganisms (bacteria, viruses and parasites) which may constitute a health risk to susceptible activities downstream (swimming, shellfish growing). French regulations[4] stipulate that prefects may issue formal requests to ANSES concerning any wastewater treatment project. ANSES may

[3] Di(2-ethylhexyl) phthalate, Di-n-butyl phthalate and Butyl benzyl phthalate
[4] Article R.1331-1 of the French Public Health Code

therefore be required to issue opinions on applications for authorisation to create or modify sewage treatment plants, to discharge into the natural environment or to reuse treated wastewater through sprinkling.

The work conducted in 2011 will focus on first, assessing the risks associated with the presence of micro-organisms in wastewater discharged after leaving sewage treatment plants located upstream from susceptible activities, and second, identifying the relevant microbiological parameters to be monitored and offering guidance values that can be used by the prefects.

New water use practices

In the context of resource conservation policies, more and more countries are encouraging the reuse of different types of water (wastewater, 'grey' water, rainwater) for certain purposes (irrigation, laundry, flushing toilets, etc.), which does not necessarily need to be of the same quality as water intended for human consumption. Since such water is heavily contaminated both microbiologically and chemically, it cannot be used directly but must undergo suitable treatment. In countries where such practices are permitted, specific regulations always accompany their use.

Thus in 2011, work is underway on:

- the possibility of reusing different types of water (treated wastewater, grey water and rainwater) and the corresponding health risks depending on the planned use. This will include expert assessments with a view to providing a regulatory framework for the reuse of grey water in France.
- assessing the health risks related to the recycling of effluent in systems for the treatment of water intended for human consumption
- the reuse of treated wastewater for watering or irrigating crops or green spaces. Earlier appraisals (2008), which concentrated on risks by oral contact, will be extended to include the assessment of risks by inhalation and skin contact, especially after sprinkling of treated wastewater.

4- Indoor air: establishment of reference values and assessment of the costs of pollution

We spend between 70 and 90% of our time (even more for certain sensitive populations such as young children and the elderly) inside various buildings (home, place of work or buildings receiving the public) and modes of transport, where we are exposed to various pollutants, mainly by inhalation. In France in recent years, increasing attention has been paid to the quality of indoor air. In 2001 the authorities created the Observatory on Indoor Air Quality (OQAI), led by the French Scientific and Technical Centre for Building (CSTB). In connection with the activities of this observatory, in which the Agency is a stakeholder, ANSES's mission is to define indoor air guideline values (IAGVs). These values are health targets to be reached to protect human health. They are based solely on health criteria, and exclude economic feasibility criteria and any metrological considerations. These values are intended to help the public authorities set values for managing the quality of indoor air.

In 2007, the Agency published a general methodology for developing IAGVs, and a list of 12 substances for which such values were to be established as a priority. Since that date, IAGVs have been published for seven substances[5].

In 2011, the Agency is continuing its work on this theme.

- In terms of work undertaken, ANSES has begun to change its methodology for setting IAGVs, which will shortly be updated;
- The list of substances for priority investigation is being updated, in collaboration with the OQAI;
- Substances currently being studied are di(2-ethylhexyl)phthalate (DEHP) and nitrogen dioxide.

At the same time, ANSES and the OQAI have this year launched an exploratory study to determine the resources available and identify the needs in terms of exposure data, so as to conduct an assessment of the costs of poor indoor air quality in France. These costs arise because of a failure to adhere to management values for indoor air quality. The exploratory study will survey earlier work conducted outside France and undertake a critical analysis of the methods used. Based on data available for France, this exploratory study will be used to make an initial diagnosis of the feasibility of assessment and select an assessment method.
Finally, the Agency is conducting research on consumer products that may emit pollutants. After initial investigations of emissions of volatile organic compounds (VOCs) from building and decorating products, ANSES is continuing its work in 2011 on such emissions in the indoor environment, from various sources such as household products, cleaning products, air fresheners, etc.

5- Radiofrequencies and health: an integrated approach

The development of radiofrequency technologies and their associated applications - i.e. using electromagnetic fields emitted in the frequency range between 9 kHz and 300 GHz - has grown rapidly over the past 20 years, with the appearance of new features for mobile telephony, the proliferation of Bluetooth, Wi-Fi or WiMAX standards, etc. Sources of radiofrequency electromagnetic fields are increasing, and are accompanied by many questions in terms of use, metrology, biological and clinical effects, epidemiology, regulation, and human and social sciences, as well as various concerns, depending on the applications considered, relating mainly to their possible health impacts.
To address the issues raised by the different uses of radiofrequencies, ANSES has carried out several expert appraisals of their health effects. It has published three opinions and reports on this subject[6] as well as a specific report on radio frequency identification (RFID) systems. In continuation of this work, in 2011 the Agency will establish an integrated scheme that will allow it to continue its expert work, and promote and support research on these issues.

[5] carbon monoxide, formaldehyde, benzene, naphthalene, trichloroethylene, tetrachloroethylene, particles
[6] in 2003, 2005 and 2009

A permanent "Radiofrequencies and Health" expert group will be created to monitor in real time the latest scientific developments in this field. Following the transfer of the missions of the Health & Radiofrequencies Foundation[7] to ANSES, a specific research programme entitled "Health and Radiofrequencies", with its own scientific board, will be created alongside the environmental and occupational health programme and will issue an annual call for research projects. Finally, ANSES will create an outreach committee, bringing together the various stakeholders interested in the subject to inform the Agency on society's expectations in terms of research, expertise and information on radiofrequencies and health.

6- Nanoparticles

Since 2006, the Agency has produced several expert reports on the health risks related to food, environmental and occupational exposure to manufactured nanomaterials[8].
In parallel with these expertise activities, the Agency has made a major contribution to the development of new risk assessment methodologies, for professionals, in the definition of safety tests or through standardisation initiatives. These activities have been carried out both nationally and internationally (ISO, OECD, European Commission).
The Agency recently produced a report presenting a method of graduated risk management (control banding) for the health of workers handling nanomaterials in the workplace. This method is a risk prevention tool. In situations of uncertainty, it takes into account various parameters including the specific physico-chemical characteristics of the nanomaterials and the available data on the toxicity of materials of similar nature and physico-chemical properties. Classifying nanomaterials in these control bands will provide producers and users with input data for risk analysis.

The actions to be taken by ANSES on nanomaterials in 2011 cover three broad themes: monitoring, support for research through its call for environmental and occupational health research projects, and support for changes to the regulations on these substances.

[7] The Health & Radiofrequencies Foundation was created in 2005 at the suggestion of OPECTS (French Parliamentary Commission for Expertise in Technological and Scientific Choices). Its missions were to define, promote and finance firstly programmes for epidemiological, experimental and sociological research into the effects of human exposure to radiofrequency electromagnetic fields, particularly as used in electronic communications, and secondly programmes for disseminating to professionals and the general public the knowledge acquired concerning these effects.
[8] 2006, "Nanomaterials: effects on the environment and human health (AFSSET)"; 2008, "Nanomaterials and occupational safety (AFSSET)"; 2009, "Nanoparticles in human and animal food (AFSSA)"; 2010, "Assessment of the risks associated with nanomaterials for the general population and the environment" (AFSSET)".

5. ANSES, a new player in health and safety

The French Agency for Food, Environmental and Occupational Health & Safety was created on 1 July 2010 through the merger of two French health agencies: AFSSA (the French Food Safety Agency) and AFSSET (the French Agency for Environmental and Occupational Health Safety). By incorporating their respective missions, ANSES now provides a cross-functional perspective on health issues and can identify, overall, the risks to which people are exposed through their lifestyles and consumption patterns, or the characteristics of their environment, including in the workplace.

Protecting human, animal and plant health

In terms of human health, ANSES covers three fields: food, the environment and the workplace. Its mission is also to assess risks to animal and plant health. On the basis of its scientific reports, it formulates opinions and recommendations for the authorities.

Ensuring food safety and quality

The Agency assesses health and nutritional risks throughout the agri-food sector. It evaluates the nutritional properties of substances included in food and feed, as well as the associated benefits. It monitors eating habits and trends, and identifies populations most at risk. Lastly, it assesses the health quality of water intended for consumption.

Assessing health risks related to the environment

Health and environment are closely related. ANSES assesses the impact of the environment on human health, so as to better identify health risks related to pollution of the human environment (air, water, soil). It covers several topics: cancer and the environment, exposure to biological, chemical and physical agents, regulations on the use of hazardous chemicals, etc.

Assessing health risks in the workplace

At present, concerns are growing about exposure to occupational diseases and deferred risks related to chemicals such as those found in nanomaterials or asbestos. ANSES is studying the mechanisms of exposure in the workplace and the health risks specific to different professions, through innovative evaluation methods and tools. Within the National Network for Monitoring and Prevention of Occupational Diseases (RNV3P) ANSES is actively contributing to the development of knowledge of hazards and exposure in the workplace, as well as the definition of vigilance strategies.

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ANNEXES

Annex 1: List of opinions issued by the Agency since 2008 in the field of environmental health

Annex 2: Press release of 22 February 2011

"Launch of the ANSES call for research proposals on environmental and occupational health"

Annex 3: Press release of 1 February 2011

"Health and safety of water and aquatic environments: ANSES and ONEMA sign a partnership agreement"

Annex 4: News update of 2 November 2010

Publication of the ANSES report on the study of "Natural outcrops of asbestos"

Annex 5: News update of 25 October 2010

"Lighting systems using light-emitting diodes (LEDs): health issues to be considered"

Annex 6: Press release of 10 June 2010

"Regulated swimming pools open to the public: AFSSET recommends more hygiene measures with better control of water and air quality, and calls for vigilance with respect to workers, high-performance swimmers and very young children"

Annex 1: Work carried out by the Agency since 2008 in environmental health

2010

- Health effects of lighting systems using light-emitting diodes (LEDs)
- "Natural outcrops of asbestos": review of knowledge of the exposure, health risks and measurement practices in France and in other countries
- Assessment of health risks related to swimming pools - Part 1: regulated swimming pools
- Health effects of extremely-low-frequency electromagnetic fields
- Indoor air guideline values: 4 reports, on tetrachloroethylene (perchloroethylene), trichloroethylene, naphthalene and particles
- Assessment of the risks associated with nanomaterials for the general population and the environment

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- Volatile organic compounds and the indoor environment
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- Impact of post-treatment technologies on NO_2 emissions from diesel vehicles, and the related health aspects
- Assessment of the health risks related to artificial bathing pools
- Cancers and the environment
- Assessment of the health risks to humans related to the presence of the pandemic influenza virus in the air of buildings and its potential release via the ventilation systems
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- Man-made mineral fibres: mineral wool and continuous glass filaments
- Assessment of the risks linked to the injection of biogas into the natural gas distribution network
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- Glycol ethers
- Artificial snow: Assessment of the health risks linked to the use of additives
- Health risks linked to the presence of formaldehyde in indoor and outdoor environments
- Indoor air guideline values: Benzene
- Microbiological quality of bathing water: Classifying the quality of bathing water at the national level according to the method of the new European Directive 2006/7/EC
- Health impacts of noise generated by wind turbines

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Annex 2:

Maisons-Alfort, 22 February 2011

Press release

"Launch of the ANSES call for research proposals on environmental and occupational health"

Today ANSES launched a call for research proposals on environmental and occupational health in association with the French Environment and Energy Management Agency (ADEME), the National Cancer Institute (INCa) and the French National Agency for Water and Aquatic Environments (ONEMA), under the Ecophyto 2018 plan.
Launched within the framework of the National Research Programme for Environmental and Occupational Health (PNREST), **this call for research proposals aims to motivate scientific communities to produce useful data at all stages of health risk assessment.**
It concentrates its work on research questions raised by the ministries and State agencies concerned by these topics.
The call has been launched in support of public policies: it presents the research priorities of the Second Environmental Health Plan, the Second Occupational Health Plan, the 2009-2013 French Cancer Plan and the Ecophyto 2018 Plan.
Within the context of these plans, the call for proposals is organised around the following topics: the health impact of toxic, carcinogenic, mutagenic and reproductively toxic substances, airborne particles, environmental asbestos, noise pollution, etc. It takes into account all environments (the work environment, indoor air, water, soil, etc.) and also focuses on vulnerable and sensitive populations. Projects involving emerging risks (new technologies, nanomaterials, medicinal product residues, endocrine disruptors, psychosocial risks) are strongly encouraged.
In concordance with the integration by ANSES of the missions of the Health and Radiofrequencies Foundation, **this call for proposals includes a special call on the health effects of radio frequency emissions**. Funding in this area is provided by a tax on radiofrequency transmitters, €2 million of which have been allocated directly to ANSES for this purpose.

The total budget comes to over €6 million, due to the participation of the following cofinancers:
the French Environment and Energy Management Agency (ADEME), the National Cancer Institute (INCa) and the French National Agency for Water and Aquatic Environments (ONEMA), under the Ecophyto 2018 plan. This funding will be added to the initial budgets allocated to ANSES by the Ministries in charge of Ecology and Labour as well as the proceeds of the radiofrequencies tax.
In 2010, the call for proposals met with great success, as the number of applications received was even greater than the preceding year (147 in 2010 compared to 118 in 2009).
The average grant awarded in 2010 was €110 thousand, and the programme has financed 276 research projects since it began in 2002, for a total of €26 million.
In order to effectively target projects of superior scientific quality, a new selection procedure based on letters of intent has been set up this year. The 2011 selection process will therefore be divided into two stages:
· an initial selection on the basis of letters of intent,
· a second round of selection based on complete applications for the shortlisted letters of intent.

The results of the research projects funded within the framework of this programme are showcased at public presentations organised by ANSES. The next session of these Scientific Gatherings will be entitled "From RSIs to nanoparticles – today's environmental and occupational health risks".

Find out more: www.anses.fr_

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Annex 3:

Paris, 1 February 2011

Press release

Health and safety of water and aquatic environments:

ANSES and ONEMA sign a partnership agreement

On 31 January 2011, Marc Mortureux, Director General of the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) and Patrick Lavarde, General Director of the French National Agency for Water and Aquatic Environments (ONEMA), signed a three-year partnership agreement in order to consolidate their ability to meet health and safety challenges related to the sectors of water and aquatic environments.

The agreement will principally result in joint action on the following key issues and areas of concern:

- prioritising the pollutants to be studied,
- assessing the health risks linked to pesticides,
- characterising emerging risks from, for example, drug residues, nanoparticles, and cyanotoxins,
- developing methods for chemical and ecotoxicological analyses.

As a result of this commitment, in 2011 ONEMA will contribute to ANSES's objectives and its annual call for research projects in the field of environmental health. In the first quarter of 2011, the two agencies will also co-host an inter-agency workshop with the official ANSES partners (a network of 31 institutions, *Réseau 31*) on the hazards and risks related to water and aquatic environments.

Moreover, ANSES and ONEMA will expand a joint knowledge base on pesticides and associated risks by sharing information and data on water and substance characteristics. As a part of the French National Plan for reducing pesticide use (the *Ecophyto 2018* Plan), the two agencies will together develop a national information system on the risks and impacts of pesticides in water, as well as on the identification of use indicators, risks and impacts associated with pesticide use.

This agreement reinforces the commitment of both agencies to build upon their complementary strengths and cooperation between their teams, enabling them to deal more effectively with the challenges of public and environmental health policies related to water and aquatic environments.

Annex 4: News update of 2 November 2010

Publication of the ANSES report on the study of “Natural outcrops of asbestos”

The French Agency for Food, Environmental and Occupational Health & Safety (ANSES) has just published a review of current knowledge of the health risks and public health measures taken in France and in other countries to deal with the exposure of humans to natural outcrops of asbestos.

Asbestos is mainly found in France around natural rocky outcrops in Upper Corsica and New Caledonia. These outcrops, due to erosion or specific construction work (building, road networks, earthworks, etc) may lead to humans being exposed to asbestos fibres and potential risks to their health.

The ANSES report gives a synthesis of current knowledge in terms of metrology, assessment of the exposure of populations and the effects on public health. It also reviews the measures taken to deal with asbestos outcrops in France and in other regions of the world.

The converging proof in the scientific publications studied shows that there is a risk for local populations and workers during moving or use of asbestos-bearing rocks.

The review of public health practice reveals that some measures are widespread but differ from one country to another (risk taken into account in urban planning, inspection of outdoor worksites, handling of rubble, etc). The report specifically mentions that local management initiatives, particularly in France, are effective and may be generalised to other regions facing identical risks.

ANSES recommends that current public health practice be improved and completed in various ways, in particular to reinforce protection of populations exposed to construction work on asbestos-bearing land. These recommendations should enable policy-makers and risk managers to adapt or define appropriate measures for specific exposure situations encountered in various French territories where asbestos-bearing ground is involved.

The report, which was written in response to a request from the Ministries responsible for health, the environment and work, may be consulted below.

Annex 5: News update of 25 October 2010

"Lighting systems using light-emitting diodes (LEDs): health issues to be considered"

Today, the French Agency for Food, Environmental and Occupational Health & Safety (ANSES) is publishing its expert appraisal on the health issues surrounding lighting systems using LEDs; such a study has never been carried out before. Because of their low electricity consumption and high efficiency, lighting systems using LEDs are at the forefront of technology in terms of energy performance and are well-fitted to play a role in energy-saving policy. The market for these systems is growing rapidly. However, risks have been identified concerning the use of certain LED lamps, raising potential health concerns for the general population and professionals.

The principal characteristic of diodes sold for lighting purposes is the high proportion of blue in the white light emitted and their very high luminance ("brightness"). The issues of most concern identified by the Agency concern the eye due to the toxic effect of blue light and the risk of glare.

The blue light necessary to obtain white LEDs causes toxic stress to the retina. Children are particularly sensitive to this risk, as their crystalline lens is still developing and is unable to filter the light efficiently.

These new lighting systems can produce "intensities of light" up to 1000 times higher than traditional lighting systems, thus creating a risk of glare. The strongly directed light they produce, as well as the quality of the light emitted, can also cause visual discomfort.

As part of its expert appraisal, ANSES carried out various pioneering studies to evaluate the risks of these new lighting systems, on the basis of the European photobiological safety standard[9]. Some of these products fall into higher Risk Groups than certain traditional lighting systems which are still available to the general public.

In this context, ANSES recommends that only LEDs belonging to Risk Groups similar to those of traditional lighting systems be accessible to the general public, with higher-risk lighting systems being reserved for professional use under conditions in which it is possible to guarantee the safety of workers.
Furthermore, ANSES emphasises the need to reduce the perceived luminous intensity, in order to mitigate the risk of glare.

The agency also recommends avoiding the use of light sources with a strong blue component in places frequented by children.

Lastly, ANSES has made various recommendations concerning consumer information, modifications to and implementation of the standards in force and the need for further knowledge of health issues surrounding artificial lighting

[9] NF EN 62471:2008 This standard applies to lamps and devices using lamps. It recommends exposure limits for radiation from these light sources. It considers all of the photobiological hazards which may affect the eye (thermal and photochemical hazards) and defines 4 risk groups: risk group 0 (no risk), risk group 1 (low risk), risk group 2 (moderate risk), risk group 3 (high risk).

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Annex 6:

Maisons-Alfort, 10 June 2010

Press Release

Regulated swimming pools open to the public: AFSSET recommends more hygiene measures with better control of water and air quality, and calls for vigilance with respect to workers, high-performance swimmers and very young children

AFSSET is today publishing a report on its collective expert appraisal of the health risks associated with regulated swimming pools open to the public.

It concerns the 16,000 pools intended for sports or recreation (municipal swimming pools, pools in hotels, campsites, holiday apartment complexes, etc.) and fed by the public water supply. Twenty-five million swimmers visit these pools every year.

The supervisory authorities find that French swimming pools have a good rate of compliance with the regulations, in particular those concerning microbiological quality. Nevertheless, risks remain concerning microorganisms (fungal disease, warts, diarrhoea, etc.).

However, for AFSSET the main risk in regulated French swimming pools arises from chemicals: water disinfection products (chlorine, bromine, ozone, etc.) combine with organic matter brought into the water by bathers to form by-products which are harmful chemical contaminants, such as trichloramines or chloroform. These compounds may reach levels that can cause respiratory (asthma, bronchitis, etc.), skin (eczema) and eye disorders among people spending time at the pools, starting with the most regular users (competitive swimmers, lifeguards, maintenance and reception staff). These risks also affect very young children whose immune and respiratory systems are still developing.

In this context, AFSSET recommends the following changes to improve health protection:

- **To reduce the concentration of pollutants in the pools, the following two actions are required:**

  - **a significant reinforcement of personal hygiene** to reduce the introduction of organic matter and pathogens. This requires strict adherence to the standard measures (soapy showers, wearing a bathing cap, cleanliness, etc.). Swimming pools could make this easier for bathers by adapting the layout of the premises to make passageways more obvious, providing soap in the showers, strengthening hygiene rulings, etc. These simple, low-cost measures are highly effective in reducing water contamination.

  - better control of treatments. AFSSET recommends revising the regulations in this regard.

  AFSSET recommends establishing air quality monitoring for swimming pools. It also calls for indoor pools to be classified as "buildings subject to specific pollution", which would impose **an obligation to maintain a minimum flow of fresh air** (60 m^3 per hour and per person). This will provide a significant benefit for workers.

With regard to the water, **AFSSET recommends introducing measures to reduce the amount of organic matter present.** This involves coagulation prior to filtration, and the monitoring of new parameters (turbidity, total organic carbon). It also recommends updating the disinfection control parameters (monitoring of *E. coli* bacteria, etc.).

AFSSET also proposes establishing appropriate protocols for cleaning surfaces and maintaining premises. These environments have not so far been covered by the regulations. **Finally, AFSSET recommends establishing mandatory continuous self-inspections in swimming pools**. If both issues were adequately controlled, this would significantly reduce the concentration of disinfectants in the water (to the standards of the German regulations, 0.3 to 0.6 mg/L for chlorine) while at the same time decreasing levels of pollutants that are by-products of disinfection.
This will bring significant benefits to anyone spending time at the pools, starting with the most regular users.

- **Furthermore,**
  - for the specific case of **very young children** (typically less than 2 years of age), AFSSET calls for vigilance, due to their particular sensitivity to disinfection by-products and their relatively poor hygiene. It is important to place baby bathers under medical supervision to ensure the absence of any contraindications (including a history of respiratory disorders). The activity should take place in pools where water quality is well controlled (dedicated pool, recycled water, trained personnel, etc.).

  - for staff working at the swimming pools, AFSSET advocates more thorough medical supervision in addition to the assessment of health risks.

  This AFSSET expert appraisal was conducted at the request of the Ministries for Health and Ecology in order to initiate a review of the regulations relating to swimming. This work will be supplemented in the near future by an assessment of health risks associated with "atypical" swimming pools (thalassotherapy centres, whirlpools, spa-leisure centres, etc.). Its findings will be presented in 2011.