



Health and Environment Update

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Health and Environment Working Party
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JRC Environment and Health Strategy

The four main objectives of the JRC strategy are:

1. To develop and validate concepts, methods and methodologies for:
 - assessment of human exposure to environmental stressors,
 - monitoring of environmental stressors and
 - implementation of integrated risk assessment
2. To develop the methodology for crossing environment quality information with health related information on a common platform to visualise and unveil potential E&H interactions and to assist in causal analysis of environment and health relationships.
3. Health Impact Assessment approaches – develop the “environmental burden of disease” concept as tool for quantification and communication of environment and health interactions.
4. To help elucidate the health effects of environmental stressors through targeted experimental work, toxicogenomic analyses, computational techniques, integrated modelling and analytical tools.



JRC Environment and Health Strategy

Three are the main axes of work:

1. Exposure assessment
2. Platforms for integration of Environment and Health information
3. Health effects and health impact assessment



JRC Environment and Health Strategy

1. Exposure routes

Outdoor air satellite data fusion for integrated pollution and health effect management

Indoor air focus on personal exposure to chronic low doses
release of chemicals from products/articles
health impact of ETS
characterisation of pathogens/allergens

UV radiation human exposure model
satellite-derived UV climatology maps

Noise WHO night-time noise guidelines
validation of new noise propagation models
EU-wide action on epidemiology of combined exposure to noise and chemicals

Food contact develop, validate, apply analytical methods for detection **materials** of contaminants

Water detection/exposure assessment to contaminants in drinking water



FACILITIES & NETWORKING

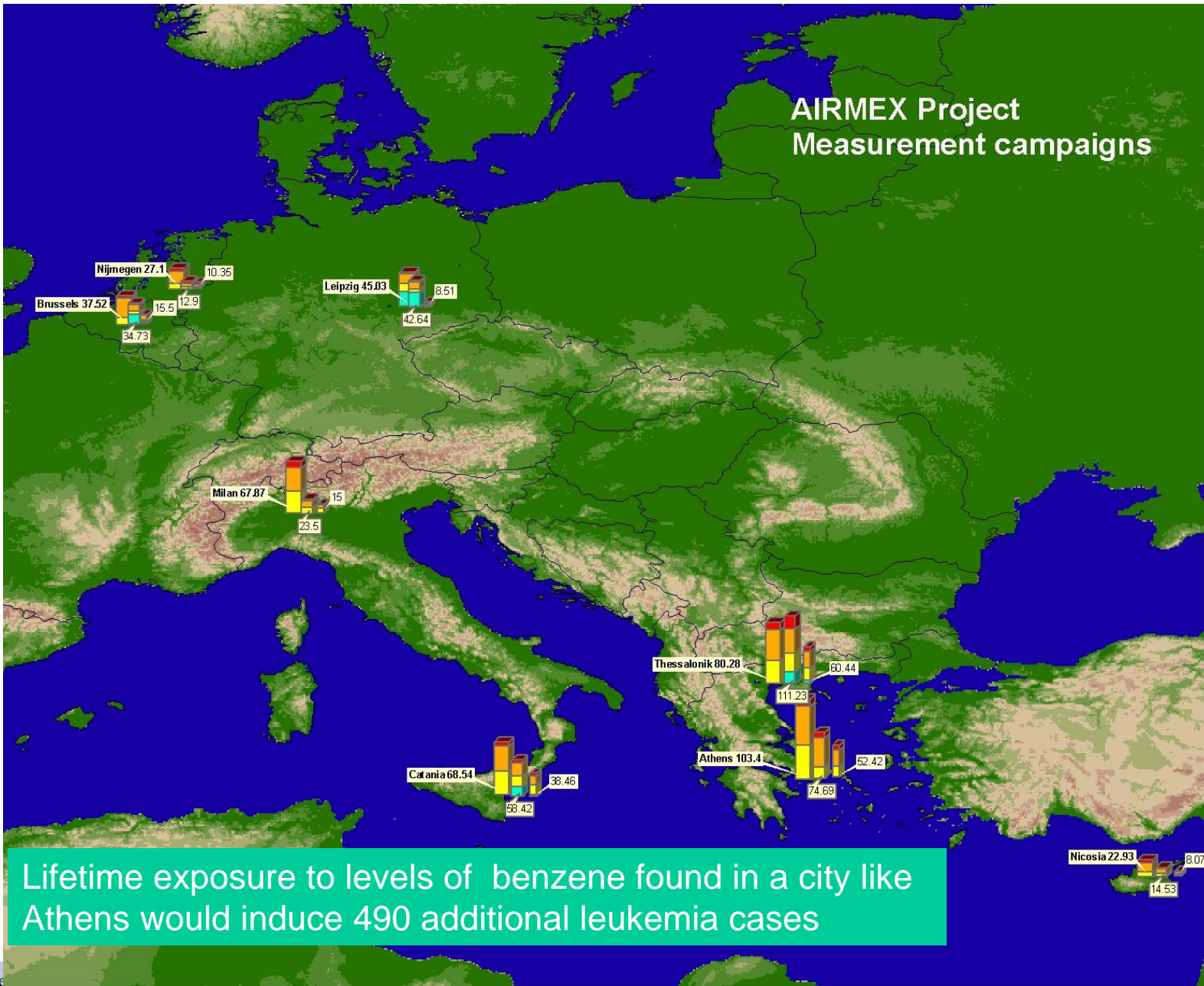
Indoortron: a JRC facility unique in the EU

A 30 m³ walk-in environmental chamber featuring controlled temperature, relative humidity, air quality, and air exchange rate.



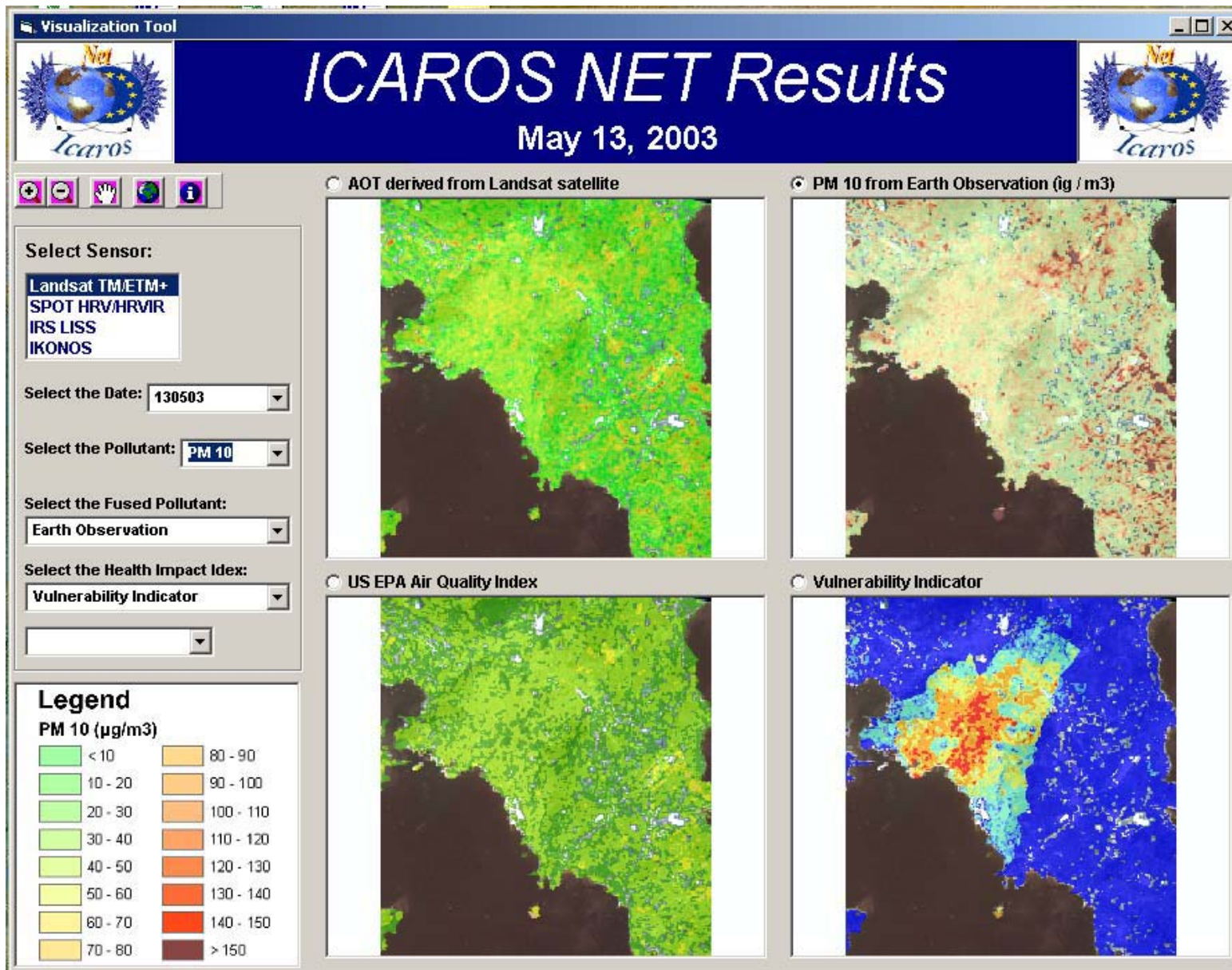


AIRMEX Project Measurement campaigns



- Concentration values (ug/m3)
- Personal concentration
 - BENZENE
 - TOLUENE
 - XYLENE
 - FORMALDEHYDE
 - Indoor
 - BENZENE
 - TOLUENE
 - XYLENE
 - FORMALDEHYDE
 - Outdoor
 - BENZENE
 - TOLUENE
 - XYLENE
 - FORMALDEHYDE

Lifetime exposure to levels of benzene found in a city like Athens would induce 490 additional leukemia cases





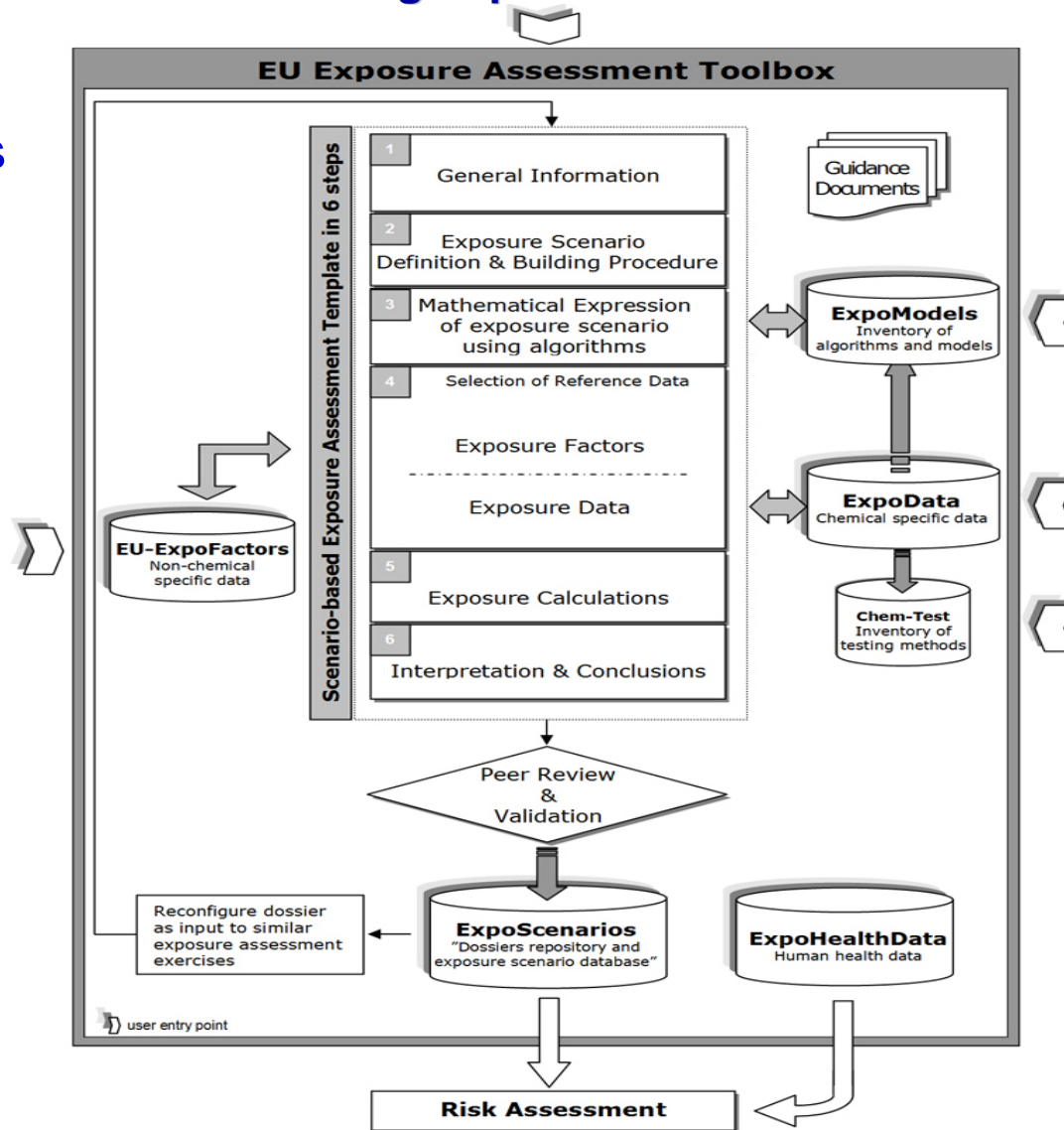
2. Exposure Assessment:

Development and review of scenario-based exposure assessment dossiers using EIS-ChemRisks tools and stakeholder dialogue procedures

The “European Exposure Assessment Toolbox” supports the GPSD and offers the “REACH Implementation Projects” (RIPs) initial pilot exercises and support on downstream user issues.

Collaboration with WHO on guidelines for uncertainty treatment in exposure assessment

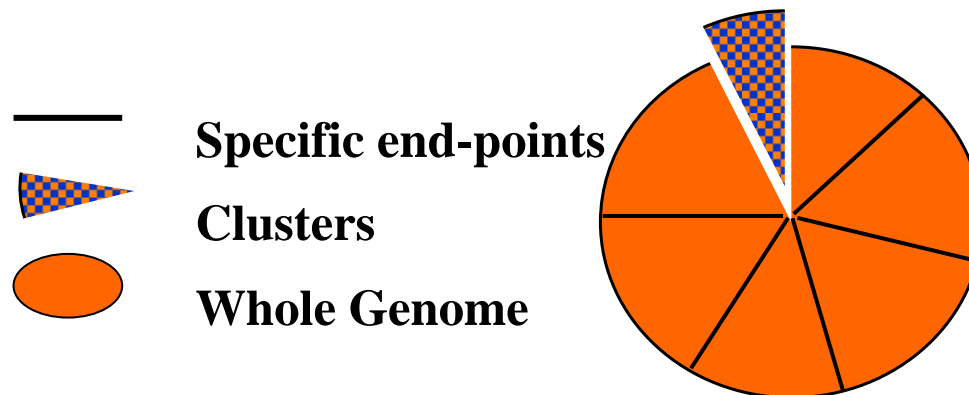
Development of European Human Exposure Data Centre in collaboration with EEA





Health Effect Assessment

- Focus on chronic combined exposure to low doses of toxicants across the human life span
- Investigate the role of risk modifiers
 - Age
 - Diet
 - Gender
 - Time window of exposure
 - Individual susceptibility
- Couple exposure estimates/measurements of priority stressors with biokinetic/dynamic modelling to elucidate estimation of biologically effective dose on target organs → contribute to mechanistic understanding of cause and effect
- Combine biokinetic/metabolic models with toxicogenomics analysis using whole DNA micro-arrays to address the full spectrum of effects

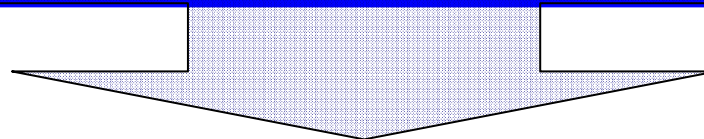
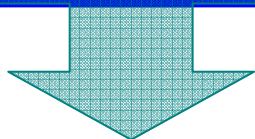




The future: 2007-2013

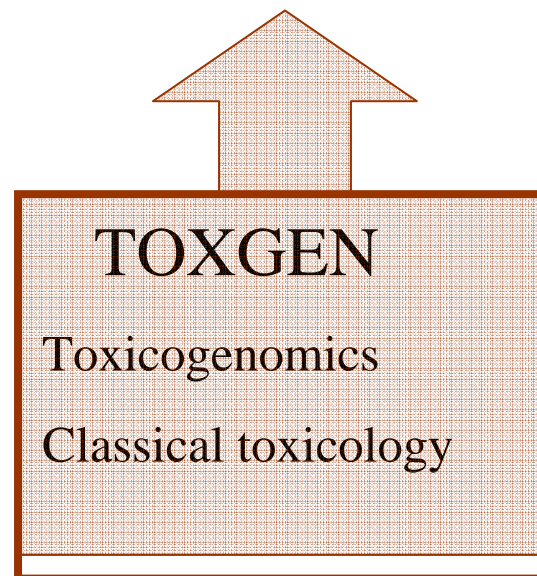
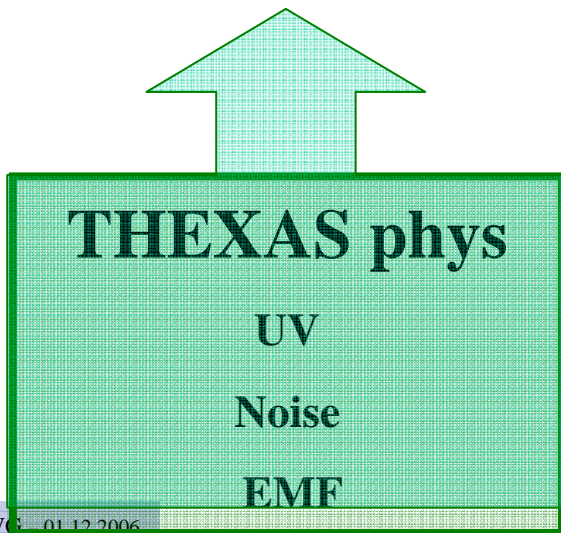
We will focus on:

- Systematic assessment of the link between human exposure to chemicals released from consumer products and health effects
- Reduction of uncertainty in exposure assessment through integration of data from toxicological analyses, environmental and bio-monitoring and epidemiological information
- Research on the health effects of long-term exposure to low doses of chemicals and chemical mixtures with emphasis on susceptible population groups (including co-exposure to physical stressors such as noise)
- Advancement and EU-wide harmonisation of exposure assessment methodologies



EXPO - MODE

EXPO - HEALTH





Action EXPOHEALTH

Scope

To identify, develop and assess novel methodologies which are instrumental to approach the complexity of environmental health science. Integrating toxicogenomics, computational techniques for data analysis and advanced analytical chemistry, this action will follow an inter and multidisciplinary approach to assess the relationships between chronic low dose exposure to environmental stressors across the human life span from fetus to adulthood

Objectives 2006

- ✓ To develop and validate methods for assessing exposure in indoor and occupational environments to chemicals released from consumer products
- ✓ To conduct research on Environmental Tobacco Smoke and Tobacco Additives
- ✓ To conduct pre-normative research on human exposure from materials in contact with food
- ✓ To operate the CRL on food contact materials in support of Reg. 882/2004
- ✓ To develop systems biology methodologies for the assessment of health effects from exposure to complex chemical mixtures and to combined exposures to chemical and physical agents
- ✓ To promote methods and techniques for monitoring emissions from building materials and consumer products



FP 7

Action

Human Exposure to Environmental Stressors and Health Effects

EXPO-HEALTH

Policy Theme 2: Solidarity and responsible management of resources

Scope **Agenda 2.3: Environment and Health**

The overall objective of Expo-Health is to render the JRC a centre of reference in the EU on the study of combined human exposure to mixtures of chemical and physical stressors and the associated potential adverse health outcomes. This will be done by identifying, developing and assessing novel methodologies which are instrumental to approach the complexity of environmental health science.

Creation of a Human Exposure Data Centre will be explored in collaboration with the European Environment Agency to bring together data on health stress from exposure to chemicals in the environment and consumer products. In addition, the Expo-Health laboratories will seek to provide reference methods and measurements for assessing combined exposure to and health effects of consumer products.



Specific objectives for 2007

-To support the Community Public Health Program and the Consumer Policy as well as the implementation of the Environment and Health Action Plan by:

- Exposure measurement campaigns in European cities assessing indoor air quality in public buildings
- Release and exposure measurements of chemicals from materials (incl. nanomaterials) and consumer products (e.g. building materials, textiles)
- Toxicogenomic models for co-exposure to water / food (arsenic / atrazine), water / air (arsenic / naphthalene) contaminants and dietary factors (proteins in diet) and genetic determinants (gender difference) \
- *In vitro* exposure set-ups to indoor air contaminants

-To do pre-normative research and provide institutional support to the work of the CRL on Food Contact Materials serving the official feed and food controls regulation 882/2004

- To support the implementation of the Drinking Water Directive (98/83/EC) (EU Acceptance Scheme) as well as the European Microbiology expert Group



FP 7

Action

Integrated Exposure Assessment and Modelling

EXPO-TOOLS

Policy Theme 2: Solidarity and responsible management of resources

Agenda 2.3: Environment and Health

Scope

To develop methodologies and tools, to provide reference data and guidance towards a harmonized exposure assessment in the EU.

Furthermore, ExpoTools will contribute to the development and establishment of a generic consumer exposure model framework by developing a taxonomy of sources and building source models following a tiered approach



Specific objectives for 2007

- To further operate the exposure assessment toolbox on methodologies, assessment procedures, reference data and guidance in support to GPSD and the New Chemicals Policy (REACH)
- To create a first draft of the generic consumer exposure model framework; to develop a protocol for consumer exposure modeling inter-comparison and validation exercise
- To prepare harmonized ambient noise mapping assessment methods and to contribute (in collaboration with ExpoHealth) to reviewing health effects due to ambient noise
- To contribute in cooperation with EMF-NET to an operational science/policy interface aiming at improving communication on the impact of EMF on human health



Forthcoming meetings/events in 2007

- Expert workshop on co-exposure to noise and chemicals
Ispra, 15-16 January
- International Symposium on Environment and Health in
the Mediterranean region, Seville, 10-14 October
- Expert workshop on health risk modifiers - venue to be
defined, November
- EU Indoor air workshop – Brussels, December



Thank you for your interest !

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