



Community-funded research on air pollution and health

Dr Tuomo Karjalainen

European Commission

Research Directorate-General

Environment Directorate

Climate Change and Environmental Risks Unit
tuomo.karjalainen@ec.europa.eu



Main DGs and agencies of the Commission addressing E&H health issues

FUNDING OF EUROPEAN RESEARCH



Research Directorate-General (DG Research):

- **✓** *Environment* Directorate
- √ Health Directorate
- **✓** Biotechnologies, Agriculture and Food Directorate

Information Society and Media Directorate-General (DG Infso)



POLICY MAKING		
Environment	Environment DG (DG ENV)	European Environment and Health Action Plan (EHAP), air pollution, noise-related issues, climate change, water pollution, REACH
FOOD AND FEED SAFETY CONSUMER AFFAIRS PUBLIC HEALTH	Health and Consumer Protection DG (DG SANCO)	EHAP, Public health policies (EMF, indoor air issues), Community legislation on food contaminants, risk assessment committees (SCHER, SCENHIR), Programme of Community Action in the Field of Health 2008-2013
Enterprise and Industry	Enterprise and Industry DG	Community legislation on substances, REACH
Directorate General for Employment, Social Affairs & Equal Opportunities	Employment, Social Affairs and Equal Opportunities DG	Occupational health
OTHER ACTORS		
JRC EUROPEAN COMMISSION	Joint Research Centre DG	Validation of chemical testing methods, EHAP
EEA	European Environment Agency	Reporting
MECHA	European Chemicals Agency	REACH



Projects funded

COOPERATION

	Framework Programm	Nb projects dealing with impact of air pollution on health	
		Fifth Framework Programme of Research (1998-2002)	12
Sixth Framework Programme of Research (2002-2006)		11	
	SEVENTH FRAMEWORK PROGRAMME	Seventh Framework Programme of Research (2006-2013)	2 (after 1st call)



➤ Air quality-related health impacts: FP5 projects



AIR POLLUTION-RELATED HEALTH IMPACTS

FP5 projects addressing air pollution and health issues

Air Pollution and Respiratory Health

AIRALLERG - Effects of Outdoor and Indoor Air Pollution on the Development of Allergic Disease in Children.

BIOAIR - Longitudinal Assessment of Clinical Course and Biomarkers in Severe Chronic Airway Disease.

ECHRS II - European Prospective Study on Environment, Allergy and the Lung.

HELIOS - Biomarkers for the Non-invasive Assessment of Acute and Chronic Effects of Air Pollutants on the Respiratory Epithelium.

HEPMEAP - Health Effects of Particles from Motor Engine Exhaust and Ambient Air Pollution.

MOCALEX - Measurement of Occupational Allergen Exposure.

<u>PAMCHAR</u> - Chemical and Biological Characterisation of ambient air coarse, fine and ultrafine particles for Human Health Risk Assessment in Europe.

PATY - Pollution and the young combined analyses of cross-sectional studies of respiratory health of children and air pollution.

PAWG - Programmable Air Wave Generator with Controlled Temperature, Pressure, Humidity and Air Wave Frequencies for Calibration.

RAIAP - Respiratory Allergy and Inflammation due to Ambient Particles - A Europe-wide Assessment.

RUPIOH - Relationship between Ultrafine and Fine Particulate Matter in Indoor and Outdoor Air and Respiratory Health.

Top

Air Pollution and Genotoxic or Carcinogenic Effects

AMBIPATH - Mechanism-based Approaches to Improved Cancer Risk Assessment of Ambient Air Polycyclic Aromatic Hydrocarbons (PAHs).

CHILDRENGENONETWORK - European Network on Children's Susceptibility and Exposure to Environmental Genotoxicants.

EXPAH - Effects of PAHs in Environmental Pollution on Exogenous and Endogenous DNA Damage.

GEN-AIR - Molecular Changes and Genetic Susceptibility in Relation to Air Pollution and Environmental Tobacco Smoke: a case-control study in non-smokers nested in the epic investigation.

Top

Air Pollution and Cardiovascular Effects

<u>AIRGENE</u> - Air Pollution and Inflammatory Response in Myocardial Infraction Survivors: Gene-environment-interactions in High-risk Group. **HEAPSS** - Health Effects of Air Pollution on Susceptible Subpopulations: Ultrafine particles and myocardial infarction.

MAAPHRI - Multidisciplinary Approaches to Airborne Pollutants Health-Related Issues.

Top

Air Pollution and Networking, Risk Assessment

AIRNET - A Thematic Network on Air Pollution and Health.

EMECAP - European Mercury Emission from Chlor-alkali Plants.





FP5 projects addressing air pollution and health issues

MULTIPLE STRESSORS AND FACTORS AND HEALTH IMPACTS

E21-4AYC - Environmental Influences and Infection as Aetiological Agencies in Atopy and Asthma in Young Children.

EPILYMPH - Environmental Exposures and Lymphoid Neoplasms.

GEOPARKINSON - Parkinsonism and Parkinson's Disease.

HEARTS - Health Effects and Risk of Transport Systems.

PARSIFAL - Prevention of Allergy - Risk Factors for Sensitisation in Children related to Farming and Anthroposophic Lifestyle.

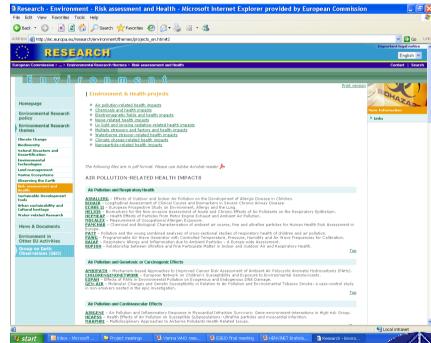
PASTURE - Protection against Allergy: Study in Rural Environments.

PDCAAE - Prevalence and Determinants of Childhood Asthma and Allergies across Europe.

PINCHE - Policy Interpretation Network on Children's Health and Environment.



http://ec.europa.eu/
research/environment/pdf/env_health_
projects/env_health_ brochure.pdf



Final reports:
http://ec.europa.eu/research/environment/c
themes/projects_en.htm



>FP6 projects addressing air pollution and health issues







Impetus for increased spending on E&H issues: European Environment and Health Action Plan [EHAP] adopted in 2004→ 66 projects funded by the Sixth Framework of Research (2002-2006) with a total EC contribution of over €200M → results starting to become available







Review of
European
research on the
most indoor
air- relevant
health effects
and respective
exposures to
contaminants in
indoor air

✓ Evaluation of interventions on environment and health exposure reduction measures on a regional level and promoting of implementation of successful initiatives in other regions of Europe √ Focus on the exchange of useful practices in two areas: (i) the reduction of traffic-related health hazards (ii) improvement of indoor air quality

√Main objective is to increase the information on the PM characteristics throughout Europe, describing the PMsystem with respect to geographical and meteorological conditions, particle formation processes and their transport. ✓IAO a minor aspect

✓ Identification of the remaining knowledge gaps in the field of air pollution and health in relation to the objectives of Environment & Health Action Plan ✓ IAQ a minor aspect

► (Action 5 of EHAP) Integrate and strengthen European environment and health research → make full use of the results from EU and nationally funded projects



Final workshop Brussels 16-17 September 2008

✓ENVIE: www.envie-iaq.eu/home.html

✓ PRONET: http://www.proneteurope.eu

✓ COST ACTION 633: http://cost633.dmu.dk

✓ CAIR4HEALTH: www.cair4health. eu





GABRIEL



Fstablishment of a network of **European centres** of excellence conducting integrated multidisciplinary research programmes on allergy/asthma and environmental factors (e.g., outdoor and indoor pollution), nutrition, lifestyle (including occupation), infections and genetic susceptibility

✓ Identification of how genes and the environment cause the development of asthma ✓ Identification of both risk and protective factors, with the long-term aim of preventing the illness

✓ Establishment of expert teams for each of the four priority diseases of the European **Environment and** Health Action Plan (allergy/asthma; cancer: neurodevelopmental disorders; endocrine disrupting effects). to summarise the current scientific basis regarding the links between health and environment

- (Action 6 of EHAP) Target research on diseases, disorders and exposures → improve knowledge of the links between environmental exposures and four priority diseases and to strengthen the integration of the research results into relevant policy measures.
- asthma, allergy
- ✓ neuro-immune disorders
- ✓ cancers
- ✓ endocrine-disrupting effects



✓ GA2LEN: www.ga2len.com

✓ GABRIEL: www.gabriel-fp6.org

✓ HENVINET: www.henvinet.eu











- ✓ aims at producing a new integrated risk assessment framework, based on the full chain approach (causal chain spanning sources of pollution, releases into various media, dispersion and transport, exposure medium inhalation/dermal contact/ingestion, intake, uptake, dose, health effects and impacts)
- ✓ Sub-projects (SP).
- □ SP1 will review and develop the tools and methods needed for integrated assessments;
- □ SP2 will review and develop monitoring and modelling methods necessary to support integrated assessment;
- □ SP3 will apply the methods developed in SP1 to seven policy areas (Transport, housing, agricultural land use, water, household chemicals, waste and climate);
- □ SP4 will design a web-based integrated assessment toolbox or system which will be the operational means to assess environment and health risks.

Housing - including the effects both separately and in combination of environmental tobacco smoke, indoor air pollution (e.g. from cooking and heating, moulds, furnishings etc), noise and indoor climate (including temperature and dampness) on acute and chronic health (respiratory illness, cardiovascular illness, winter mortality and infant mortality).

- ➤ (Action 7 of EHAP) **Develop methodological** systems to analyse interactions between environment and health
- → research into the adequacy of current risk assessment and possible development of new methodologies to assess better the risks coming from environmental factors, and to improve economic valuation and impact analyses of prevention strategies



- ✓INTARESE: www.intarese.org
- **✓NOMIRACLE:**

http://viso.jrc.it/nomiracle

- ✓ HEIMTSA: www.heimtsa.eu
- ✓2-FUN: www.2-fun.org
- ✓ DROPS: www.nilu.no/DROPS
- ✓ ENVIRISK: http://envirisk.nilu.no

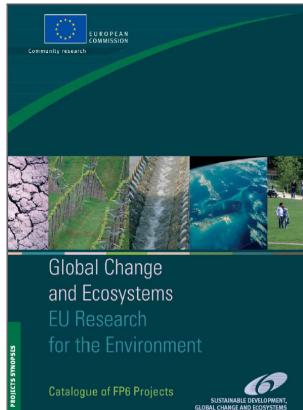


FOOD QUALITY AND SAFETY IN EUROPE PROJECT CATALOGUE

ftp://ftp.cordis.europa. eu/pub/food/docs/ fp6-tp5-projects.pdf



More information on FP6 projects - catalogues



http://ec.europa.eu/ research/environment / pdf/ global_ change_ecosystem. pdf





http://ec.europa.eu/research/allergy/index.htm

http://europa.eu.int/comm/research/fp6/ssp/themes_en.htm

http://cordis.europa.eu/ search/index.cfm





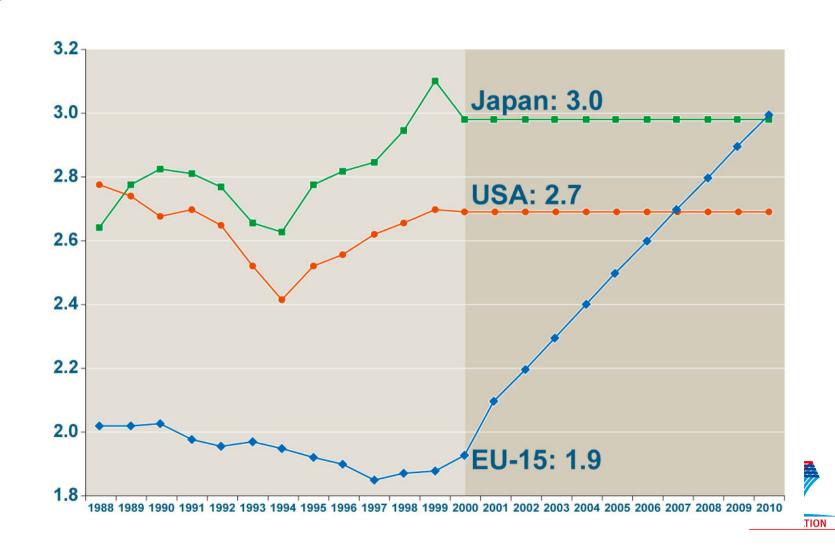


Seventh Framework Programme of Research (2006-2013)

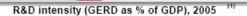


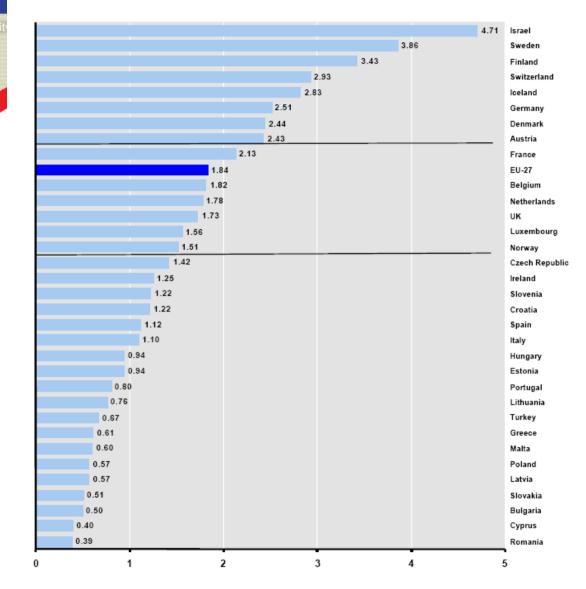


Research: filling the gap Total expenditure on R&D, % of GDP – Barcelona Summit, 2001



Research spending 2005





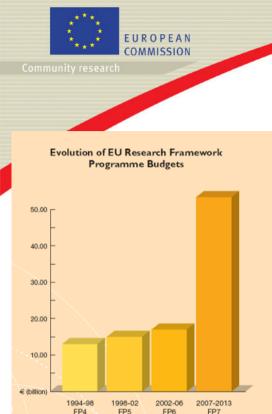
Source: DG Research Data: Eurostat, OECD

Note: (1) NL, IT, RO, UK, HR, TR, IS, CH: 2004; AT, FI: 2006.

Key Figures 2007







What's new as compared to FP6?

COOPERATION

Increased duration: seven years

✓ Increased budget: average increase 40% per annum as compared to FP6 (€5 billion in 2006; €9.9 billion in 2013)

- → budget for environmental research: around €200 M in 2006/2007, around €350M in 2013; sharp increase only from 2011
- ✓ New structure: cooperation, ideas, people, capacities
- Basic ('frontier') research to be funded via the 'Ideas' programme
- Flexible funding schemes. New: support for frontier research. No cost models. Increased EC contribution for S/T (up to 75%)
- ✓ Joint Technology Initiatives (long-term public-private partnerships in fields of high industrial/policy relevance)
- ✓ Simpler procedures (submission of documents, audit certificates, subcontracting, evaluation criteria etc). Redress procedure.
- Logistical and administrative tasks —>external structures



Specific programmes

Collaborative research: research activities carried out in trans -national cooperation in 10 thematic areas - budget €32.4 bn

Frontier research: "investigator-driven" research carried out across all fields (bottom-up approach) by individual teams in competition at the European level - €7.51 bn

Human potential: Strengthening the human potential in research and technology in Europe - budget €4.75 bn

Research capacity: research infrastructures; regional research driven clusters; unleashing the full research potential in the EU's "Convergence" regions; research for and by SMEs; "Science in Society" issues; "horizontal" activities of international co-operation - budget €4.10 bn

Euratom

Joint Research Centre (S/T support to EU policies): €1.75 bn

Joint Research Centre (nuclear)



Cooperation programme: 10 themes

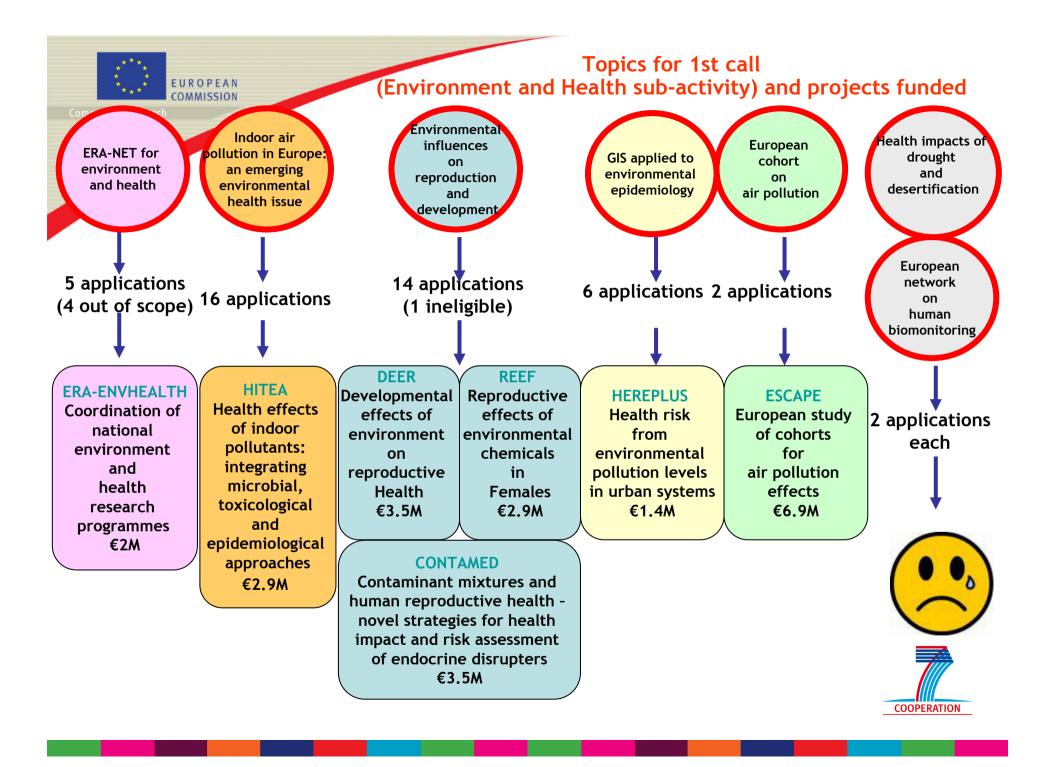
			Cooperation	programme. To	circines
	THEME	E&H ACTIVITIES COVERED	FP7 BUDGET (€ bn)	BUDGET OF 1st CALL (€M)	BUDGET OF 2nd CALL (€M)
1	HEALTH	Cancer, infectious diseases	6.10	637	549
2	FOOD, AGRICULTURE AND FISHERIES, AND BIOTECHNOLOGY	Food contaminants, animal diseases	1.94	192	110
3	INFORMATION AND COMMUNICATION TECHNOLOGIES	Personalised exposure measurement devices; ICT for environment	9.05	1 019	477
4	NANOSCIENCES, NANOTECHNOLOGIES, MATERIALS AND NEW PRODUCTION TECHNOLOGIES		3.48	396	221
5	ENERGY		2.35	109	70
6	ENVIRONMENT (INCLUDING CLIMATE CHANGE)	'Environment and Health' sub- activity: all areas of E&H	1.89	200	222
7	TRANSPORT (INCLUDING AERONAUTICS)		4.16	442	283
8	SOCIO-ECONOMIC SCIENCES AND THE HUMANITIES		0.62	59	N.A.
9	SECURITY		1.40	120	N.A.
10	SPACE		1.43	35	Ŋ.A.
	TOTAL		32.4	3 209	COONERATION

*Selection of some projects still ongoing



Main funding schemes

COMMISSION					
Commun Budget	Average size of consortium	Average duration	Name in FP5	Name in FP6	Name in FP7
€4M-€7M (in Environment theme)	3-7 partners	4-5 years	Did not exist	Networks of excellence (NoE)	NoE
	Depends on task; minimum 3 partners	2-5 years		Integrated projects (IPs)	Collaborative project: large scale integrating project
Up to €3.5M (in Environment theme)			Shared-cost research project	Specific Targeted Research Projects (STREPs)	or small or medium- scale research project
Not indicated	Minimum 3 partners	Up to 4 years	Concerted action	Coordination actions (CAs)	Coordination and supporting action (of coordinating or supporting type)
	At least 1 legal entity	2 years	Accompany ing measure	Specific support actions (SSAs)	
€100K to €400K per year, up to €0.5M-2M per grant	Individual research team with Principal Investigator named	Up to 5 years	Did not exist	Did not exist	European Research Council (ERC) Starting Independent Researcher Grant
€100K to €500K per year, up to €0.5M-2.5M per grant					ERC Advanced Investigator Grant





Topics for 2nd call (Environment and Health sub-activity)

Community



Health impacts of exposure to radiofrequency fields in childhood and adolescence



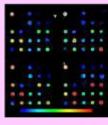
Comparison of health risks
in populations in
the Arctic and selected areas
in Europe due to the
spreading of contaminants
resulting from climate
change



Databases based on European cohort studies and their exploitation for advancement of knowledge of environment-health relationships



European research network on noise and health



New, improved and validated biomarkers to investigate long term health impacts of exposure to environmental pollutants



Quantification of changing surface UV radiation levels and its impact on human health

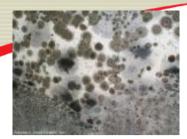
COOPERATION



1st call outcome: Air pollution-related projects funded by areas other than 'Environment and Health'







Under negotiation: indoor air quality and health

TOPIC TITLE IN THE CALL	ACRONYM	TITLE	EC CONTRIB UTION
Performance indicators for health, comfort and safety of the indoor built environment	PERFECTION	Performance indicators for health, comfort and safety of the indoor environment	€1.5M







Under negotiation: air quality and climate

TOPIC TITLE IN THE CALL	ACRONYM	TITLE	EC CONTRIBU TION
Megacities and regional hot-spots air quality and climate	MEGAPOLI	Megacities: emissions, urban, regional and global atmospheric pollution and climate effects, and integrated tools for assessment and mitigation	€3.4M
	CITYZEN	Megacity - zoom for the environment	€2.9M







Under negotiation: allergy

TOPIC TITLE IN THE CALL	ACRONYM	TITLE	EC CONTRIBU TION
Impact of exogenous factors in the development of allergy	EFRAIM	Mechanisms of early protective exposures on allergy development	€3M





Next calls



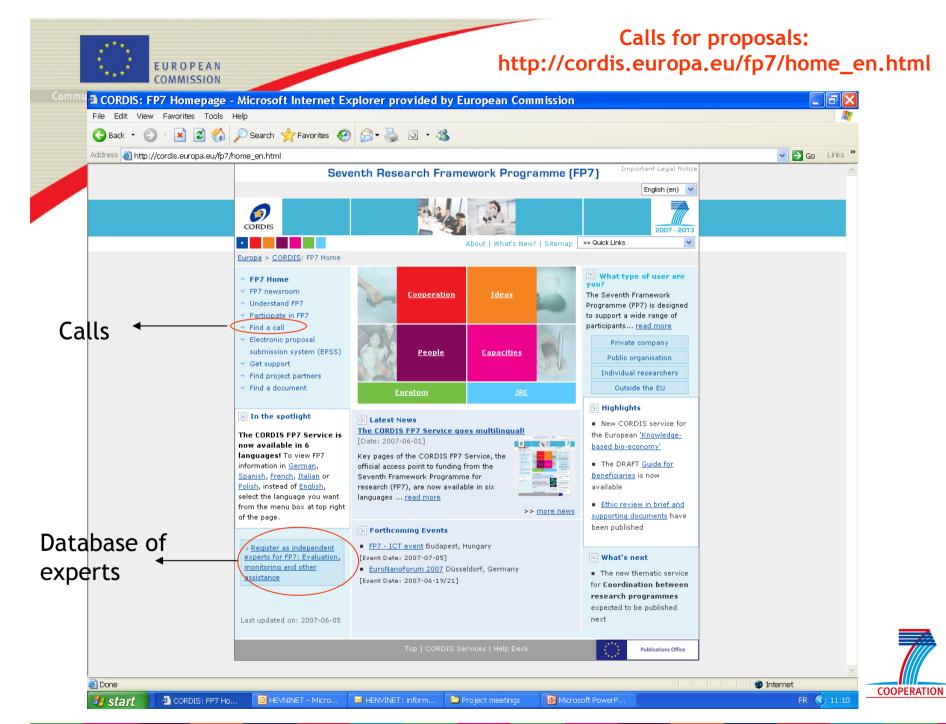
- ■2nd call recently closed: applications to be evaluated in April (a few address indoor air and health issues)
- □3rd call: topics under preparation to be published in June/July?
- ☐4th call: To be published in January 2009





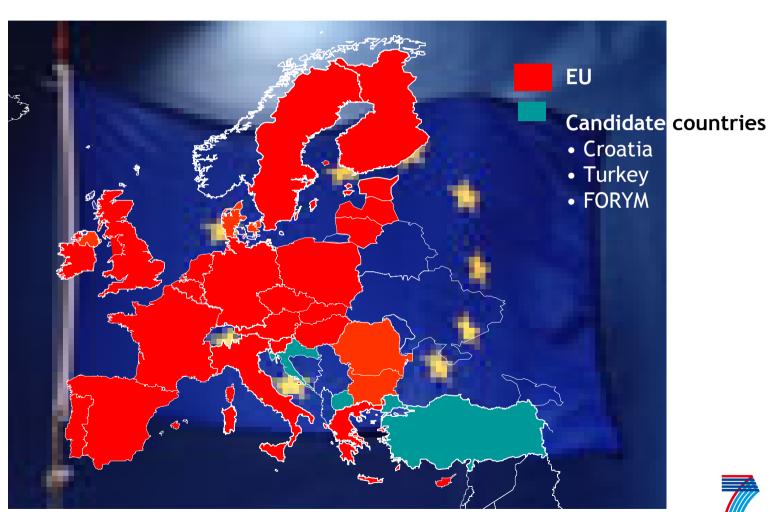
- Launched in November 2007
- Funding: €322M (around €50-60M per annum)
- ☐ Calls for proposals and tenders are managed by the Public Health Executive Agency (PHEA) of DG SANCO
- It co-finances projects
- ☐ Funds are available in a separate budget for organising conferences
- Call published two days ago, deadline 23 May 07
- ☐ Topics on IAQ

More info:http://ec.europa.eu/health/ph_programme/howtoapply/call_for_propal_en.htm





Thank you for your attention







➤ Other air pollutionrelated projects funded by FP5 and FP6 (for info)



MULTIPLE STRESSORS, INTEGRATED ASSESSMENTS (INCL. AIR POLLUTION)



meteorology, air pollution and population exposure- http://fumapex.dmi.dk



URBAN EXPOSURE Integrated exposure management tool characterizing air pollution-relevant human exposure in urban environment - www.nilu.no/urban_exposure



HEAVEN Healthier environment through the abatement of vehicle emissions and noise http://heaven.rec.org



ECNIS Environmental cancer risk, nutrition and individual susceptibility - www.ecnis.org

Final reports: http://ec.europa.eu/research/quality-of-life/ka4/ka4_reports_en.html



PROJECTS O	F POLICY RELEVANCE CARRYING OUT REVIEWS/NETWORKING
Commu Science Policy Air quality	NEPAR Network for the support of European policies on air pollution - http://nepap.ivl.se
ACCENT ATMOSHERIC COMPOSITION CHANGE THE EUROPEAN NETWORK OF EXCELLENCE	ACCENT Atmospheric composition change - European network of excellence - www.accent-network.org
ATREUS	ATREUS Advanced tools for rational energy use towards sustainability with emphasis on microclimatic issues in urban applications - http://aix.meng.auth.gr/atreus/index.htm
	COST 732 Quality assurance and improvement of microscale meteorological models - www.mi.uni-hamburg.de/Home.484.0.html
	COST 728 Enhancing mesoscale meteorological modelling capabilities for air pollution and dispersion applications - www.cost728.org
	COST 633 Particulate matter - properties related to health effects - http://cost633.dmu.dk



MODELLING, I	METHOD DEVELOPMENT
URBAN-AEROSOL	particulate matter chemical characteristics and source-to-inhaled dose relationships - www.nilu.no/projects/urban-aerosol
INTEGAIRE	INTEGAIRE Integrated urban governance and air quality management in Europe - www.integaire.org
ROSCATA	OSCAR Optimised expert system for conducting environmental assessment of urban road traffic - www.eu-oscar.org
	SAPPHIRE Source apportionment of airborne particulate matter and polycyclic aromatic hydrocarbons in urban regions of Europe - www.gees.bham.ac.uk/research/sapphire
	PARTICULATES Characterisation of exhaust particulate emissions from road vehicles - http://lat.eng.auth.gr/particulates/administrative_info.htm
	ARTEMIS Assessment of traffic emissions and inventory systems - www.trl.co.uk/artemis/index.htm
Air/IEU	AIR4EU - Air quality assessment for Europe: from local to continental scale http://www.air4eu.nl/
	MERLIN Multi-pollutant, multi-effect assessment of european air pollution control strategies: an integrated approach - www.merlin-project.info
O South Paris Pari	POLYSOA Secondary organic aerosols serve as condensation points for cloud droplet formation and play an important role in global climate and atmospheric chemistry - http://polysoa.web.psi.ch
BOND	BOND Biogenic aerosols and air quality in the Mediterranean area - http://milos.ipta.demokritos.gr/bond
ISHTAR Hygurd folkers for halft Tamport differen and Antick holings Recovery	ISHTAR Integrated software for health, transport efficiency and artistic heritage recovery - www.ishtar-fp5-eu.com
	COOPERATION