Invited projects:
DROPS
ENVIRISK
HENVINET

Alena.Bartonova@nilu.no

www.nilu.no

DROPS: Development of Macro and Sectoral Economic Models Aiming to Evaluate the Role of Public Health Externalities on Society

Co-ordinator: Jozef M. Pacyna jp@nilu.no

Project officer: Tuomo Karjalainen

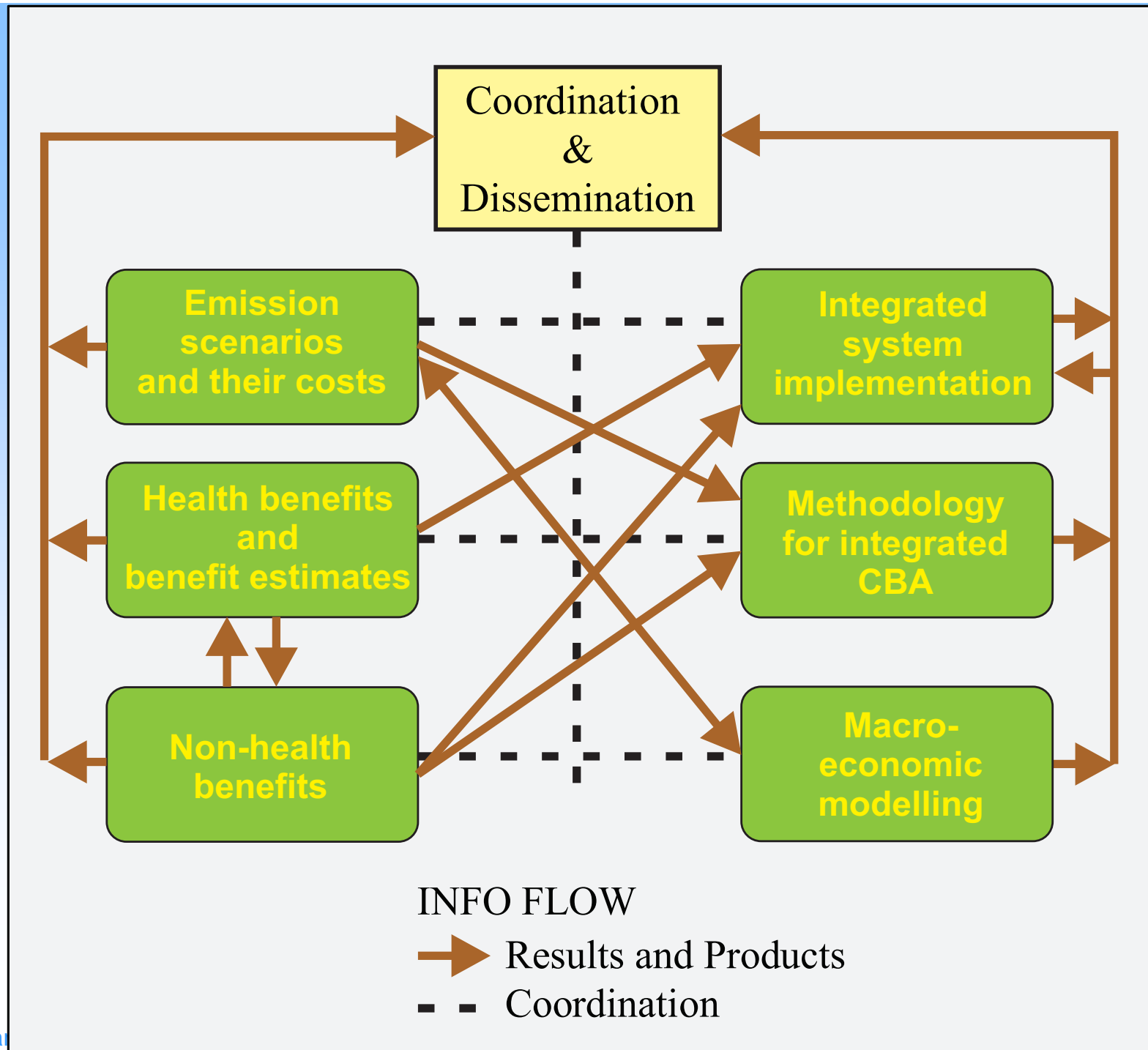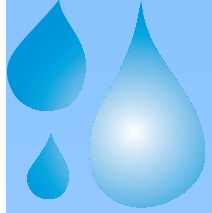http://drops.nilu.no

www.nilu.no NILU

DROPS facts

- **STREP, Priority 8.1, FP6-2004-SSP-4**
- **Participants:**
  - ❖ Norwegian Institute for Air Research, NO
  - ❖ University of Stuttgart, Institute of Energy Economics and the Rational Use of Energy, DE
  - ❖ Charles University Environment Centre, CZ
  - ❖ Institute of Ecology of Industrial Areas, PL
  - ❖ Medical University of Silesia, PL
  - ❖ NILU Polska Ltd, PL
  - ❖ Cambridge Econometrics, UK
- **Duration: 1.11. 2005-31.1. 2008**
- **Total effort: 178 person-months**
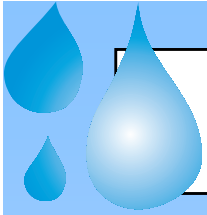
www.nilu.no NILU

DROPS aims

- Extend existing methodologies and models to provide impact-pathway based model for evaluation of the role of public health externalities on society, made operational for ozone, heavy metals (Hg, Cd, As, Ni, Pb), PCBs, dioxins and indoor air pollution.

www.nilu.no

Coordination & Dissemination

Emission scenarios and their costs

Health benefits and benefit estimates

Non-health benefits

Integrated system implementation

Methodology for integrated CBA

Macro-economic modelling

INFO FLOW

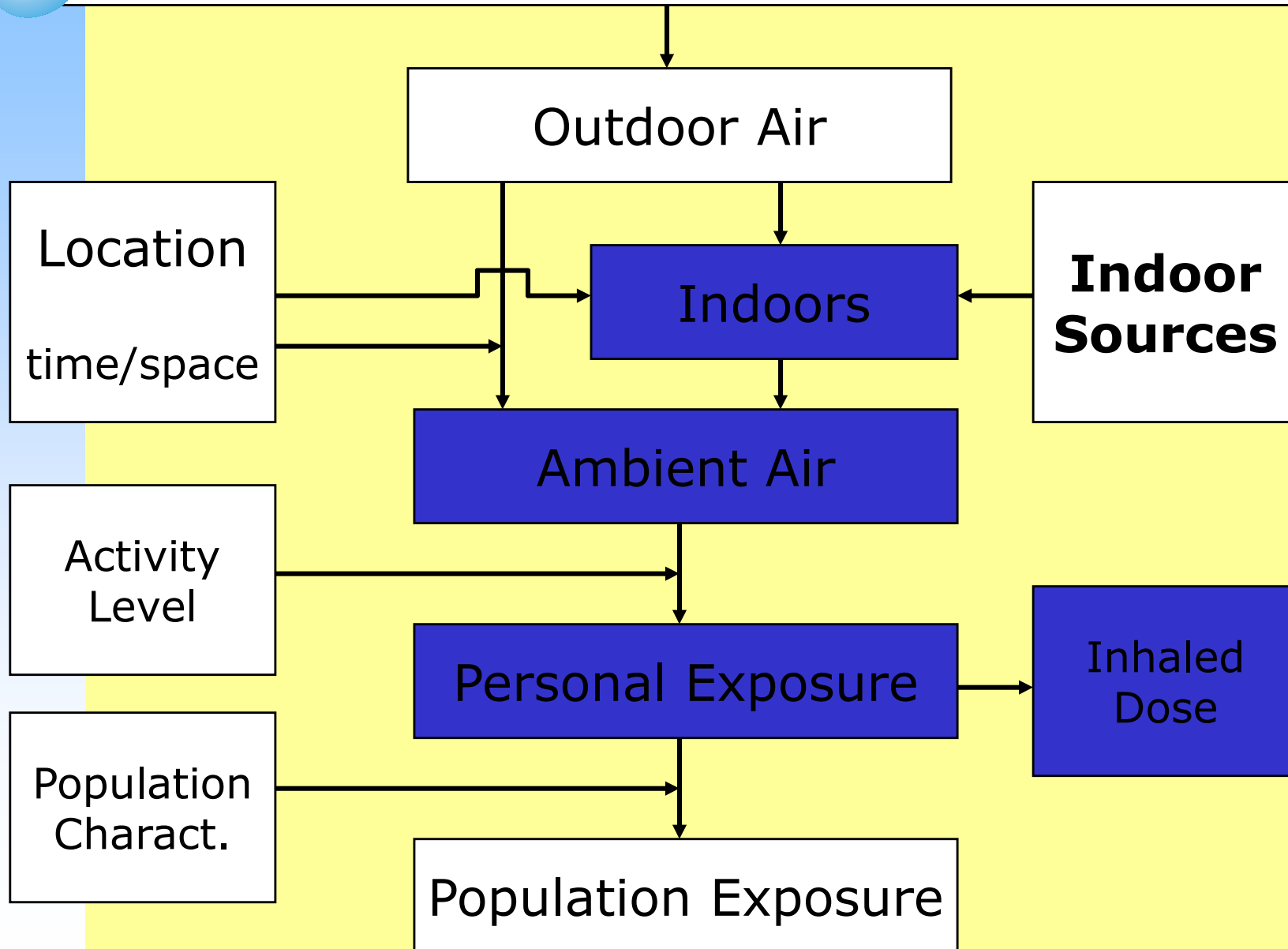Results and Products

Coordination

Brussels, Ma...

Assessment of the effect of outdoor particulate matter changes on indoor concentrations

- To assess the effect of changes in PM concentrations for the selected emission scenarios on indoor concentrations, taking into account contributions from selected indoor sources of particulate matter

Emission Scenario

Outdoor Air

Location

time/space

Indoors

Indoor Sources

Ambient Air

Activity Level

Personal Exposure

Inhaled Dose

Population Charact.

Population Exposure

Available information

- Time-Activity Scenarios (individuals)
- Some information on population frequencies of indoor sources, smoking, housing.
- Outdoor PM10 and PM2.5 concentrations (AirBase)
- Model for assement of indoor concentrations of PM related to indoor and outdoor particles sources (Urban Exposure)
- Modeling results for the Clean Air for Europe program (PM2.5 and PM10)
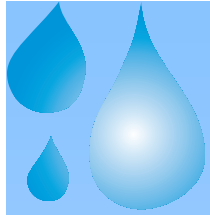
TMAD scenario

HOUR	MICRO ENVIROMENT	ACTIVITYLEVEL
1	HOME	SLEEPING
2	HOME	SLEEPING
3	HOME	SLEEPING
4	HOME	SLEEPING
5	HOME	SLEEPING
6	HOME	LIGHT_EXERCISE
7	TRAVEL_TO	SITTING
8	WORK	SITTING
9	WORK	SITTING
10	WORK	SITTING
11	WORK	SITTING
12	WORK	SITTING
13	WORK	SITTING
14	WORK	SITTING
15	WORK	SITTING
16	TRAVEL_FROM	SITTING
17	HOME	LIGHT_EXERCISE
18	HOME	SITTING
19	LEISURE	LIGHT_EXERCISE
20	HOME	SITTING
21	HOME	SITTING
22	HOME	SITTING
23	HOME	SLEEPING
24	HOME	SLEEPING

NILU

Indoor sources

Scenario	Indoor sources:	House Age	Room Area (m2)	Ceiling Height (m)	Filter Cleaning Device	Smoking	Indoor Heating	Gasstove	Vacuuming	Pets
1	Home	New	Constant	Constant	Yes	No	No	No	No	No
	Work	New	Constant	Constant	Yes	No				
2	Home	New	Constant	Constant	Yes	Yes	No	No	No	No
	Work	New	Constant	Constant	Yes	No				
3	Home	New	Constant	Constant	Yes	No	No	No	No	No
	Work	New	Constant	Constant	Yes	Yes				
4	Home	New	Constant	Constant	Yes	No	Yes	No	No	No
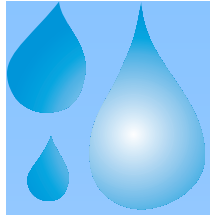
PM now: selected cities

UNTRY	ST.NO EIO NET	CITY	TYPE	PM 2,5	Year	PM 10	Year	Br.gr.	L.gr.
	0011	Praha Mlynarka	UT	Hour	2004	Hour	2004	50.07	14.39
	0020	Praha Aliba	SB	Hour	2004	Hour	2004	50.01	14.45
	1080	Halle am Salle Verkehr	UT	Hour	2004	Hour	2004	51.48	11.98
	1081	Halle am Salle Ost	SB	Hour	2004	Hour	2004	51.49	12.01
	0861	Firenze Gramsci	UT	Day	1999	Hour	2004	43.77	11.27
	0862	Firenze Bassi	UB	Day	1999	Hour	2004	43.79	11.29
	0060	Trondheim Elgeseter	UT	Hour	2004	Hour	2004	63.42	10.40
	0066	Trondheim Teknostallen	UB	Hour	2004	Hour	2004	63.42	10.42
	0012	Kraków Urban	UT	Day	2004	Hour	2003	50.05	19.92
	0039	Kraków Suburban	UB	Day	2004	Hour	2003	50.07	20.05
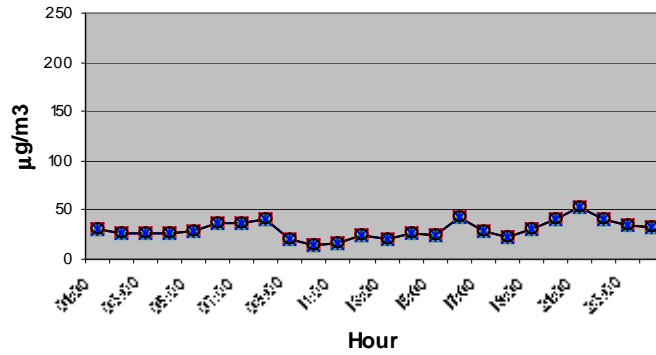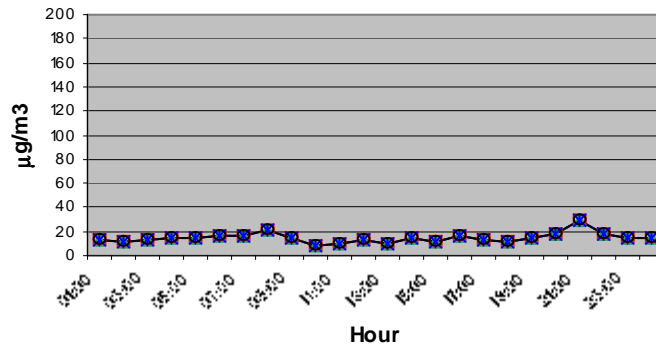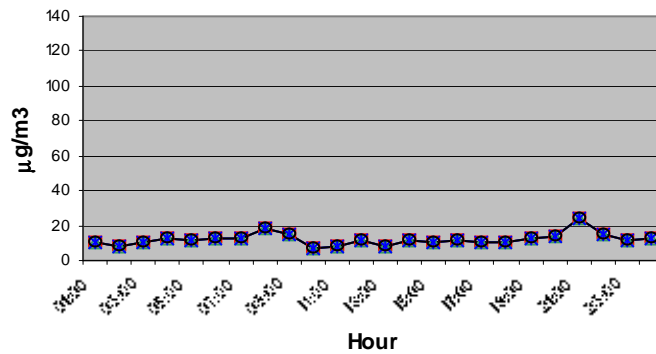
www.nilu.no NILU
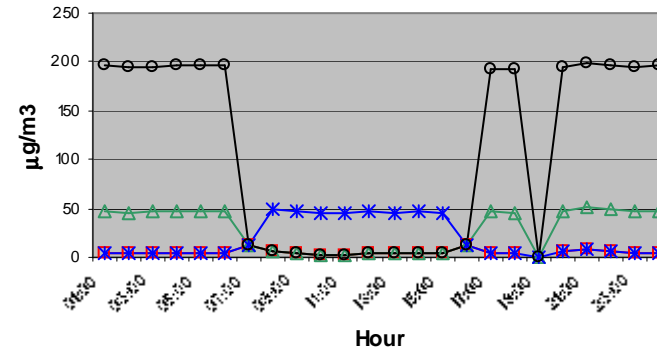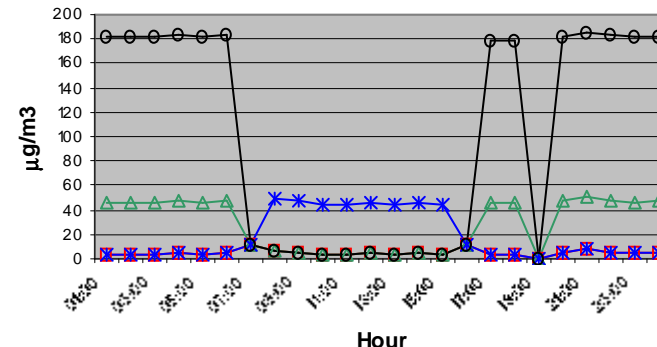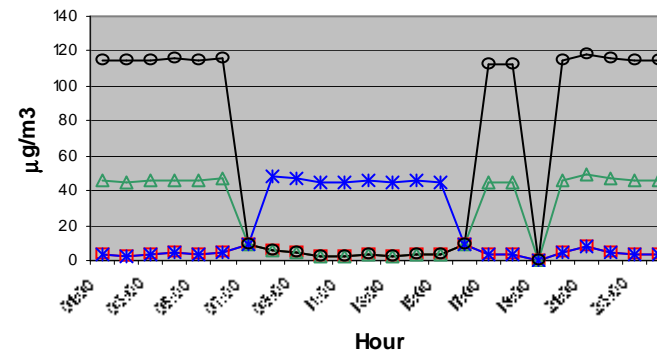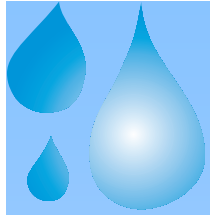
Contribution of indoor sources

TRONDHEIM - PM2.5 INDOOR

With open fire

With smoking

g/m3

Hour
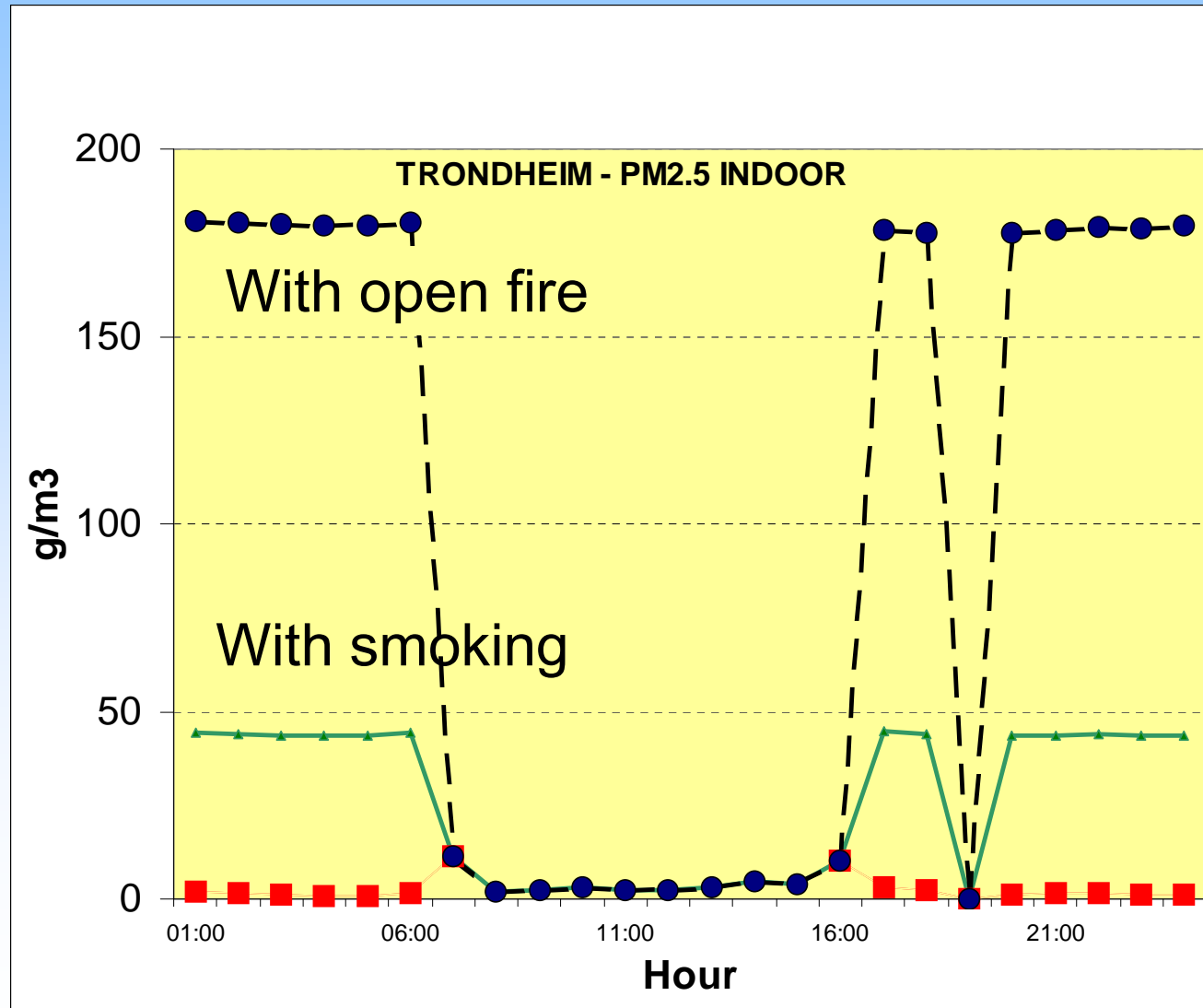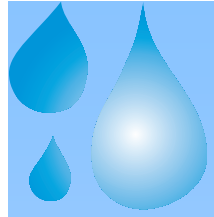
Total respiratory deposition at home

µg/day	Male		Female	
	Non-smoker	Smoker	Non-smoker	Smoker
Halle	140	811	112	643
Trondheim	77	749	60	593
Krakow	411	1075	331	857

ENVIRISK
Assessing the risks of environmental stressors: contribution to development of integrating methodology

alena.bartonova@nilu.no

http://envirisk.nilu.no

Project officer: Tomas Turecki

ENVIRISK facts

- EU-funded STREP
- Start date: 1. 3. 2007
- Duration: 24 months
- 7 partners: CZ (IEM, ZUKOLIN), FI (KTL), IL (Technion), NO(NILU), SK (SMU), UK (Uhertfortshire)
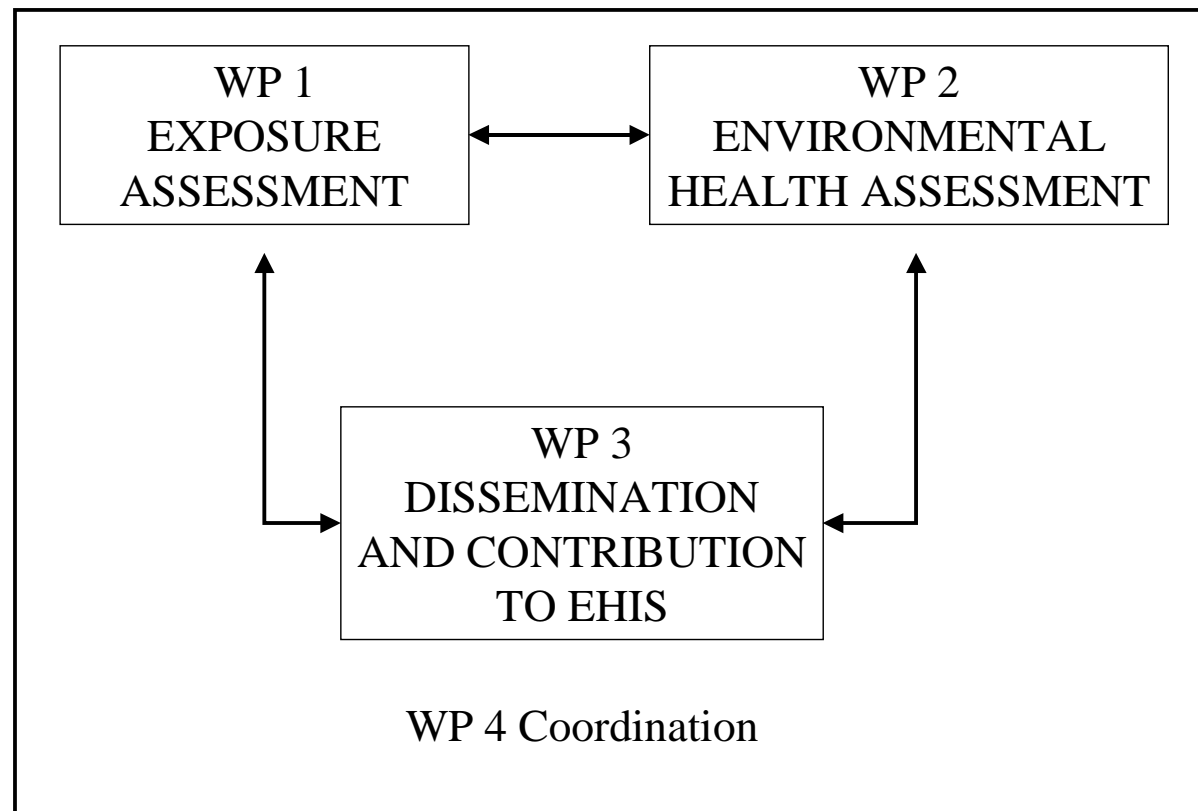- Total effort 132 person-months

ENVIRISK aims

- Identify and assess available monitoring data
- Develop protocols for exposure assessment and for assessment of exposure-effect relationships
- Pilot the exposure and risk modelling framework for three indicators:
    - exposure to atmospheric PAH
    - multimedia PCBs, dibenzofurans and dioxins
    - atmospheric particulate matter and other irritants relevant to respiratory morbidity and mortality
- Economic assessment of (EA) protocols

ENVIRISK main idea

- SK, CZ: extensive and comprehensive environment-health databases

- Call: Develop and implement a methodology for EHA

- Use the SK, CZ databases to check feasibility

- Provide applied methodology to the user (EHIS)
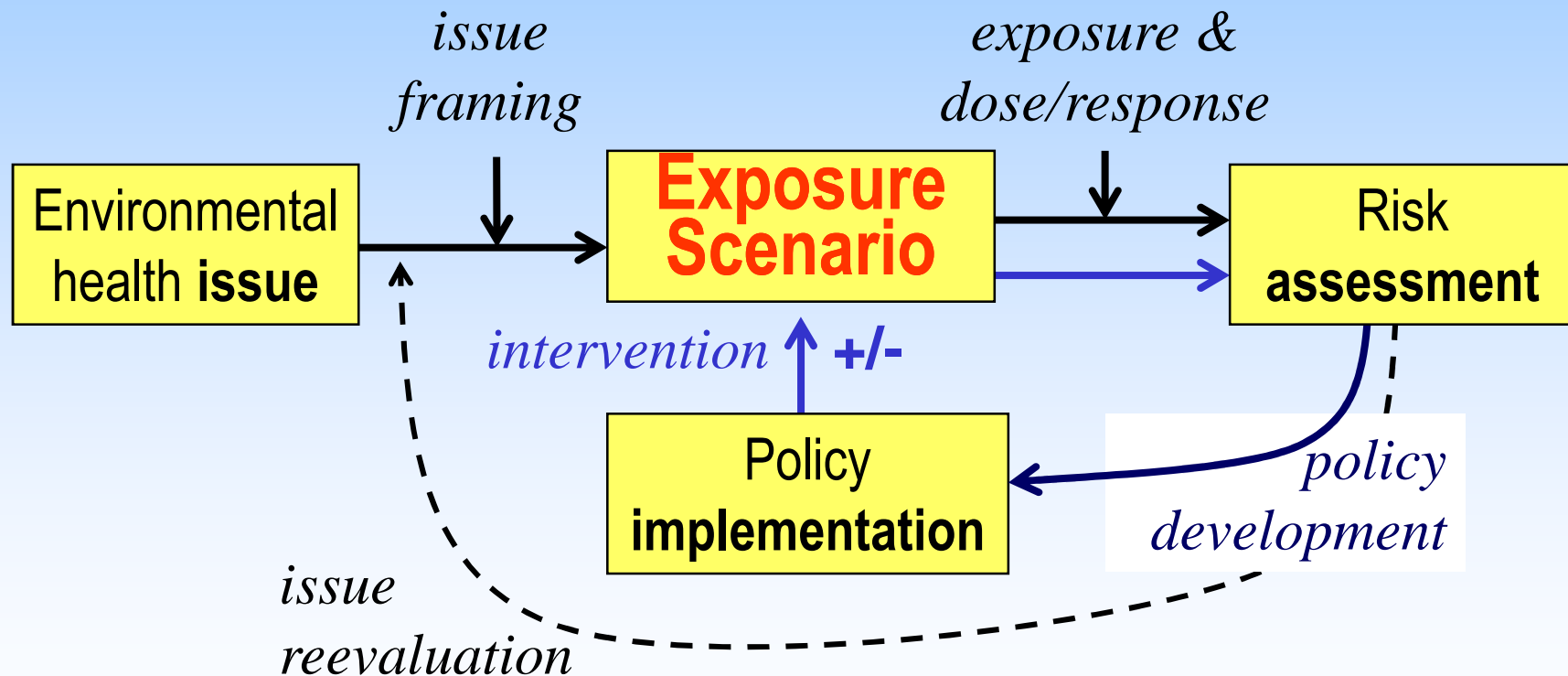
ENVIRISK simple structure

WP 1
EXPOSURE
ASSESSMENT

WP 2
ENVIRONMENTAL
HEALTH ASSESSMENT

WP 3
DISSEMINATION
AND CONTRIBUTION
TO EHIS

WP 4 Coordination

www.nilu.no

ENVIRISK SK databases

- **FIBRETOX:** 387 subjects (239 exposed, 148 controls);

- **PCBRISK:** Age groups: 450 children 8-9-years old, 2400 adults;

- **PLUTOCRACY:** 272 mother/newborn pairs in Slovakia;
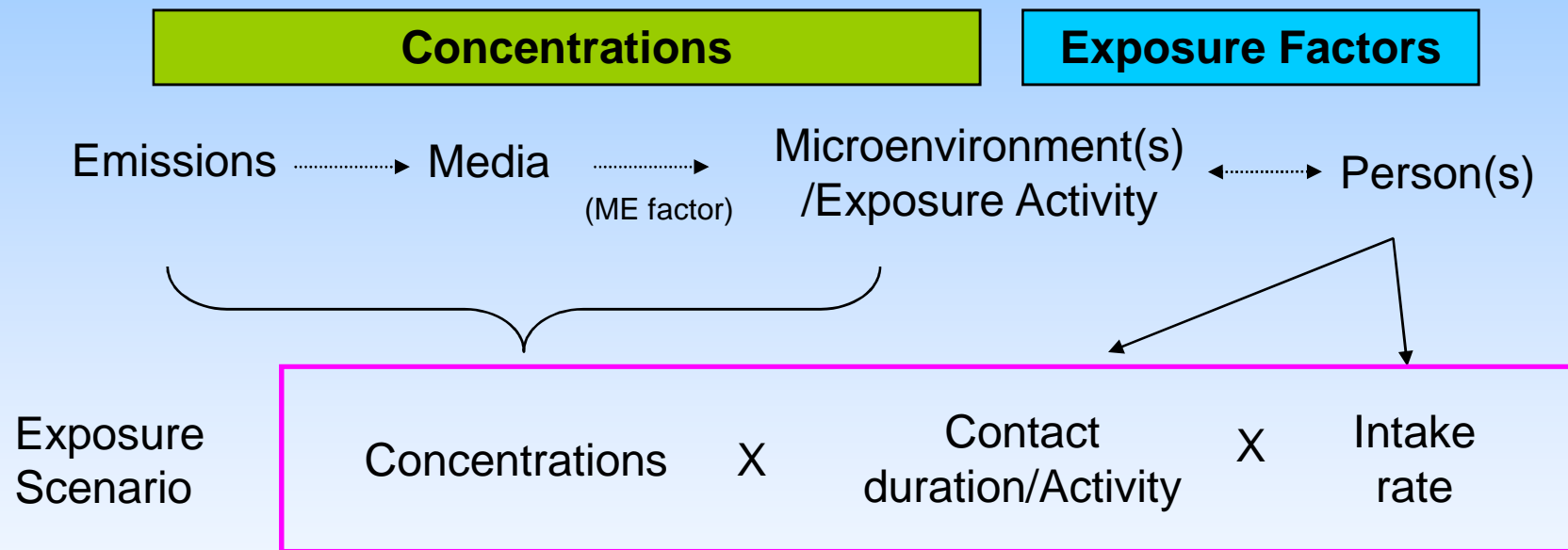
- **SPEECD:** 1137 mother child pairs.

Exposure Scenario is the key

issue
framing

exposure &
dose/response

| Environmental health **issue** | → | **Exposure Scenario** | → | Risk **assessment** |

intervention ↑ **+/-**

| Policy **implementation** |

policy development

issue reevaluation

What is the Exposure Scenario?

Concentrations	Exposure Factors

Emissions ┄┄┄➤ Media ┄┄┄➤ Microenvironment(s)/Exposure Activity ◄┄┄➤ Person(s)

(ME factor)

Exposure Scenario

$$\text{Concentrations} \times \text{Contact duration/Activity} \times \text{Intake rate}$$

Exposure scenario

A set of conditions or assumptions about sources, exposure pathways, amounts or concentrations of agent(s)involved, and exposed organism, system, or (sub)population (i.e., numbers, characteristics, habits) used to aid in the evaluation and quantification of exposure(s) in a given situation.

International Program for Chemical Safety

# Policy interventions in exposure scenarios
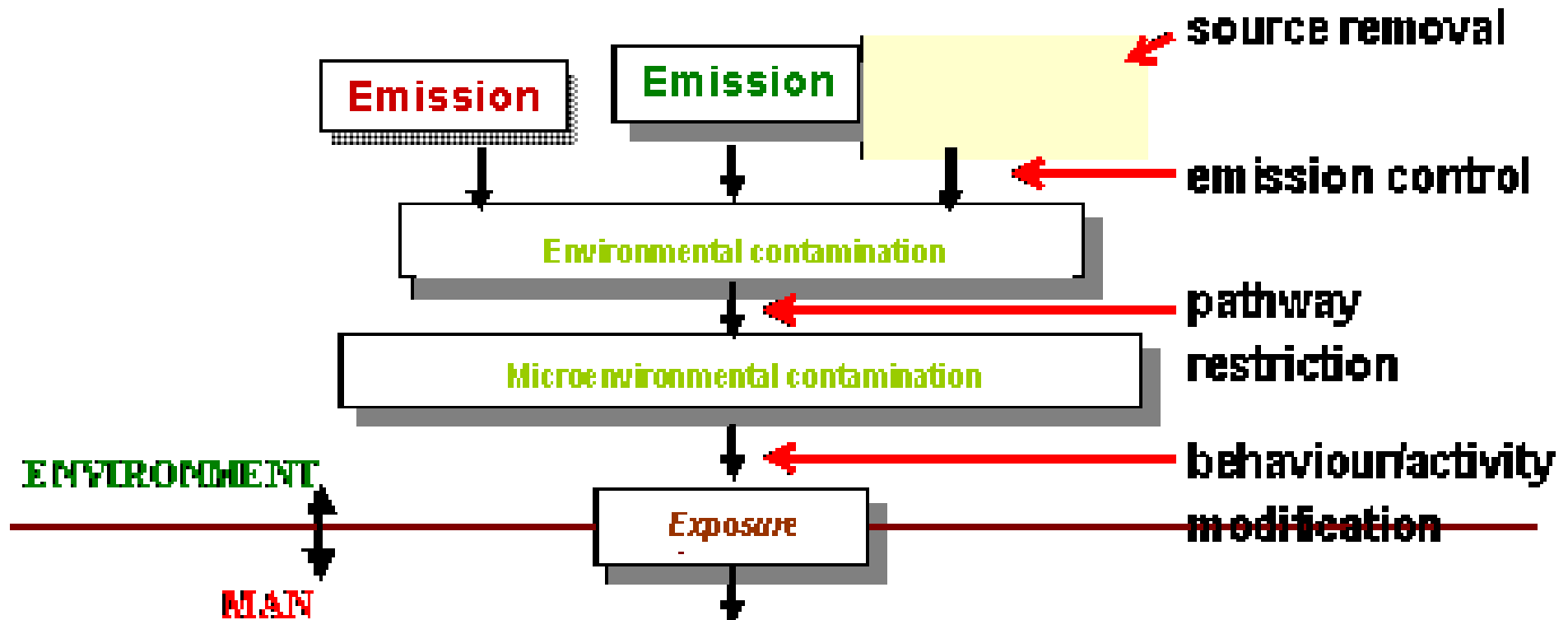
Issue framing, exposure scenario, and dose-response in HIA
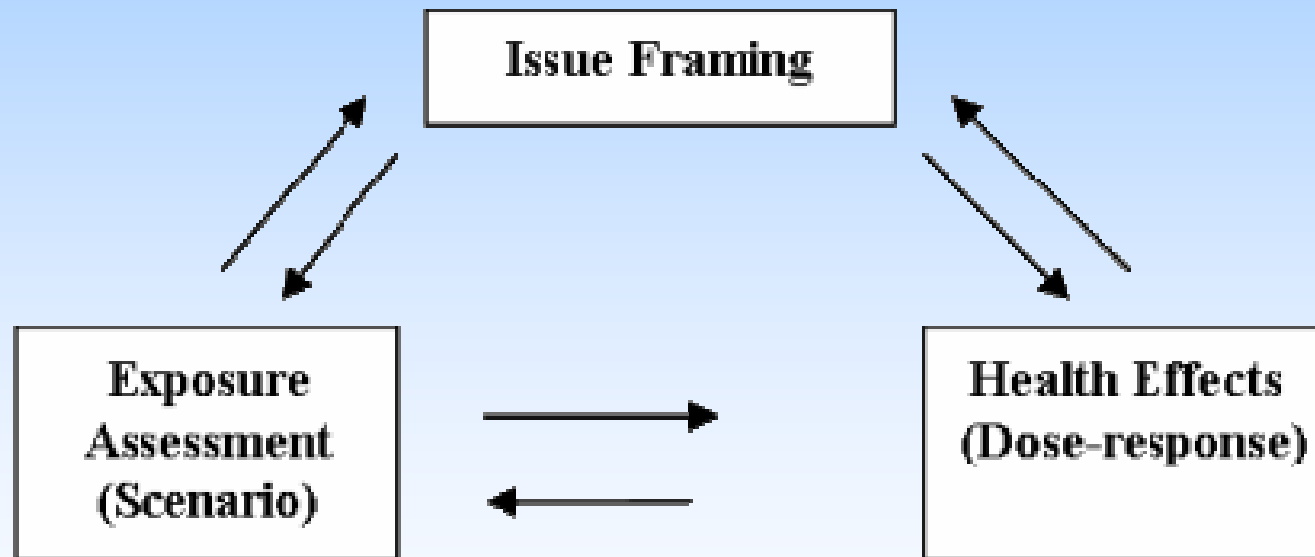
Questions and issues to keep in mind in issue framing

- What is the purpose? Why are we doing the assessment?
  - o To determine what sources or exposure factors to control?
  - o Or are we evaluating a set of policies?
  - o Do we want to evaluate risks from a particular source?
  - o Are we concerned about risks from a certain agent?
- Who will use the assessment?
- Who will be impacted by the assessment?
- Who to include in the assessment?
- What are all possible exposure routes?
  - o What is the relative importance of each?
- What else should be included? Are there any other risks or benefits to be accounted for?

Exposure-Intake Modelling Framework
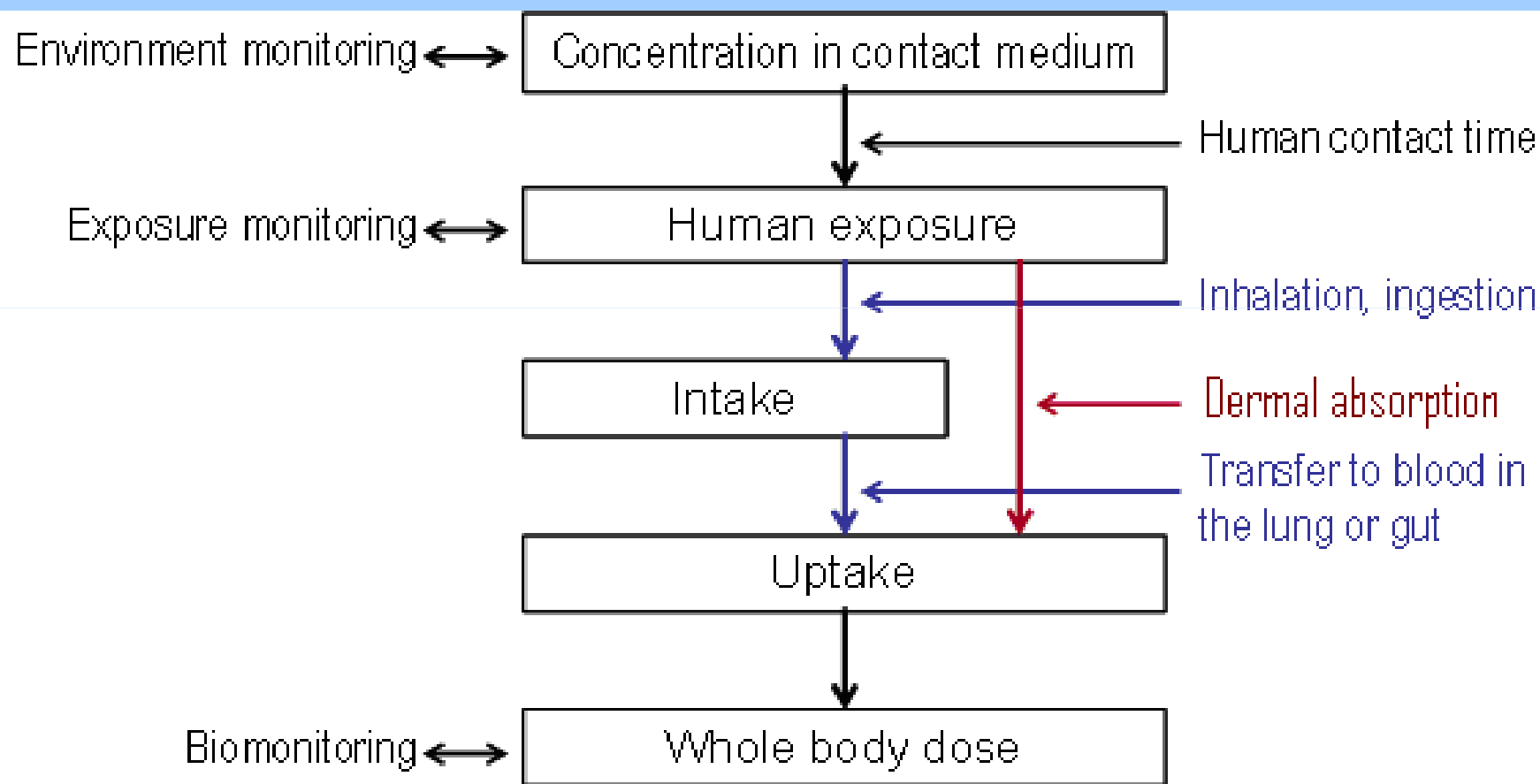
Exposure platform

Platform component	Intended use
ExpoScenario	▪ Provide instructions on how to define exposure scenarios
ExpoDB	▪ Provide chemical related information relevant for exposure assessment
ExpoConcentrations	▪ Provide measured exposure concentrations
iFDb	▪ Provide easy-to-use reference database on intake fraction publications
SaDB	▪ Provide easy-to-use reference database on source attribution publications
ExpoTool	▪ Calculation of environmental concentration in different media, exposure, intake and intake fraction
External sources	▪ Provide easy access to available sources of information ▪ Provide information that may be used in ExpoTool

Envirisk work until now

- Define and evaluate exposure relevant to the selected health end points
- First steps towards Euro-wide assessment, especially of PAH
- Deliverable 1.1: Review of databases, modelling methods and tools for exposure assessment
- Deliverable 1.2: An integrated framework and methodology for exposure assessment in environmental health policy impact assessment

HENVINET
health and environment network

alena.bartonova@nilu.no

Project officer: Tomas Turecki

http://henvinet.nilu.no

www.nilu.no

HENVINET in summary

- EU-funded Coordination Action
- start 1.11.2006, runs for 42 months
- 30 partners from 17 countries (5 outside Europe)
- Coordinator: NILU
- Support development of integrated health and environment policies
  - Environment and Health Action Plan
  - Environment and Health Information System
- Focus on four priority health end points:
  asthma and allergies, cancer, neurodevelopmental disorders, endocrine disruptors

HENVINET Partners (1)

1. Norwegian Institute for Air Research (NILU)   (NO)
2. Norwegian Veterinary Institute (NVI)   (NO)
3. Stichting Ecobaby   (NL)
4. United Bristol Healthcare NHS Trust   (UK)
5. Public Health Services Gelderland Midden (HGM)   (NL)
6. Central Science Laboratory   (UK)
7. Slovak Medical University   (SK)
8. Institute for Food Bioresources (IBA)   (RO)
9. Italian National Agency for New Technologies,
   Energy and the Environment (ENEA)   (IT)
10. European Centre for Environment and Health–WHO EURO (INO)
11. University of Hertfordshire   (UK)
12. Netherlands Organisation for Applied Research (TNO)   (NL)
13. Finnish Meteorological Institute (FMI)   (FI)
14. European Commission - Joint Research Centre (JRC)   (INO)
15. Regione Piemonte   (IT)

HENVINET Partners (2)

17. Institute for Medical Research and Occupational Health (CR)
18. Umeå University (SE)
20. Slovak Technical University (SK)
21. Norwegian School of Veterinary Science (NO)
22. Stockholm University (SE)
23. University of Southern Denmark (DK)
24. Wageningen University (NL)
25. National Centre for Scientific Research "Demokritos" (GR)
26. University of Oslo (NO)
27. Doctors for the environment (AR)
28. Peking University School of Public Health (CN)
29. Integral University (IN)
30. eThekwini Health Unit (ZA)
31. National Institute of Public Health (MX)
32. National Institute of Health (IT)

Henvinet aims

- Evaluation of knowledge on environmental causes related to the health end points

- Evaluation of DSTs related to the health end points

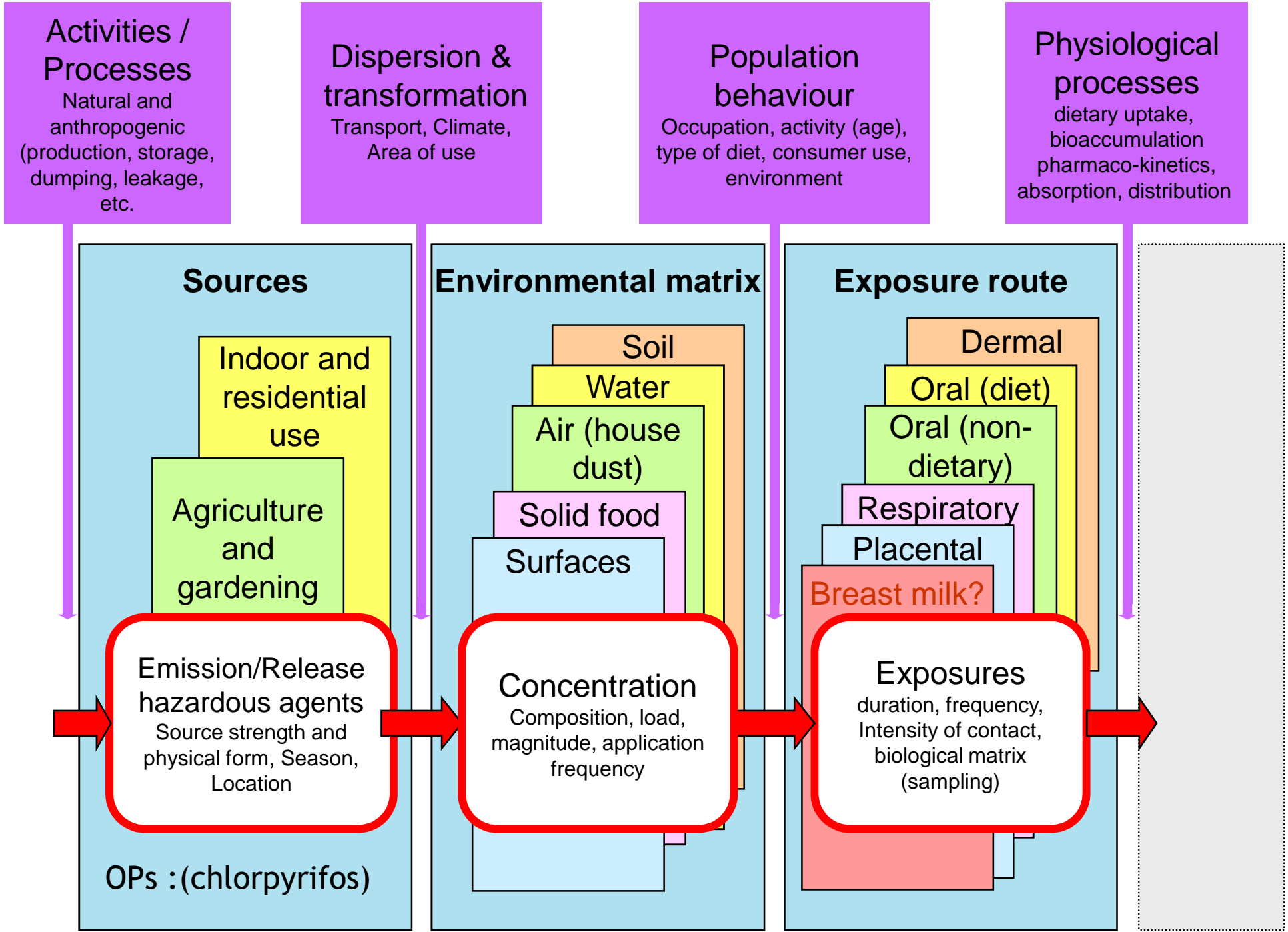- Science-policy interface

information

structure

HENVINET
HEALTH AND ENVIRONMENT NETWORK

WP 1

Evaluation and exploitation of best practices

WP 4

Validation and exploitation of decision support tools

WP 2

System and database

WP 3

Interaction with policy and dissemination

www.nilu.no NILU
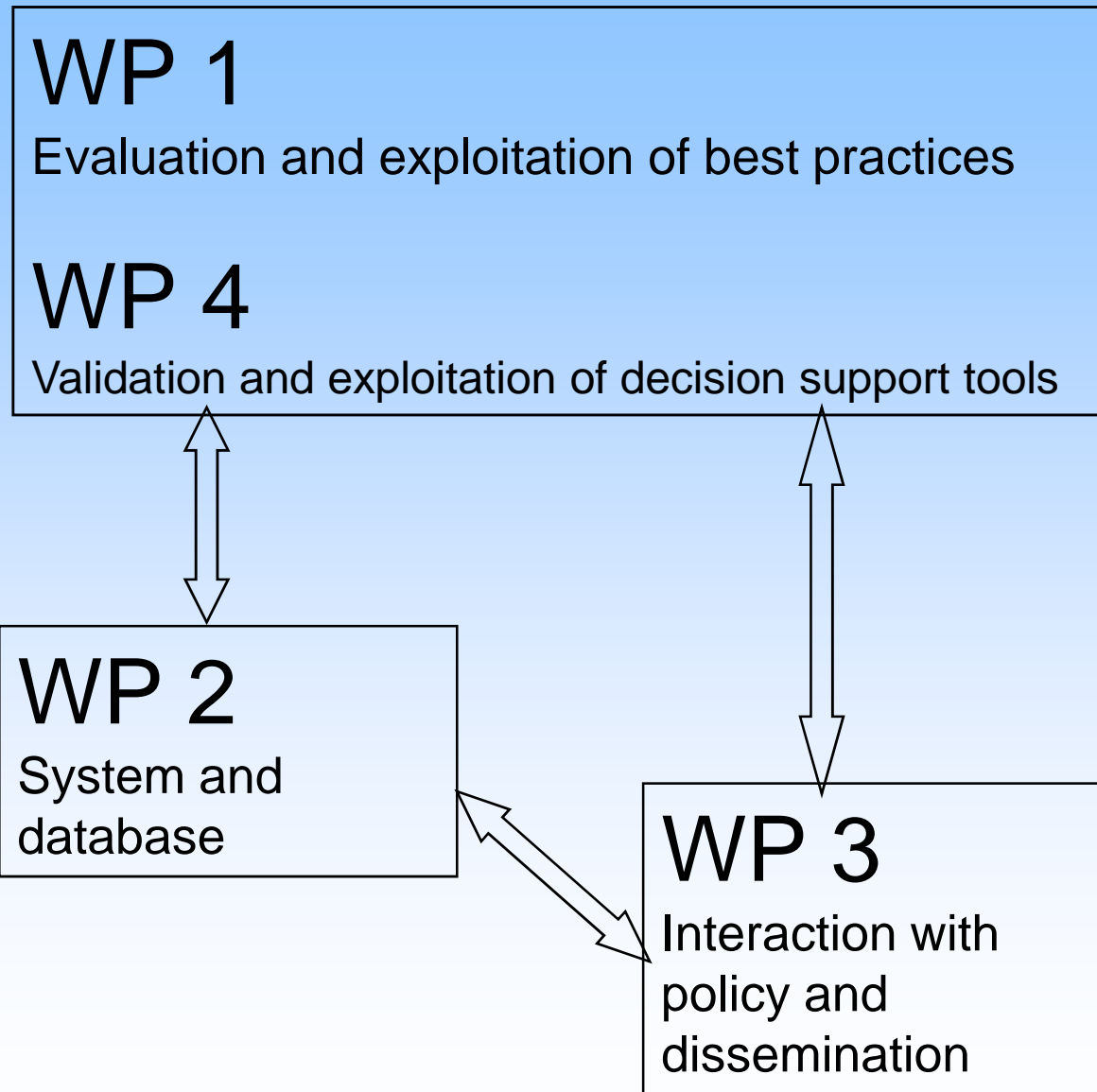
HENVINET WP1, WP4 products

- Reviews of research findings: four topic groups (env. health), interaction with environmental specialists
  - Defined framework
  - Structured reviews
  - Knowledge evaluation criteria
  - Internet based tool at henvinet.nilu.no, for respiratory diseases and climate change
- Reviews of DST
  - Found about 20+ DSTs, contact info collected

www.nilu.no NILU

Evaluation of knowledge

- 1. Establish a causal diagram to identify key parameters in the cause-effect relationship between a given environmental stressor and a given health impact
- 2. Individual experts apply knowledge quality evaluation criteria to the parameters identified in Step 1;
- 3. The results of Step 2 are analyzed and discussed.
  - Identifying areas where experts agree on low quality;
  - Identifying areas where experts disagree
  - Identify the potential policy implications (PP)
  - Identifying the research implications

HENVINET results to date

- Dissemination strategy: science-policy interface – iteration 1
- D1.1: first review and knowledge assessment - draft
    - Asthma and allergy
    - Cancer
    - Endocrine disruptors
    - Neurodevelopmental disorders

www.nilu.no