



Towards a Sustainable Urban Environment (SUE)

Pollutants in the Urban Environment (PurE)

**Welcome to the
PurE Launch Event**

Arup, 24 June 2009, London

Programme

Time	Topic	Duration (minutes)
09:30	Registration and tea/coffee	
10:00	<ul style="list-style-type: none"> ● Overview of the project outputs 	15
10:15	<ul style="list-style-type: none"> ● PUrE methodology and software platform: An overview ● Q&A Session 	45 15
11:15	PUrE outputs: Case study I <ul style="list-style-type: none"> ● Determining the contribution of the sources and mixtures of pollutants to environmental and human health impacts in Sheffield ● Discussion 	30 15
12:00	PUrE outputs: Case study II <ul style="list-style-type: none"> ● Examining the role of the Green Grid in London in reducing urban pollution and health impacts ● Discussion 	30 15
12:45	Lunch and networking	60
13:45	PUrE outputs: Case study III <ul style="list-style-type: none"> ● Legacy pollution: Assessing the implications of policies on ecological and health impacts for the former Avonmouth smelter ● Discussion 	30 15
14:30	Tea	15
14:45	PUrE outputs: Case study IV <ul style="list-style-type: none"> ● Considering uncertainty in sustainability assessments ● Discussion 	30 15
15:30	<ul style="list-style-type: none"> ● Way forward and wrap-up 	10
	Meeting Close	

Aims of the meeting

- To showcase the PurE outputs
 - PurE methodology
 - PurE software platform
 - Case studies

PurE project overview

- **A multidisciplinary consortium project**
 - academic and non-academic partners (20)
- **Duration**
 - 1.5 + 4 years
- **Project funding**
 - £2 million (funding) over 5.5 yrs
 - Funded by EPSRC under the “Sustainable Urban Environment” programme

PUR E Consortium



Academic partners:

- **The University of Manchester**
- **Cardiff University**
- **Forest Research**
- **London School of Hygiene and Tropical Medicine**
- **University of Exeter**
- **University of Sheffield**
- **University of Surrey**

Non-academic and Steering Group:

- **ARPA Sicily**
- **ARUP**
- **EA**
- **Forestry Commission**
- **Golders**
- **HPA**
- **SEPA**
- **SEEDA**
- **SNIFFER**
- **TRL**
- **UKWIR**
- **WRc**

PURÉ project

● Aim

- To develop an integrated decision-support framework for more sustainable management of urban pollution

● Not the aim

- To solve every pollution problem, **but**
- To develop the necessary framework for solving a class of problems and enabling structured, transparent and informed decision making

Example questions that can be explored in PUrE

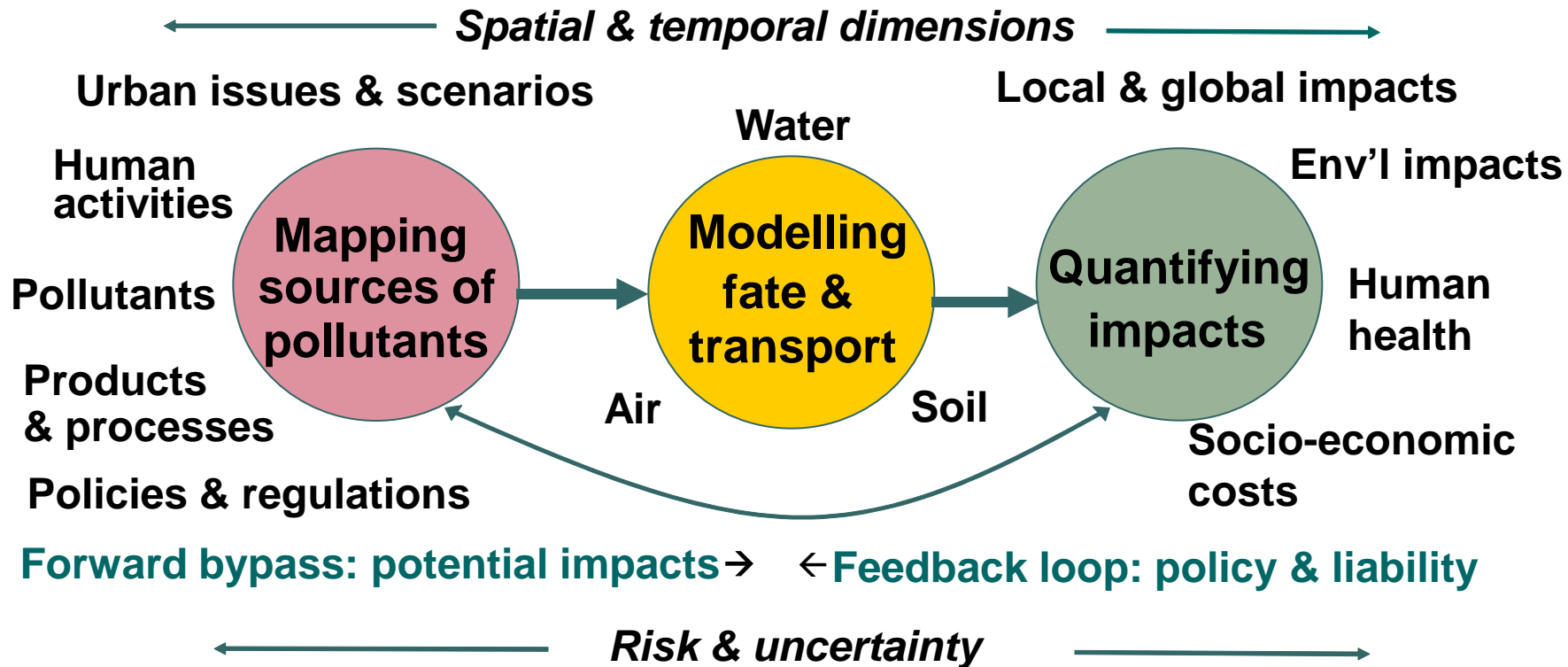


- What are the major sources of **pollutant** X in an urban area?
- How would changes to a **process** X affect the local environment and population? What are the life-cycle implications?
- How could **product** X affect the urban environment and urban society? What are the life-cycle implications?
- Would **activity** X have any negative effects on the health of urban dwellers?
- What are the implications of **policy** X ?

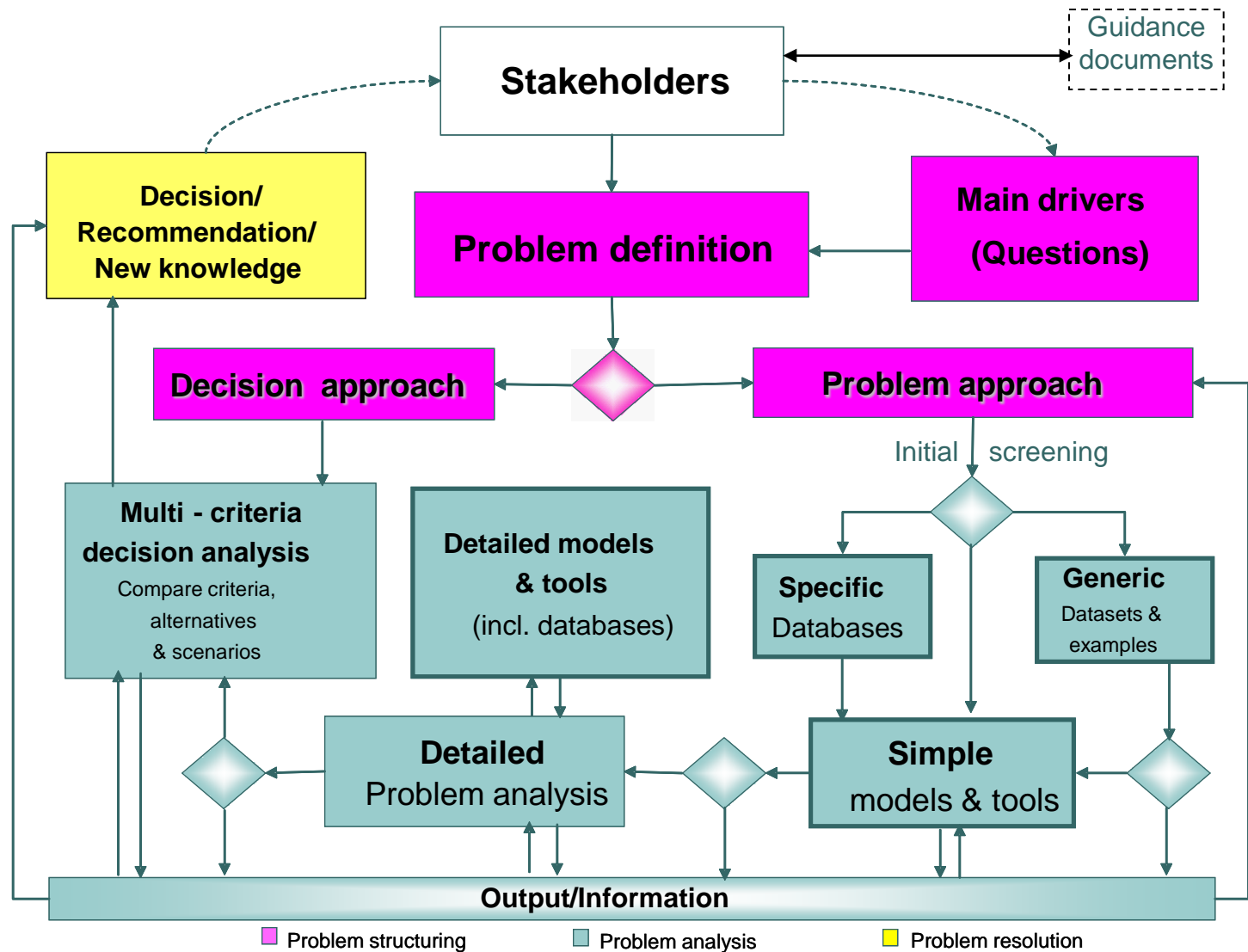
Methodology: PUrE conceptual approach



Sustainable development



Methodology: PUrE decision-support framework



PUR E decision-support framework

- Comprises a suite of models and tools for different stakeholders
 - Industry, local authorities, NGOs, policy-makers/implementers, researchers
- Enables simple screening studies and/or detailed modelling
 - Uses existing science and models as well as developing new

PURe software platform



PUR E software platform



The screenshot displays the PUR E software interface. The main window is titled "Scenario A (Energy Supply - Coal)". The left sidebar shows a "Solution Explorer" tree with categories like "Problem Definition", "Sources of Pollution", and "Scenario A". The main content area shows the scenario name "Energy Supply - Coal" and an overview: "Additional 40MJ of Energy provided to PUEHam through increased capacity at existing Coal Fired Power Station." Below this, a list of "Sources to be used in this scenario" includes "Coal Fired Power Station", "Biomass Power Station", "Docks", and "Biomass Production", with checkboxes for each. A "PUR E Level 1 Groundwater Model" dialog box is open, showing "General Information" (Run Name: CP_GWEx, Description: Ogato Banks model of groundwater flow to an extraction point) and "Sources & Receptors" (Source to Model: Coal Fired Power Station, Pollutant to Model: Select a Pollutant to Model..., Receptor to Include: Water Extraction Point). The bottom of the interface features a "Framework Explorer" with a flowchart diagram and a "Framework Help" section with a search bar and a "Welcome to the PUR E Knowledge Base" message.

PURé software platform



The screenshot displays the PURé software interface. The main window is titled "PURé Analysis" and contains a map with various layers and a grid of blue dots. A dialog box titled "PURé Level 1 Air Dispersion Model" is open, showing configuration options for a model run.

Legend:

- + Background Layer
- + Coal Fired Power Station (Red dot)
- + Biomass Power Station (Red square)
- + Docks (Purple dot)
- + Biomass Production (Green square)

PURé Level 1 Air Dispersion Model - General Information:

- Run Name: CP_PM10
- Time Period: 3 Months
- Description: A brief description of the model run.
- The current Model run includes 1 Source Points and 1 Receptor Points. On an average PC it will take approximately 12 minutes to run the model.

Sources to Include:

- Coal Fired Power Station [IS]
- Biomass Power Station [IS]
- Layer 3
- Layer 4

Buttons: Run, Cancel

Status Bar: X: 448103 Y: 422999 OS National Grid [OSGB36]

Tools used in PUrE

- GIS mapping
- Life cycle assessment
- Substance flow analysis
- Dispersion modelling
- Ecological impact assessment
- Health impact assessment
- Multi-criteria decision analysis (MCDA)

Testing the methodology: Test beds



- Test bed 1: Treatment Options for Municipal Solid Waste (MSW)
- Test bed 2: Sustainable Energy Options: Biomass vs Coal

Testing the methodology: Case studies



- Mixture of pollutants
 - Sheffield
 - London (Green grid)
- Legacy pollution
 - Avonmouth
- Uncertainty in decision making
 - Waste management

Sheffield case study

- Main driver/question
 - What is the contribution of different sources and mixtures of pollutants to environmental impacts and human health?
- Purpose
 - To quantify the environmental and health impacts of sources and mixtures of pollutants

London Green Grid case study

- Main driver/question
 - What role does the Green Grid play in reducing urban pollution and what are the ecological and health impacts?
- Purpose
 - To quantify the health benefits of the Green Grid

Avonmouth case study

- Main driver/question
 - What are the implications of emissions regulation on ecological and health impacts?
- Purpose
 - To improve understanding of impact of interventions

Uncertainty in sustainability decision making

- Main driver
 - Characterisation of uncertainty in sustainability assessment/decision making
- Purpose
 - Methodological development to enable uncertainty assessment
- Case study: waste management

PURÉ outputs

- Journal papers: 22 (+12)
- Conference papers: 25
- Reports: >40
- Invited presentations: 40
- PURÉ software platform

Acknowledgements

- All PURÉ researchers
- All PURÉ partners
- All PURÉ stakeholders