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Open
COLlaboration for
POLicy MOdelling



The OCOPOMO Approach: Conceptualising Stakeholder Participation in Public Policy Development

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**Citadel Statement Lecture,
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Agenda



- ❖ Setting the scope: Challenges ahead
- ❖ OCOPOMO and its method to engage stakeholders in policy development
- ❖ Scenario building, analysis and modelling of policy
- ❖ Innovation and impact

Setting the scope: Challenges ahead



- ❖ Significant societal transitions and drastic changes in economy, climate and demography
- ❖ Longer-term transformations to be mastered and steered



Demands for Open Government and Good Governance Principles



Transparency, accountability, coherence, openness, participation ...



Challenges in Policy Development



- ❖ Appropriate ICT support in policy planning not deployed widely
- ❖ Management of complexity in strategy and policy formation
- ❖ Development, visualisation and simulation of appropriate policy models usually done by experts
 - black-box approach
- ❖ Lack of open collaboration and therewith transparency in identifying the crucial features of complex social environments to inform policy models
- ❖ Online participation means not yet deployed widely in strategic decision making

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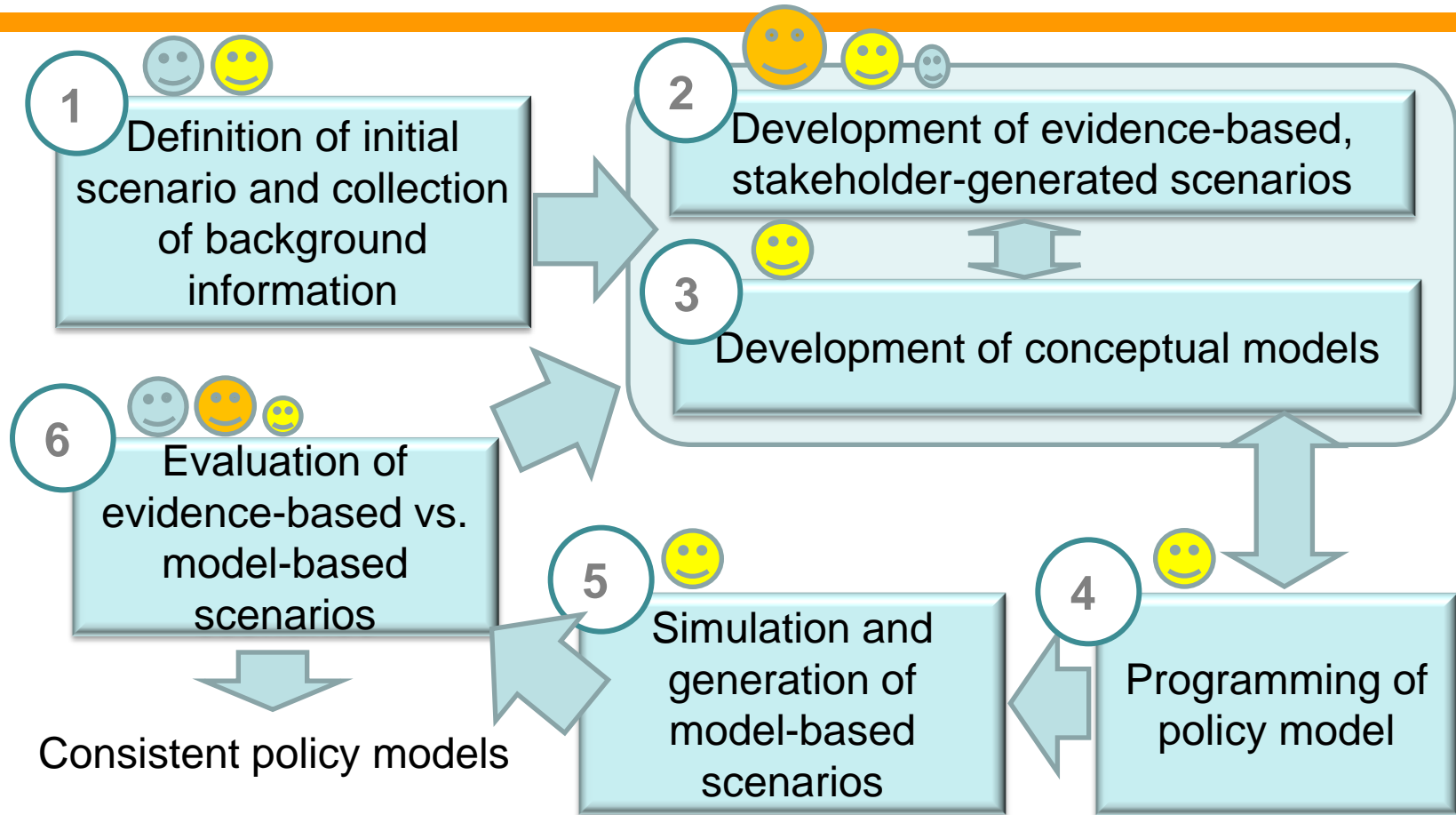
Aims of OCOPOMO Project



- ❖ Support key stakeholders to participate in the processes of policy formulation
 - Policy analysts, policy operators, wider stakeholder groups of specific policy domains
- ❖ Integrate methods and tools of scenario-based policy formation with formal policy modelling
- ❖ Develop an integrated ICT platform for efficient policy making
 - Mechanisms of open collaboration along the policy process
 - Supporting engagement of wide stakeholder groups



OCOPOMO's Integrated Policy Process and Involved Actors



Legend: # Process phase

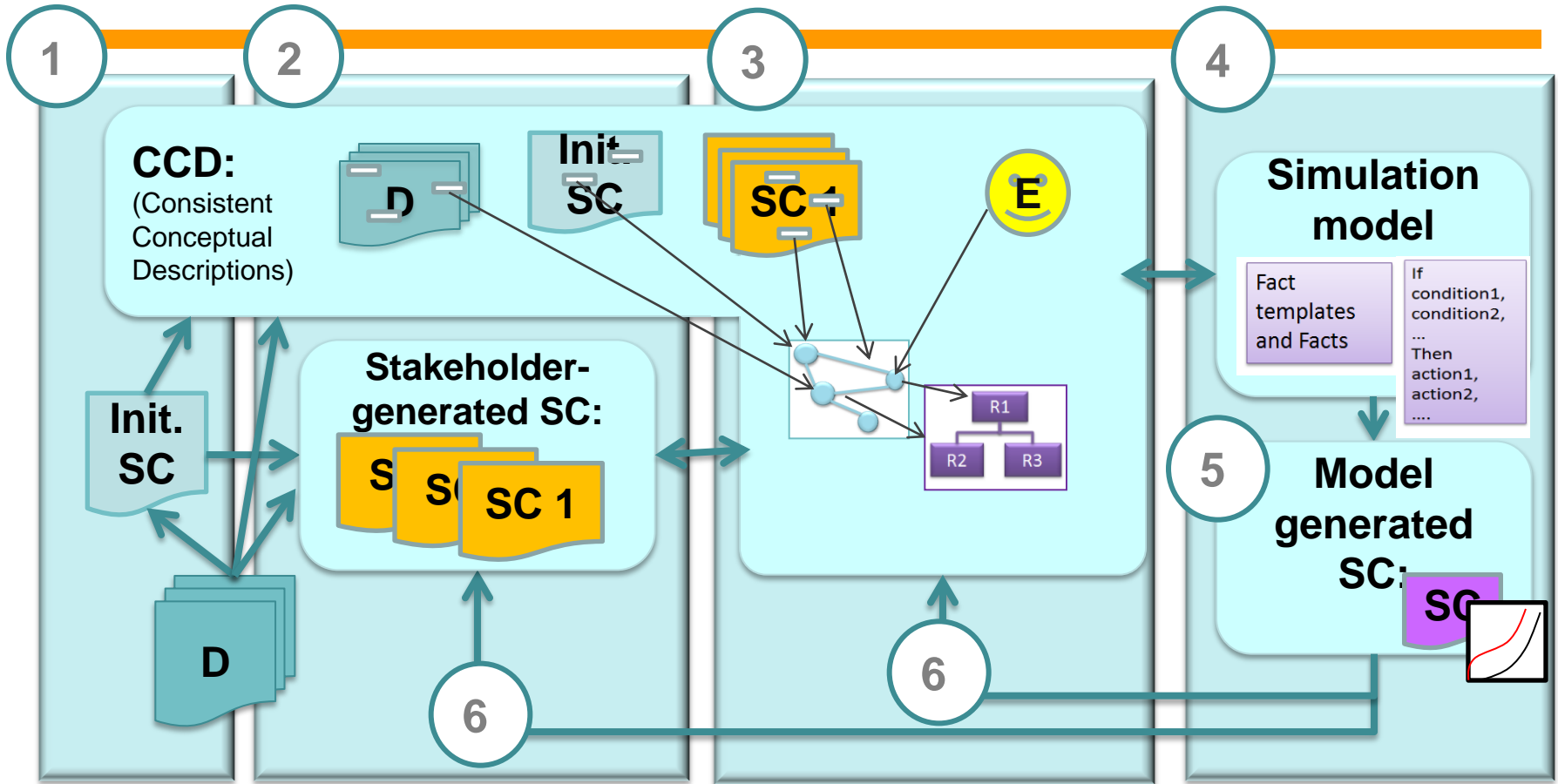
→ Transition to next phase

Actors: Domain Experts (Policy Planner / Strategic Decision Maker)

Stakeholders involved

Experts for Policy Analysis / Policy Modelling

Artefacts along the Process Phases



Legend:



Process phase



Expert knowledge



Relevant aspect



Information flow



Documents



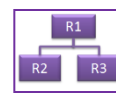
Network of social relationships



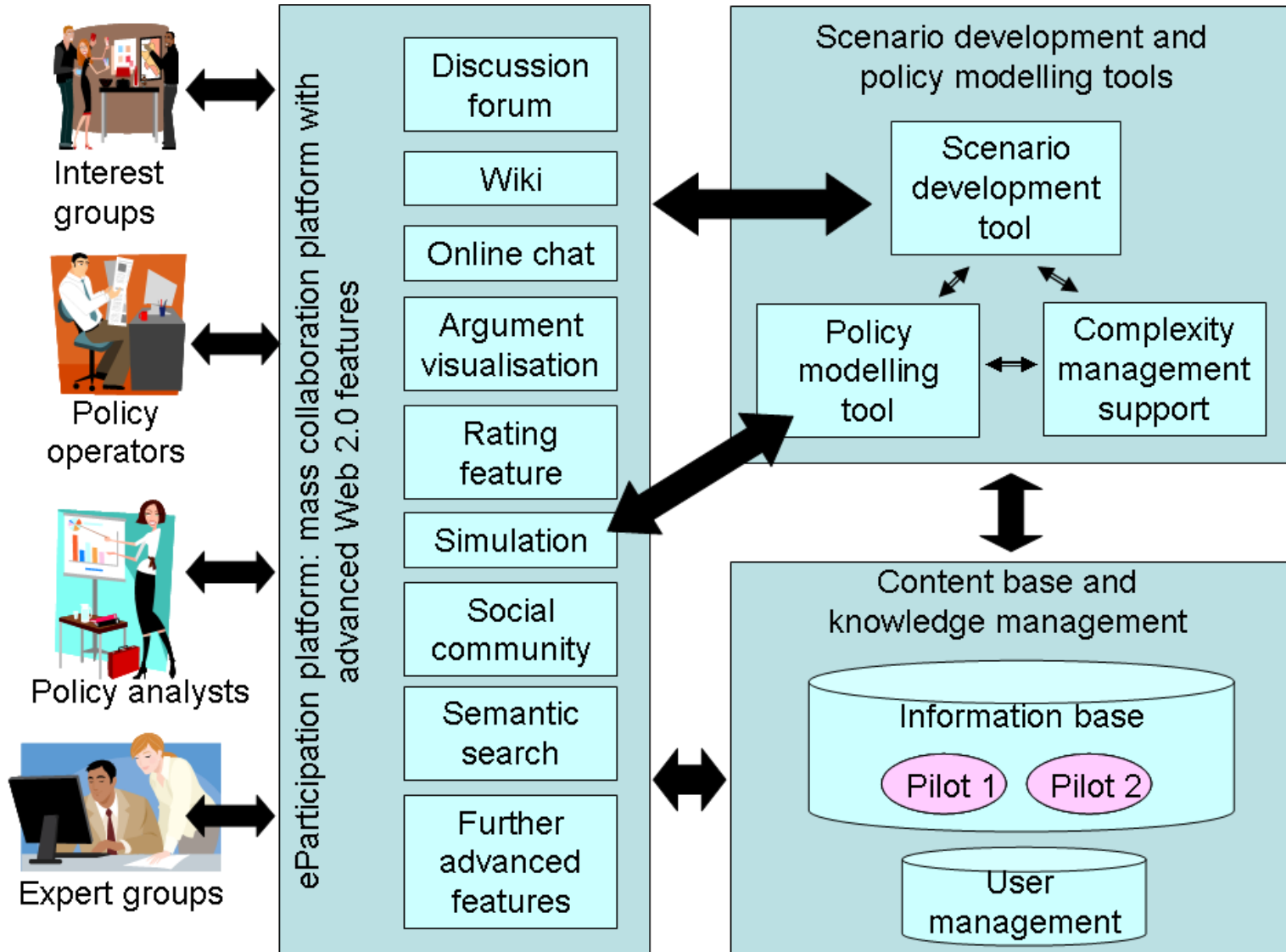
Information flow detailed steps



Scenarios



Rule-Dependency-Graph



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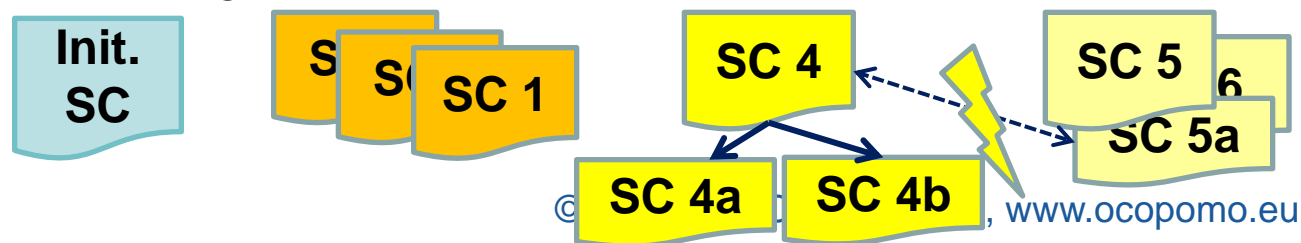
What is scenario building in OCOPOMO



❖ Method for foresight according to Geschka (1978):

*“systematic,
participatory,
future intelligence gathering and
medium-to-long-term vision building process
aimed at present-day decisions and
mobilising joint actions”*

- ❖ Scenarios
 - Are textual descriptions of a perceived view or understanding of a topic under discussion
 - Cover existing world status or mental model of stakeholders
- ❖ Alternative scenarios may exist or are developed to describe different aspects and /or alternatives
- ❖ Different stakeholder groups may develop different sets of scenarios independently
- ❖ Some scenarios may also be conflicting among different stakeholder groups
- ❖ Scenarios may be extended and therewith advance an existing scenario (nesting scenarios)



- ❖ Scenarios can be developed in a transparent and inter-subjective manner
- ❖ Scenarios used as common reference point for formal policy modelling and as communication instrument
- ❖ Relevant information and data can be included in scenarios in an unbiased manner by stakeholders
- ❖ Assumptions on developments expressed through the scenarios are shared
- ❖ Scenarios must be consistent but no common agreement and viewpoint has to be developed
 - Elicitation of critical features
- ❖ Scenarios developed by others help to understand their viewpoints and therefore supports acceptability

A detail of a scenario developed for the Kosice Self-Governing Region



I am living with my wife and two children in a three room flat below the top of the house. The house, in which my flat is in, is not well insulated and, hence, has high consumption of energy for both electricity and heating. Since energy prices are increasing and the energy consumption in my house is very high, I am reflecting alternatives both to decrease consumption such as renovation and to switch the source of energy (if possible). Currently, I am recognising that energy consumption is too high and more and more becomes too expensive for me and my family. Hence, I want to reduce costs of energy consumption. For me who am living in a flat, the association of flat owners is responsible for energy issues, i.e. they have to perform energy audits by law. Citizens need to provide certificates on how efficient energy use is in the house (energy certificates and energy audits). I have to discuss with my family and neighbours. Together we can consult the association of flat owners for a plan to trigger renovation. The association of flat owners, then, calculates the impact of the renovation, the increased energy price and the reduced energy consumption for the future maintenance costs. Urban householders are obliged to create an association; rural houses are not. An association hires service company/building manager (on fee) who is responsible for dealing with heat and electricity providers. An association may refuse to cooperate with a service company and make arrangements with heat provider on its own. An association itself can be member of a higher association. An association of associations is a board of directors, which e.g. talks with regional or even national governments.

Analysing the scenario ..



I am **living with** my wife and two children **in** a three room **flat** below the top of the **house**. The house, in which my flat is in, is not well insulated and, hence, has high consumption of energy for both electricity and heating. Since energy prices are increasing and the energy consumption in my **house** is very high, I am **reflecting alternatives** both to **decrease consumption** such as **renovation** and to **switch the source of energy** (if possible). Currently, I am **recognising** that **energy consumption** is too high and more and more becomes too expensive for me and my **family**. Hence, I want to **reduce costs of energy consumption**. For me who am **living in** a **flat**, the **association of flat owners is responsible** for energy issues, i.e. they have to **perform energy audits** by law. **Citizens need to provide certificates** on how efficient energy use is in the house (**energy certificates** and **energy audits**). I have to **discuss with** my **family** and **neighbours**. Together we **can consult** the **association of flat owners** for a plan to **trigger renovation**. The **association of flat owners**, then, **calculates the impact of the renovation**, the increased **energy price** and the reduced **energy consumption** for the future **maintenance costs**. **Urban householders are obliged to create** an association; **rural houses are not**. An **association hires service company/building manager** (on fee) who is **responsible for dealing with heat and electricity providers**. An **association may refuse to cooperate with a service company** and **make arrangements with heat provider** on its own. An **association** itself can **be member of** a higher association. An association of associations **is a board of directors**, which e.g. **talks with regional** or even **national governments**.

Data derived from scenario (1/2)



Class of Stakeholders	Class of objects	Characteristics
<ul style="list-style-type: none"> → Households <ul style="list-style-type: none"> - <i>Flat owner</i> - <i>Flat mates</i> - <i>Neighbour</i> → Association of flat owners → Service company → Government <ul style="list-style-type: none"> - <i>Regional</i> - <i>National</i> 	<ul style="list-style-type: none"> → House (Flats) → Heating system → Energy audits → Message <ul style="list-style-type: none"> - <i>Demand</i> - Provide energy certificate - Perform energy audit 	<ul style="list-style-type: none"> → House <ul style="list-style-type: none"> - <i>Established in</i> - <i>Renovated in</i> - <i>Insulation</i> - <i>Electricity consumption</i> - <i>Heating consumption</i>

Data derived from scenario (2/2)



Actions:	Rules:	Relations:
<p>→ Flat owner</p> <ul style="list-style-type: none"> - recognising - reflecting alternatives - decreasing consumption - switching source of energy - reducing costs - discussing with - consulting - creating an association <p>→ Association of flat owners</p> <ul style="list-style-type: none"> - trigger renovation - calculating impact - hiring service company - perform energy audits 	<p>→ IF energy prices are high AND energy consumption is very high THEN flat owners reflect alternatives to decrease consumption AND/OR to switch the source of energy.</p> <p>→ IF renovation is needed AND support is asked for THEN energy audit AND certificate are needed</p>	<p>→ being responsible for</p> <p>→ living in</p> <p>→ sharing flat with</p> <p>→ providing certificates to</p> <p>→ belonging to</p>

CCD Tool supporting data extraction – Annotation of Scenarios

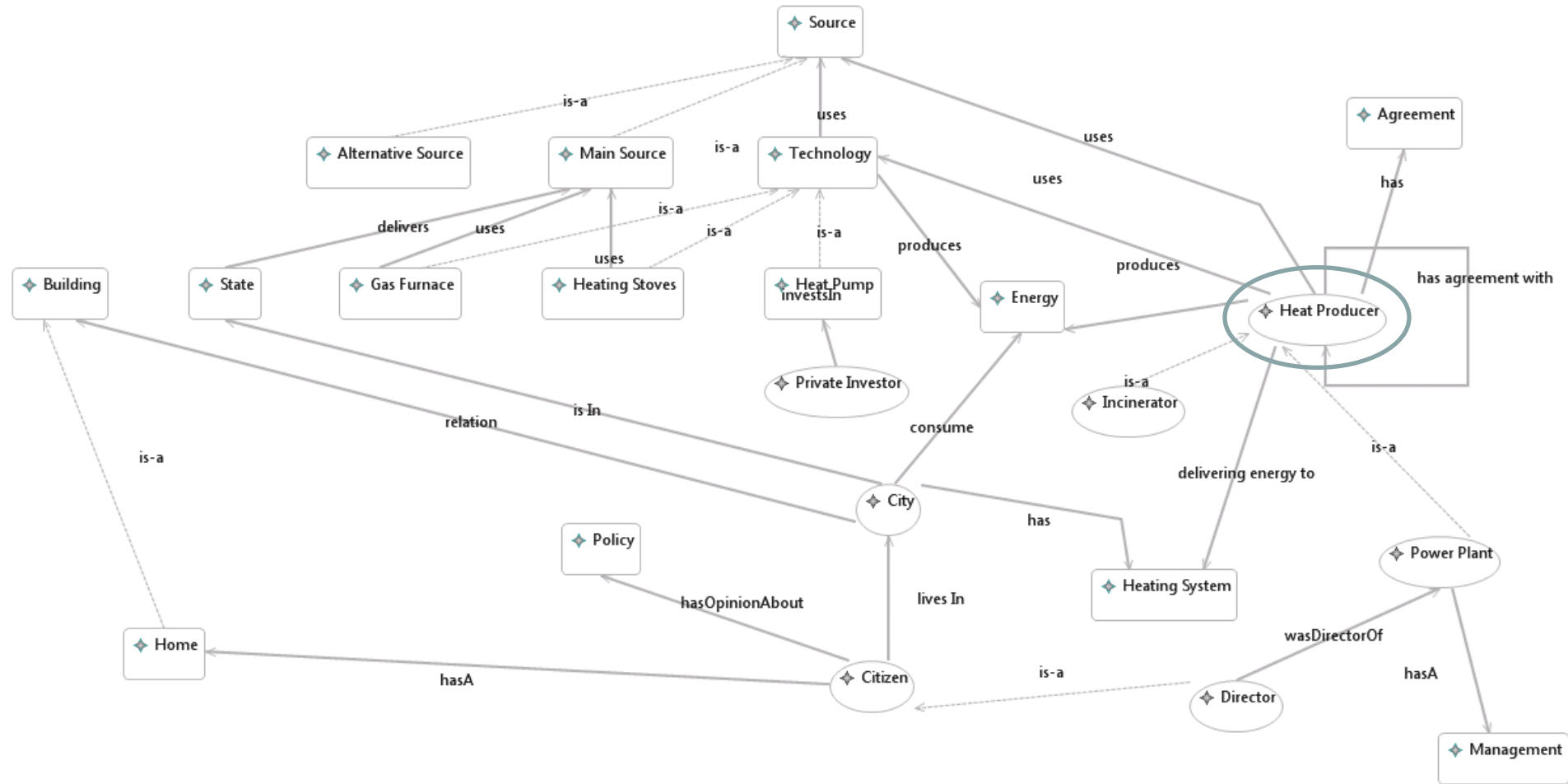


The screenshot displays the CCD tool interface. The main window shows a text document with several paragraphs of text. The text is annotated with yellow and blue highlights. A tooltip is visible over a highlighted section, displaying the text: "Actor (name: Heat Producer, description: null) EY. The current technology is working well".

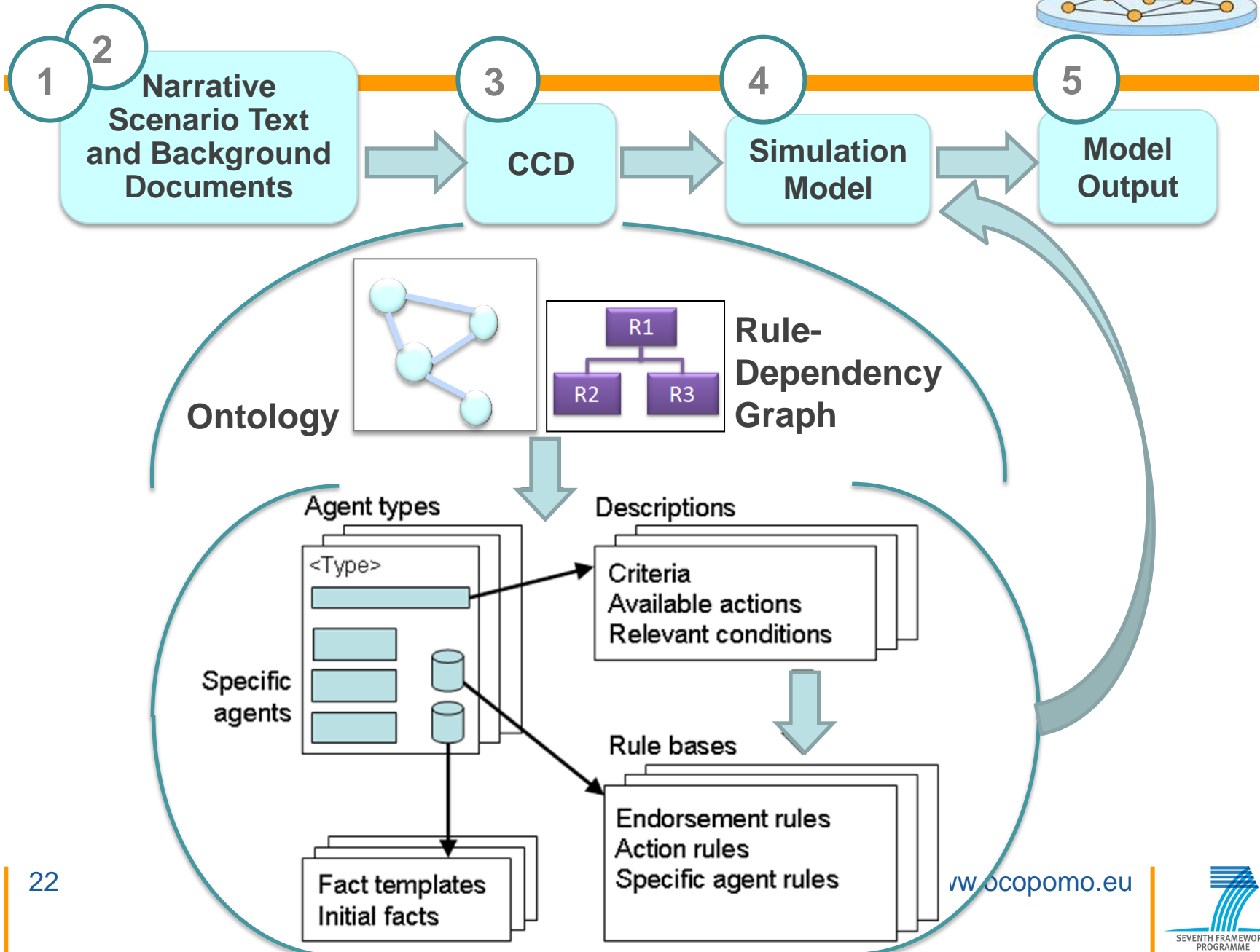
The right-hand side of the interface shows a hierarchical tree view titled "CCD Annotation View". The tree structure is as follows:

- CCD
 - Actors
 - Actor: Heat Producer
 - File Annotation heat producer
 - Relation: Heat Producer produces E
 - Relation: Heat Producer uses Sourc
 - Relation: Heat Producer isIn
 - Relation: Heat Producer uses Techn
 - Relation: Heat Producer covering
 - Relation: Heat Producer hasAgreen
 - Relation: Heat Producer deliveringE
 - Relation: Heat Producer has Agree
 - Relation: Heat Producer coveringDe
 - Relation: Heat Producer capacity Ir
 - Relation: Heat Producer actualCO2
 - Relation: Heat Producer sellingPrice
 - Actor: Power Plant
 - Actor: Incinerator
 - Actor: Citizen
 - Actor: Private Investor
 - Actor: City
 - Obects
 - Actions
 - ActionInputOutputs
 - Enums
 - Variables
 - Annotations

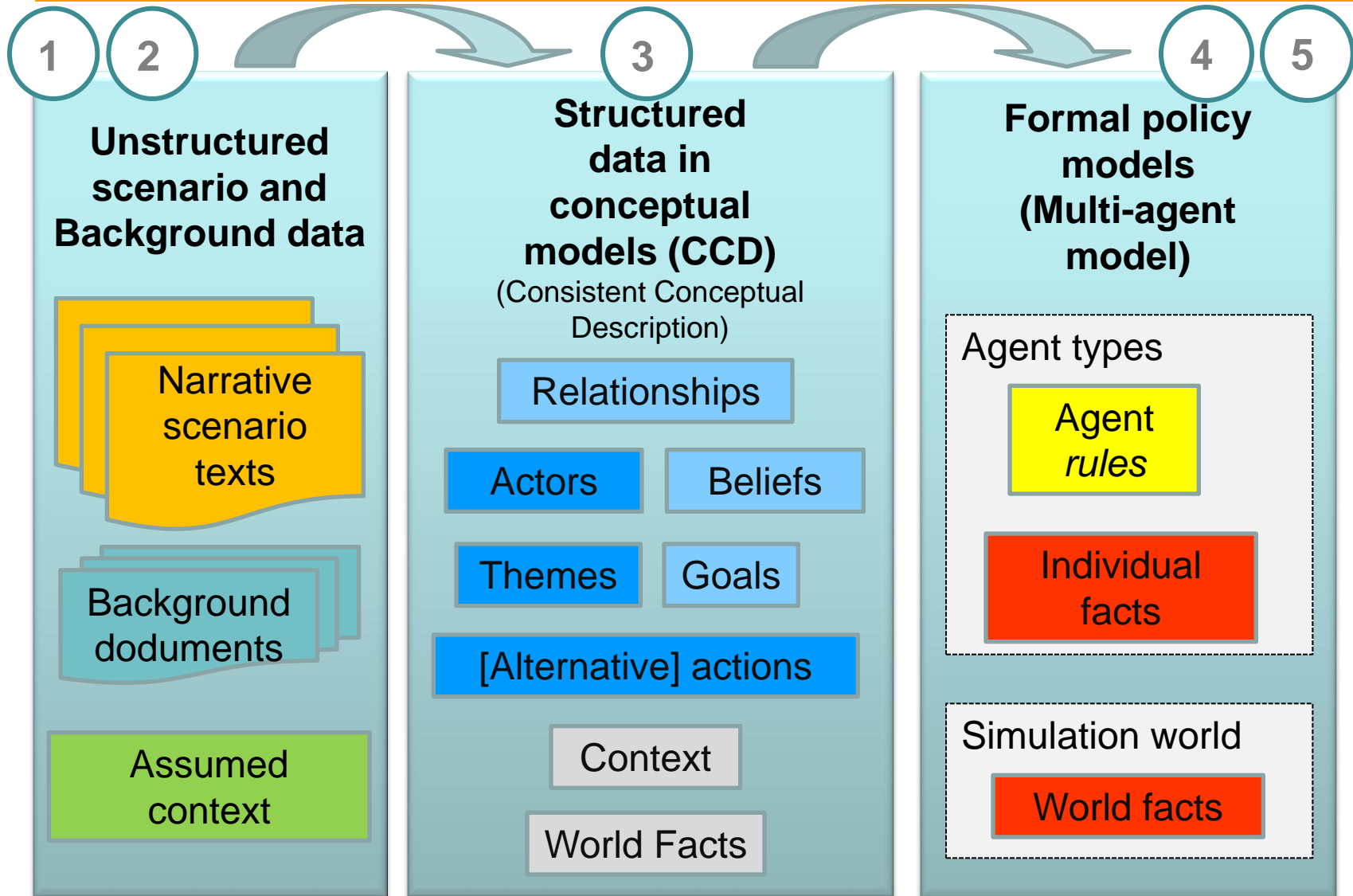
CCD Tool Supporting Visualisation: Ontology



Step-wise Model Transformation



Transformation: From narrative text to formal statements in code



Visualising Transformation for Stakeholders: Identification of Aspects of Relationships



Phrase in scenario description	Aspect (issue)	Category	Characteristics of aspects	Model component
<p><i>... living ... in a three room flat ... house ... is not well insulated ... reflecting alternatives to decrease [energy] consumption ... and to switch the source of energy [to renewable and green]</i></p>	Energy consumption	State: Alternative or multivariate	If alternative: {"nuclear", "gas", "solar", "wind", "bio-mass", "hydro-thermic"} or if multivariate: <nuclear x_s per cent, gas x_f per cent, solar x_n per cent, wind x_w per cent, bio-mass x_b per cent, hydro-thermic x_h per cent>	Condition part of a rule in an agent's rulebase, fact
		Goal (description of desired future state)		Also a fact
	consume	State change (ways and means, measures to be taken)	Action description: <i>insulate house to reduce energy consumption</i> <i>switch to green energy provider</i>	Action part of a rule in an agent's rulebase, to be determined by analysing possible ways from current states to goals
Household	Actor	Endowed with a rule base, a fact base and goals	Agent class	

Visualising Transformation for Stakeholders: Detailing Facts



Model structure	Model comp	Name	Natural language description	Formal description (Code)
<i>Agent "Household"</i>	Structure	Household	Agent class	class household{...}
	Facts	Current state	Current consumption of energy per household	Class ConsumptionState { double InsulationClass; double soilCapacity; double priceOfSolarEnergy; double windCapacity; double priceOfWindEnergy;..}
			Current state of house insulation	
			Current price for heating energy per energy type	
Desired state	Desired state	Desired insulation of house	PlanningGoal [objective insulation] [objective minimumCost] [objective greenEnergy] [priority high]	
		Desired consumption of energy in households		
Agent „regionalGovernment“	Structure	regionalGovernment	Agent class	Class regionalGovernment{...}
	Facts	Desired state	Maximum necessary import of gas from UA	PlanningGoal [objective reduceGasImport]

Visualising Transformation for Stakeholders: Identification of Rules

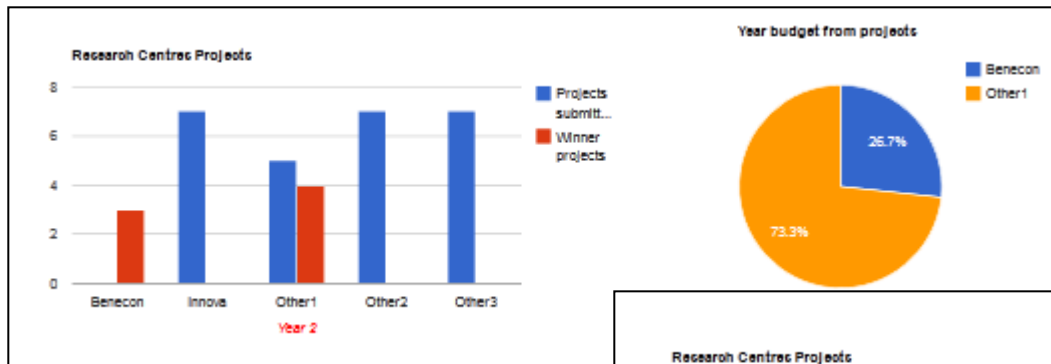


Model structure	Model comp	Name	Natural language description	Formal description (Code)
<i>Agent</i> <i>"Household"</i>	Struct.	Househ	Agent class	class household{...}
	Facts	Risk	House owner will not insulate house Government will not subsidise investment in soilPlants on house GreenEnergy Production cost might heavily exceed the price of nuclearEnergy.	Risk [noInsulation]; Risk [HighEnergyCosts]; Risk [noInvestmentSubsidy]; Risk [highCostsGreenEnergy]; Risk [lowCostsNuclearEnergy]
	Rules		If it is true that investment in SoilPlants is subsidised by Government AND if houseOwner insulates house AND if GreenEnergy Production cost do not exceed prices of nuclearEnergy AND if GreenEnergy Production cost do not exceed prices of gasEnergy AND if enough Sun to produce SoilEnergy then invest in soilEnergy plants	If (noRisk){ Purchase(SoilPlants) AND Receive(InvestmentSubsidy) }

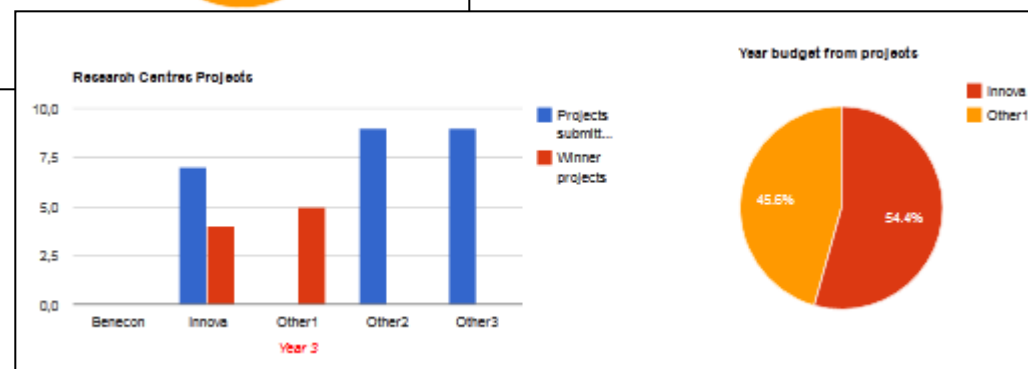
Simulation Outcome for Stakeholders: Model-based Scenario and Graphical Representations



- ❖ Simulation runs (step 5 in the OCOPOMO policy development process) generate audit trails and statistical charts
 - Not necessarily readable for stakeholder
- ❖ Policy modellers transform simulation outcome into readable format
 - Model-based scenarios (text description about what happened in the simulation)
 - Supported by charts



Model-based SC



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- ❖ OCOPOMO policy development process: integrated approach from narrative scenarios to formal policy models
 - Iterative process of identifying the parameters and features informing formal policy models
- ❖ Consistent conceptual description (CCD): Incorporating traceability in the iterative policy development process
- ❖ Open collaboration in policy development through integrated web 2.0 based e-participation toolbox
 - Enabling policy analysts, policy operators and wider stakeholder groups to work together collaboratively

Expected impact



- ❖ Contribution to strategic policies and to implement open government
- ❖ Contribution to transform government and administration to an open, effective and efficient participative governance (good governance principles)
- ❖ Provide new opportunities for open discourse among stakeholders of the policy domain and the policy experts
 - in stakeholder-oriented scenario generation
 - in evaluation of formal policy models
- ❖ Improve transparency and traceability in strategic decision making by involving different stakeholders in the participative process via the open collaboration platform



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Many thanks for your attention!

Project partners:



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