

Shaping Tomorrow's Soil Health: A Focus on Prioritizing Contaminants of Emerging Concern (CECs) in soil and groundwater Investigations

Project overview

October 14, 2025

Introduction and objectives



Why this project ?

- **Learning from challenges** : investigations and detection of environmental risks before a potential crisis
- **Focus on specific pollutants** instead of developing a complete “activities-pollutants” matrix
- **Developing knowledge:**
 - Potential sources of pollution
 - Pollutant behavior
 - Toxicity
 - Analytical methods
 - Trigger values

Which CEC (Contaminant of Emerging Concern) ?

Selection criteria

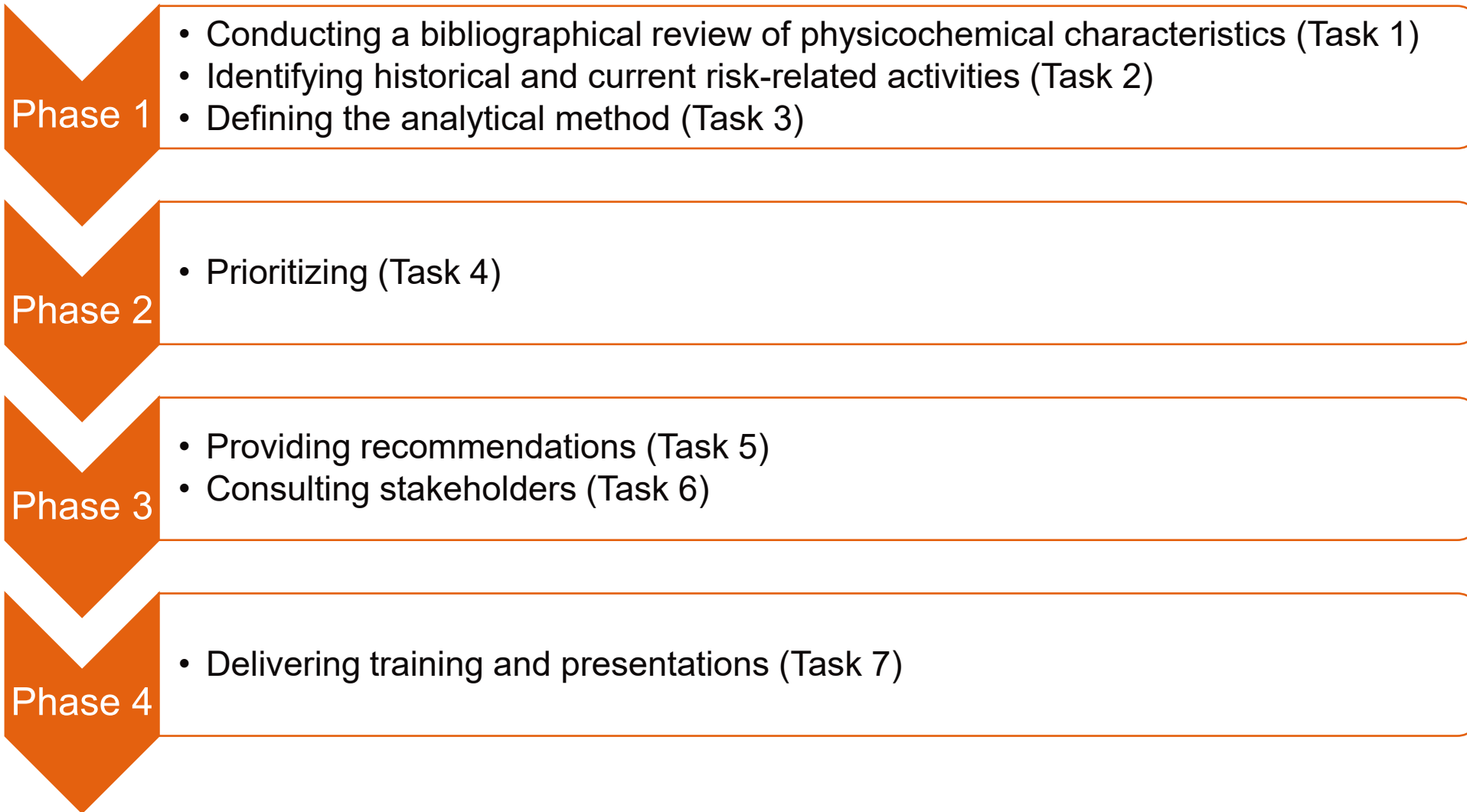
- Pollutants relevant to local pollutions in soil and groundwater
- Review of scientific literature and conferences
- POPs (Stockholm Convention)
- Groundwater watchlist ; ongoing-discussion on the future soil watchlist

Which CEC (Contaminant of Emerging Concern) ?

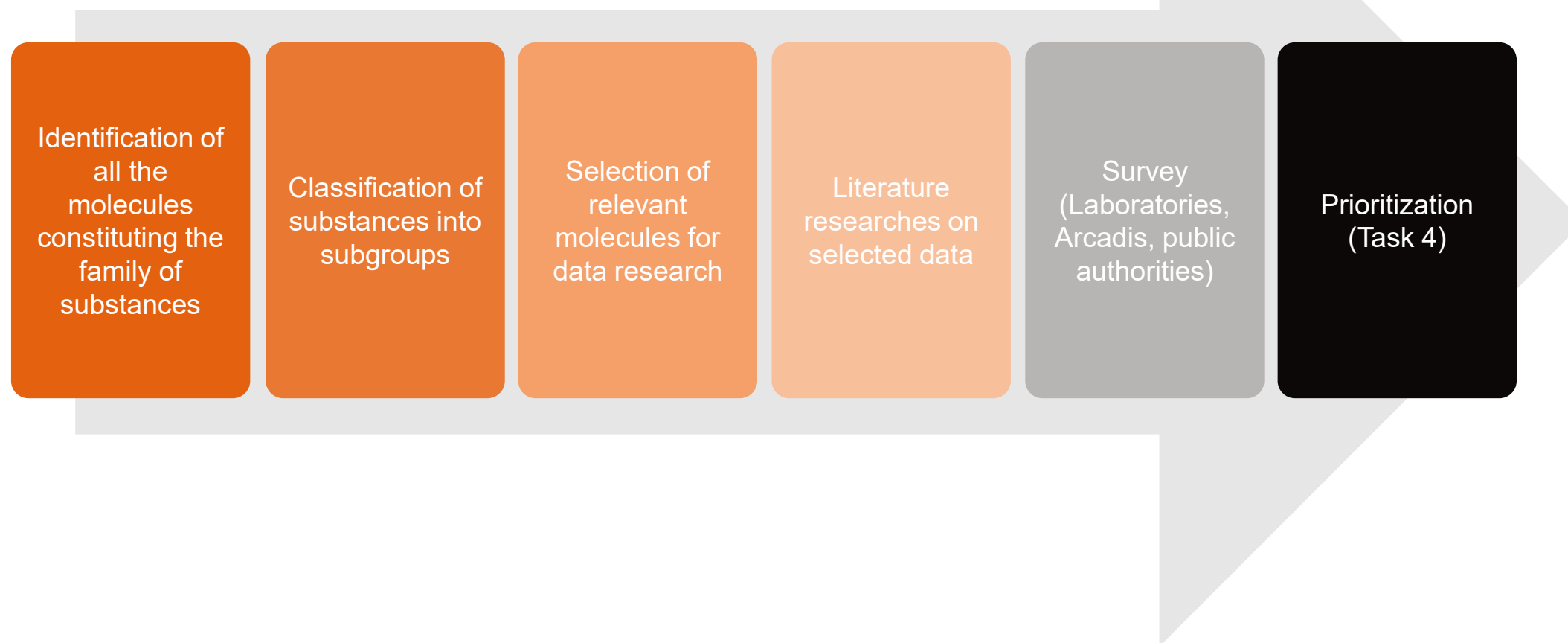
YES	NO
<ul style="list-style-type: none">1. PCBs2. Dioxins/furans3. Phthalates and other plasticizers4. Flame retardants5. Bisphenols6. Chlorobenzenes7. Chloronaphthalenes (PCNs)8. Short-chain chlorinated paraffins (SCCPs)9. Hexachlorobutadiene (HCBD)	<ul style="list-style-type: none">1. Sufficient recommendations for soil experts → pesticides, 1-4-dioxane, phenols, surfactants2. Work in progress → PFAS3. Insufficient scientific data → Microplastics4. High degree of uncertainty regarding local pollutions → PPCP (pharmaceuticals and personal care products)

Methodology

Project roadmap - Key stages of the project



General methodology



General methodology – Preselection

Substances authorized in the EU

(Flame retardants, bisphenols, chlorobenzene, plasticizers, SCCP, HCBd)

Presence on one of the **watch lists** (POP, NORMAN, EU priority list, REACH lists (SVHC, Authorizations, Restrictions), and in the PNN database)

PBT/vPvB

(Persistent, Bioaccumulative, Toxic / very Persistent, very Bioaccumulative))

ED

(Endocrine Disruption – for human health and/or the environment)

CMR, STOT RE

(Carcinogenicity, Mutagenicity, Reproductive toxicity, Specific Target Organ Toxicity after Repeated Exposure under CLP (EC) 1272/2008)

Substances prohibited in the EU

(PCB, PCN, dioxins & furans)

Pre-selection of 7 indicators PCBs + 11 dioxin-like PCBs based on literature review

Pre-selection of 7 dioxins and 10 furans based on toxicity and environmental presence (included in the priority list 2013/29/EU)

Pre-selection of one isomer per group pf PCN (8 groups depending on the number of chlorine atoms around the aromatic molecule)

General methodology – Selection of relevant molecules for data research

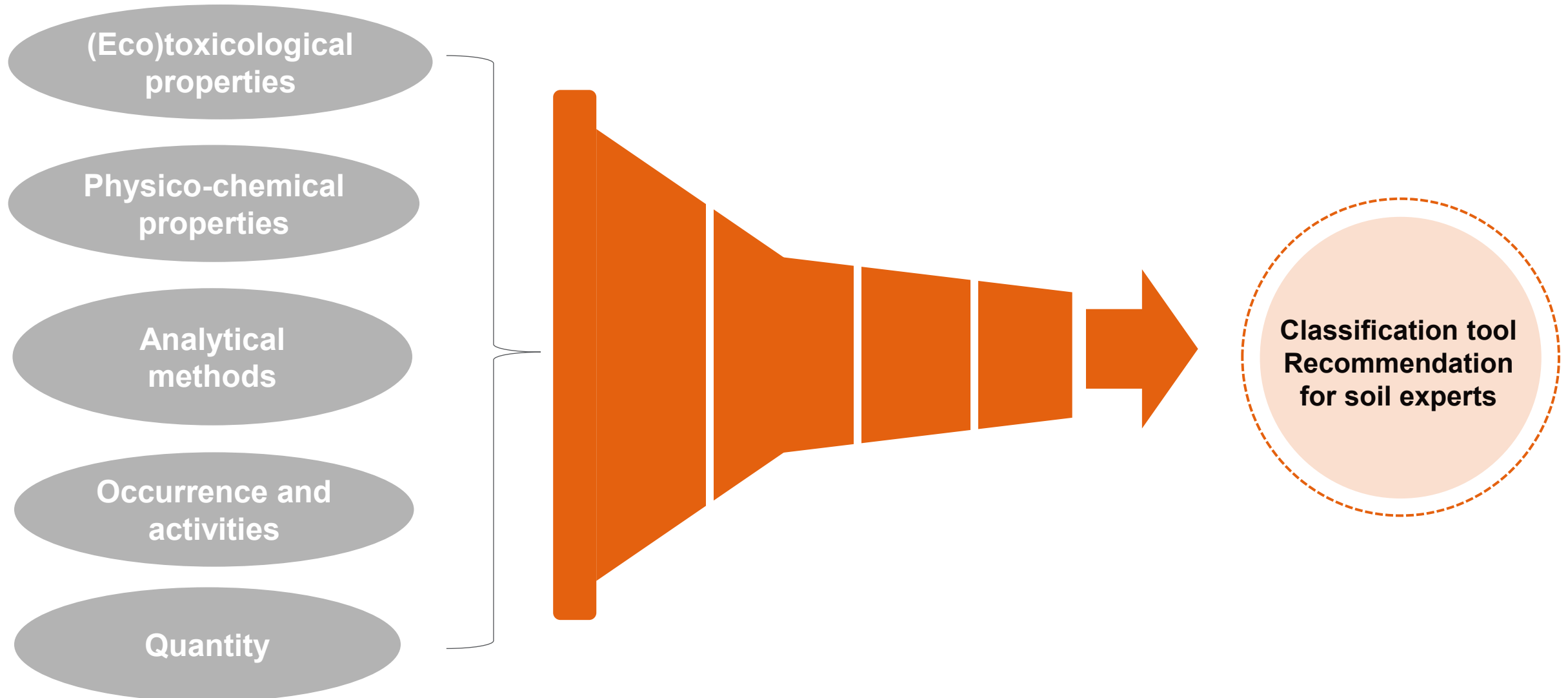
Selection finale	Global	Toxico	List	Total selection (without duplicates)
Flame retardants	312	81	53	101
PCN	75			8
Plasticizers	110	28	33	41
Bisphenols	105	20	4	20
Chlorobenzene	12	3	12	12
Hexachlorobutadiene	1	1	1	1
SCCP	1	1	1	1
PCB	209			18
Dioxins et furans	210		17	17
Total	1035	134	121	219

- 219 substances selected
- Creation of a database on each of these substances

Substance prioritization



Substance prioritization



Classification tool

Substances authorised in the EU

Step 1

CEC – (Eco)toxicological scoring

- PBT/vPvB
- Endocrine disruptor
- H-phrases

CEC - Physico-chemical scoring

- Mobility

Global scoring

Selection of substances based on score

Step 2

CEC - Quantity

Exclusion of substances (identified as priorities in step 1) produced or imported in low quantities (ECHA)

Step 3

CEC - Occurrence data

Inclusion of substances exceeding detection limits in monitoring and biomonitoring (Belgium, EU)

Substances banned in the EU

Selection substances based on literature

All data collected

Conclusion and further actions

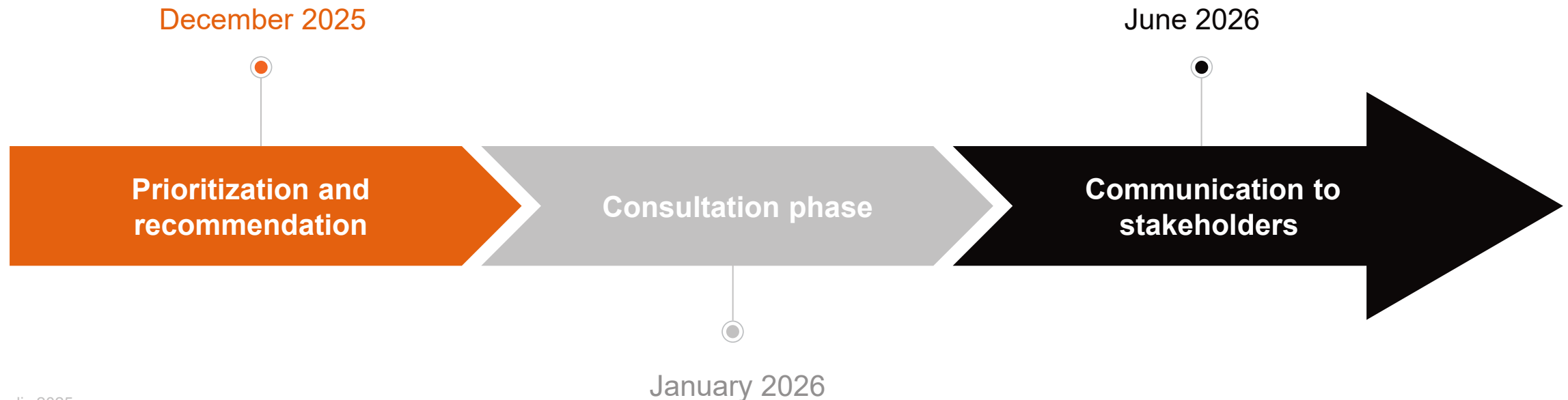


Conclusion

Conclusion:

- Multidisciplinary projects
- Collection of data on preselected substances based on data available during the literature research
- Final goal is to provide recommendation to soil experts (investigation, activities, analytical methods,...)

Next Steps:



Q/A

More questions? Come to our Arcadis Booth



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