

Innovative Circularity of Raw Materials



NWE – REGENERATIS project – REMICRRAM Methodology

*2nd Advisory Board Meeting
At OVAM, Belgium*

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Content:

1. NWE-REGENERATIS Methodology

1.1 Objectives

1.2 General overview

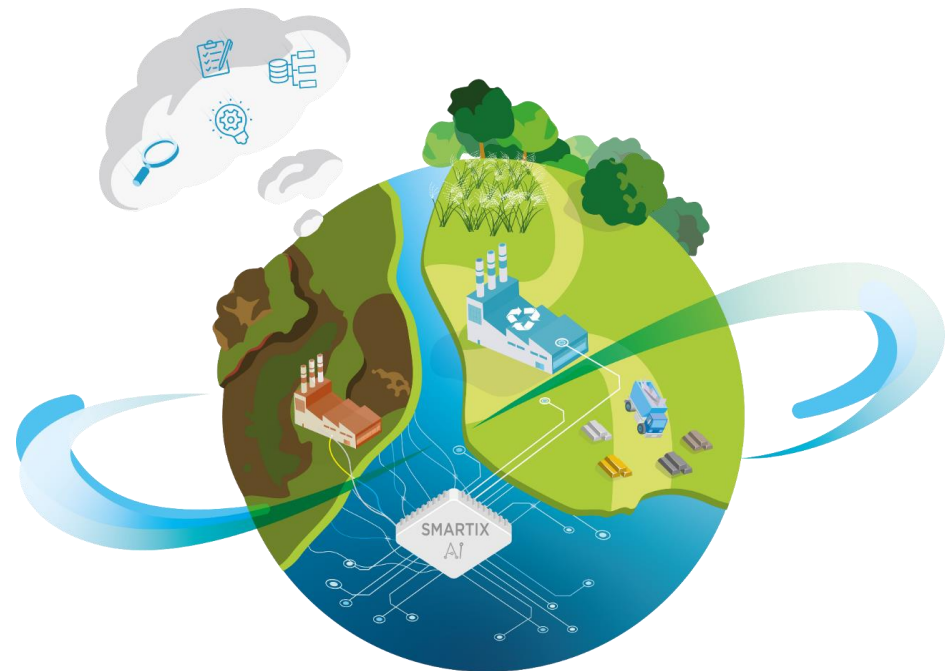
1.3 Phase 1 – SMART PHOENIX

1.4 Phase 2 – SMARTIX

1.5 Phase 3 – Business model

1.6 Decision

1.7 Expected outcomes



1. REGENERATIS methodology (REMICRRAM)

1.1. Objectives

1

Selection and characterization of PMSD

2

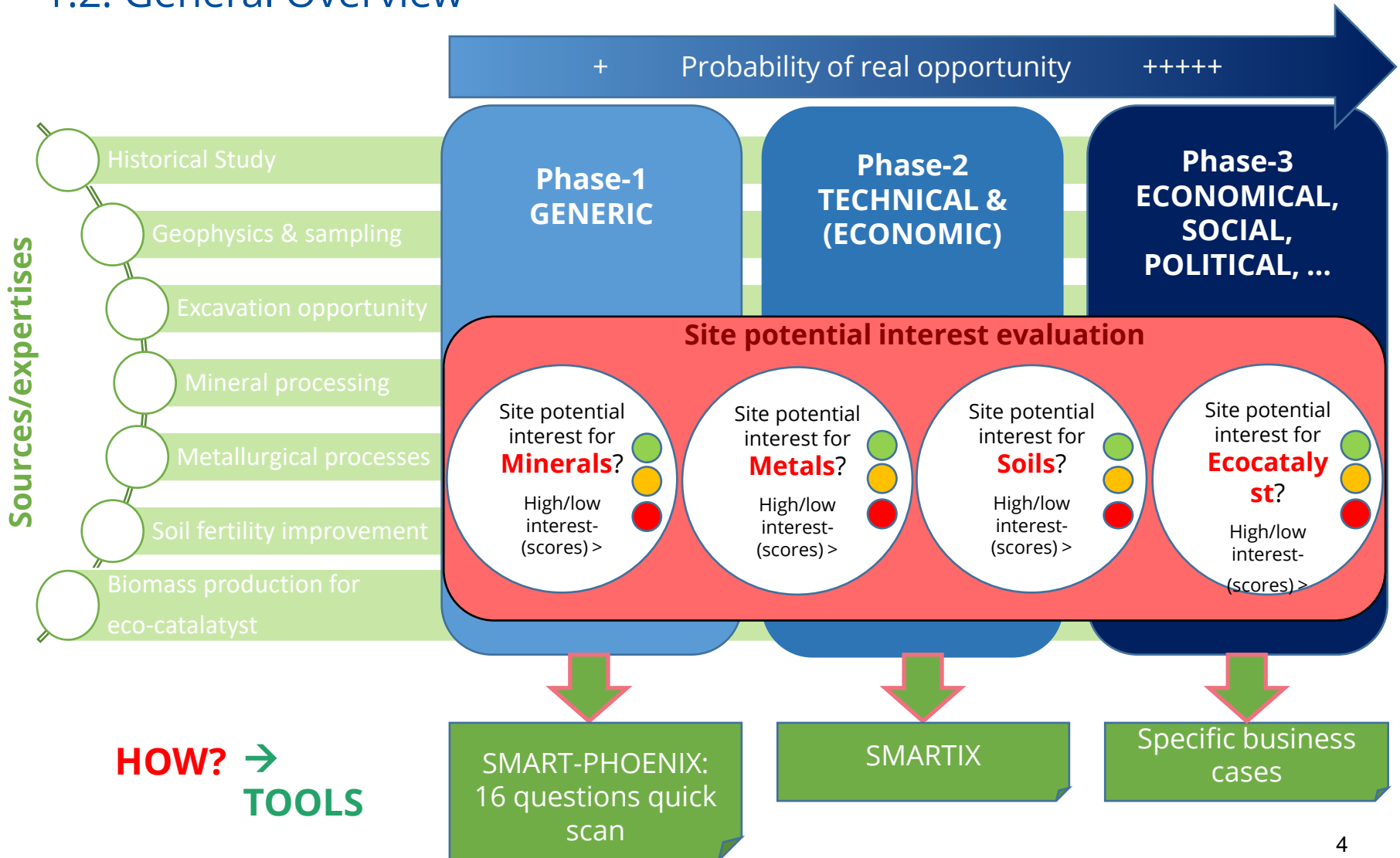
Demonstration of the recovery potential of secondary raw materials from PMSD

3

Creation of site-specific business plan based on A.I. tool - SMARTIX

1. REMICRRAM

1.2. General Overview



1. REMICRRAM

1.3. Phase 1 - SMART PHOENIX

1. Does it contain a landfill, **deposit** or backfill that may contain significant **metallic residues**?
2. Is the site a **PMSD**?
3. Is the site registered in a **database/inventory**?
4. What is the expected **volume of metallurgical residues**?
5. What is the **site area occupied by residues**?
6. What are the **main kind of metallurgical residues** present?
7. Are the residues **separated** ?
8. What area is still occupied by **construction**?
9. What area is occupied by **trees**?
10. Is there **historical data** easily available?
11. Is the site easily **accessible** for trucks and heavy equipment?
12. Is the site classified as a **hazardous/high-risk site**?
13. Does the site need to be **rehabilitated**?
14. Is there a known interest for the **reconversion** of the site?
15. What area is still occupied by **low vegetation** - grass, bushes (i.e., soil suitable for eco-catalysis)?
16. What is the **current use** of the site?

1. REMICRRAM

1.3. Phase 1 - SMART PHOENIX

4 categories of materials

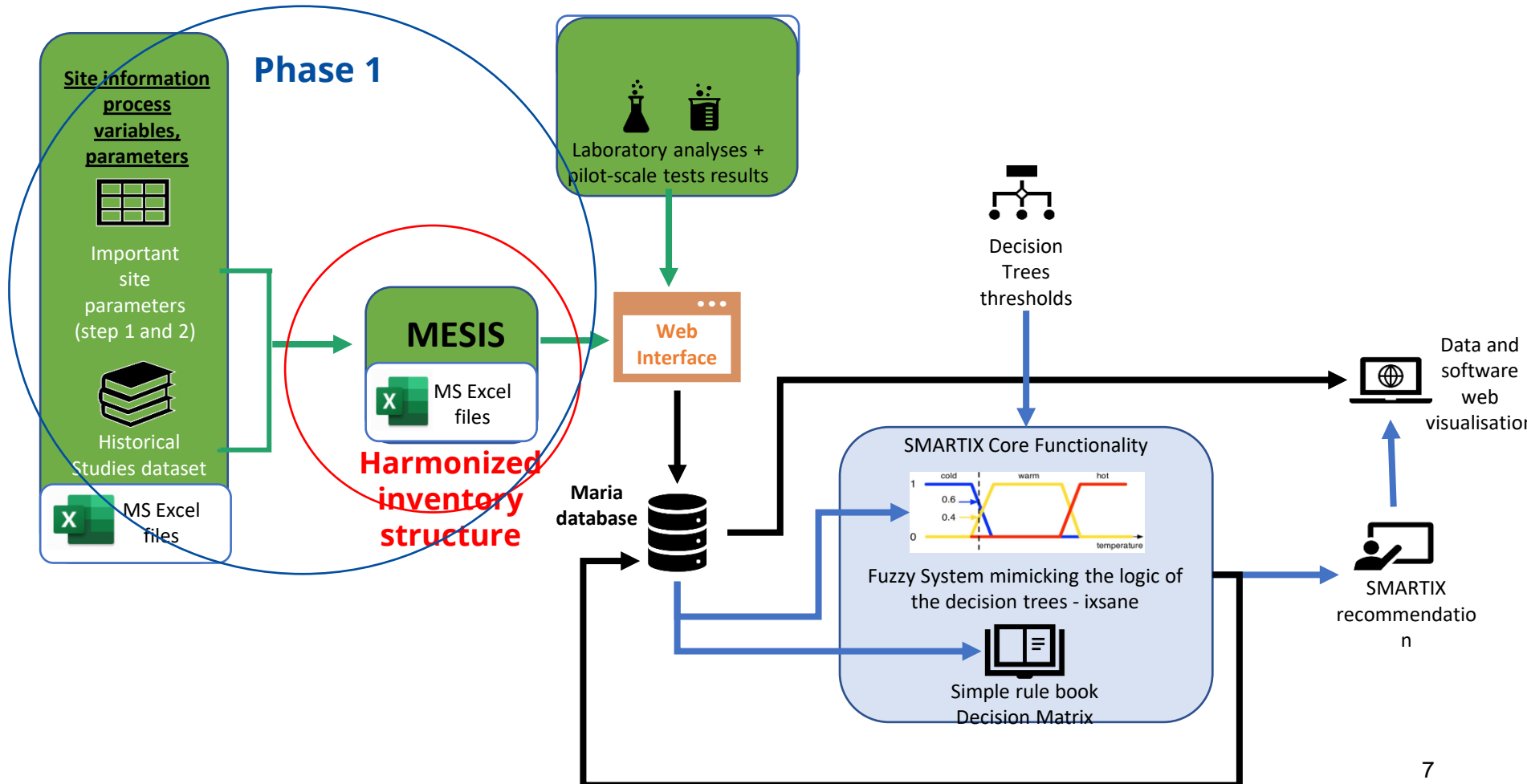
Question	recovery of minerals	recovery of metals	soil improvement	ecocatalyst production
Does it contain a landfill, a deposit or a backfill with possible metallic residues (Pb, Cu, Zn, Fe)?				
Yes	40	40	0	0
No	20	20	0	0
Is the site a PMSD?				
Yes	200	200	0	200
No	0	0	0	0
Is the site registered in a database/inventory?				
Yes	10	10	0	0
No	0	0	0	0
Unknown				
What is the volume of the residues from metallurgical origin (m3)?				
0 to 100 000	0	0	0	0
100 000 to 500 000	10	10	0	0
> 500 000	20	20	0	0
What is the site area occupied by residues (m2)?				
0 to 10 000	10	10	10	0
10 000 to 100 000	10	10	10	20
> 100 000	10	10	10	20
Unknown				

Weights for each category of materials

Final scores

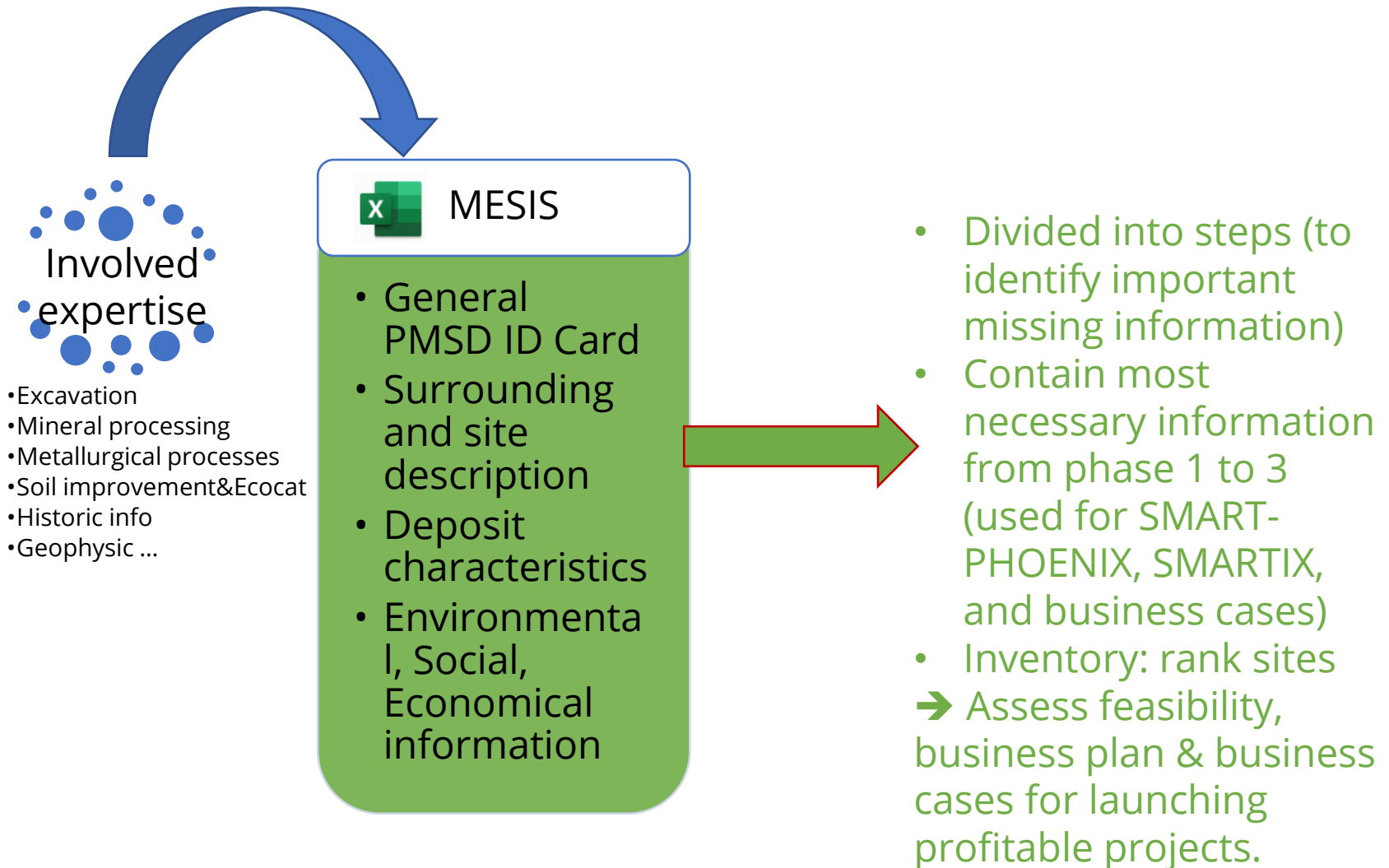
1. REMICRRAM

1.3. Phase 1 - Setup of data sources, data flow, and long-time data storage



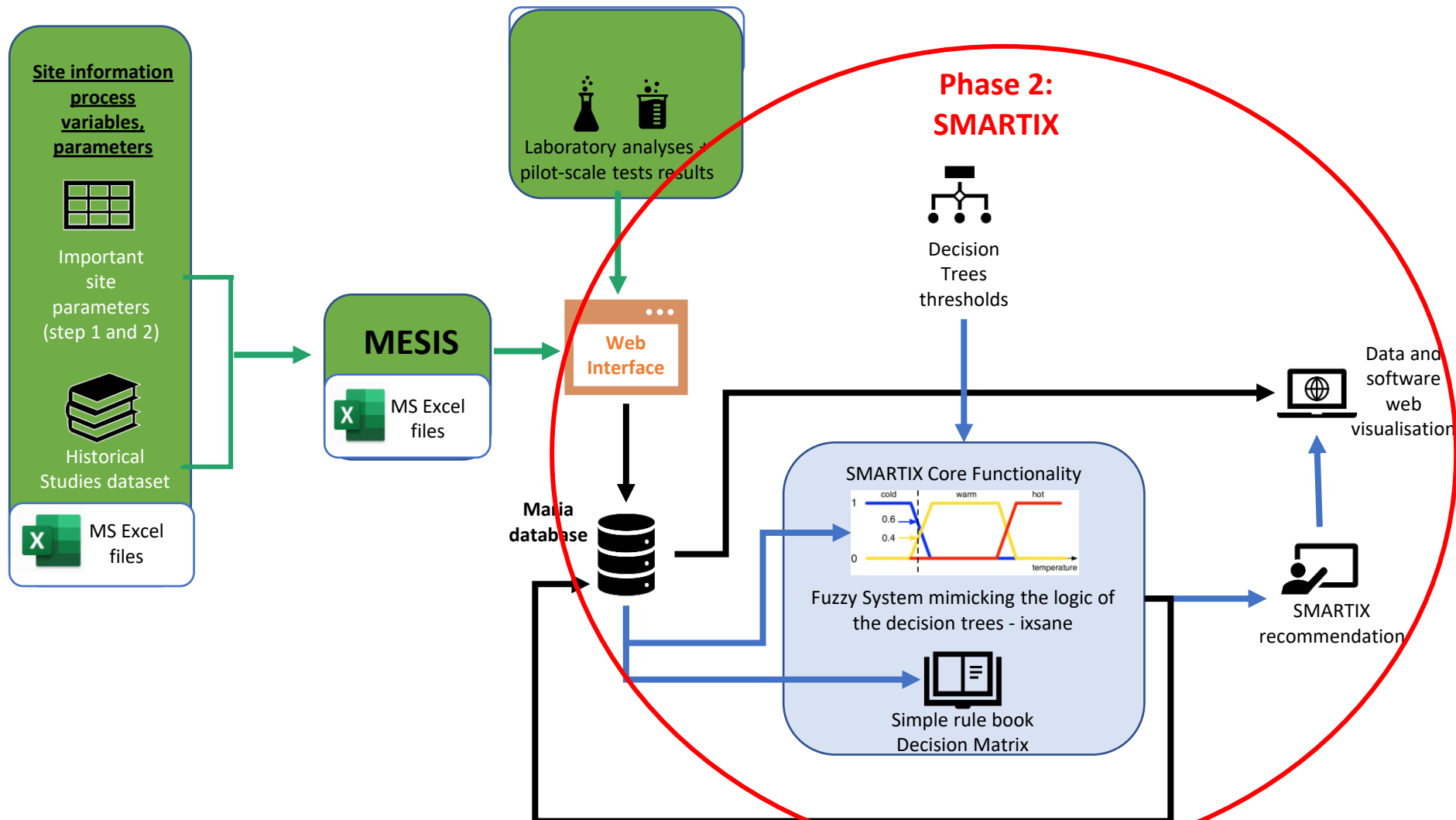
1. REMICRRAM

1.3. MESIS



1. REMICRRAM

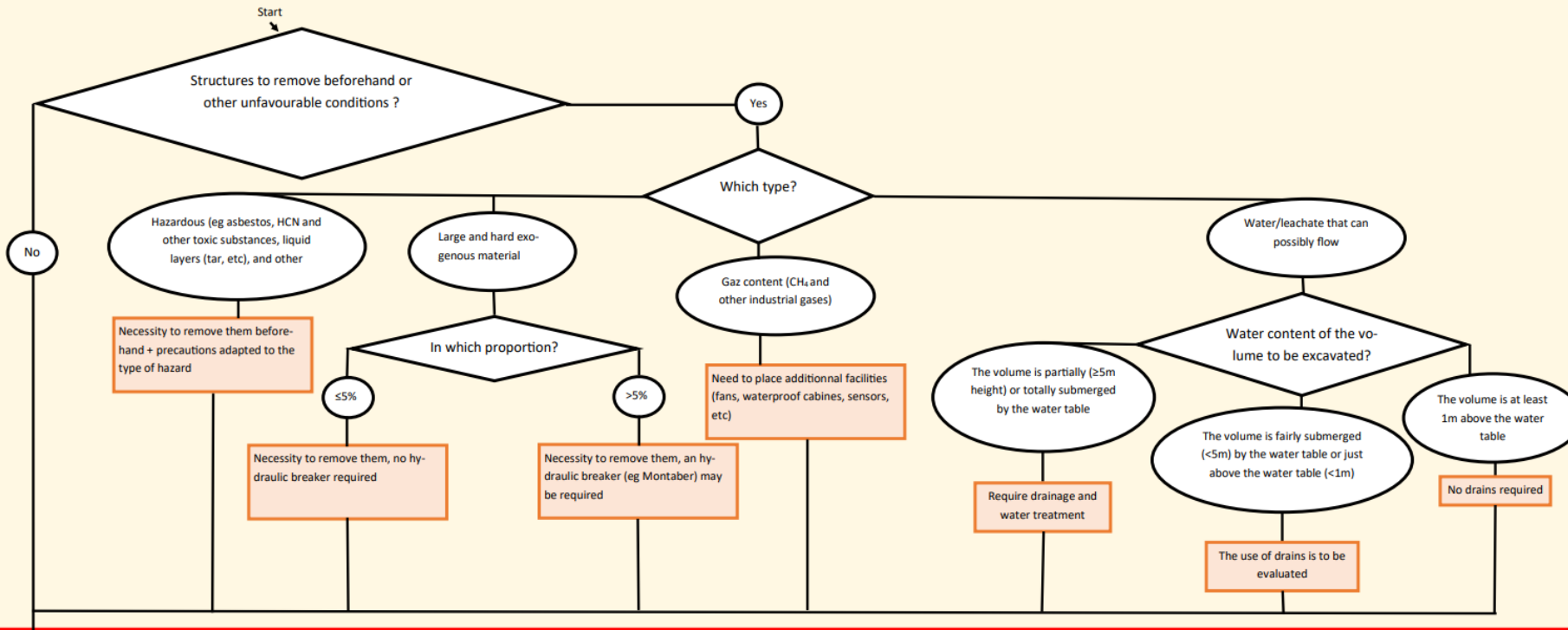
1.4. Phase 2 - SMARTIX



1. REMICRRAM

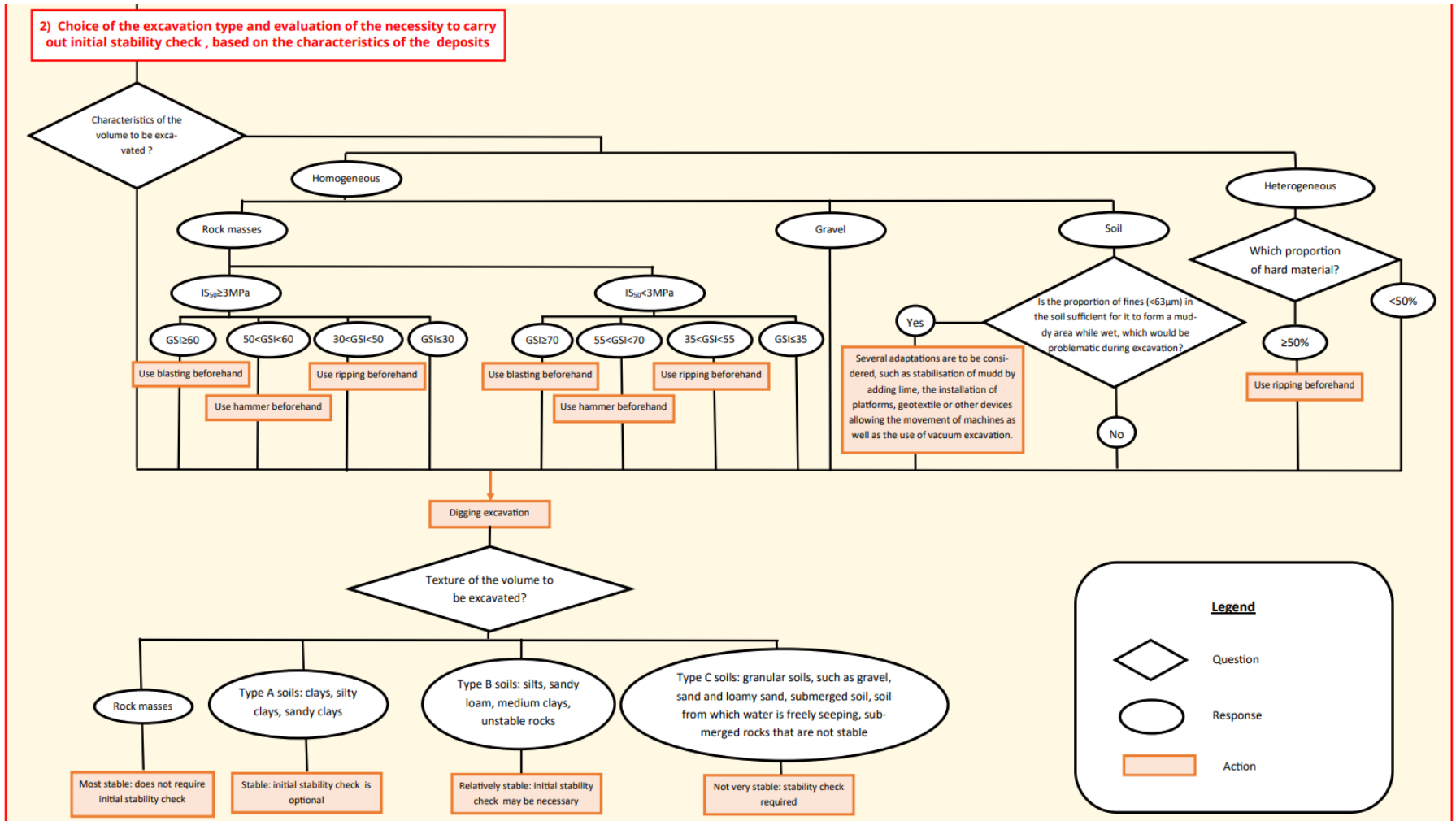
1.4. Phase 2 – SMARTIX – Decision tree of civil engineering tree

1) Preliminary actions to be carried out related to the characteristics of the site



1. REMICRRAM

1.4. Phase 2 – SMARTIX – Decision tree of civil engineering tree



1. REMICRRAM

1.5. Phase 3 – Business Model

Business model for urban mining project



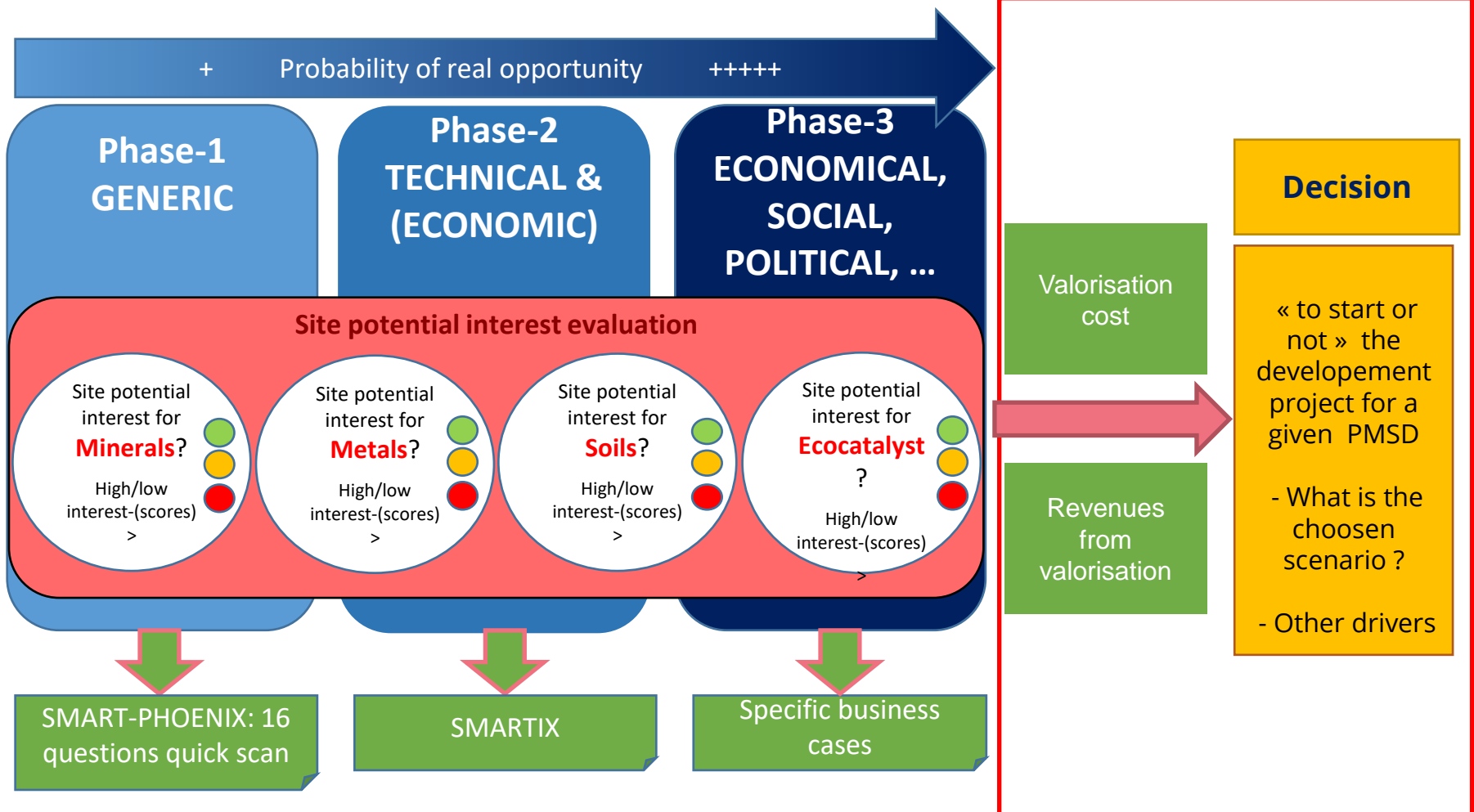
1. PMSDs CONTENT CHARACTERIZATION
 - Geophysics
 - Guided soil sampling
 - Sampling analysis
2. MATERIAL RECOVERY PRE-OPERATIONS
3. MATERIAL RECOVERY OPERATIONS
 - Site Preparation
 - Environmental monitoring and human health safety measurements
 - Staff cost for general management of site
 - Material recovery activities
4. ECOCATALYSTS
 - Site visit and sampling
 - Soil characterization analysis
 - Greenhouse experiments
5. MATERIAL TRANSPORT
6. SITE RESTORATION AFTER URBAN MINING PROJECT
7. METALS, MINERALS, MATERIALS, AND SOIL RECOVERY
8. ENERGY RECOVERY
9. LAND RECOVERY
10. ECOCATALYSTS PRODUCTION, if pilot test is conclusive
11. OTHER REVENUES AND BENEFITS
12. UNFORESEEN COST



- REMICRRAM vs. traditional rehabilitation methods of metallurgical sites
- Prediction of rehabilitation costs
- Detailed estimations : lab tests and pilots
- Optimised options of valorizations: quantities, location, processes, cost, revenues,...
- Cost benefits analysis

1. REMICRRAM

1.6. Decision



1. REMICRRAM

1.7. Expected outcomes

✓ Allow a **better management** of the past-metallurgical sites

✓ **Improve the management of uncertainties**

✓ To develop a **database of residues/deposits** and identify optimal recovery methods

✓ To **reduce the costs of rehabilitation** of sites

✓ Enables the integration of optimised management in the promotion of the **circular economy**

✓ Promotes **recovery of materials, land, mineral and brownfields**, creating **local jobs**

Interreg 
EUROPEAN UNION
North-West Europe
NWE-REGENERATIS
European Regional Development Fund

Avec le soutien de
la 
Wallonie



**Do you have any
questions?**

Thank you!

<https://www.nweurope.eu/REGENERATIS/>