

How to evaluate landfill mining? On the challenges of assessing feasibility and performance

Joakim Krook

Environmental Technology and Management



Preconditions for assessment of Landfill Mining

- Complex projects with several objectives, outputs & values
- Early phase of development with few real-life applications
- Ex ante assessments of planned or hypothetical projects
- **Deficit in knowledge and records of accomplishment**



Methodological issues of recent LFM assessments

SELECTION OF LANDFILLS

- * Low-grade MSW
- * Low alternative costs

- Importance of site-specifics
- Implications of results?

EMPLOYED PROCESSING SCHEMES

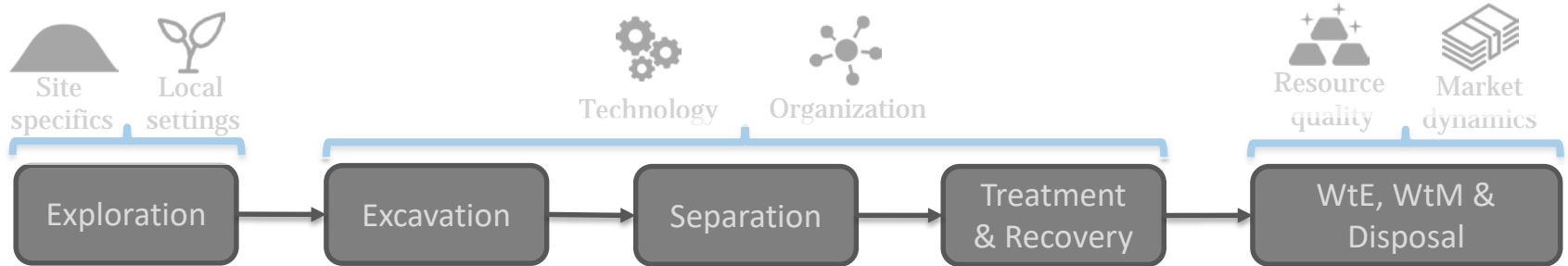
- * Simple to advanced schemes
- * Often only one processing line

- Criteria for selection?
- Treated as “Black boxes”

ASSUMPTIONS OF MARKETABILITY

- * Exhumed resources salable
- * Full substitution

- No discussion on marketability
- High impact on results



SPECIFICNESS AND QUALITY OF DATA

High/Moderate

Low

- * Data from adjacent fields, estimates & small-scale tests

- Lack of discussions about applicability and implications of used data

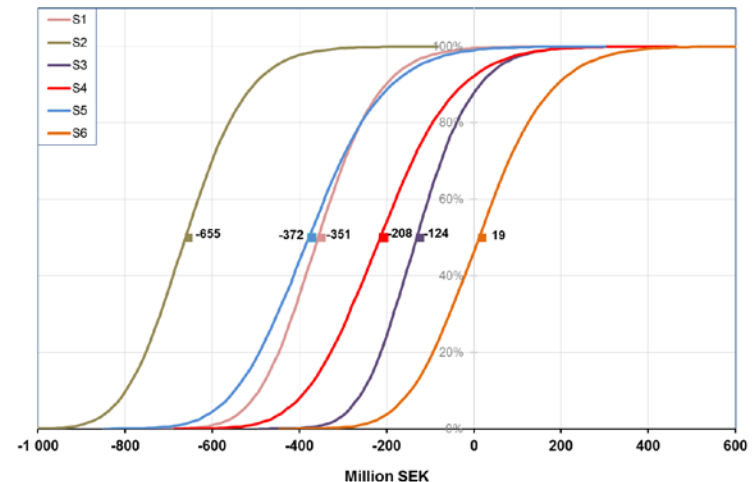
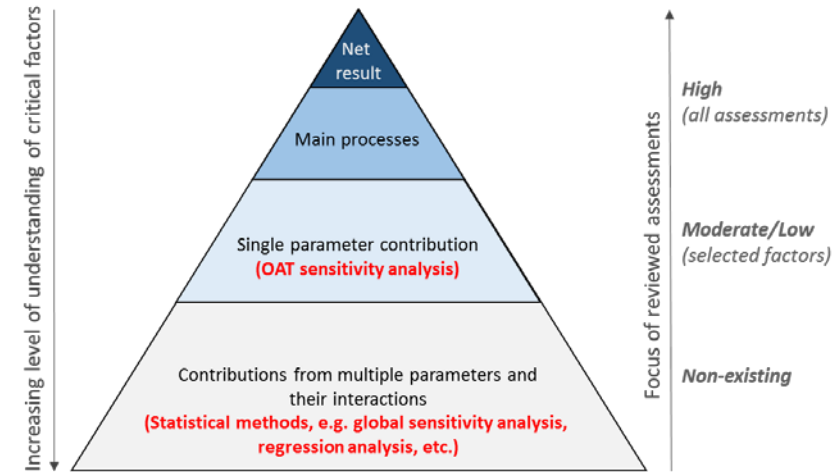
- * Input parameters as single, estimated values

- Stochastic variations & **epistemological uncertainties** not included



Implications on the validity and usefulness of the results

- Recent assessments target deterministic results on potential & feasibility
 - Net outcome for a few scenarios
 - The understanding of criticality is often limited to main processes
- Ignoring scenario and data uncertainties provide simplified results, but are they valid and useful?
 - High implicit uncertainties
 - Miss out potentials for improvement
 - Difficult to identify critical factors





Recommendations for the assessment of landfill mining

- From deterministic to explorative approaches...
 - Full recognition of uncertainties on scenario and data levels
 - Systematic and advanced sensitivity analysis methods
- From guessing to knowing...
 - Unlock the “black boxes” of the LFM value chain
 - Small-scale tests → Pilot trials → Full-scale projects
- From narrow scopes to the broader picture...
 - Consistency and transparency of modelling principles
 - Many positive and negative values

Joakim Krook
joakim.krook@liu.se

www.liu.se