Demo 4: Anthropogenic Resource Project Classification

Learning objectives

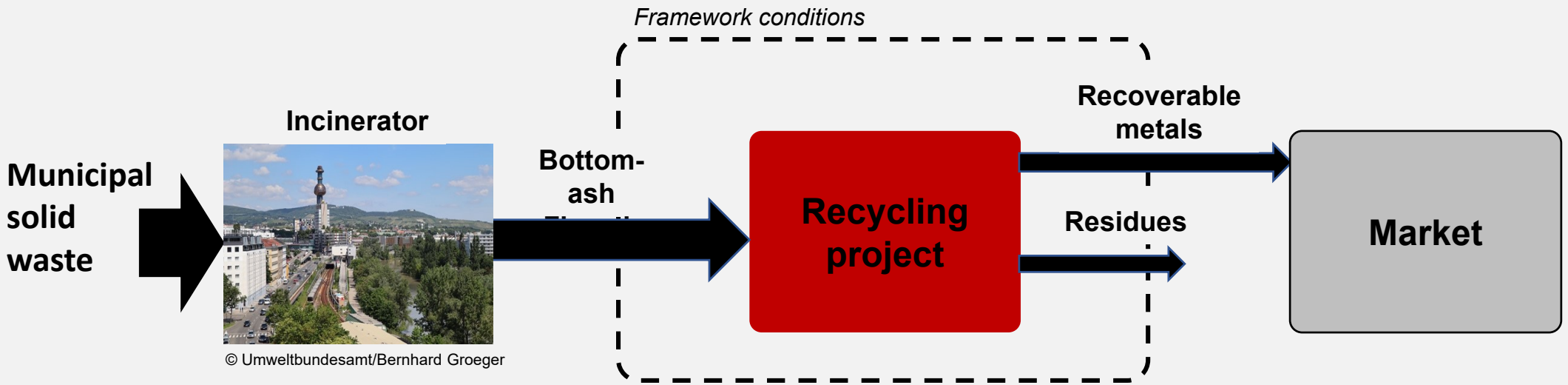
1. What influences the development of a recycling project?
2. How does the UNFC application work?
3. What are the benefits of using UNFC?

Agenda

1. Classroom exercise
2. Case study presentation

Intro

1 Imagine the future development of a recycling project



2 What contingencies (factors) need to be considered for developing the project?

Classroom exercise 1/2

3 **Name at least 1 contingency that plays a role for the development of the project.**

UNFC axis	
Environmental-social-economic viability	? ? ?
Project feasibility & status	? ? ?
Level of confidence	? ? ?

Classroom exercise 2/2

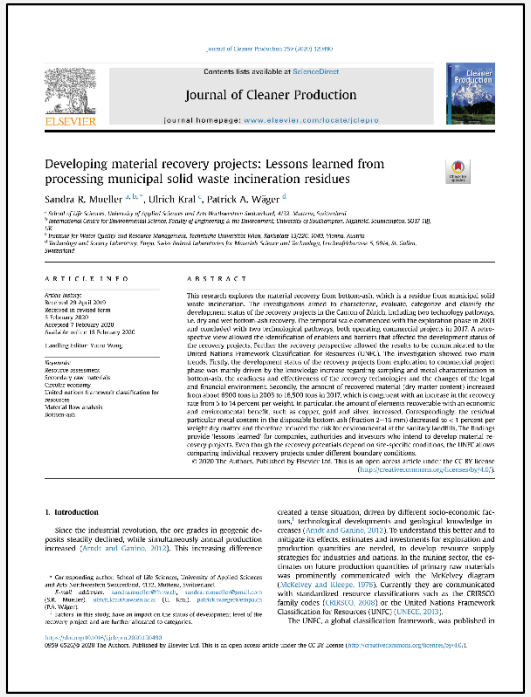
4 **Cluster the contingencies in view of their relevance for stakeholders.**

UNFC axis	Investor	Project developer	Public / NGO	Regulator	Policy maker
Environmental-social-economic viability					
Project feasibility & status					
Level of confidence					

Case study

Project characteristics

Target materials	Ferrous metals, non-ferrous metals, stainless steel, glass
Source	Bottom-ash from municipal solid waste incineration
Location	Canton Zurich, Switzerland
Time perspective	Retrospective: From exploration to production



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Developing material recovery projects: Lessons learned from processing municipal solid waste incineration residues

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ARTICLE INFO

ABSTRACT

1. Introduction

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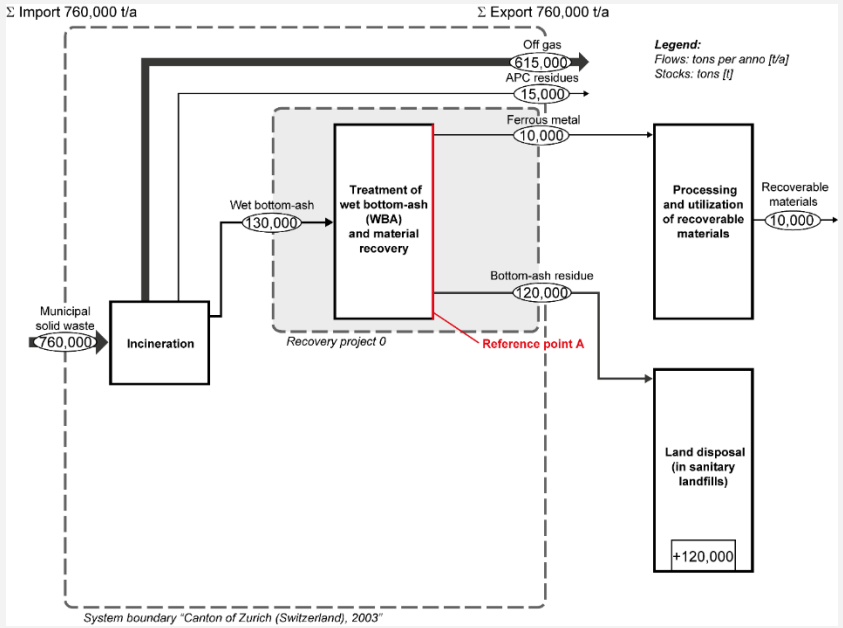
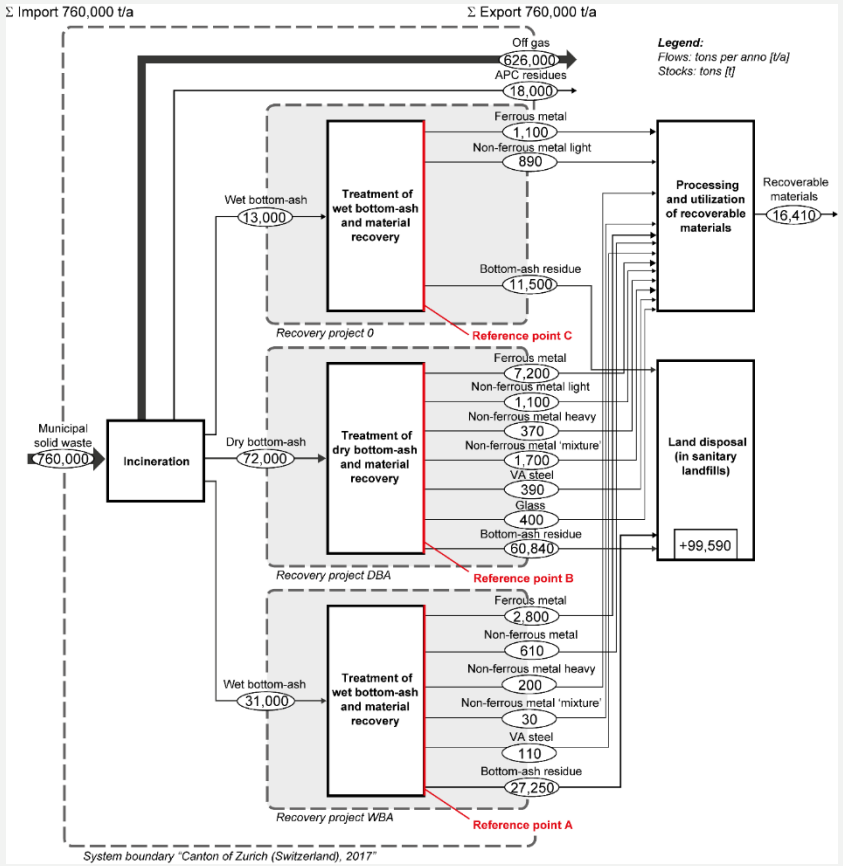
Material flows [tonnes/year]

2013



2017



Project evaluation

Socio-economic viability

Factor	Description	Quantitative or qualitative determination
Legislation	A law or set of laws that is being created (Cambridge English Dictionary, 2018).	Description of key aspects in existing regulatory system in the relevant spatial location.
Policy implementation	The quality of policy formulation and implementation.	Description of existing policies in the relevant spatial location.
Awareness of raw material criticality	Consciousness and knowledge about the criticality of situation regarding raw material shortages.	Description of potential on material shortages in the area of interest.
Political willingness	A preparedness or readiness on how a community, company or other political unit manages raw materials.	Description of intentions and implementations of measures from a political unit in the relevant spatial location.
Stakeholder interest	The interest of a group of people that influences the intended mining project's progress with regard to market conditions.	Description of the stakeholders' interests and intentions.
Social license	The recovery sector's efforts on reaching out to global and local stakeholders (Owen and Kemp, 2013).	Status description of legal local requirement and activities to societal and community situation regarding access to land, water and other financial and human resources (Owen and Kemp, 2013).
Financial capability	The management of amounts of money for investment, because it may be profitable or useful in the future.	Description of management and investment capabilities.
Profitability	The degree to which a business or activity yields profit or financial gain (Oxford Dictionaries, 2018a).	Description of mining proceeds (adapted from Feiz and Ammenberg, 2017).

Project categorization

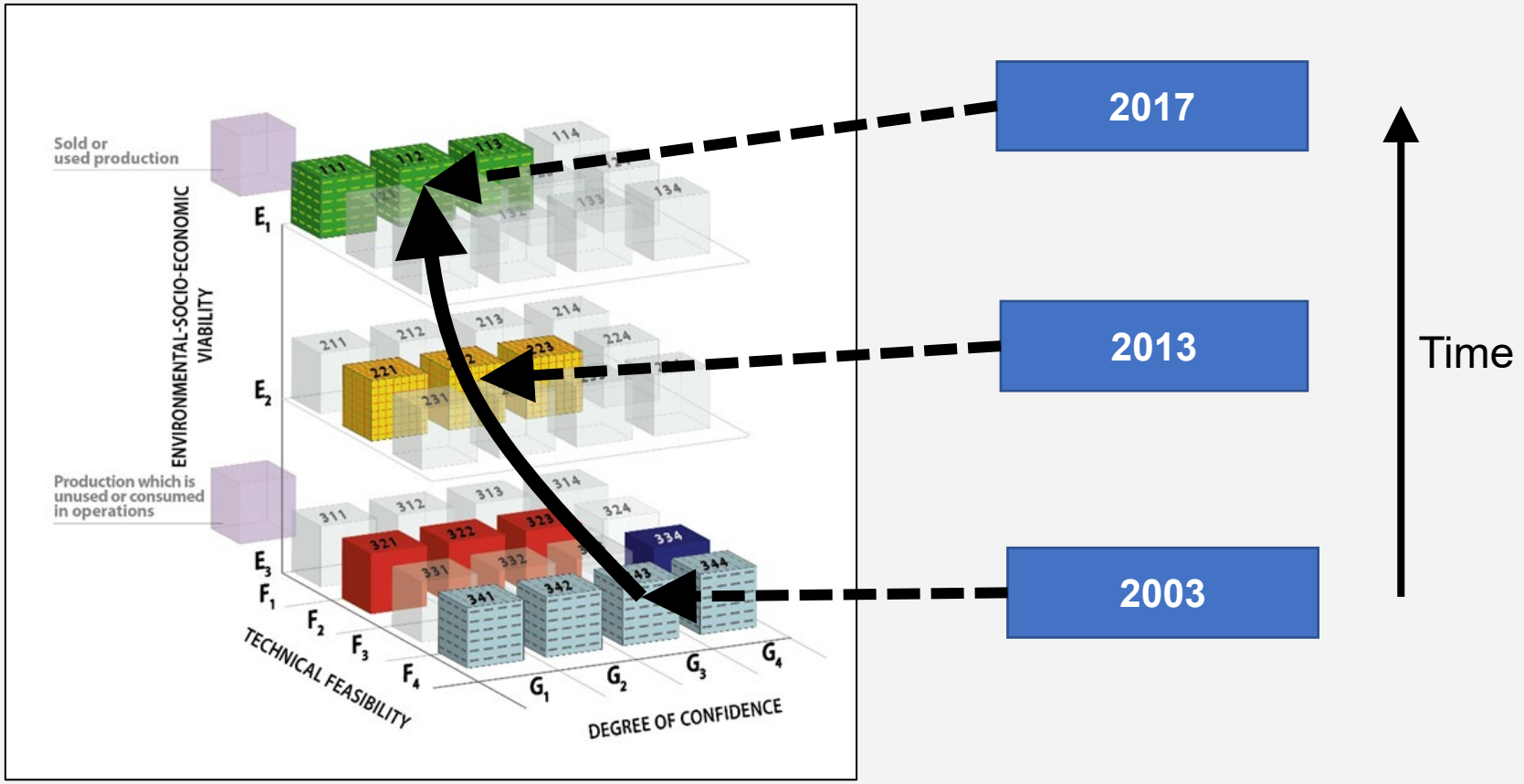
Treatment of dry bottom-ash and material recovery

Time

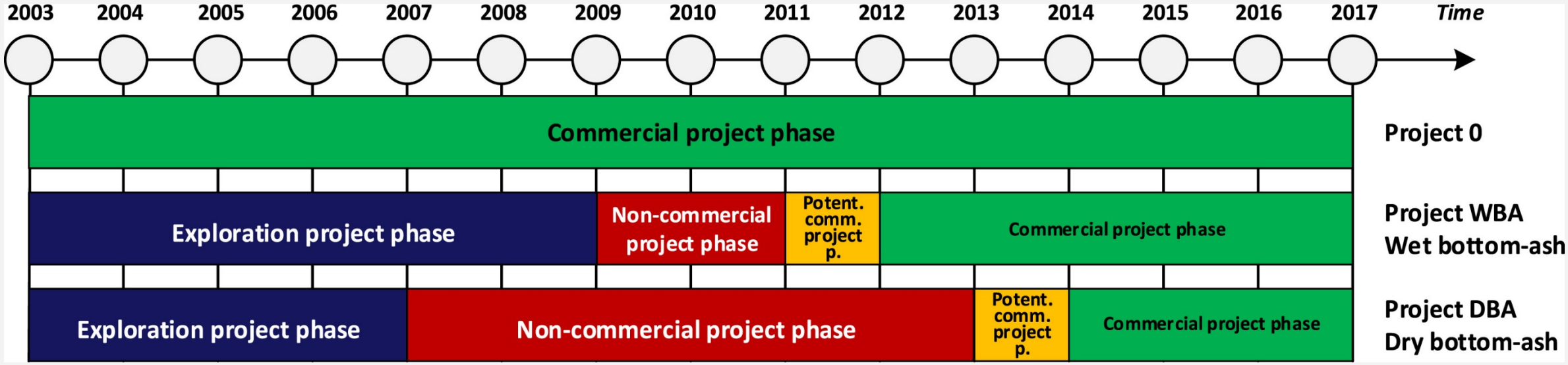
Factors at the E- F- G axis

	2003, 2004, 2005	2009	2011, 2012, 2013	2011, 2012, 2014	2012, 2013, 2014	2013, 2014	2015	2016
Geological knowledge (G-axis)								
Knowledge of raw material regarding quantity and quality	**G2**	**G2**	**G1**	**G1**	**G1**	**G1**	**G1**	**G1**
Supply continuity	**G3**	**G2**	**G2**	**G2**	**G2**	**G2**	**G2**	**G1**
Overall category	**G3**	**G2**	**G2**	**G2**	**G2**	**G2**	**G2**	**G1**
Socio-economic viability (E-axis)								
Legislation	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**
Policy implementation	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**
Awareness of raw material criticality	**E3**	**E3**	**E2**	**E2**	**E1**	**E1**	**E1**	**E1**
Political willingness	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**	**E1**
Stakeholder interest	**E3**	**E2**	**E2**	**E2**	**E1**	**E1**	**E1**	**E1**
Social license	**E2**	**E2**	**E2**	**E2**	**E1**	**E1**	**E1**	**E1**
Financial capability	**E3.1**	**E2**	**E2**	**N/Ap**	**E1**	**E1**	**E1**	**E1**
Profitability	**E3.2**	**E3.1**	**E2**	**E2**	**E1**	**E1**	**E1**	**E1**
Overall category	**E3.2**	**E3.1**	**E2**	**E2**	**E1**	**E1**	**E1**	**E1**
Field status and feasibility (F-axis)								
Infrastructure	**F3**	**F2.1**	**F1.2**	**F1.2**	**F1.2**	**F1.2**	**F1.2**	**F1.1**
Technology readiness level (TRL)	**F3**	**F2.2**	**F2.2**	**F2.2**	**F1.2**	**F1.2**	**F1.2**	**F1.1**
Operating license	**F4**	**F2.2**	**F2.2**	**F2.2**	**F1.2**	**F1.2**	**F1.2**	**F1.1**
Overall category	**F4**	**F2.2**	**F2.2**	**F2.2**	**F1.2**	**F1.2**	**F1.2**	**F1.1**
Final combination of overall categories	**G3, E3.2, F4**	**G2, E3.1, F2.2**	**G2, E2, F2.2**	**G2, E2, F2.1**	**G2, E1, F1.2**	**G2, E1, F1.2**	**G2, E1, F1.2**	**G1, E1, F1.1**

Project classification 1/2



Project classification 2/2



Lessons learned

1. Contingencies that affect the development of a recycling project

2. Case study experiences

3. UNFC benefits

Thank you!

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