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18/05/2015

Technical feasibility study and impact evaluation of an industrial waste gasification and valorization plant in Antwerp

Project team:

- For RDB-Envilux: Alfons Buekens
- For VITO: Karl Vrancken, Ann Van der Linden, Dirk Nelen, Ive Vanderreydt

VITO in a nutshell

200 scientific articles

400 patents worldwide

1000 Research projects

+500 Research partners

750 Highly-qualified researchers

26 Nationalities

7 locations in Belgium

HQ in Mol, Belgium

Data 31/12/2013

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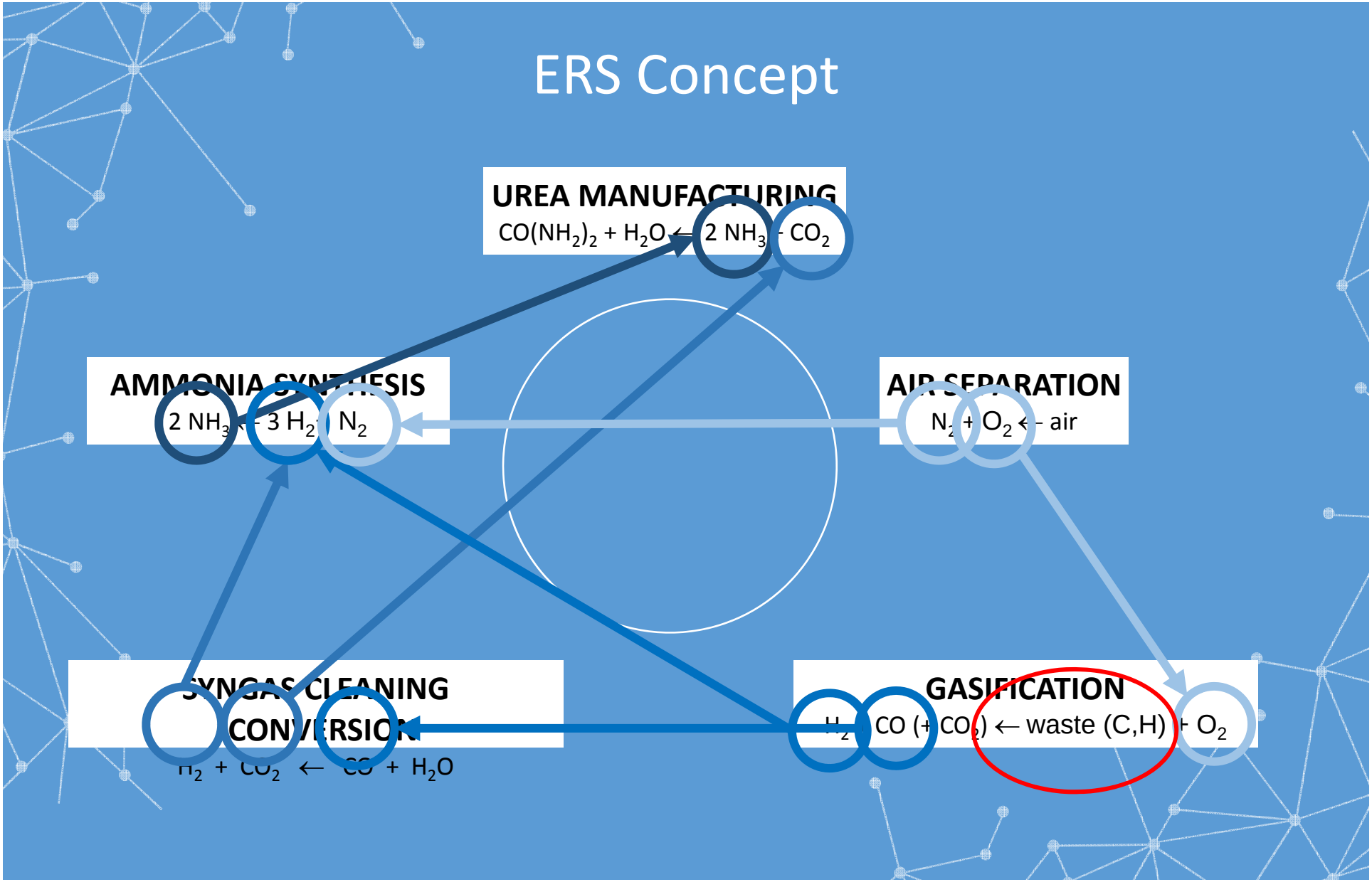
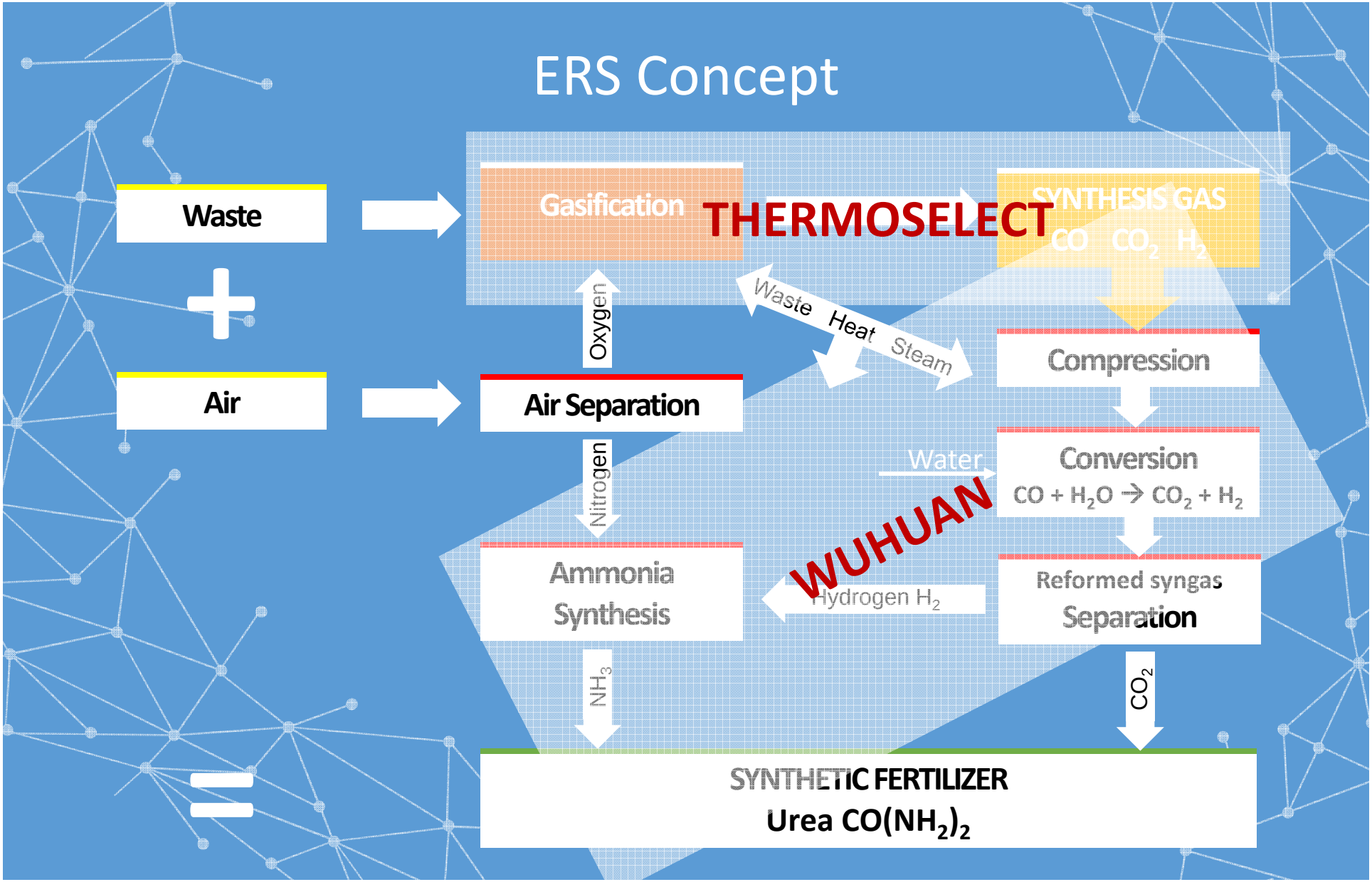
ERS Concept



ERS Concept



Approach

1 Technical feasibility

Prof. A. Buekens

RDB – Envilux

2 Environmental impact evaluation

Prof. K. Vrancken + team

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Does the project have a sound technical design?

Is it an innovative concept?

What will be the overall impact on the environment?

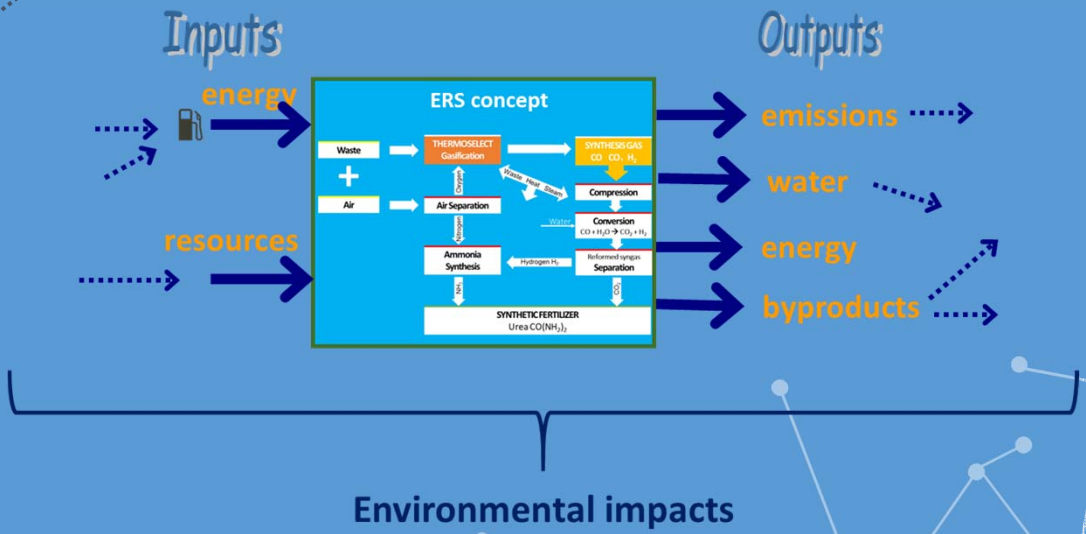
How does this impact compare to
- traditional waste management
- traditional production

Assessment of environmental impacts

METHODOLOGY

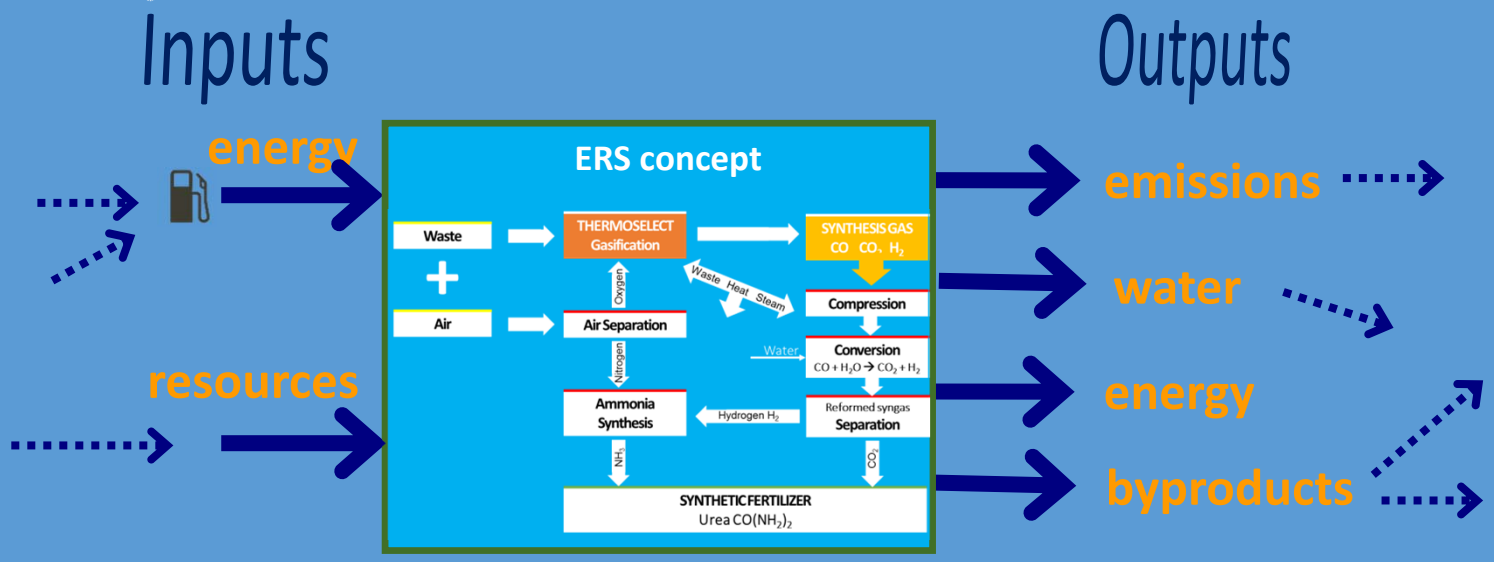
taking into account the **total life cycle**

all relevant inputs and outputs of the system, including all upstream and downstream impacts



Assessment of environmental impacts

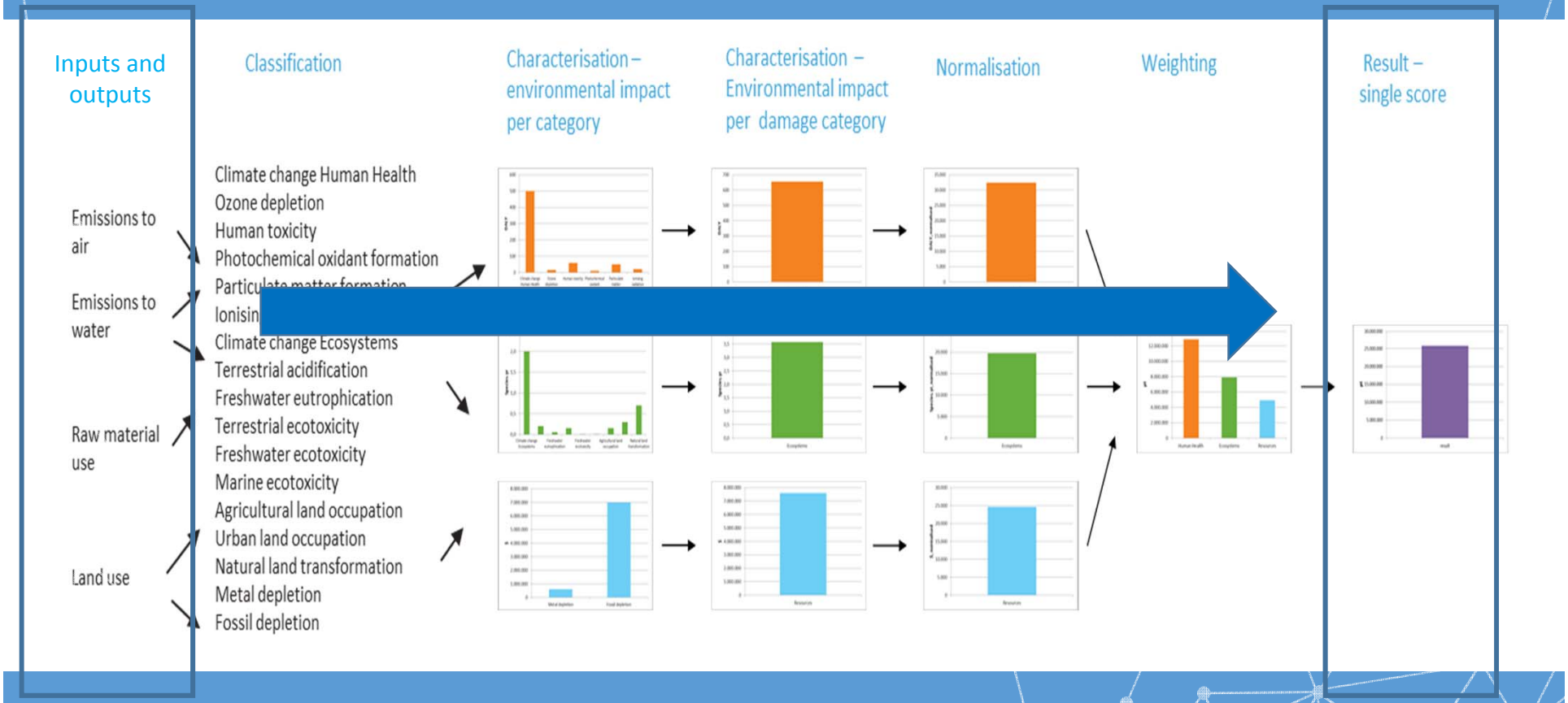
METHODOLOGY



Environmental impacts

Assessment of environmental impacts

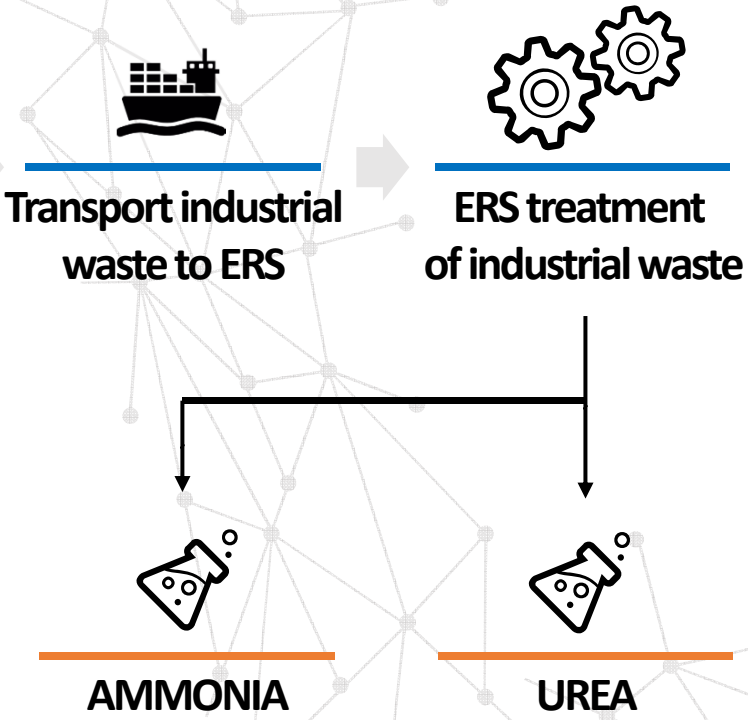
METHODOLOGY



Assessment of environmental impacts

ERS System

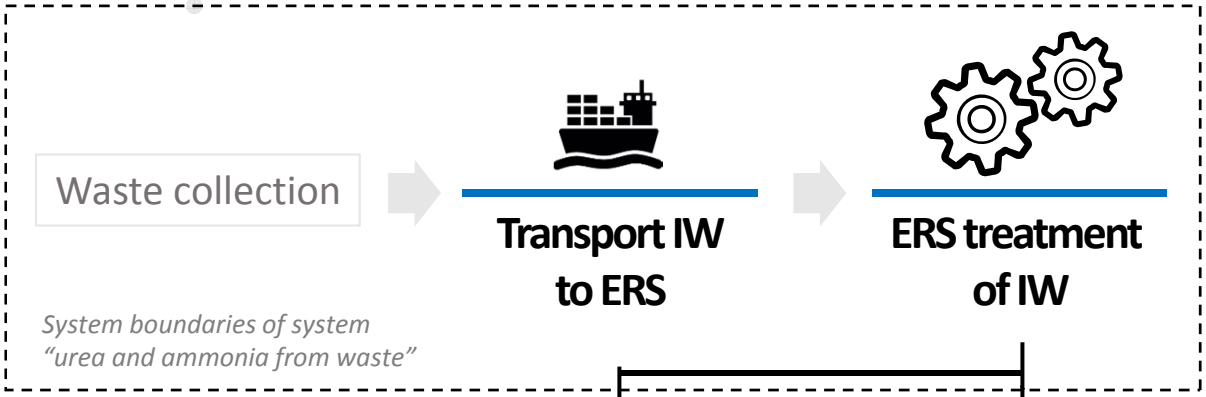
Waste collection



Functional unit: production of 650 kton of ammonia and 1,240 kton of urea from 3,500 kton of industrial post-recycling waste

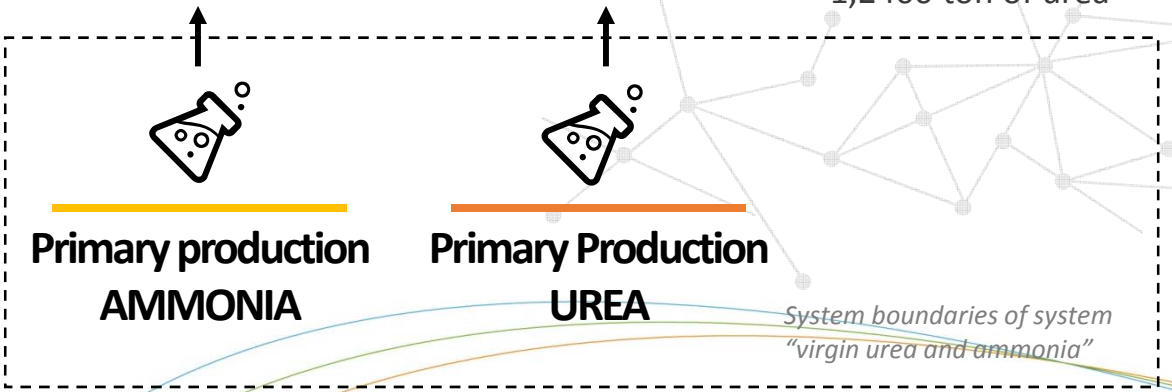
Assessment of environmental impacts

Benchmark from ammonia and urea production perspective



ANALYZED PROCESS

Functional unit: production of 650 kton of ammonia and 1,2400 ton of urea



AVOIDED PROCESS

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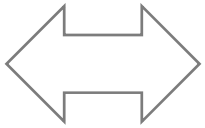
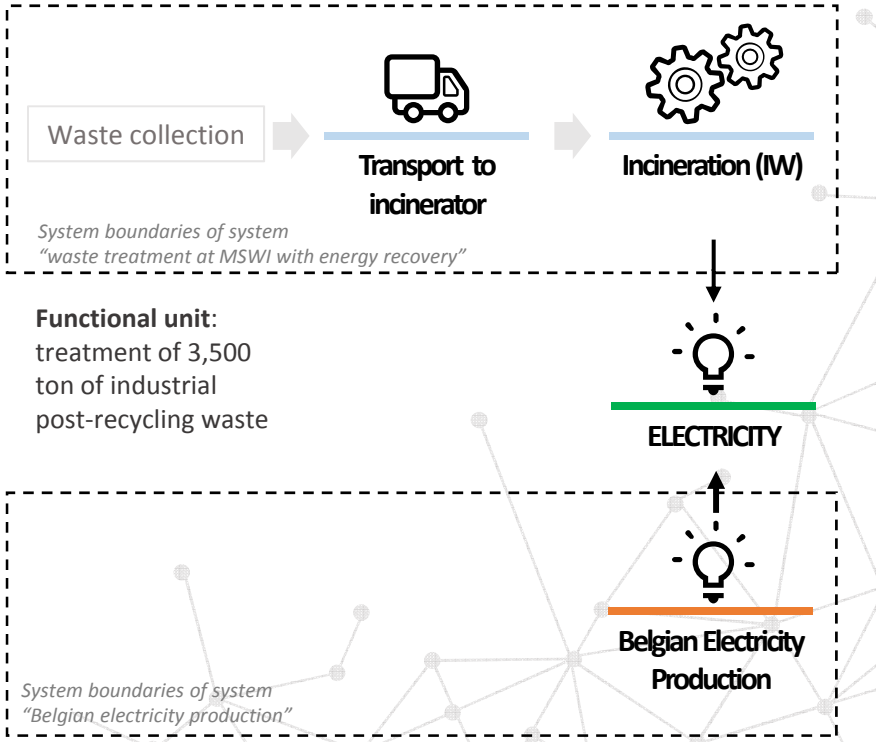
Assessment of environmental impacts

Benchmark from waste management perspective

ERS concept

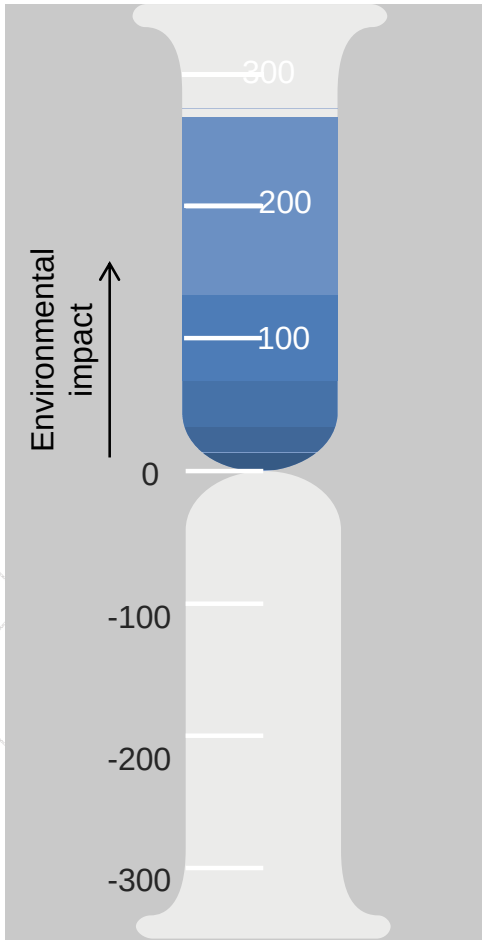
Functional unit:
treatment of 3,500
ton of industrial
post-recycling waste





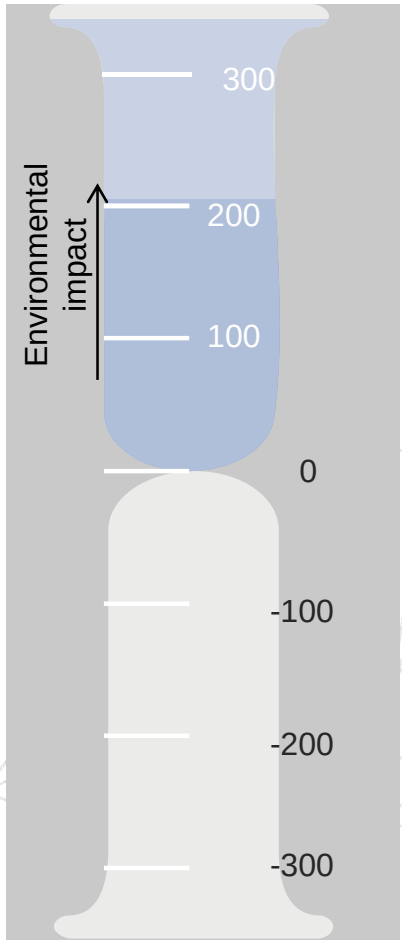
Result

Ammonia and urea production perspective



ERS concept

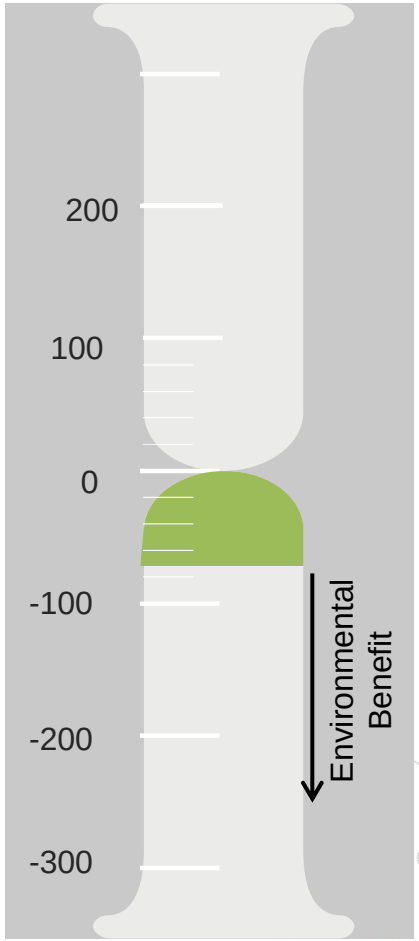
Fossil based production



Result

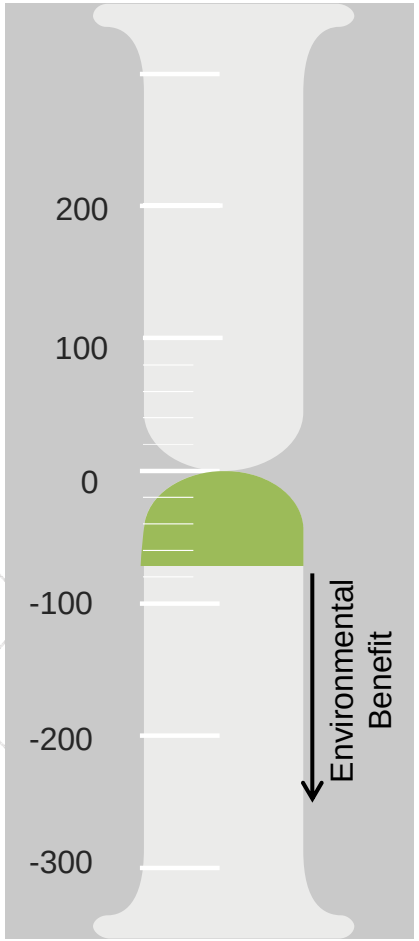
Ammonia and urea production perspective

Net result



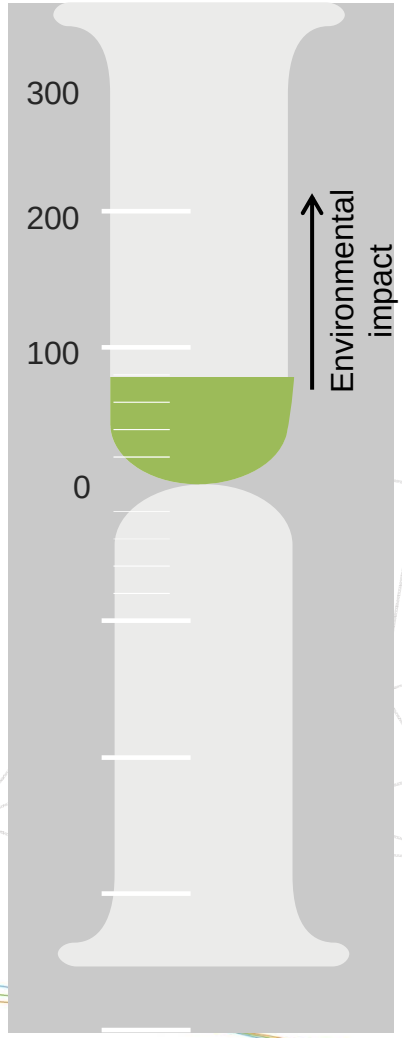
Result

Waste management perspective



Urea and ammonia production

Incineration



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Conclusions

Innovative concept, based on proven technologies

Better overall environmental performance compared to traditional techniques

Recommendations

Focus on high calorific input

Effects on input and output markets

Use existing experience for operation

Optimalisation potential