

Innovative characterization of Landfills and Smart decision-making as part of the circular economy

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Supporting a new Circular economy for Raw materials recovered from landfills

The Interreg North-West Europe Project is coordinated by SPAQuE and unites 8 partners from 4 EU regions.



Making decisions about what & why ?

Facts & Figures :
According to EU
Landfill Mining
Consortium EURELCO
Europe has :

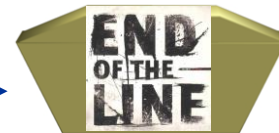
- 500.000 landfill sites
- 90% not operated according to current standards (non-sanitary landfills)



Making decisions about what & why ?



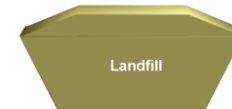
Landfilling : final waste disposal sites as the end of the line in a linear economy



Is this the end of story ?



Risk based approach (source – pathway – target) : install a safe infinite containment



Guarding the status quo :
is this static concept robust to environmental changes ?

COCOON-analysis :

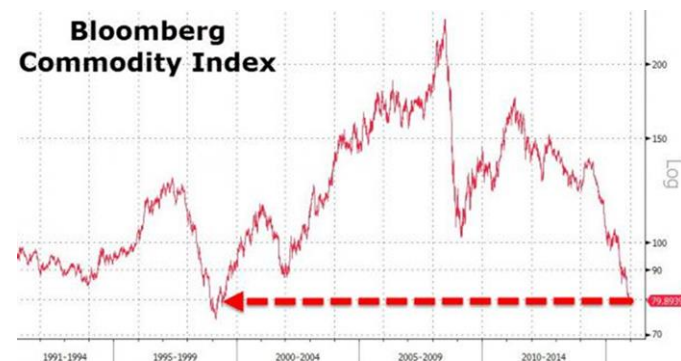
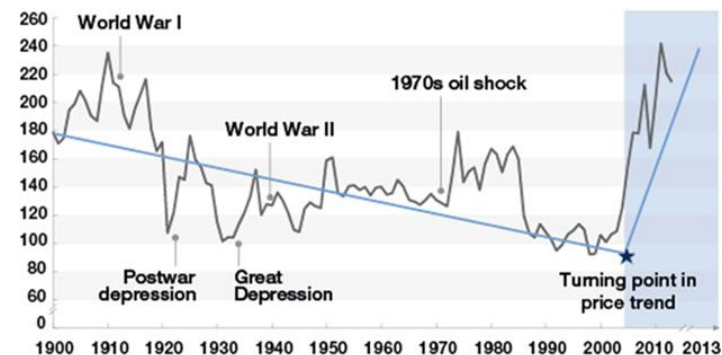
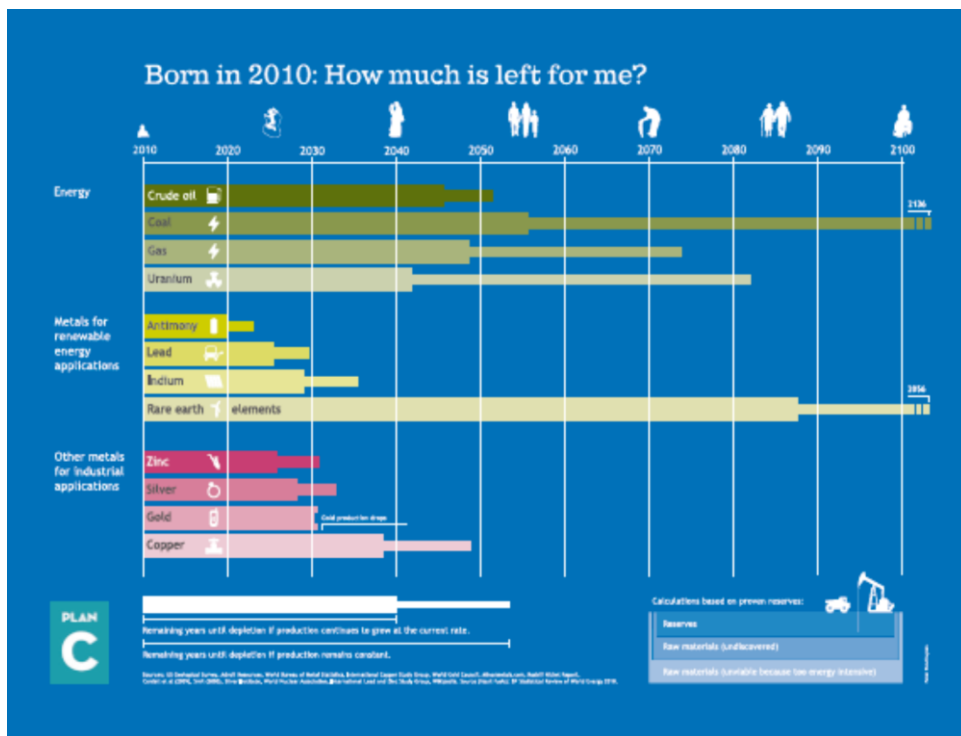
we are lucky people : there is quite a lot of room for improvement !

Introduction of Dynamic Landfill Management

WTF Landfills ?!

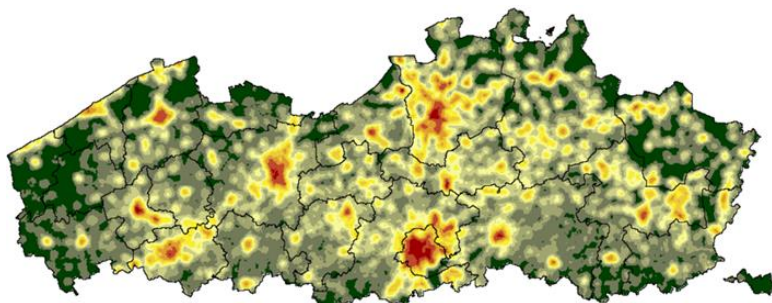


Demand & supply, prices

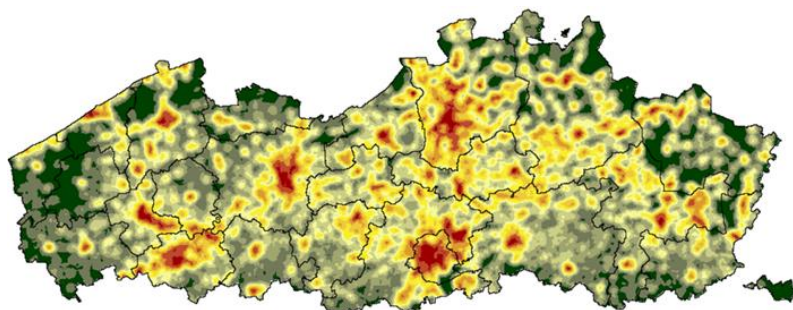


Broader framework

Spatial pressure and climate change



Spatial pressure 2010 - 2050



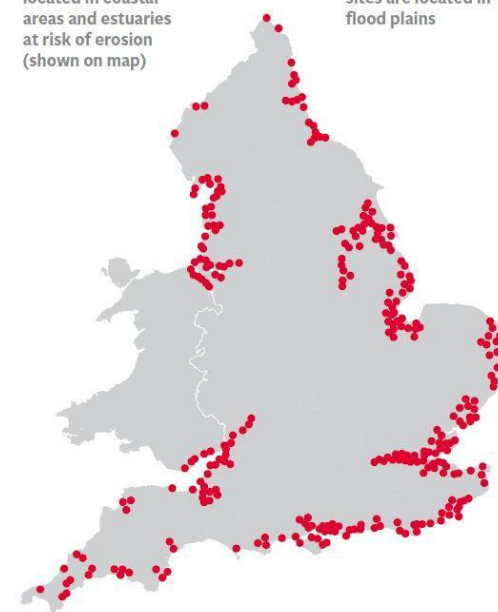
COASTAL AND ESTUARY LANDFILL DUMPS SITES AT RISK OF COASTAL EROSION IN ENGLAND AND WALES

1,264

landfill sites are
located in coastal
areas and estuaries
at risk of erosion
(shown on map)

2,946

additional landfill
sites are located in
flood plains



SOURCES: JAMES BRAND AND DR KATE SPENCER,
QUEEN MARY UNIVERSITY OF LONDON, DAREN GOODY

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MORE BEAUTIFUL**

Broader framework

Spatial pressure and climate change



JASON DEAREN AND MICHAEL BIESECKER, ASSOCIATED PRESS
SEP. 2, 2017, 3:08 PM



At the Highlands Acid Pit on Thursday, August 31, 2017, the No Trespassing sign on the barbed-wire fence encircling the 3.3-acre Superfund site barely peeked above the churning flood water from the nearby San Jacinto River.

Toxic waste sites flooded

At least 13 toxic waste sites in Texas were flooded or damaged by Hurricane Harvey, according to the Environmental Protection Agency. The agency announced Saturday that it had assessed 41 Superfund sites using aerial images, and determined the ones badly affected by the storm.

The impact of flooding on the sites is unknown. The EPA said its workers have not been able to "safely access the sites" but are ready to do so as soon as the floodwaters recede. In the Houston area, authorities had said it would take 10-15 days for floodwaters to recede.



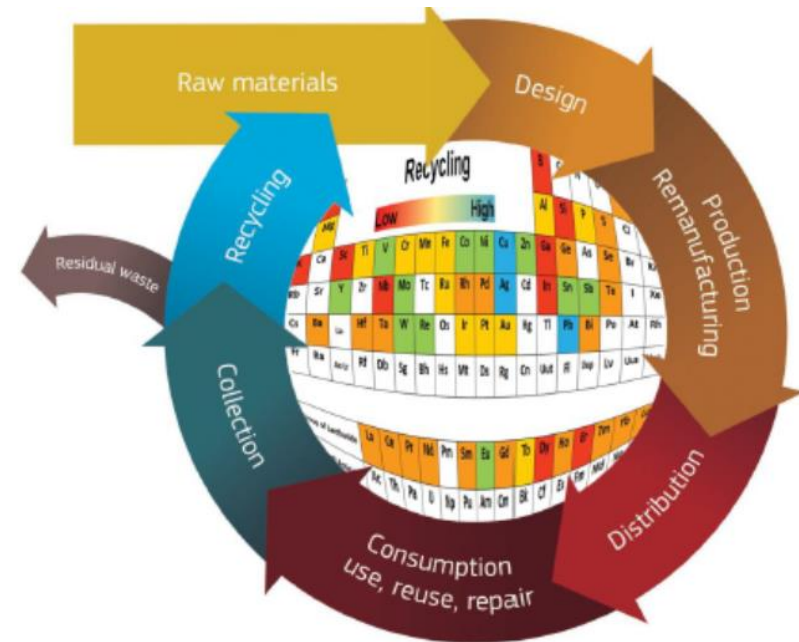
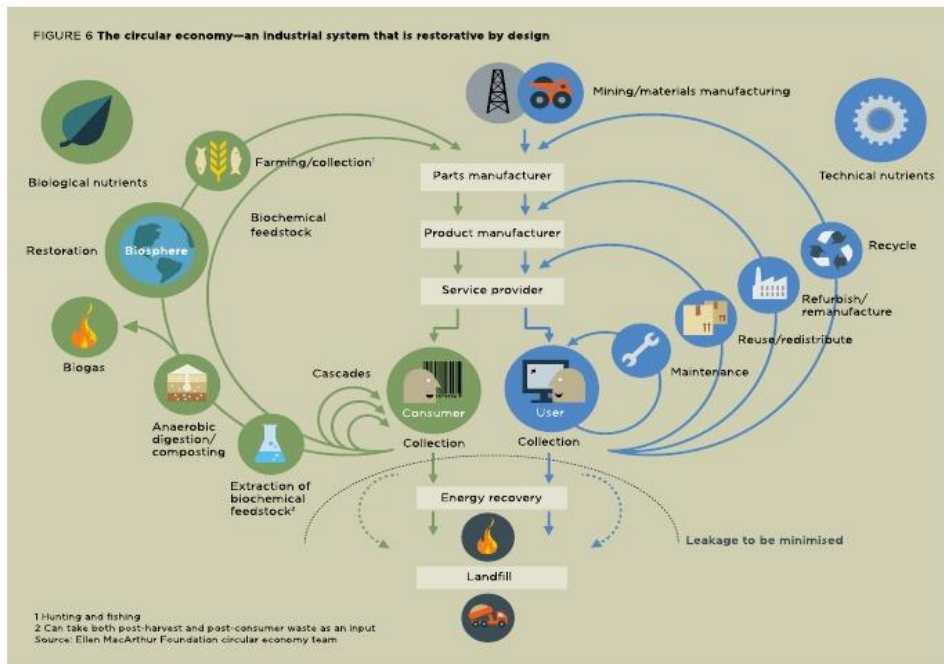
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Transition from Waste to material management

Final waste disposal versus stock of resources



Decision making and models

Conceptual site models & Decision support tools

SWOT of traditional CSM :

- ▶ Strength : objective and straight forward evaluation of Landfills on large scale
- ▶ Weakness : CSM with strong emphasis on impact of Landfills at environment (black box)
- ▶ Opportunities : new focus on Landfills and more data available
- ▶ Threats : unfulfilled expectations and timeframes not respected (no interim use)

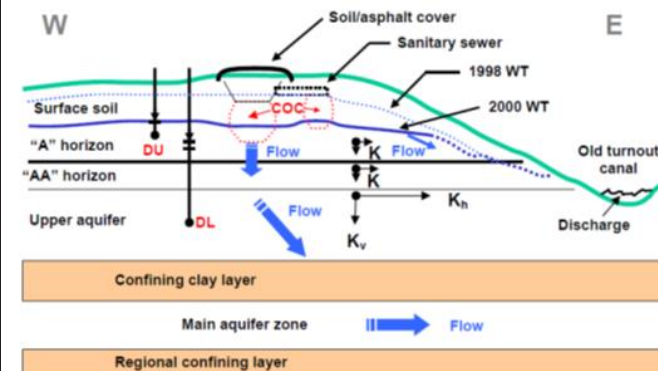
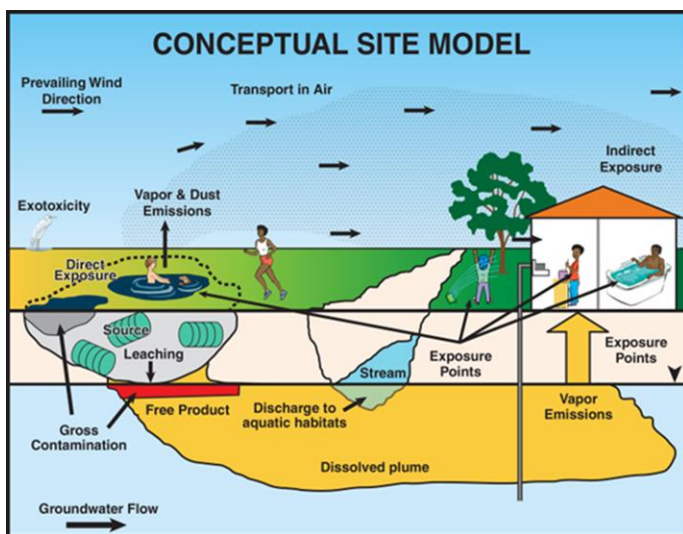
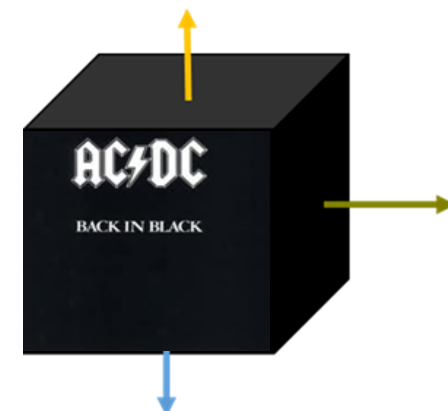


Figure 3-1. Initial conceptual site model showing a confining layer between two aquifers.



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Decision making and models

Conceptual site models & Decision support tools

Soil exploration = boring ?

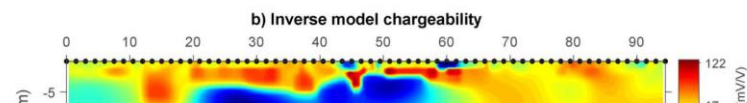
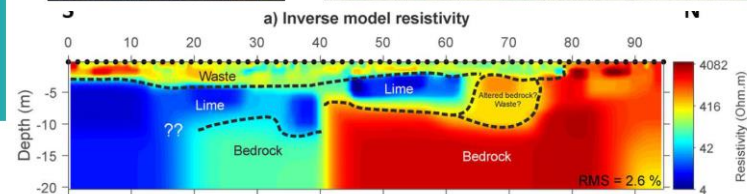
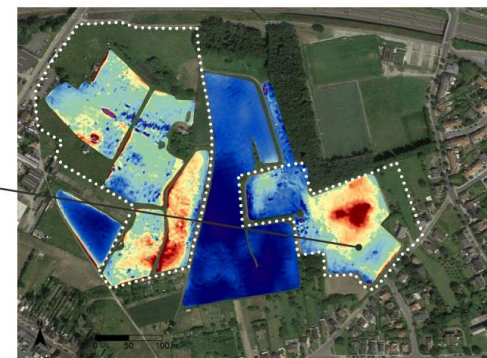


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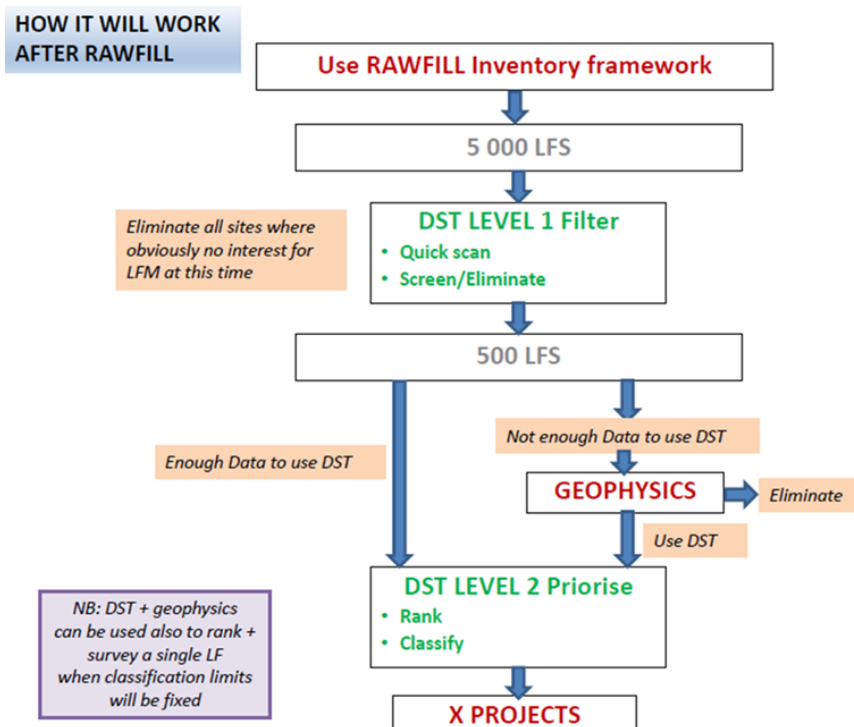
ECa 4 m HCP (mS/m)
 0 10 20 30 40 50 60 70



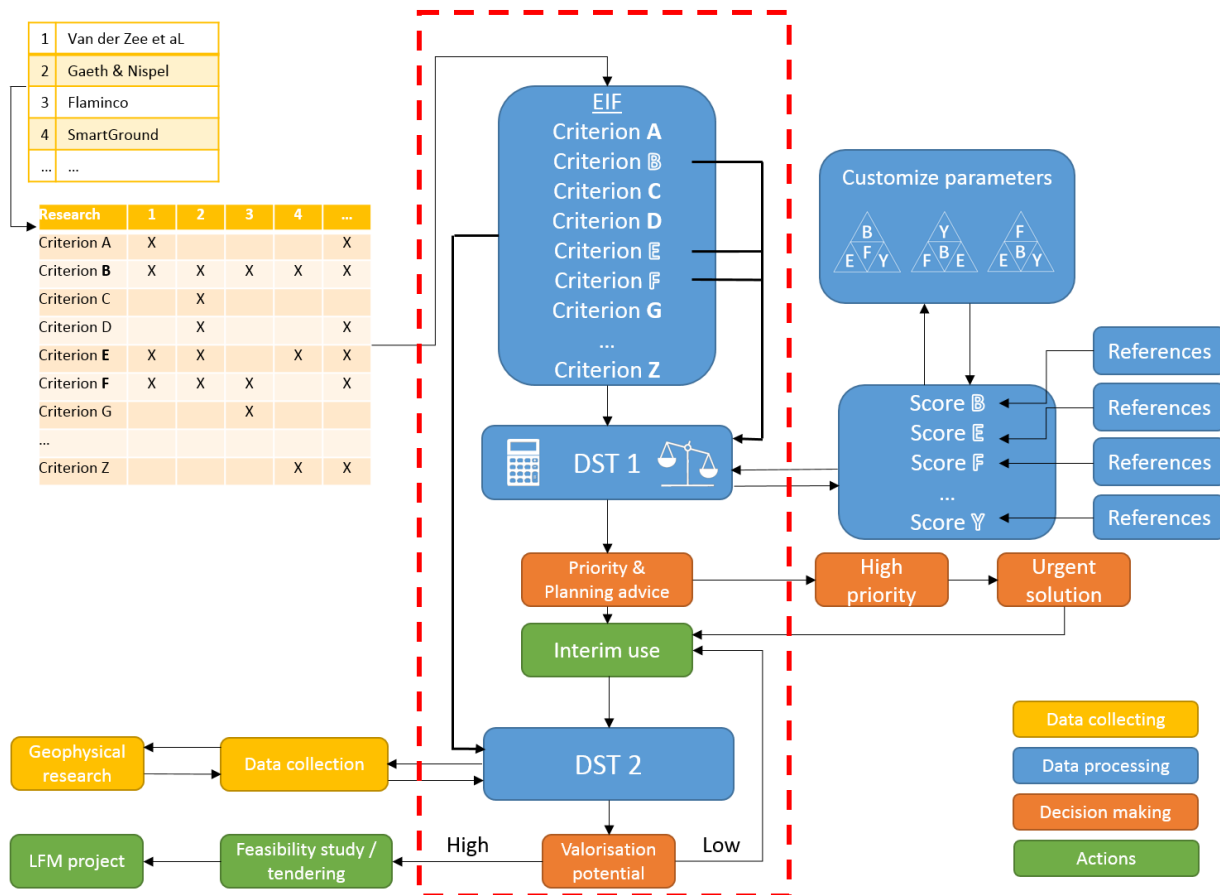
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Objectives of Rawfill



Tiered approach (2 steps)

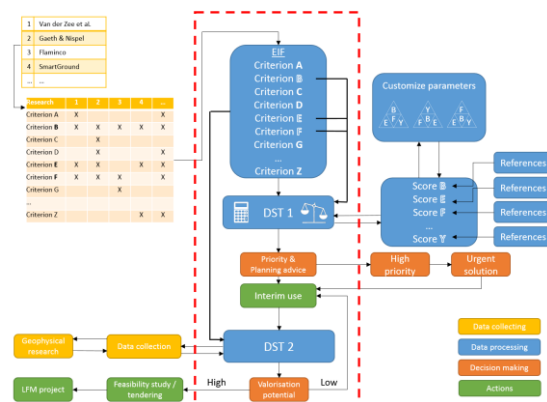


Tiered approach (2 steps)



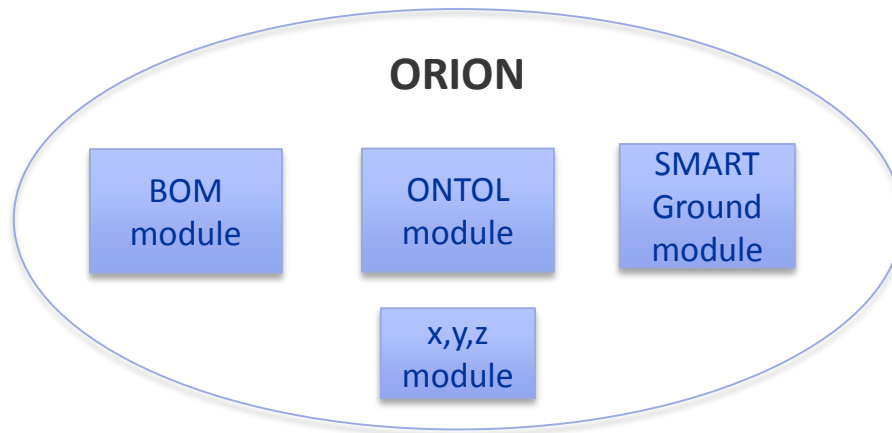
Servant Cedalion is leading the temporary blinded giant Orion to the light Eos.

- The metaphor of dwarfs standing on the shoulders of giants expresses the meaning of "discovering truth by building on previous discoveries".
- Isaac Newton in 1675: "If I have seen further it is by standing on the shoulders of Giants."



Orion: connecting & delivering solutions

- Not reinventing but re-using & recycling already developed tools for similar conditions / sites
- Customizing those tools and combining them in the Dashboard of DST 2 - Orion



Brownfield Opportunity Matrix – HOMBRE
ONTOL – UNFC for Anthropogenic resources
SMARTGround - MSCA

Looking forward to see you again at the RAWFILL final conference in June 2020



Interreg



EUROPEAN UNION

North-West Europe

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European Regional Development Fund

Thank you!