

**Strength in numbers:
Evaluating a Bioeconomy Region from an
integrative Life Cycle perspective**



Alberto Bezama

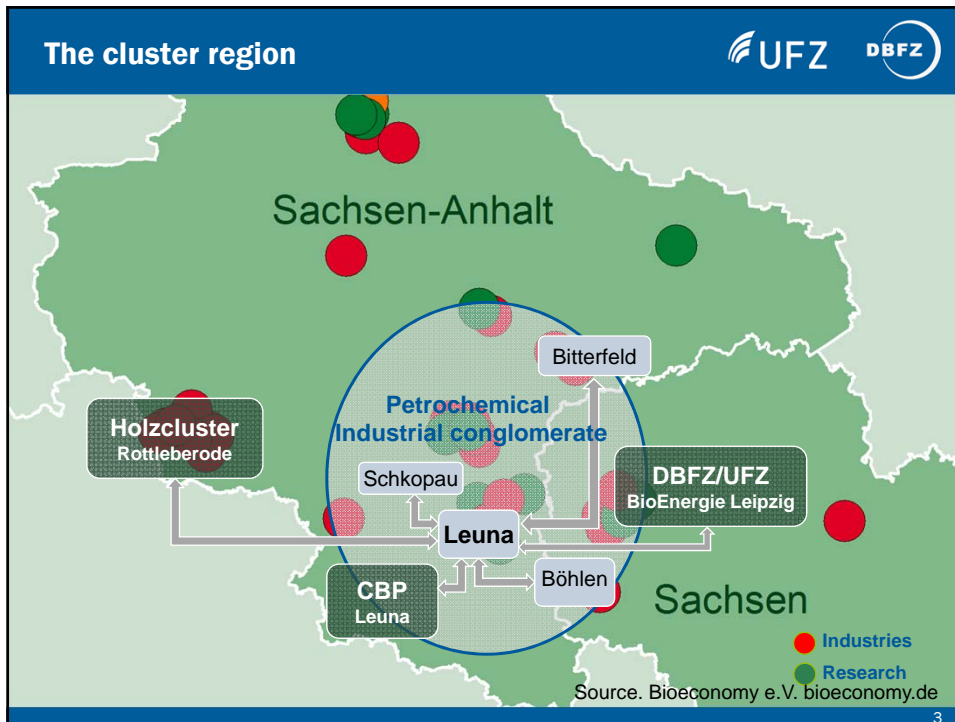
Motivation

There is always strength in numbers. The more individuals or organizations that you can rally to your cause, the better.

Mark Shields

 quotefancy

Source: [quotefancy.com](https://www.quotefancy.com)



To evaluate a bioeconomy network with regional LCA-based tools

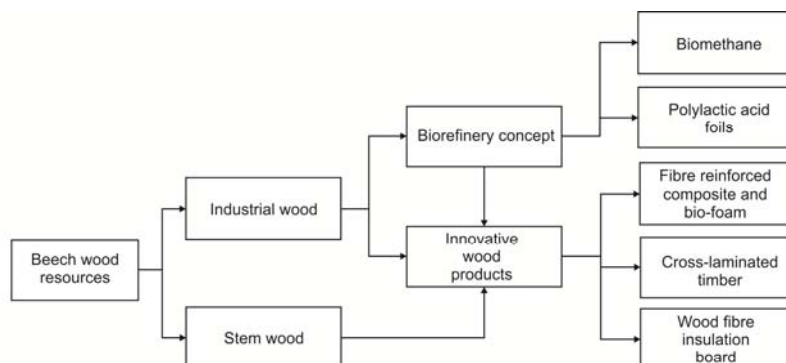
To compare the performance of bio-based products against their standard reference products





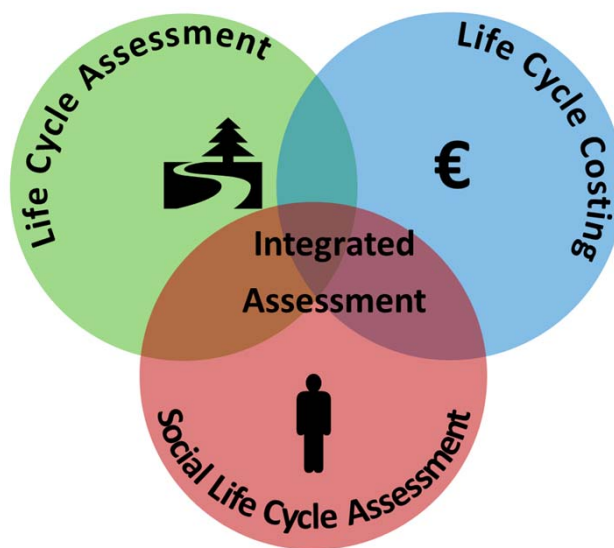
<http://dreamicus.com/>

An exemplary product basket for the Bioeconomy Region



Function vs. Mass

	Product basket - Bioeconomy Region	Reference Product Basket	
40,000	Biomethane	Methane	40,000
50,000	Expanded PLA	Expanded Polystyrene (EPS)	50,000
10,000	Fibre reinforced composite and bio-foam	Polyurethane	12,500
50,000	Cross-laminated timber	Reinforced concrete (load-bearing structure) + calcareous sandstone (excluding EPS)	325,000
5,000	Wood fibre insulation board	Expanded Polystyrene (EPS) board	1,750
Annual production volume (t/a)			Annual production volume (t/a)



Results: The big picture



Results: What have we learned?



Results: What have we learned?

Sustainability and Resources Management



Source: Pixabay.com, User: ElisaRiva



Source: Pixabay.com, User: PublicDomainPictures

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Results: What have we learned? – Sustainability and Resources Management

Material use of biomass is an adequate utilization pathway for sustainably available biomass



Photo: Lothar Sprenger

Don't discard bioenergy: It can still play a role in the future energy sector



Photo: DBFZ



Photo: DBFZ

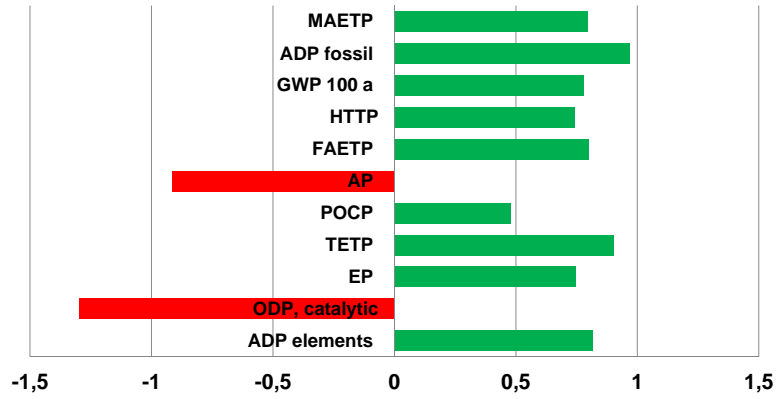


Photo: grtgaz.com

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Relative advantage of the regional bio-based basket in comparison of CML 2013 Impacts



ADP elements: Abiotic depletion of elements [kg Sb-equiv.] HTTP: Human toxicity potential [kg DCB-equiv.]
 EP: Eutrophication potential [kg Phosphat-equiv.] GWP 100 a: Global warming potential [kg CO2-equiv.]
 TETP: Terrestrial ecotoxicity potential [kg DCB-equiv.] ADP fossil: Abiotic depletion of fossils [MJ]
 POCP: Photochemical ozone creation potential [kg Ethen-equiv.] MAETP: Marine aquatic ecotoxicity [kg DCB-equiv.]
 AP: Acidification potential [kg SO2-equiv.] FAETP: Freshwater aquatic ecotoxicity potential [kg DCB-equiv.]

Results: What have we learned? – Sustainability and Resources Management

Material use of biomass is an adequate utilization pathway for sustainably available biomass



Photo: Lothar Sprenger

Don't discard bioenergy: It can still play a role in the future energy sector



Photo: DBFZ

The actual road to sustainability must consider the regional capacities and structures



Photo: redmondmag.com



Photo: DBFZ



Photo: grtgaz.com

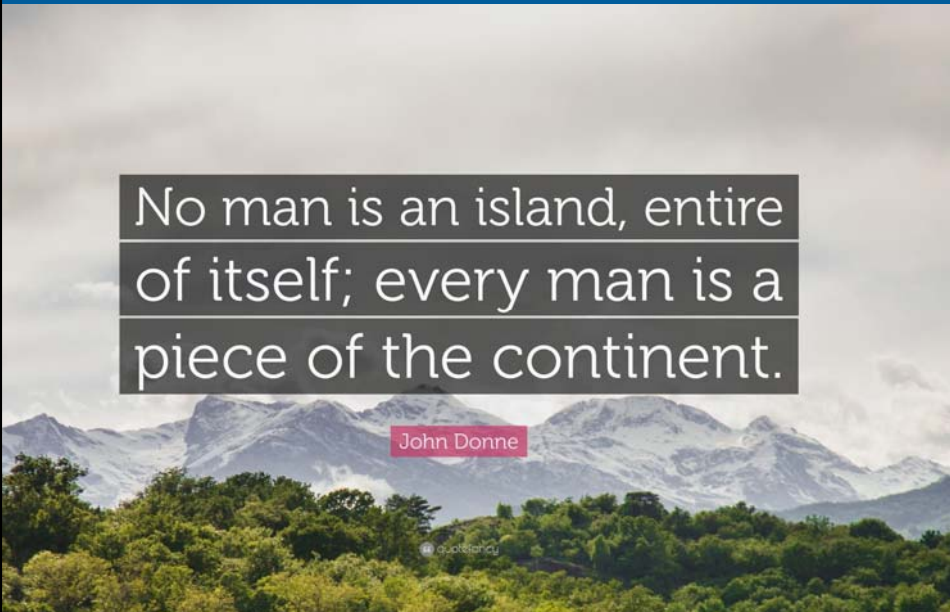


Photo: thepeakbc.com



No man is an island, entire
of itself; every man is a
piece of the continent.

John Donne



Bringing the systems perspective



Source: praxis-henning.eu

Establishing a regional critical mass



Source: Pixabay.com, User: maxjkt

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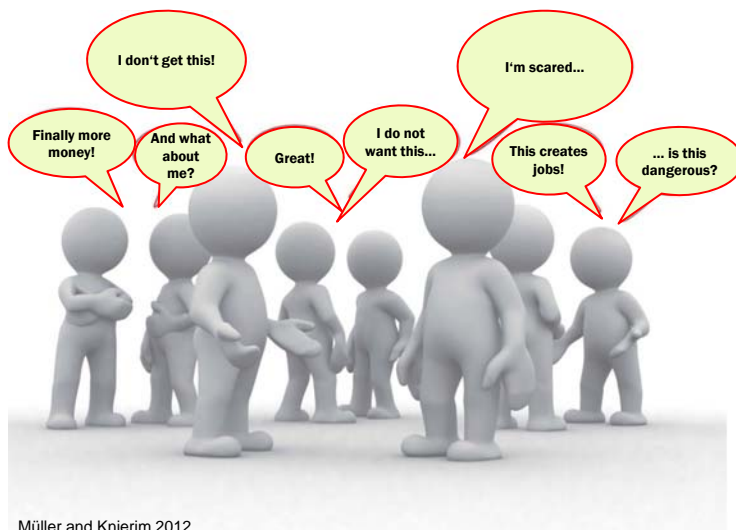
Social acceptance



Source: Pixabay.com, User: GDJ



Source: Pixabay.com, User: GDJ



Müller and Knierim 2012



Inclusion, discussion, connection



SOCIAL ACCEPTANCE

One last thought...



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A part of the main



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In summary...



There is always strength in numbers. The more individuals or organizations that you can rally to your cause, the better.

Mark Shields

It is not in numbers, but in unity, that our great strength lies.

Thomas Paine

Source: quotefancy.com



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