DF94: Turning Waste into Value: Life Cycle Assessment of Side Stream Valorisation and Food Waste Reduction



WLAN name: guest-ZHAW

Access code: 763427

DISCUSSION FORUM ON LIFE CYCLE ASSESSMENT

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94th LCA Discussion Forum

Turning Waste into Value: Life Cycle Assessment of Side Stream Valorisation and Food Waste Reduction

Matthias Stucki
Claudio Beretta
Dimitri Chryssolouris

Friday, November 6, 2026, 08:30-12:00h and 13:00-17:15h
ZHAW Wädenswil, Campus Grüental, Aula in GA 203 and online
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Side Stream Valorisation

- Switzerland: about **2.8 Mt** of food losses and waste (FLW) per year[1]
- **Processing** is the largest stage (~1 Mt), mostly side streams[1]
- **Side streams**: by-products, e.g. spent grain, okara, cocoa shells
- Valorisation: ideally **as food**, otherwise as feed, materials or energy
- Action Plan: **halve avoidable FLW by 2030** vs. 2017[2] (including side streams)

Source: [1] Beretta & Hellweg (2019), Waste Management 98; [2] Swiss Federal Council (2022), Action Plan against Food Waste

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Key questions

- Which side streams offer the **greatest environmental benefit** when valorised?
- How should side streams enter the LCA: **allocation, substitution or burden-free**?
- What is the **realistic potential** in Switzerland, and what holds it back?

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Programme (1)

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Time	Working Title	Speaker [Chair]
08:15	Registration and Coffee	Dimitri Chryssolouris, ZHAW
08:50	Welcome and Introduction to the Topics of the Day	Matthias Stucki & Claudio Beretta, ZHAW
09:00	**Session 1: Why Food Waste & Side Streams Matter**	**[Matthias Stucki]**
09:00	Action Plan Against Food Waste: Implementation, Monitoring and the Crucial Role of LCA for Food Waste Reduction and Side Stream Valorisation	Florence Favre, BAFU
09:20	From Material Flows to Environmental Impacts: Modelling Food Systems to Support EU Policies and Boost Innovation	Annarita Valenzano, JRC
09:40	Environmental Impacts of Food Waste in Europe and Priorities for Mitigation	Mara Petruzzelli, Agroscope
10:00	Discussion	all
10:15	**Interactive Coffee Break**	
10:45	**Interactive Break Recap**	
10:55	**Session 2: Methodological Approaches to Assess Side Stream Valorisation**	**[Dimitri Chryssolouris]**
10:55	Methodological and Data Challenges in the Assessment of By-Product Valorisation – and Approaches to Address Them	Vanessa Zeller; Justus-Liebig-Universität Giessen
11:15	Insights and Learnings from Comparative LCAs on Side Streams in Switzerland	Stefanie Maeder, Intep Integrale Planung GmbH
11:35	Realistic Potential of Valorising Side Streams	Claudio Beretta, ZHAW
11:55	Discussion	all
12:10	**Interactive Lunch Break**	

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Programme (2)

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13:40	**Interactive Break Recap**	
13:50	**Session 3: Case Studies**	**[Claudio Beretta]**
13:50	Upcycling of Brewer's Spent Grain: Life Cycle Sustainability Assessment of the CHEERS Biorefinery	Dimitri Chryssolouris, ZHAW
14:10	Comparative Screening Life Cycle Assessments of Okara Valorisation Scenarios	Karina Rohrer & Lena Breitenmoser, FHNW
14:30	From By-Product to Food Innovation: Upcycling Side Streams into Novel Foods	Corinna Bolliger, ZHAW
14:50	Nutritional Losses in Food Waste and Sidestreams, and the Environmental Impacts of Overconsumption	Silvia Zingale, Agroscope
15:10	Discussion	all
15:30	**Interactive Coffee Break**	
16:00	**Interactive Break Recap**	
16:10	**Session 4: Short Presentations**	**[Matthias Stucki]**
16:10	Food Waste to Reduce Food Waste: LCA Insights from the AgriBioPack Project	Agata Costanzo, Sant'Anna School of Advanced Studies (online)
16:20	LCA of the Multivalorisation Biorefinery of Botanical Ingredients in the Project SustaiNext	Adriana Díaz, ECODESIGN company (online)
16:30	Expired Food: A Proven Source of Energy	Mahtab Pak, UMWELT s.r.l
16:40	LCA of Food System Wastes Valorised in Peat-reduced Horticultural Substrates	Reto Deuber, ZHAW
16:50	Closing reflections and outlook	Matthias Stucki & Claudio Beretta, ZHAW
17:05	**End of LCA Forum**	

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Interactive Breaks

- To facilitate exchange
- The Idea is to discuss a question during breaks
- After the breaks we will gather answers and discuss them briefly



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Session 1: Why Food Waste & Side Streams Matter

Action Plan Against Food Waste: Implementation, Monitoring and the Crucial Role of LCA for Food Waste Reduction and Side Stream Valorisation	Florence Favre, BAFU
From Material Flows to Environmental Impacts: Modelling Food Systems to Support EU Policies and Boost Innovation	Annarita Valenzano, JRC
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Interactive Coffee Break:

Question: Which food side stream has the greatest sustainability potential in Switzerland?

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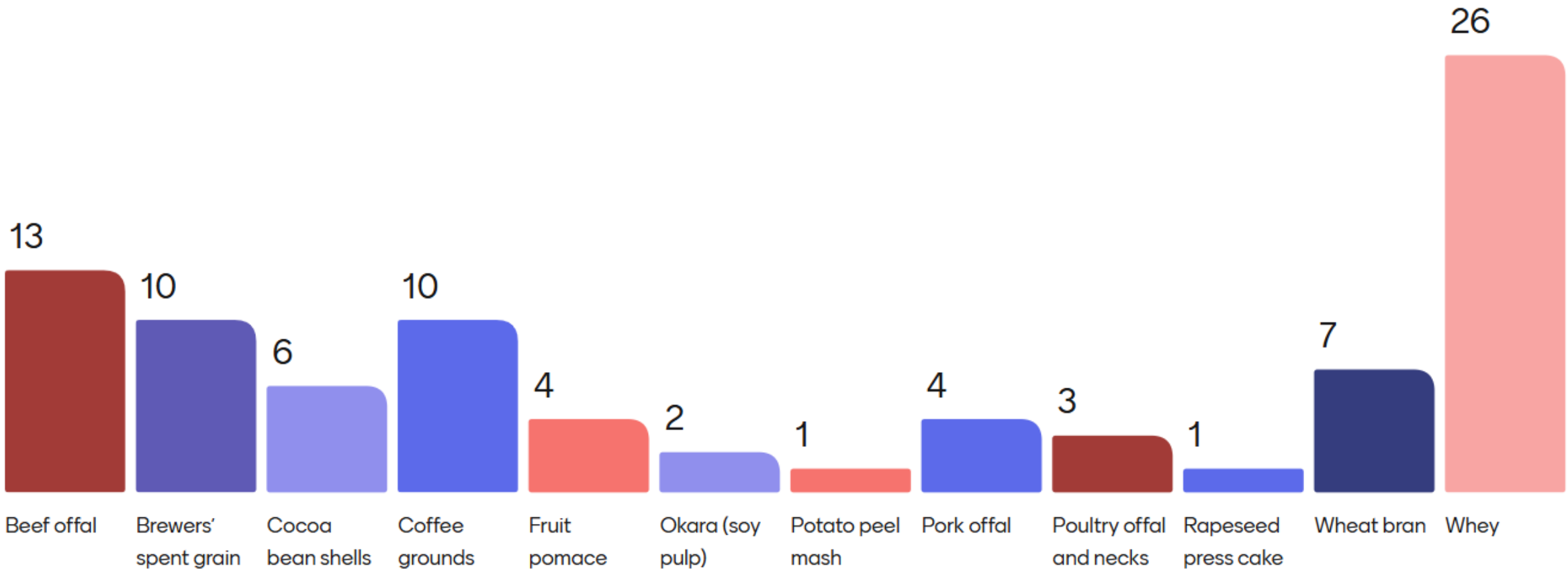
Which food side stream offers the greatest ecological potential in Switze



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Session 2: Methodological Approaches to Assess Side Stream Valorisation

Methodological and Data Challenges in the Assessment of By-Product Valorisation – and Approaches to Address Them	Vanessa Zeller; Justus-Liebig-Universität Giessen
Insights and Learnings from Comparative LCAs on Side Streams in Switzerland	Stefanie Maeder, Intep Integrale Planung GmbH
Realistic Potential of Valorising Side Streams	Claudio Beretta, ZHAW

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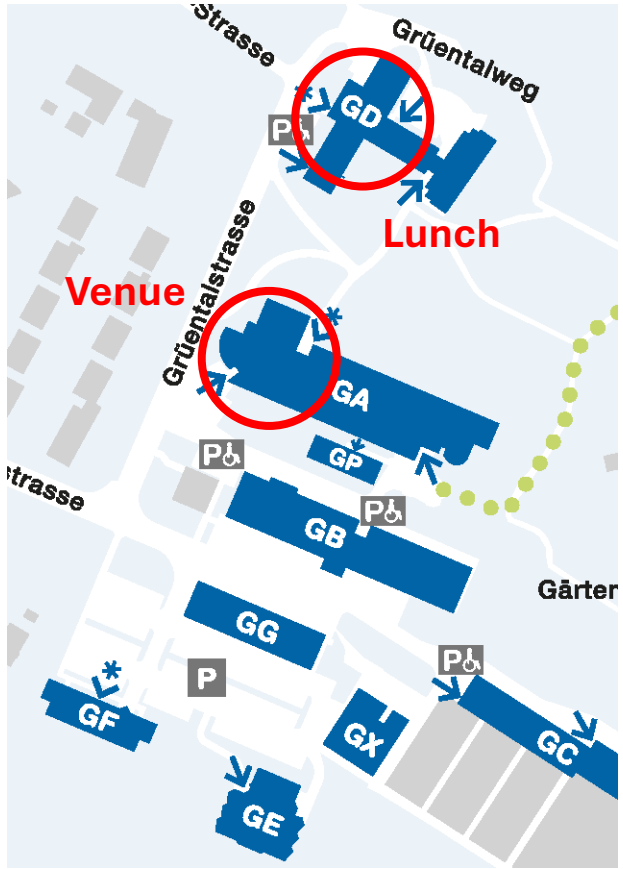
Instructions Lunch

UNGARISCHE ART
Seitanstreifen, Paprika, la Fraîche, Penne, Rosenkohl

CORDON BLEU
Pommes frites, Karotten

- Lunch at the ZHAW restaurant in the building **GD**.
- Please indicate to the cashiers that you are attending the LCA Discussion Forum, so that they can add your order to the event tab.
- The registration fee covers a beverage and the daily meal or salad buffet.
- Other items in the restaurant are at your own expense.
- A vegetarian meal option is always on offer.



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Interactive Lunch Break:

Question: Allocation or substitution – does the goal of the LCA matter?

Which approach would you recommend when assessing:

1. **The environmental footprint of granola containing apple pomace as an ingredient?**
2. **The environmentally preferable valorisation pathway for apple pomace (e.g., granola ingredient vs. animal feed)?**

Would you use the same approach for both? Why (not)?

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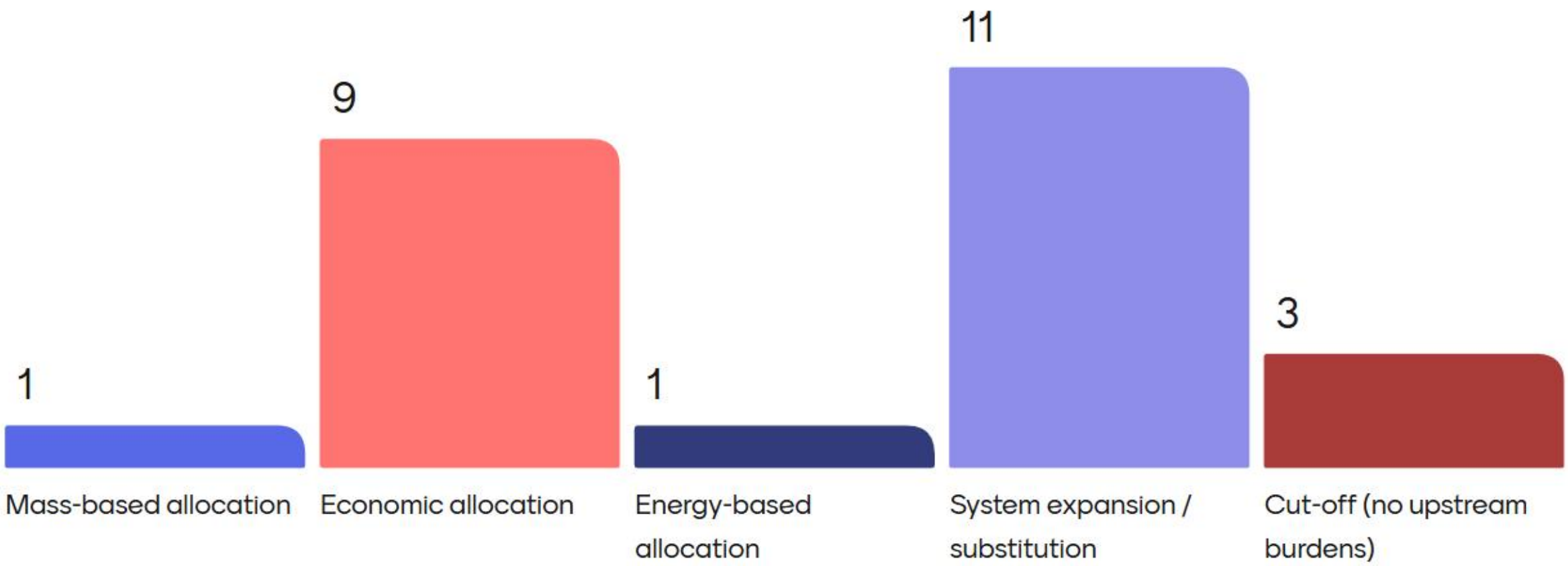
Which approach would you recommend...

Case 1: Quantifying the environmental footprint of granola containing apple pomace – which approach would for the pomace?



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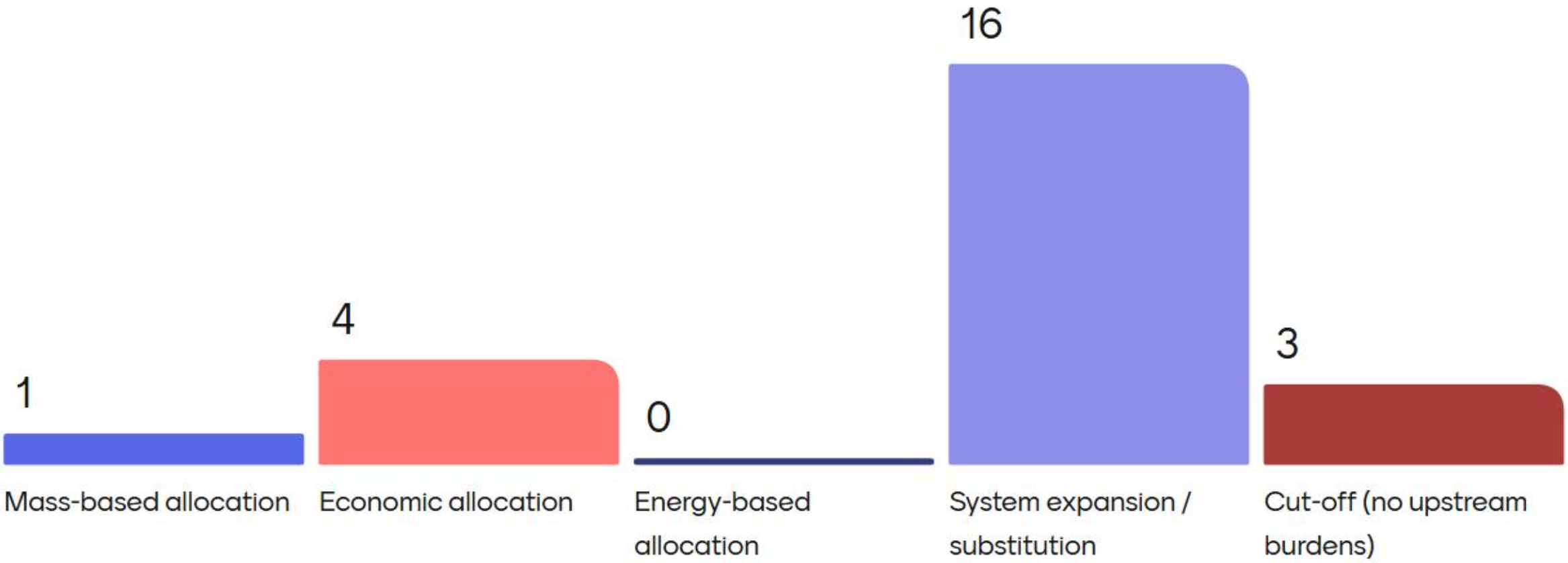
Which approach would you recommend...

Case 2: Comparing valorisation pathways for apple pomace (granola vs. animal feed) – which approach would you use?



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Session 3: Case Studies

Upcycling of Brewer's Spent Grain: Life Cycle Sustainability Assessment of the CHEERS Biorefinery	Dimitri Chryssolouris, ZHAW
Comparative Screening Life Cycle Assessments of Okara Valorisation Scenarios	Karina Rohrer, FHNW
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Interactive Coffee Break:

Question: What are your main take-home messages from today?

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Session 4: Short Presentations

Food Waste to Reduce Food Waste: LCA Insights from the AgriBioPack Project	Agata Costanzo, Sant'Anna School of Advanced Studies (online)
LCA of the Multivalorisation Biorefinery of Botanical Ingredients in the Project SustaiNext	Adriana Díaz, ECODESIGN company (online)
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Which insights do you take home from this forum?

Better insights into the Swiss Action Plan
Difference btw Valorisation and Utilisation as terms

results aren't always straight forward and depend on many factors (substitution, functional unit, allocation method).

Valorization pathways need to be carefully reflected and compared against each other.

Impact, not just tonnes.

Consider the substituted markets response

Base data for specific analyses are being developed

circular bioeconomy is feasible

, food waste topic is larger than I thought

Product basket = super cool

Understanding the scale, uncertainty, and variability of substitution is key for waste-related lca

HILCSA and how to properly integrate the social/economic aspect of food supplies

Group responses
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Closing Reflection

- **Prevention first**; valorise the side streams that cannot be avoided
- Benefit = **substituted products** minus **added impacts** of valorisation
- Replace the products or ingredients with the **highest impact**
- Method choices **can reverse LCA results**: be transparent
  - **Substitution**: benefit of valorisation vs. status quo
  - **Allocation**: side-stream product vs. other products
- Potential depends on **logistics, quality and demand**, not just technology

Outlook 2027

DF 95:
The environmental footprint of AI: Beyond power consumption

organised by Carbotech AG

10 March 2027, **GEP Pavillon (ETH Zurich)**

DF 96:
Regionalised LCA: bridging methodological advances, tool development and practical applications

organised by Agroscope

2 September 2027, **GEP Pavillon (ETH Zurich)**

DF 97:
From Carbon Removal Claims to Environmental Reality: LCA of CDR Pathways

organised by PSI/ETH Zurich

11 October 2027, **GEP Pavillon (ETH Zurich)**

DF 98:
LCA in Swiss construction: needs, data and tools

organised by treeze Ltd.

2 December 2027, **GEP Pavillon (ETH Zurich)**

Registration and payment

To register for a LCA Discussion Forum, please use the following link:
https://ethzurich.eventsair.com/lca2027/registration/Site/Register

https://lca-forum.ch/

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Assessing the Environmental Footprint of AI: Data, Methods and Transparency Challenges for LCA

95th LCA Discussion Forum

10th March 2027

What to expect

- Beyond electricity: chips, water, critical raw material and global supply chains
- Data centers under the LCA lens with **Infomaniak** and **TCO Development**
- Where AI pays off ecologically
- a lot of time for discussion!!

Join the discussion:

As AI continues to expand across industries, there is a growing need for robust and transparent approaches to evaluate the environmental footprint of both AI systems and the hardware that enables them. This discussion forum will bring together experts from LCA, semiconductor manufacturing, data center operations, and AI development to discuss current knowledge, methodological gaps, and future directions for environmental assessment.

Thank you and farewell!

Matthias Stucki

Claudio Beretta

Dimitri Chryssolouris



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