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Article

Road to a bioeconomy in the European Union: Mapping drivers of precision fermentation adoption

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Online-Appendix

„Road to a Bioeconomy in the European Union: Mapping Drivers of Precision Fermentation Adoption“

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Appendix

Appendix A: Detailed Overview of Interviewed Experts

No.	Function	Organization Type	Rationale for Inclusion	Date
1	Consultant	Consultancy	<ul style="list-style-type: none"> • Works at the technology practice of one of the largest management consultancies globally, consulting for several Fortune 500 companies • Co-authored seminal and respected reports on the transformation of diverse industries and value chains through synthetic biology, including PF • Previously worked at an established deep tech think tank • Holds a PhD in Biochemistry ➔ Works with the niche and the socio-technical regime; unique perspective on landscape pressure on regime; and interactions between niche and (industry) regime 	26.04.2023
2	Investment Manager	Venture Capitalist	<ul style="list-style-type: none"> • Experienced venture capital investor and company builder with strong focus on biomanufacturing • Board member at European start-up that utilizes PF to produce staple foods ➔ Works from the niche with several PF companies, has a short- and long-term view on potential niche development 	26.04.2023
3	Doctoral Student in Law, Consultant	University: Faculty of Life Sciences: Food, Nutrition and Health; Faculty of Law and Economics	<ul style="list-style-type: none"> • PhD student in law conducting research on authorization procedures of novel technologies and regulation of food innovations in the European Union • Consultant for government bodies, European institutions, and NGOs ➔ Works with the established regime on interactions with the niche, especially from a regulatory perspective 	27.04.2023

No.	Function	Organization Type	Rationale for Inclusion	Date
4	Scientist and Entrepreneur	Biotechnology Start-Up	<ul style="list-style-type: none"> • Former researcher on strain engineering and biogas fermentation at renowned research institute • Co-Founder and Chief Science Officer of a EU-based start-up company developing and producing already known, adapted, or novel macromolecules utilizing PF • Holds a PhD in Biochemistry ➔ As a core niche actor, the expert offers a micro-level perspective on developing and commercializing innovations from PF 	27.04.2023
5	Policy Affairs Manager	Non-Governmental Organization	<ul style="list-style-type: none"> • Heads the German office of an internationally active NGO promoting alternative proteins (including products from PF) to transform the global food system ➔ Regularly collaborates with start-ups (niche), corporations, research institutions, and government bodies (socio-technical regime) to promote interactions 	27.04.2023

No.	Function	Organization Type	Rationale for Inclusion	Date
6	Scientific Director and Investment Director	(Impact) Venture Capitalist	<ul style="list-style-type: none"> Scientific advisor and director at an internationally active venture capitalist firm with a strong focus on environmentally sustainable transformation of real economy value chains. Involved in several investments in start-ups utilizing PF or further enabling and facilitating technology in the value chain. Co-authored reports with leading corporates and consultancies on the topic, which are referenced by various experts, stakeholders, and institutions Holds a PhD in molecular biosciences Worked several years in management consulting. ➔ Takes a short-term and long-term perspective on the challenges and drivers of the niche's potential development, grounded by a deep technical and economic understanding. Facilitates interactions between the niche and the established regime 	28.04.2023
7	Professor of Communication Studies and Author	University: Department of Communication Studies	<ul style="list-style-type: none"> Associate Professor of communication studies, conducting research on relationships between social movements; media and technology; and the food system, with a focus on alternative proteins and food justice Published several articles on the perception, discourse, and acceptance of products from cellular agriculture, such as animal-free dairy made using PF ➔ Provides unique insights into the status, challenges, and opportunities faced by niche actors in communicating their vision to the regime 	01.05.2023

No.	Function	Organization Type	Rationale for Inclusion	Date
8	Researcher and Consultant	Private and Independent Research Institute on Renewable Carbon	<ul style="list-style-type: none">• Leads a department and working group at an internationally recognized research institute focusing on renewable carbon and bio-based products• Experienced researcher and consultant involved in various national and international research projects on topics such as biotechnology, chemical recycling, CO₂-based fuels and monomers, and sustainable feedstock• Co-founded and organized a conference on CO₂ as feedstock for fuels, chemicals, and polymers• Holds a degree in Biology➔ Works with government institutions and industrial companies (socio-technical regime), start-ups and R&D labs (niche); acts as observer and facilitator of multi-level interactions	03.05.2023

Appendix B: Coding Structure Used for Analyzing Interviews

Deductive derived codes without formatting, inductive emerged codes in *italic*.

Conceptual Level	Code	Subcode
Drivers of Adoption (Geels & Schot, 2007)	Learning Effects	Technological
		Commercial
	Sociological & Socio-Technical	Involvement of Powerful Actors
Barriers Faced by Emerging Niche (Kemp et al., 1998)	Infrastructure	
	Production Factors	<i>Investments for Scale-Up</i>
		<i>Socio-Technical Structure</i>
		Price Lock-In
	Government and Policy Factors	Regulation Lock-In
		<i>Regulatory Approval</i>
	<i>Value Creation</i>	
	Cultural and Psychological Factors	<i>Lack of Awareness and Narratives</i>
		<i>Socio-Political</i>
		<i>GMO</i>
		<i>Consumer Acceptance</i>
Landscape Changes (Geels, 2002)	Long-Term	<i>Sustainability</i>
		<i>Food-Security</i>
	Short-Term	<i>Supply Chain Fragility</i>
		<i>Technologization</i>

Conceptual Level	Code	Subcode
Regime Destabilization (Geels, 2002)	Stricter Regulation	
	Changing User and Market Preferences	
	<i>Sustainability Commitments</i>	
	<i>Geopolitical Tensions</i>	
	<i>Supply Chain Disruptions</i>	
Windows of Opportunity (Geels, 2002)	<i>Sustainability as a Performance</i>	
	<i>Criteria</i>	
	<i>Quotas</i>	
	<i>Competitive Moves Among Firms</i>	

Source: Own Illustration.