

Environmental effects of the Austrian pork meat production

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SUSTAINABLE EUROPE
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Presentation outline

- (1) Introduction
- (2) Project outline
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Sustainable Europe Research Institute

headquarters in **Vienna** with about **30 employees**

Annual turnover: **1.5 million €**

3 groups: Sustainable Economy, Resource Use & Global Responsibility, Quality of Life & Integrated Strategies

National, European and international projects



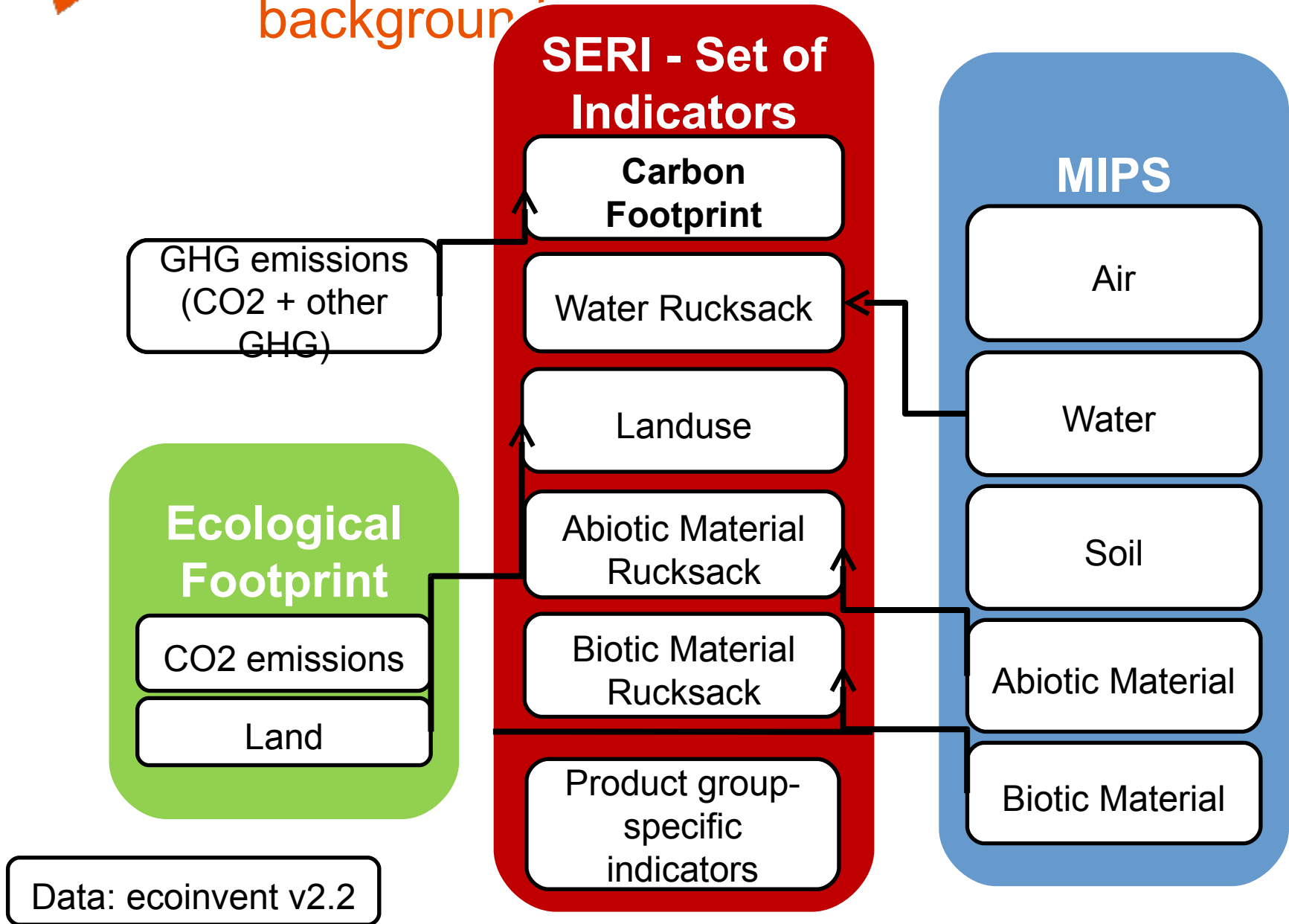
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SERI set of indicators: scientific background



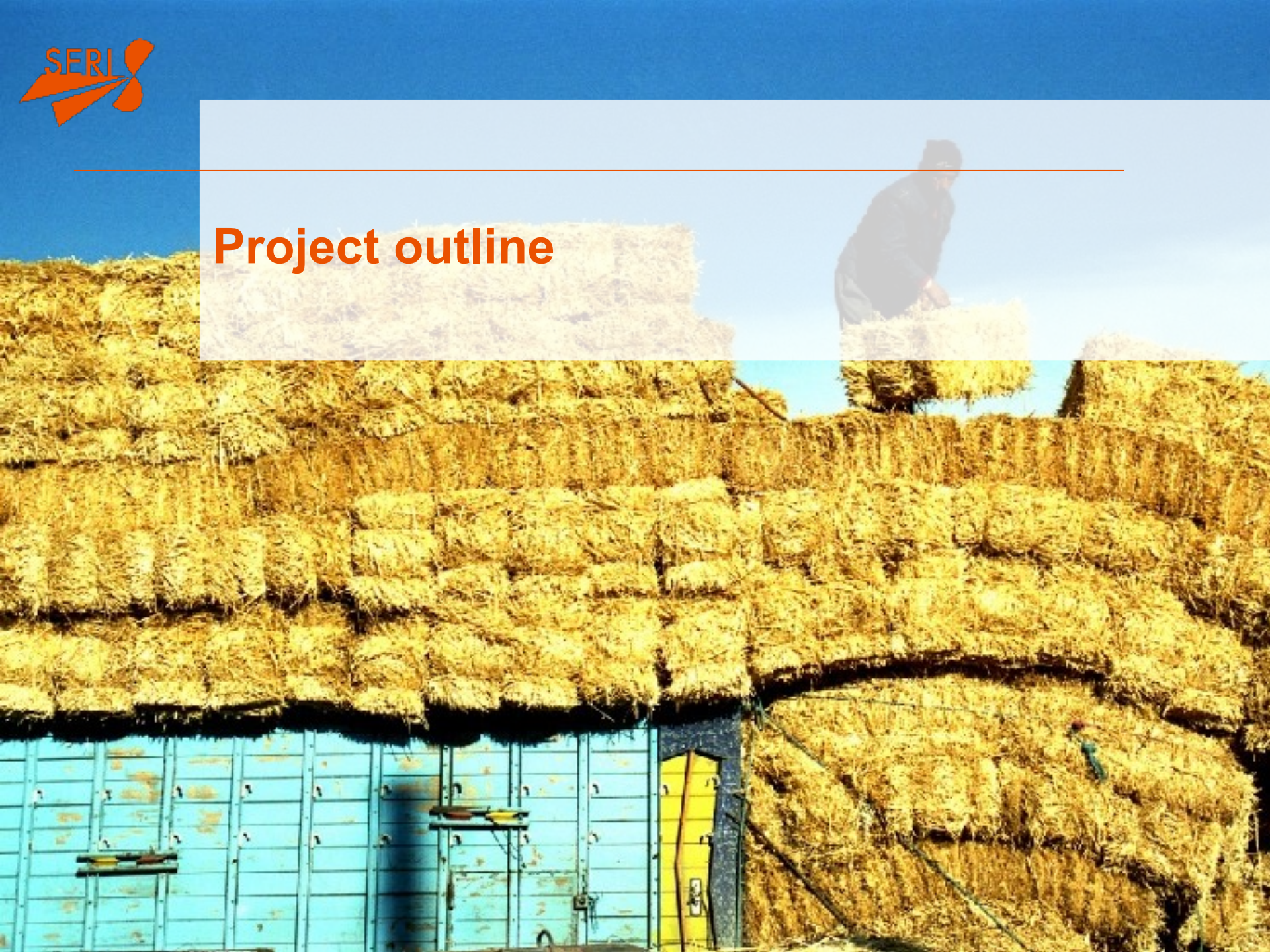


A set of environmental indicators (SERI and Friends of the Earth Europe)

Resource use category		also for companies		also for regions	
		Product level		National level	
Materials	biotic	Material Rucksack of products	biotic	Material flow-based indicators of countries <small>(including materials embodied in imports and exports)</small>	biotic
	abiotic		abiotic		abiotic
Water		Water Rucksack / Water Footprint of products		Water Rucksack / Water Footprint of countries <small>(including water embodied in imports and exports)</small>	
Land area		Actual land use of products		Actual land use of countries <small>(including land embodied in imports and exports)</small>	
GHG emissions		Carbon Footprint of products		National GHG emissions <small>(including GHG emissions embodied in imports and exports)</small>	



Project outline

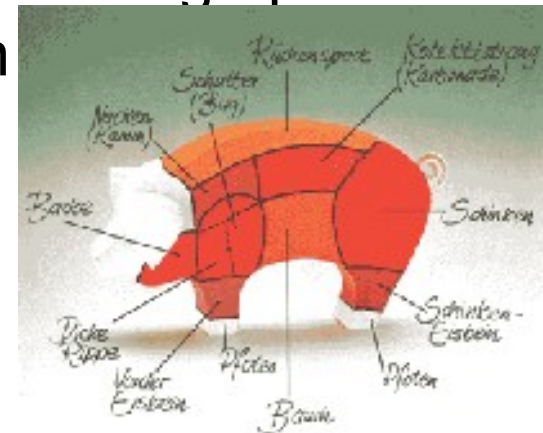




Project team

- **Project owner:**
 - SPAR Österreichische Warenhandels-AG
- **Project leader:**
 - SERI
- **Project partners:**
 - VLV - Verband landwirtschaftlicher Veredelungsproduzenten und Landwirtschaftskammer Oberösterreich
 - BIO AUSTRIA
 - University of Life Science Vienna (BOKU) and Research Institute of Organic Agriculture (FiBL) Austria

- Scientific life cycle (ISO 14040/44) analysis of environmental effects of conventional Austrian pork meat production (AMA) for functional unit of **1 kg pork meat (live weight)**
- Comparison of conventional with alternative production systems (organic, Gustino Stroh)
- Identification of leverage points within the production process
- In cooperation with agricultural stakeholders using up to date primary data representing the Austrian reality





Pork production and LCI



System boundaries: „from cradle to gate“ (PAS 2050 B2B)



Methodical challenge

- LULUC - land use and land use change in Carbon Footprint assessments

Szenario for LULUC	Reference	kg carbon dioxide per kg soy meal (fresh mass)
Minimum	Jungbluth et al. (2007)	0,9
Average	Hörtenhuber et al (2010)	4,8
Maximum	Hörtenhuber et al (2010)	12,1

Period under observation: 20 years

Source: Jungbluth et al. (2007), Hörtenhuber et al. (2010a)

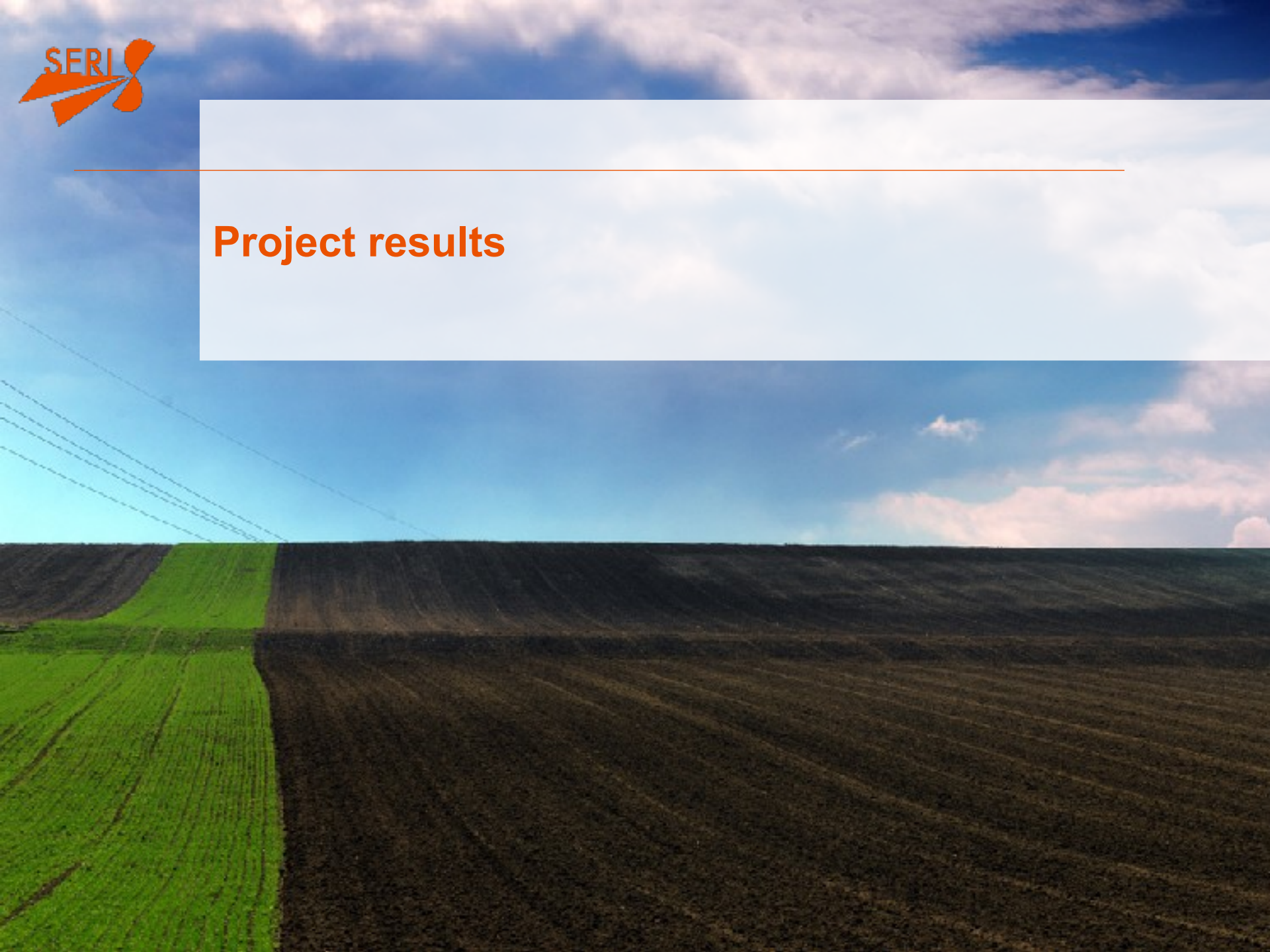


Comparison of production systems

	Conventional	Gustino Stroh	Organic
Barn in sqm	985.5	1085	1000
Field in ha	40	40	32
Meadows in ha	0.5	0.5	19
Feeding pigs/ breeding sows	1400/ 65	1400/ 65	465/ 24
Live weight feeding pigs in kg	118	116	130
Animal feed	3.4 kg/kg	3.3 kg/kg	4.0 kg/kg
Feed mix	CCM, soybean meal (import), misc. grain	CCM, soybean meal (import), misc. grain	Vivia faba, soy (Europe), misc. grain, dried corn



Project results





Comparison of results

	Conventional	Gustino Stroh	Organic
Carbon footprint in kg (incl. avg. LULUC)	3.7	3.5	1.2
Carbon footprint in kg	1.2	1.0	1.3
Water footprint in m ³	0.04	0.04	0.05
Landuse in m ²	4.2	4.5	19.9
Abiotic Material Rucksack in kg	1.4	1.4	1.5
Biotic Material Rucksack in kg	2.6	2.4	4.9



Hot spots conventional production 1kg fresh weight

	biotic	abiotic	Land use	Water	CO ₂ e	CO ₂ e (incl avg LULUC)
	% of total	% of total	% of total	% of total	% of total	% of total
Infrastructure	0.0	0.3	0.7	0.0	0.0	0.0
Soy	16.2	45.1	27.4	21.8	27.1	78.1
Other animal feed	82.7	48.4	71.5	39.7	27.8	8.6
Energy	1.1	6.3	0.3	9.5	10.5	3.3
Water consumption	0.0	0.0	0.0	29.1	0.4	0.1
Manure management & barn emissions	0.0	0.0	0.0	0.0	34.2	10.7



Proposed measures

- Animal feed:
 - Soy and rape from countries with reduced LULUC - > Europe (Danube region)
 - Organic production reduces carbon footprint (no mineral fertilizers, pesticides)
- Manure management:
 - Solid manure systems
- Energy management
 - Reduction of total energy demand
 - Change in breeding processes
 - Green energy mix and/or renewable energy systems



Proposed measures: reduction potential

	biotic	abiotic	Land use	Water	CO ₂ e	CO ₂ e (incl LULUC)
	kg/kg meat	kg/kg meat	m ² / kg meat	m ³ / kg meat	kg/kg meat	kg/kg meat
Results AMA	2,6	1,4	4,2	0,04	1,2	3,7
Scenario organic soy	+7%	-36%	+4%	-27%	-17%	-73%
Scenario solid manure	+4%	0%	0%	-2%	-22%	-8%
Scenario energy	-1%	+3%	+4%	-24%	-25%	-8%



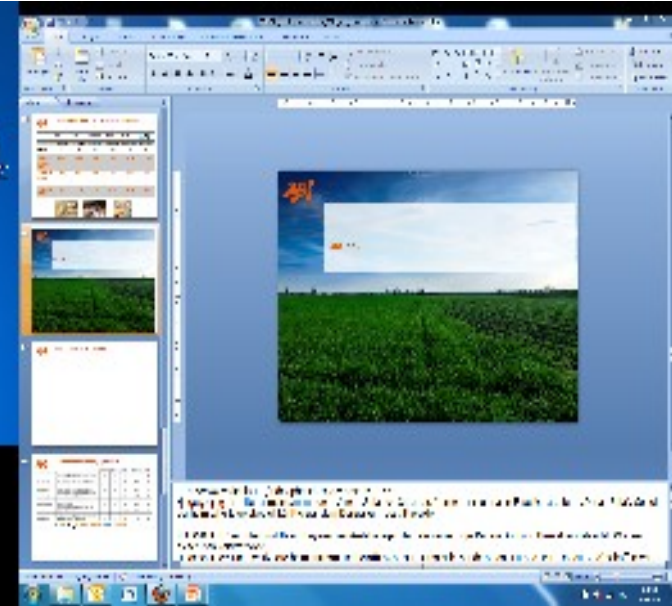
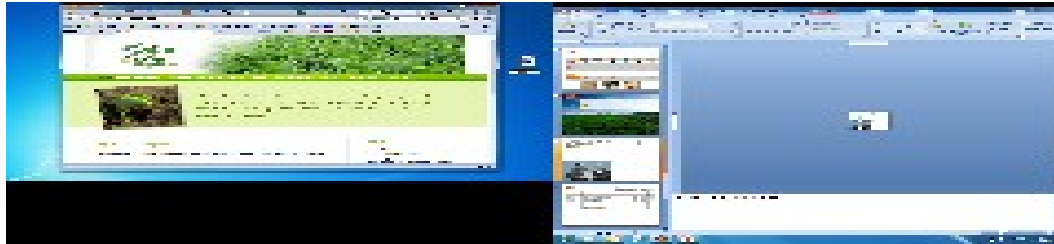


Outlook





Association Danube Soy





Environmental effects of nutrition

	biotic	abiotic	Land use	Water	CO ₂ e
	kg	kg	m ² a	l	kg
Meal (50% pork meat, 50% potatoes)	2.0	1.1	3.3	32.2	2.9
Meal (50% org. pork meat, 50% potat.)	3.8	1.2	15.1	32.8	0.9
Meal (49 % soy granulate, 50% potatoes)	0.3	0.3	1.5	9.8	0.5
1600 kcal/day					

- Soy granulate produces up to 90% less GHG emissions than pork meat, depending on origin and cultivation

Thank you for your attention!

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