**Science-to-Business
Center Eco²**
Energy efficiency and climate protection

SLCA perspectives

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ENERGY EFFICIENCY
CLIMATE PROTECTION

Eco²

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Life Cycle Management
Evonik Industries

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Evonik is one of the world's leading specialty chemicals companies

Evonik figures 2010

Sales 2010	€ 13.3 billion
thereof Chemicals	€ 12.9 billion
thereof Real Estate	€ 0.4 billion
EBITDA	€ 2.365 billion
Profitability (EBITDA Margin)	17.8 %
Return on Capital Employed (ROCE)	15.0 %
Employees in 2010	34,407
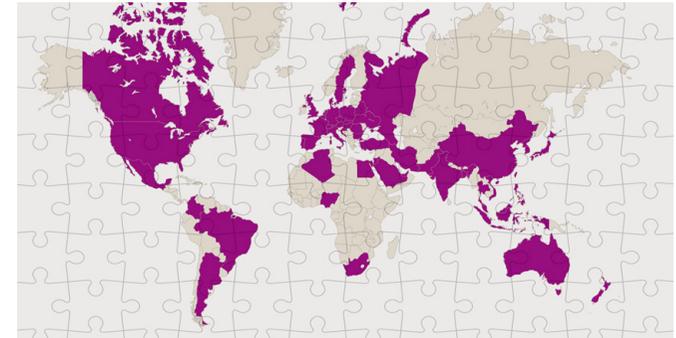
Advanced Intermediates	**Coatings & Additives**
Inorganic Materials	**Health & Nutrition**
Performance Polymers	**Consumer Specialities**

Who we are:
Evonik Chemicals Business Area R&D

Research, development and innovation are key elements in the strategy for sustainable growth
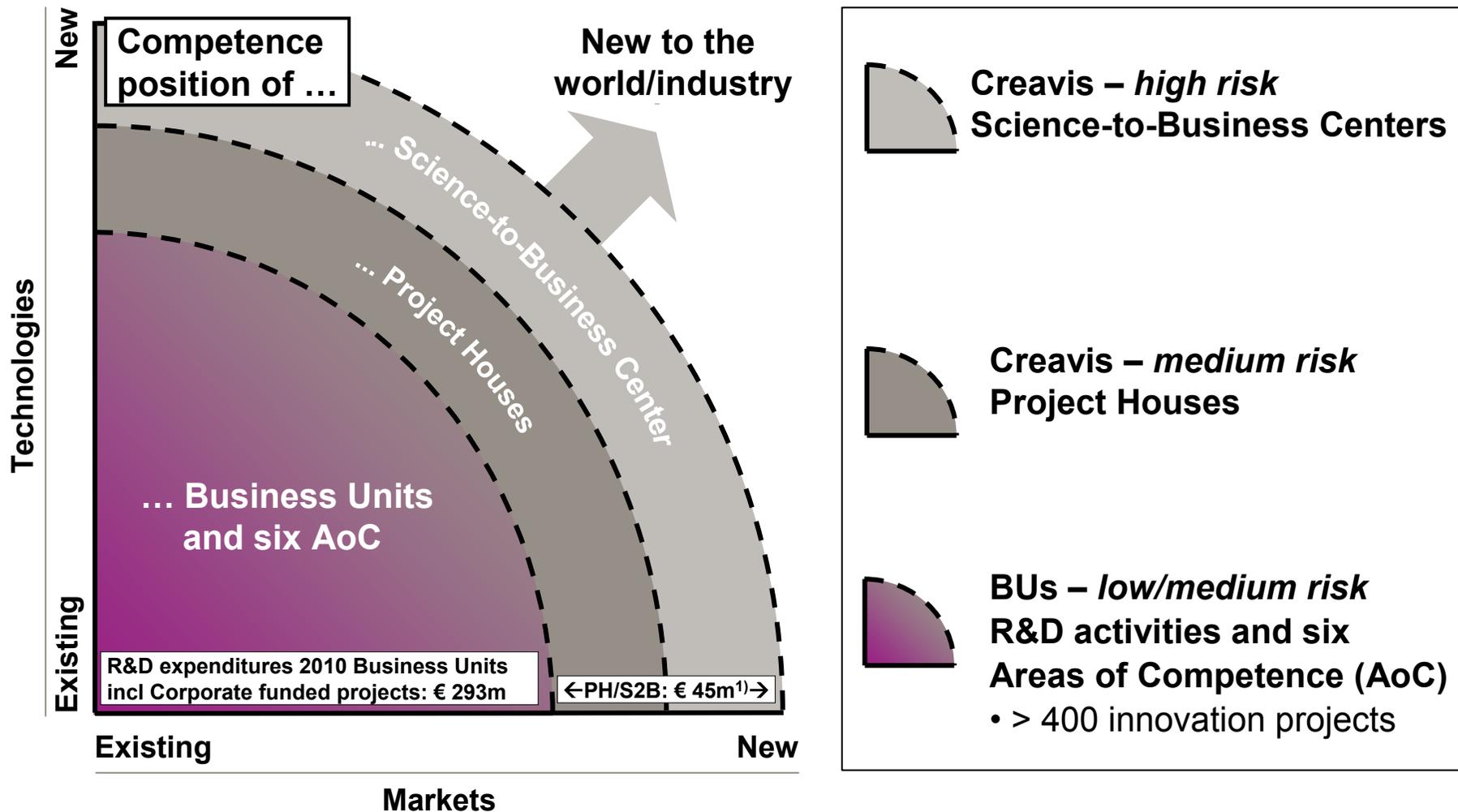
→ **€ 338 million R&D expenses in 2010**

→ **+13% higher R&D expenses versus 2009**

→ **More than 2,300 employees in R&D**

→ **More than 35 R&D sites worldwide**

→ **More than 300 cooperations and collaborations worldwide**

Source: Science-to-Business Center Eco² (June 2011)

Evonik R&D Structures – a risk adapted accelerator to stimulate innovation into profit

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Position of innovation driving competences within Evonik

New

Competence position of …

New to the world/industry

… Science-to-Business Center

… Project Houses

Technologies

… Business Units and six AoC

Existing

R&D expenditures 2010 Business Units incl Corporate funded projects: € 293m

←PH/S2B: € 45m[1])→

Existing   New

Markets

Creavis – *high risk* Science-to-Business Centers

Creavis – *medium risk* Project Houses

BUs – *low/medium risk* R&D activities and six Areas of Competence (AoC)
• > 400 innovation projects

Source: Science-to-Business Center Eco² (June 2011)

PH : Project House   S2B: Science-to-Business Center
AoC = Areas of competence   1) Budget share of Evonik Degussa for Creavis   page | 5

The objective of Creavis

Our Mission

Create profitable and sustainable new business for Evonik via strategic R&D activities

SLCA

Our Vision

Outside of the operative business areas …

- we address strategic megatrends and future topics
- create viable bases for the realisation of the visions of Evonik
- use Evonik's core competences for the development of new business areas

Our Science-to-Business concept vertically integrates R&D activities along the value chain

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Our Science-to-Business concept

This project was financially supported by the state of North-Rhine Westphalia and was co-financed by the European Union.

Material → **Component** → **Device** → **System** → **New Business**

➔ Vertical integration of R&D activities along the entire value chain with academic, research and industrial partners

➔ Joint development co-operations with customers on an international basis

➔ All activities from fundamental R&D to system development located under one roof

➔ Leads to accelerated development of new competencies, business and new areas

The positioning of the Science-to-Business Center Eco² is aligned with future needs

SLCA

Global Business Environment

Mega Trend Categories

- Globalization
- Demo-graphics
- Con-sumption Patterns
- Natural Resources & Environment
- Regulation & Activism
- Wild-cards

Natural Resources & Environment Macro Trends

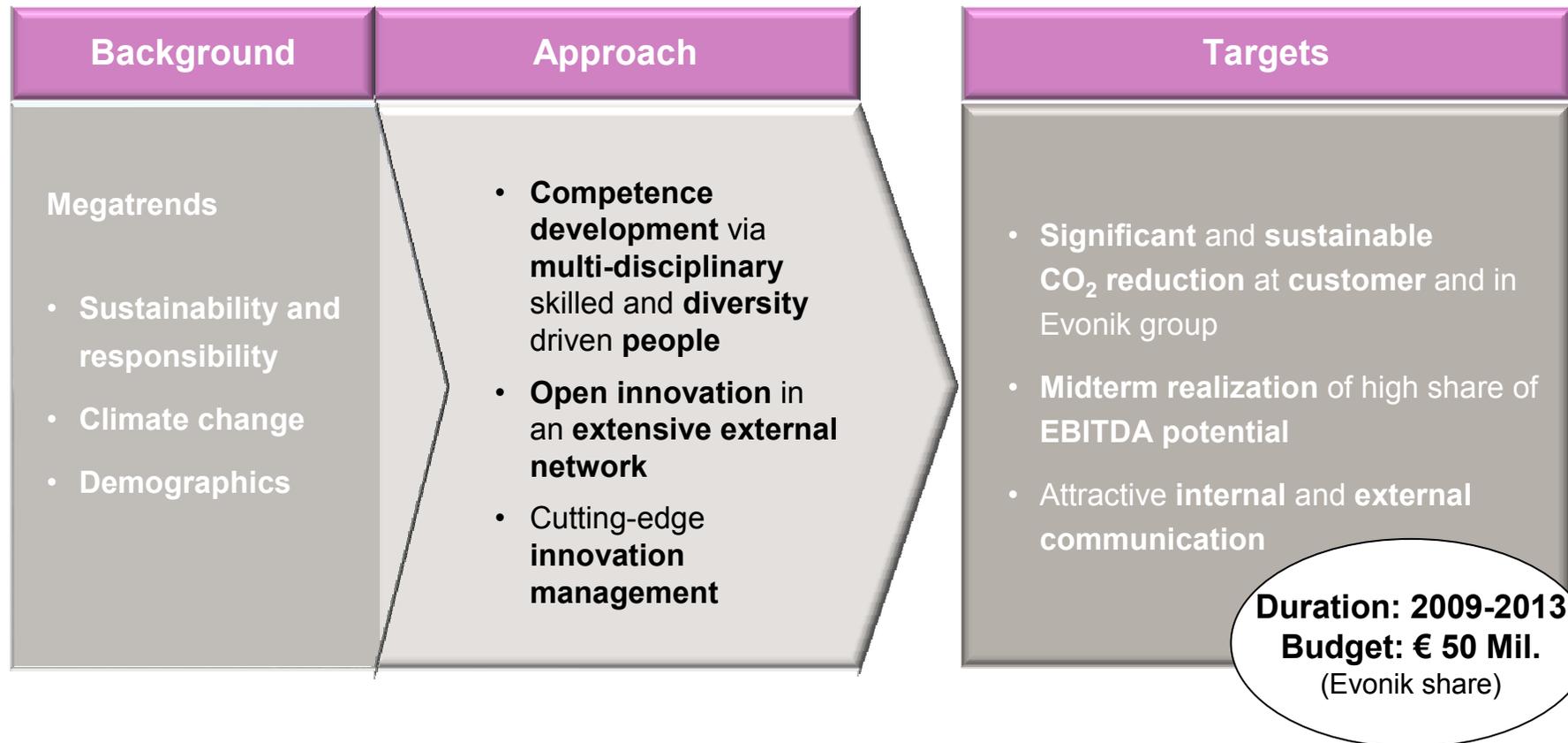| Accelerating natural resource demand versus increasing supply scarcity	Energy conservation and innovation	Increasing environmental issues and concerns	Global climate change	Increasing competition and conflict over natural resources & environment

SUSTAINABILITY TOPICS

Science-to-Business Center Eco² is driven by the megatrends sustainability, climate change and demographics

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Strategic Approach of Eco²

Background	Approach	Targets
Megatrends • Sustainability and responsibility • Climate change • Demographics	• **Competence development** via **multi-disciplinary** skilled and **diversity** driven **people** • **Open innovation** in an **extensive external network** • Cutting-edge **innovation management**	• **Significant** and **sustainable** CO_2 **reduction** at **customer** and in Evonik group • **Midterm realization** of high share of **EBITDA potential** • Attractive **internal** and **external communication**

Duration: 2009-2013
Budget: € 50 Mil.
(Evonik share)

Offering customers value-added sustainability solutions is a good way to differentiate from competitors.

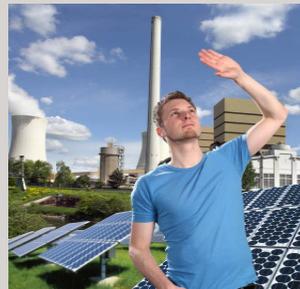# The S2B Eco² pools the group's energy efficiency and climate protection expertise

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Science-to-Business Center Eco²

Energy Efficiency and Climate Protection
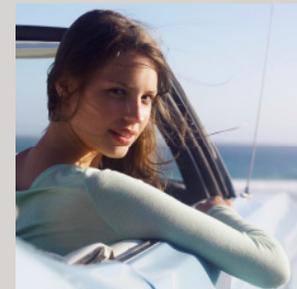
Line of Development

| CO_2 Separation and Use | Energy Generation | Energy Storage | Energy Efficiency Customer Solution | Energy Efficiency Evonik Processes |

Life Cycle Management

| Corporate | BU´s | Services |

"Must-meet" criteria help to reduce the work load in future idea/project assessments

"Must-meet" criteria at Eco^2

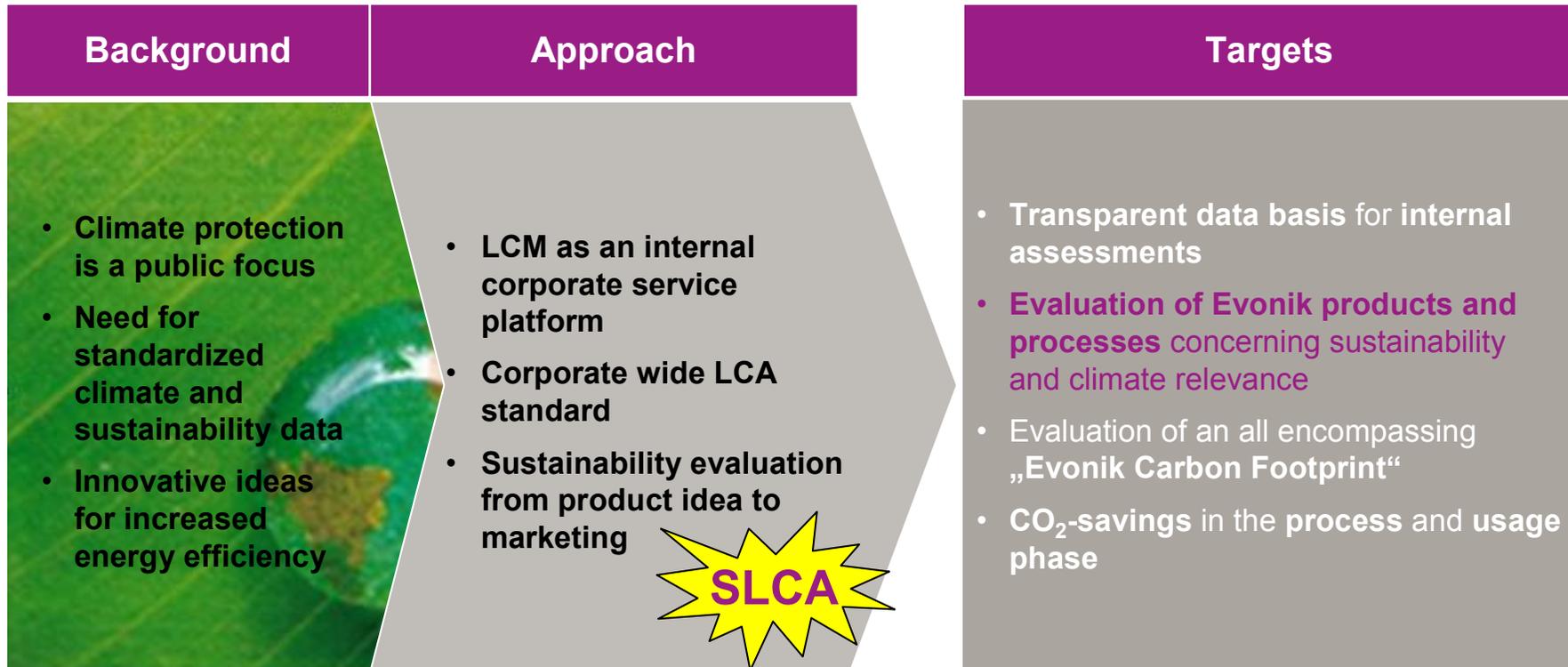|		Yes [2]	No
A	Is there a CO_2 equivalent saving impact of > 0,1 Mil. t p.a. [1] ?	☐	☐
B	Is time-to-market < 10 years ?	☐	☐
C	Is there a cross BU benefit ?	☐	☐
D	Cumulated 5 years Evonik R&D spendings < 10 Mil. € ?	☐	☐
E	Good sustainability prognosis ?	☐	☐ **SLCA**

1) in year 5 after launch   2) if "yes", idea / project is "go"; if <u>one</u> answer is "no", idea / project is "No-go"

Eco² projects will be evaluated for their sustainability by Life Cycle Assessments

EVONIK INDUSTRIES

June 2011

S2B Eco² – Life Cycle Management

Background	Approach	Targets
• **Climate protection is a public focus** • **Need for standardized climate and sustainability data** • **Innovative ideas for increased energy efficiency**	• **LCM as an internal corporate service platform** • **Corporate wide LCA standard** • **Sustainability evaluation from product idea to marketing** **SLCA**	• **Transparent data basis** for **internal assessments** • **Evaluation of Evonik products and processes** concerning sustainability and climate relevance • Evaluation of an all encompassing „**Evonik Carbon Footprint**" • **CO_2-savings** in the **process** and **usage phase**

„Carbon Footprint" is a leading parameter for the evaluation of products and processes at Evonik but "sustainability assessment" under development .

Social LCA in GaBi:
Life Cycle Working Time Approach

SLCA

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BR: sugarcane, in fermentation (HP_SM) [b] [Evonik] -- DB Process

Object   Edit   View   Help

Name: BR | sugarcane, in fermentation (HP_SM)   Source b

Parameter

LCA | LCC: 0 € | LCWT | Documentation

Alias/factor: 1   Comment
Year: 2008
Completeness: No statement

Qualified working time (QWT): Defaults

Flow	Quantity	INTERNAL	Unit	Standa	Origin	EXTERNAL	Unit	Stand	Origin
GQL A	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
GQL B	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
GQL C	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
GQL D	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
GQL E	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
Total	**Working time (LCWT)**	**0**	**Seconds worked**	-	-	**0**	**Seconds worked**	-	-

Health and Savety (HSWT): Defaults

Flow	Quantity	INTERNAL	Unit	Standa	Origin	EXTERNAL	Unit	Standa	Origin
Lethal accidents	Number (LCWT)	0	Cases	0 %	(No statement)	0	Cases	0 %	(No statement)
Serious non-lethal accidents	Number (LCWT)	0	Cases	0 %	(No statement)	0	Cases	0 %	(No statement)
Unhealthy labour conditions	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)

Humanity of working conditions (HWT): Defaults

Flow	Quantity	INTERNAL	Unit	Standa	Origin	EXTERNAL	Unit	Standa	Origin
Actual women employment	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
Child labour	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
Discrimination in job access	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
Forced labour	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
Hazardous child labour	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
No collective bargaining	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
No right to organise	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)
Unequal remuneration	Working time (LCWT)	0	Seconds worked	0 %	(No statement)	0	Seconds worked	0 %	(No statement)

→ **current LCA software offers unsatisfactory data to work with**

Source: Science-to-Business Center Eco^2 (June 2011)

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Companies have their data on corporate or site level but not on product level

Evonik's CR report uses Global Compact Guidelines

Principle	Policies, regulations, management systems	Examples of activities in 2010
Human rights		
Principle 1: Support for human rights	Global Social Policy (page 25)	CRtopic human rights (page 19)
Principle 2: Exclusion of human rights abuses	Global Social Policy (page 25), ESHQ policy (pages 25, 28)	New Procurement Policy (page 19), CRtopic human rights (page 19)
Labor		
Principle 3: Freedom of association	Global Social Policy (page 25)	
Principle 4: Abolition of forced and compulsory labor	Global Social Policy (page 25)	
Principle 5: Abolition of child labor	Global Social Policy (page 25)	
Principle 6: Elimination of discrimination	Global Social Policy (page 25), Code of Conduct (page 24)	
Environment		
Principle 7: Precautionary environmental protection	ESHQ rules (pages 25, 28), Chemicals: Environmental management systems based on ISO 14001 (page 31)	Audits to check compliance with ESHQ rules (page 31)
Principle 8: Initiatives to promote greater environmental responsibility	ESHQ rules (page 25), ICCA Global Product Strategy (page 44), Responsible Care Global Charter (pages 42–43)	Electromobility (page 40), EffiCO$_2$ (page 39)
Principle 9: Encouraging the development and diffusion of environmentally friendly technologies	ESHQ values (page 25), ESHQ rules (page 28)	Work at the Science-to-Business Center (page 37)
Anti-corruption		
Principle 10: Anti-corruption measures	Code of Conduct (page 24), continued development of the compliance organization (pages 26–29), policy on handling gifts, invitations and other benefits (page 27)	Training/e-learning programs on the Code of Conduct and anti-corruption measures (page 32), compliance audits (page 31), examination of the Real Estate Business Area for possible irregularities in the area of corruption (page 31), continuation of "Compliance Report", introduction of "Tone from the Top" (page 32)

Source: Science-to-Business Center Eco (June 2011)

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Global Compact

	Social Performance Indicators		
	Labor Practices and Decent Work		
	Management approach	45–54	Fully
	Aspect: Employment		
LA1	Total workforce	46–48, 51	Fully
LA2	Employee turnover	46	Fully
	Aspect: Labor/Management Relations		
LA4	Collective bargaining agreements	49	Fully
LA5	Operational changes	24–25, 49	Fully
	Aspect: Occupational Health and Safety		
LA7	Injuries, lost days, fatalities	53–54	Fully
LA8	Preventive health care	53–54	Fully
	Aspect: Training and Education		
LA10	Further training	48–49	Partially [4]
	Aspect: Diversity and Equal Opportunity		
LA13	Employee structure	47–48, 50–51	Partially [5]
LA14	Ratio of basic salary men/women	50	Fully
	Human Rights Performance Indicators		
	Management Approach	20, 24–25, 29, 49–50	
	Aspect: Investment and Procurement Practices		
HR1	Investment agreements with human rights clauses		Not reported [6]
HR2	Screening of suppliers/contractors	12, 20, 35–36	Fully
	Aspect: Non-discrimination		
HR4	Discrimination		Not reported [7]
	Aspect: Freedom of Association and Collective Bargaining		
HR5	Risk to freedom of association	49	Fully
	Aspect: Child Labor		
HR6	Risks and countermeasures		Not reported [7]

Indicator		Page	Fulfillment
	Aspect: Forced and Compulsory Labor		
HR7	Risk and countermeasures		Not reported [7]
	Society Performance Indicators		
	Management Approach	24–25, 70–73	Fully
	Aspect: Community		
SO1	Impact on communities	70	Fully
	Aspect: Corruption		
SO2	Business units analyzed	31	Fully
SO3	Employees trained	32	Partially [8]
SO4	Action taken	31	Fully
	Aspect: Public Policy		
SO5	Public policy positions, lobbying	73, 84	Fully
	Aspect: Compliance		
SO8	Fines/sanctions		Not reported [3]
	Product Responsibility Performance Indicators		
	Management approach	24–25, 42–44, 71–73	Fully
	Aspect: Customer Health & Safety		
PR1	Product stewardship	24–25, 42–44	Fully
PR3	Product information	24–25, 42–44, 71–73	Fully
	Aspect: Marketing Communications		
PR6	Advertising and promotion	24–25, 42–44, 71–73	Fully
	Aspect: Compliance		
PR9	Fines for non-compliance		Not reported [9]

SLCA

Companies need pragmatic and workable approach to SLCA

SLCA

SLCA from company's perspective

- Companies increasingly have to cooperate along the value chain to increase resource efficiency and to improve sustainability

- SLCA could be an important methodology to measure CR performance along the value chain or at least offer a structured approach how to deal with those risks (→ "hot spot identification")

- SLCA can only be successfully implemented in large organizations with existing CR management if it builds on data that are currently gathered

- Contradictory demand of "easy to perform" and "inappropriate use of country specific data" difficult to solve

- Evonik is interested in implementing SLCA components in sustainability assessment in early stage innovation process

Source: Science-to-Business Center Eco^2 (June 2011)

Questions ?

Source: Science-to-Business Center Eco^2 (June 2011)