European Policy Brief

Innovation for sustainability (I4S)

Implication for Business

Introduction

Innovation for Sustainability[1] I4S) has been the central theme of the European Commission Marie Sklodowska-Curie Initial Training Network (ITN). The I4S research group consisting of early stage researchers (ESRs) and Senior Researchers (SR's) started in 2013 with a consortium of 7 (business) universities in Europe and one in South Africa. The I4S research group explored innovation for sustainability in a broad international business context. Each research project has been conducted in close collaboration with a representative company from the business community, be it a social enterprise, an SME, a multinational, or an international organisation. The coordination of the I4S research group has been conducted by the ABIS, the Academy of Business in Society, in Brussels. During the period of 2013-2016 project visits have been made to all (business) universities involved and to many of the companies committed to the I4S local research projects. This resulted in a deeper understanding of the innovation and sustainability issues in the various companies for all researchers involved. The added value of the I4S is the mutual understanding of the importance and impact of system change at all different layers of analysis, from the individual entrepreneur up to the level of worldwide systems change.

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1. Key research question

The key question underlying the Innovation for Sustainability (I4S) studies is to explore and examine why and how sustainability driven innovation (SDI) occurs, what managerial skills and organisational competences underscore this innovative practice and experimental performance, and what the implications are for future European policy actions in support of research and innovation in this field[2].

1.1. The overarching objective

The overarching scientific objective of I4S in the framework of Marie Sklodwoska-Curie ITN is to train researchers for a better understanding of processes and practices that foster sustainability-driven innovation (SDI). SDI is understood as a business contribution to sustainable development and as fully in line with the EU's 'Europe 2020' strategy for smart, sustainable and inclusive growth[3]. Since the prominent role of business for sustainable development the I4S research is designed in a way that academia and business collaborate in order to get a mutual understanding of the complex phenomena and processes which underlie the systems change towards a sustainable world.

1.2. Sustainability driven innovation as systems change approach

SDI is trans-disciplinary, because it is based on an integrated approach to environmental, economic and social performance. It is supra-disciplinary as it operates on the system level, paradigm changes, that influence many aspects of doing business. The research approach in I4S is a collaborative with businesses and other organisations. In this research program, the researchers are positioned within an academic institution as well as within business or other partners. Academic rigour and practical relevance are cornerstones of the collaborative research network. I4S researchers have used research designs based on longitudinal, multi-level case studies and/or action research or participative methods. In almost all cases, the researchers were embedded in work-place settings to get a better understanding of the processes by which organisations and their managers work to drive innovation through teams, platforms, and networks.

2. I4S research projects in collaboration with the business

The close collaboration between researchers and business partners has delivered insights into the business community and into further exploration of academic research.

Table 1: Business Partner Descriptions

Academic Partners	Bussines Partners
Copenhagen Business School (Denmark)	VELUX is a rooftop windows manufacturer and co-founder of the Active House Alliance, an alliance seeking to improve upon the holistic approach to sustainable building. Both VELUX and Active House operate internationally, but VELUX is headquartered in Denmark, and the secretariat for Active House is currently based in the Netherlands.
Rotterdam School of Management (The Netherlands)	WBCSD is a CEO-led international organization which regroups some 200 multi-national companies. The member companies come from diverse sectors including chemicals, forests products, utilities, engineering, tires, food & beverages, consumer goods and services. The members are mainly from Europe and North America but also from Asia, Latin America, Middle East and Africa. WBCSD also brings together 60 business organizations worldwide in the Global Network, encompassing over 5,000 companies. The WBCSD head office is in Geneva, Switzerland, with an office in New York City and New Delhi. In addition to corporate members, WBCSD also collaborates with diverse stakeholders including other international organizations, universities and the public sector.
Leuphana University of Lüneburg, (Germany	Sieb & Meyer AG is an entrepreneurial SME operating in business to business markets and employing about 220 employees in Germany. The family business, founded in 1962, is owner-managed in the second generation and is a typical representative of a "hidden champion" and of the German "Mittelstand". It is driven by a strong engineering culture, develops and produces electronic components which it sells to system integrators in (historically) the machine-tool market. TechLtd has an organization with a flat hierarchy, with top management being intrinsically motivated for sustainability and coordinating the exploration of possible future sustainability-oriented products. In the past 13 years it used its core competencies to develop products for renewable energy technology markets.
Vlerick Business School Ghent (Belgium)	The partner organisation provides sustainability consultancy services both to individual organisations, as well as by gathering collaborative cross-sector and often international projects around topics of more systemic sustainability challenges. It can be seen as the leading organisation to assemble cross-sector platforms on complex sustainability issues. The organisation has offices in the UK, US, and the Asia-Pacific region; although the case studies of this research were based in the UK office.
University of Exeter (United Kingdom)	Cases for this project include a diverse group of 6 multinational companies who have used biologically-inspired innovation for various applications. Clean Inc. is a medium-sized consumer goods company in a growth stage with approximately 5K employees Textiles Inc. is a medium-sized durable goods company with international reach and 5K employees. Cosmetics Inc. is a medium-sized consumer goods company with a recently expanding reach into global markets with approximately 8K employees. ITC Inc is a rapidly expanding professional services firm with an international reach and approximately 100K employees. Electronics Inc is a global long-standing durable consumer goods company well-established in international markets with nearly 100K employees. Resources Inc. is a global international resource extraction company with over 100K employees.
University of Manchester (United Kingdom)	Tesco PLC is a British multinational grocery and general merchandise retailer headquartered in Welwyn Garden City, Hertfordshire, England, United Kingdom. It has stores in 12 countries across Asia and Europe and is the grocery market leader in the UK, Ireland, Hungary, Malaysia, and Thailand.
Capetown Graduate School of Business (South Africa)	Mr. Price is a South African retail company, with a strong focus on fashion and textiles. Headquartered in Durban and operating more than 1000 stores throughout Southern Africa.
Nyenrode Business Universiteit (The Netherlands)	Kirkman Company is a Dutch consultancy organisation with a focus on creating impact for a wider group of stakeholders, such as clients, employees, partners, the environment, society and shareholders. They focus on entrepreneurial solutions for organisations in a variety of sectors. The founders of Kirkman Company also created their own entrepreneurial collective with spin-offs and new partners, which is called 'Powered by Meaning' collective, consisting of 8 entrepreneurial companies. They have a common purpose and mission, as illustrated in a common manifest, with the main message "we believe that we need to utilize the maximum potential from all organisations to realise solutions for the challenges we face as society – today and in the future".

3. Impact of I4S research projects on business partners as experienced by the ESRs

The broad scope of the I4S research makes it challenging to isolate the impact of the research undertaken at the different companies in the various countries where the researchers are based. We give an overview of the self-estimated impact of the research findings for business as they are experienced by the early stage researchers (ESRs). Each of the ESRs has worked with a company headquartered in the same country as the academic institution where the ESR is based. In one case, of Rotterdam School of Management, the international organization was based in Geneva, Switzerland. The company partners of I4S have committed to work with the researchers for a period of 3 years (2013-2016). The majority of the ESRs have done embedded research, which means they have been able to do the research while being in the company for a longer period of time. Since the majority of the researchers are still

in the phase of finalizing their PhD research we would like to underline that the business impact is an estimate by the ESRs and that the majority of the researchers are expecting impact to increase when presenting the final results of the research to the respective companies.

3.1. Questionnaire on impact of I4S local research projects on business partners

The ESRs have been asked to fill out a questionnaire with learning insights and main findings of their research in terms of impact on business, management and strategic policy. The importance of collaboration between a researcher in a concrete company environment is seen as an added value of the I4S project. It enabled the transfer of knowledge and insights between academics and management. Embedded research has mutual benefits for business and academics, because it leaves more time for additional questioning, but also for deeper understanding than a short interview visit. It turns out that most of the ESRs not only collaborated with the business partner in the various countries, but that they also interacted beyond the business partner with other business actors. ESRs often mentioned the interaction with NGOs, governmental organisations, suppliers and clients. The dissemination of knowledge and insights from the I4S project may have gone further than the interaction with the business partner.

Table 2 summarizes the outcome of the questionnaire on the impact of the (local) I4S projects on the business partners. Again, the outcome is based on the experiences of the ESRs.

Table 2: Self-Estimated Impact by ESRs of Research Project on Business Partners

Academic Partners	Self-Estimated Impact of ESR Research Project on Business Partners
Copenhagen Business School (Denmark)	"The research has demonstrated the effectiveness of private company interaction with university researchers, and engagement as partners with alliances and networks in an international business landscape" (Lara Anne
Rotterdam School of Management (The Netherlands)	"Given the ethnographic approach to my research I was able to help WBCSD with projects related to the Sustainable Development Goals and measuring impact of the business solutions. I also contribute to WBCSD's work on bridging academics and practitioners. I helped organize a conference aimed at bridging academics and practitioners and I conducted research in this area" (Amanda Williams)
Leuphana University of Lüneburg, (Germany)	"For SMEs, a central challenge in innovating for sustainability is to create an organizational space that allows exploration for new (green) business ideas and thus a space for reinventing parts of the business. Next to developing the capability of exploring for new technologies and markets and "sensing" of the new, unknown firm environment, this also implies overcoming often strong inertial forces and "unlearning" previous business recipes for success. [...] Acting as a "critical friend" to top-management, we contributed to lay the foundations of a (radical and sustainability-oriented) innovation capability by working on what sustainable innovations means for their business and how they can possible achieve this in the future" (Samuel Wicki)
Vlerick Business School Ghent (Belgium)	"The research provides an opportunity for the practitioners to understand their projects and processes from a different perspective. Namely the research provides an insight into the micro-processes of the organisation's project work, going into a deeper level of analysis than what the organisation would normally do. This different perspective can potentially influence the way the organisation sees their own work, as well as how they communicate and explain their work to external stakeholders" (Katre Leino)
University of Exeter (United Kingdom)	"Biologically-inspired innovation is a powerful tool for sustainability-oriented innovation. However, it requires other aspects of internal sustainability cultural support, external consultants and training, novel approaches to supply chain management and is accelerated by a company sustainability narrative that views nature as the standard for sustainability" (Taryn Mead)
Capetown Graduate School of Business, (Capetown, South Africa)	"The case study supported the importance of shared systems perspectives among leadership teams, as the systems perspectives held by leadership influence the perceived purpose of the organizations and desirable practices to attain that purpose. [...] The relevance of (shared) values has already been highlighted by other studies but my research connected it to the concepts of systems thinking and demonstrated how shared values can act as organizing principles in complexity. Considering the (perceived?) complexities of the business world and the rise of systems thinking in business practices, I hope my study will impact how business can rethink their approach to values" (Felix Philipp)
Nyenrode Business Universiteit, (The Netherlands)	"The research project was truly collaborative in nature, based on mutual interaction and inspiration. Many of the ideas and initiatives that Kirkman Company put forward are reflected in my research. At the same time, they have appreciated my analysis of the Powered by Meaning network and my proposed possibilities to make the network even stronger. The most important impact I personally had is that I have helped them with further conceptualisation of the concepts they are trying to put in practice around working in networks and ecosystems. We were in continuous exchange and the ongoing feedback loops have benefited both the research as the business. We learned a lot from each other" (Monique de Ritter)

4. The broader focus of the I4S research networkcommunity

In the I4S research network the focus of SDI is beyond product and process innovation and beyond the individual firm. The intention was and is to get a better understanding of 'production-consumption systems', and new business models that create and capture value, and where interaction with social actors is part of the model. The ESRs have conducted local research projects in the companies or organizations of the I4S business partners. Research on SDI has also been done with the SRs beyond these companies to get insight in the needs for future business talent in a circular economy. In this policy brief on SDI and business impact we would like to widen the scope to front-running MNEs

4.1 Listening to the Voice of Business

In this policy brief, we would like to give special attention to an additional research project conducted with 7 front-running MNEs with a reputation of multi-annual high scores in the Dow Jones Index of Sustainability[4]. This index is seen by internationally operating business as a serious instrument to measure progress in sustainable business practices. Several of these companies are active member of the World Economic Forum. They are all strong supporters of the Paris Agreement of the UN Climate Change Conference (COP21) in 2015. In this research, we looked at two aspects: the first aspect was on the progress each of these companies made in integrating sustainability on different dimensions, such as CEO-driven leadership for sustainability, leadership across the organization, integration of sustainability in the business organization, the link between innovation and sustainability and the role of internal education to foster sustainable business practices. The differences in leadership for sustainability were larger than the differences in the other dimensions. The second aspect were the needs for specific knowledge and skills for future business leaders. We enquired what these leading MNEs need and what role business education could play in this regard[5]. The main outcomes are summarized in Table 3. We derived the most essential competencies in the following oversight.

Key Competencies for Future Leaders in Sustainability Driven Business

Leadership for Sustainability

All business leaders that we interviewed have expressed the importance of purpose-driven leadership in the transition to a more sustainable and circular economy. The tone at the top has a crucial impact on the direction of the organization, in terms of vision, strategy and implementation in the operations. 'Thought leadership' also plays a crucial role.

Organizing collective intelligence from very different sources

Knowledge is not in one place, but comes from a diversity of actors in networks. Interdisciplinary collaboration is needed to deal with change. Deriving knowledge within and outside the organization is seen as very important. Special attention is needed for intergenerational diversity in organizing collective intelligence.

Dealing with adversity, negotiating and strategic decision making as key skills

One of the most important skills mentioned during the interviews was the mastering of high-level negotiation and ability to convince and inspire others, be it inside or outside the company. Particularly, negotiating on different views on sustainable business with supply chain partners and stakeholders is seen as an important skill. Embedding sustainability is about constant negotiation to change the status quo with often competing interests or pressing business demands.

Deep knowledge of business processes and markets

Knowledge of sustainability should be connected to business processes and not set apart in CSR departments. It must be an integral part of the business and therefore future business leaders need to know about the business and about the ins- and outs of sustainability.

4.This additional research project is conducted by Annemieke Roobeek and Monique de Ritter of Nyenrode Business Universiteit. The results are published as a research paper entitled "Rethinking business education for relevance in business and society in times of disruptive change", presented at the Teaching and Learning Conference at the Academy of Management (AoM) Annual Conference, Anaheim, California, USA, 7 August 2016.
5.For the theoretical background on rethinking business education we refer to: Rasche, A. Gilbert D.U, and Schedel, I (2013). Cross-Disciplinary Ethics Education in MBA Programs: Rhetoric or Reality? Academy of Management Learning and Education, 2013, Vol. 12, Nor. 1, 71-85.

Systems thinking

Special attention should be paid to the concept of 'systems thinking'. All interviewees have stressed the importance of systems thinking, without exception. There is a need to understand the bigger scheme of things. System thinking is an essential skill for the new world of work in business and for understanding the impact of sustainability issues. Systems thinking is relevant for business in times of unprecedented change, pulled by big sustainability challenges and pushed by ongoing developments in digitization and automation.

Business Ecosystems

Companies that take climate change seriously and develop strategies based on the principles of the circular economy know that collaboration is key for breakthrough innovations. The sustainability leaders we interviewed stressed more than once the importance of designing purpose-driven and holistic organisations. No single company can make the change on its own. Collaboration, also among competitors, is part of the new organizational principle practiced in ecosystems. The ability to build coalitions and ecosystems for innovation and drastic change in society has been highlighted throughout the interviews. Ecosystems are seen as essential carriers for transformational change.

4.2 Implications for Business Education

The results from the explorative interview research among leading MNEs in sustainable business development show that SDI will have far-reaching impact on skills and knowledge for business leaders. It also reveals the new reality for business education. In order to remain relevant for business in times of disruptive and systems change, business education must rethink the core content of MBA programs, executive leadership programs and the way (doctoral) research projects are being conducted. If leading businesses ask for more holistic approaches, leadership of transformations, more knowledge about collaboration and skills to build coalitions in ecosystems, business universities will have to re-arrange the traditional definition of what is core and non-core.

5. Generic Recommendations for Business Practitioners in Innovation for Sustainability

Based on the 7 PhD projects and the additional research conducted on business needs we conclude this policy brief on business impact by 5 specific policy recommendations for business.

1. Engage in business–academia collaborations

The ABIS I4S research project has consistently shown that there is a clear added value in the collaboration between academia and business for tackling sustainability related challenges. The collaborative nature of the project has enriched the research projects by making them more relevant and has helped companies with the further conceptualisation of the issues at hand and with a profound analysis of concrete business practices. Interaction with a wide diversity of stakeholders is in its essence an add-on for all parties involved.

2. Enact entrepreneurial value–based leadership

Entrepreneurial values-based leadership is important no matter the sector or company size. Individuals that are passionate and purpose-driven act as change agents in diverse environments. A moral compass, new knowledge and skills are needed for future leaders and knowledge workers, which can be found in an overview in table 3. Given the complexity of business challenges of the 21st century, such as sustainability, values provide a compass for management and employees in making decisions and in exploring new forms of doing business.

3. Design business models for innovation based on co-optation

In order to come to real sustainable solutions, it is important to shift from business models based solely on competition to business models that are based on a mix of competition and collaboration. In the literature, this model is referred to as co-optation. In order to tackle bigger sustainability issues, it is crucial to collaborate closely across sectors and beyond existing boundaries. Therefore, the building of new partnerships, networks, multi-stakeholder platforms, coalitions and entrepreneurial ecosystems will need to be part of the new world of work.

4. Systems thinking for wicked problems such as sustainability

Systems thinking requires multilevel thinking: analysis and change needs to happen at the level of the individual (mindset and skillset change), the organization (from silo to holistic organization approach), the partnership/network level (suppliers as partners for sustainability), at the ecosystem-level (great diversity of actors working around a certain sustainability theme) and at the larger societal level (region, country, world). New leaders should be able to think holistically, which means both horizontal interdisciplinary and vertical multilevel thinking, to deeply understand the issues at hand and to be able to bring together the right people for partnership/network/coalition formation.

5. Create capacity for (disruptive) change

Innovation for sustainable business needs to take place both on the product level (more sustainable) as well as on the process level (business models and organizing principles). Altogether, there is great innovative capacity for change. Technology and digitization are important game changers, but only when the culture and mindset for change are in place.

Table 3: Knowledge and Skills Quadrant for Business Education – based on needs expressed by business leaders in sustainability[6]

Knowledge

Individual	Collective
•Knowledge of Systems Thinking •Knowledge of sustainability themes – for example circular economy •Discussion needs to be fact-based and not only opinion-based •Highly specialized expert knowledge in every part of the business (and next to integrative thinking) •Understanding a specialized field of knowledge into the 'bigger scheme of things' •Thinking in innovative ways – knowledge of designing products and innovation techniques •Knowledge of business innovation processes •Knowledge of innovation in ecosystems •Knowledge of strategies with impact •The value of an individual is a mix of knowledge, experience and network	•Organizational collective knowledge of sustainability processes •Knowledge within and outside the organization •Collective intelligence derived from great diversity of actors in networks •Collective knowledge on different levels – organization, coalition, ecosystems – prerequisite for integration of sustainability throughout layers of the company •Collective knowledge also includes intergenerational diversity – young talent needs to be included together with the expertise of the seniors

Individual — Collective

Individual	Collective
•Purpose-driven leadership/working from purpose – being guided by a moral compass •Leaders bridge sectors (public and private) •How to lead and how to follow – servant leaders and empowering 'followers' •Internal and external orientation – inside-out/outside-in •Skills of building coalitions and ecosystems •Collaboration – internally and externally, dealing with diversity •Understanding and being able to function in different worlds – public and private – empathy and insight •Understanding and being able to deal with and leading transformational change •Negotiation skills – difference between 'being right' and 'getting it done your way' •Working from passion – thinking beyond your given role – inspiring and creating of purpose cannot be 'learnt' alone, but business schools may play a role in creating the right mindset	•Designing of purpose-driven and holistic organisations •Translating systems thinking into practice •Public/Private collaboration •Bridging of sectors – learning to speak each other's language •Culture of interdisciplinary collaboration •From rhetoric to implementation – taking momentum and transform the sustainability movement in real actions •Developing of trust – human aspects of relationships •Dealing with collective change, being comfortable with the 'unknown' – being able to step out of the comfort zone, as change is not comfortable •Understanding of markets – market as starting point of change – understanding markets and collaborating with players in different markets •Dealing with adversity and understanding conflicting interests in the system •Strategic insight – clear goals and strategy for change

Skills

I4S Project Identity

Coordinator: Academy of Business in Society (ABIS) Brussels, Belgium

Funding Scheme: European Commission's Marie Skłodowksa-Curie Initial Training Network, GA: 316604

Duration: 2013-2016

Budget: Euros 2.5 million

Website: http://www.abis-global.org/projects/i4s

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Researchers	Institution	Research Theme	Theme Policy Implication
Andreas Rasche Lara Hale	Copenhagen Business School, Denmark	The New Standards Paradigm in Sustainability Transitions: Insights from the Building Sector	Support role of demonstration projects and stakeholder engagement in raising awareness, facilitating feedback, and in legitimizing standards that shape legislation
Sally Jeanrenaud John Bessant Taryn Mead	University of Exeter Business School, United Kingdom	Biologically Inspired Innovation processes and outcomes for sustainability	Encourage policy frameworks and companies to reconnect to and learn from nature in innovating for sustainability
Sally Randles Oliver Laasch	Manchester Business School, United Kingdom	Business model change through embedding corporate responsibility and sustainability	Establish clear public policies that support the evolution of business models for sustainability
Steve Kennedy Gail Whiteman Amanda Williams	Rotterdam School of Management, The Netherlands	Inter-organizational dynamics of system change for sustainability	Encourage organizations to collaborate across organizational boundaries and support alternative forms of governance for systems change
Annemieke Roobeek Monique de Ritter	Nyenrode Business University, The Netherlands	Entrepreneurs and collaborative innovation ecosystems for sustainable systems change	Support entrepreneurial innovation ecosystems and hubs for innovating for sustainability at scale
Nigel Roome Katre Leino	Vlerick Business School, Belgium	The role of multi-stakeholder platforms in sustainable development	Provide start-up funding and policy legitimacy for multi-stakeholder innovation platforms
Stefan Schaltegger Erik Hansen Samuel Wicki	Leuphana University Lüneburg, Germany	Innovation processes in sustainable energy technology innovation	Provide clear policy guidelines for SMEs, and stable, predictable market signals for technology development
Kosheek Sewchurran Felix Philipp	University of Cape Town, South Africa	Systems perspectives and values-based leadership in organizations	Encourage development of systems perspectives and values-based leadership for systems transformation

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