In the NTNU mission, we state an ambition to use our professional breadth and interdisciplinary expertise to solve complex problems and increase understanding of the relationships between technology, society and environment. We will take advantage of our unique qualifications to promote innovation and develop the knowledge base for sustainable value creation and a competitive business sector.

The ambition of the SISVI project has an excellent fit with the NTNU mission statement with the focus on innovation capabilities, competitiveness, systems thinking and business models for sustainability. With its long-term perspective, SISVI has contributed to strengthen the integration of sustainability into business practices which is in line with the overall research strategies at NTNU. The project has reinforced positive bonds with other research institutions (both national and internationally), and provided funding for 2 PhD candidates.

I would like to thank the researchers, corporate sponsors and the Norwegian Research Council who have made this project possible. I will also encourage the partners to continue working with the issues addressed, in order to contribute to the development of sustainable and competitive industries in Norway.
SISVI (Sustainable Innovation and Shared Value Creation in Norwegian Industry) was a four-year competence building project involving collaboration between Norwegian companies and scientific researchers commencing on the 28th of May, 2014.

The project was funded by the user-driven research based innovation program (BIA). This is the largest research program in the Norwegian Research Council. Co-funding for the project came from industry partners.

SISVI focused on industry needs in order to enhance competitiveness through the implementation of sustainable business practices. The main project objective was to increase competitiveness for Norwegian industry based on shared value creation and sustainability, meeting both strategic, economic and social needs.

The project was carried out in co-operation with NTNU, SINTEF Raufoss Manufacturing AS, industrial actors, and with international research communities. The industrial actors have been split into two groups:

Core companies:
- Plasto AS (Develops and produces thermoplastics);
- Hexagon Ragasco AS (World’s leading producer of composite LPG cylinders);
- Raufoss Water & Gas AS (produces and supplies ISIFLO couplings and related products for the European water & gas distribution industry).

Network companies:
- Forsvarsbygg (planning, construction, and administration of defence estates properties);
- Norsk Stålforbund (steel industry);
- Molde Kunnskapspark AS;
- Ålesund Kunnskapspark AS;
- MRB AS (business development consultancy);
- Wonderland AS (produces beds and mattresses).

An important part of the project was the implementation and integration of novel knowledge. This secured alignment between the needs of the industry actors and theoretical concepts. In this context, tools and standards for improved performance were emphasized as deliverables in the project. Guidelines and key performance indicators for shared value creation were developed along with criteria for business simulations and road-maps for corporate governance models for sustainable outcomes.

During the project period, a few other companies were invited to be test-companies (including Vik Ørsta and Øglend) for the implementation of Environmental Product Declaration (EPDs). This worked as a tool for building sustainability strategies internally and in the companies supply chains.

The project manager for SISVI was Professor Annik M. Fet, and the project coordinator was Jon Halfdanarson. Work-package leaders were Professor Arild Aspelund, Professor Alf Steinar Sætre, Professor Luitzen de Boer, and Professor Annik M. Fet.
SISVI has targeted the UN Sustainable Development Goals (SDGs) number 9, 12, and 17 by highlighting the need for the business sector to collaborate with actors outside traditional industry arenas, thereby enabling a more open innovation processes. The core company partners have started to implement the principles of SDG 12 in their daily operations. This has led to new value propositions offered to the market and reconfigured supply chains based on circular economy principles. The future challenge for the Norwegian manufacturing industry is to apply these insights to transform their existing business models through learning and experimentation over time. The aim is that social and environmental concerns will become an integral part of economic value creation for business.
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OBJECTIVES & WORKPACKAGES

Competitiveness Through Shared Value Creation
INTEGRATION AND IMPLEMENTATION
Professor Annik Magerholm Fet

Work-package 4 focused on taking the knowledge gained across the research disciplines of internationalization, innovation, and interactions in networks (work-packages 1, 2, 3) and integrating them for implementation by:

- Developing road-maps and practical multi-criteria decision support tools for practical implementation at company level, as well as environmental product documentation from the life cycle perspective.
- Establishing corporate governance models with a focus on sustainability, accountability and shared value creation.

INTERNATIONALIZATION
Professor Arild Aspelund

Work-package 1 examined the upstream and downstream challenges in international value chains. "Shared Value", a term that combines social and economic values for increased competitiveness, was central to the entire project. Operating in global and demanding value chains requires Norwegian companies to differentiate their products, processes and services from a pure cost-based perspective. This work-package provided an insight into how Norwegian firms can be competitive in an international market in the future.

INNOVATION
Professor Alf Steinar Sætre

Work-package 2 analyzed how organizations can work innovatively with resources, processes, results, values, behavior, and climate concerns. Research sought to understand how companies through inclusive business model development, could create shared value (and spur innovation) in developing economies. The research further addressed how collaboration through private-public partnerships and the institutionalization of learning with adaptive processes between actors in the value chain could stimulate shared value creation.

INTERACTIONS IN NETWORKS
Professor Luitzen de Boer

Work-package 3 analyzed the interactions in networks required to achieve shared sustainable value creation. Network and supply chains relationships of participating companies were mapped. The structures, processes, routines, cultures, and skills required for shared sustainable value creation were interrogated. A variety of drivers and barriers were examined. The work-package contributed to an understanding of how firms can actively work and interact with various supply chain actors to improve shared value creation.

MANAGEMENT AND DISSEMINATION
Professor Annik Magerholm Fet

Work-package 5 involved the coordination and dissemination across the entire SISVI project. Dissemination has been achieved largely through numerous seminars and workshops. Master students have also written their thesis under or across different work-packages and in collaboration with core companies and network companies. Dissemination has also been fulfilled by published papers in scientific journals, and presentations at international seminars held in US (Berkley), UK (Cambridge), the Netherlands (Utrecht) and Italy at the ISDSN conference in Messina. SISVI researchers in addition were involved in the NTNU Sustainability Science Conference 2017.
INTERNATIONALIZATION
Sustainability & Competitiveness

Norwegian industry is in an era of internationalization. Firms of all sizes become more and more internationally exposed at both ends of the value chain. This means that they also become more exposed to a greater variety of social and environmental challenges as they expand their activities internationally. Hence, it becomes more challenging to assess the global societal and environmental impact of firm-related activities.

The theme of Internationalization in the SISVI project has aimed to address how international firms deal with the increased complexity of sustainability challenges of internationalization. It has also aimed to investigate how international firms are able to turn sustainability challenges into increased firm competitiveness.

SISVI has followed a multi-method research approach to investigate these questions. A comprehensive literature review on sustainability and corporate social responsibility (CSR) strategies in international firms confirmed the special role that sustainability has in internationalization processes. It also revealed that sustainability and corporate responsibility grew to become a more integrated strategy among the more internationalized firms. Previous research also showed that there is an inconclusive relationship between sustainability and firm performance among international firms. There is also very little guidance for practitioners on how to create sustainability strategies that also build competitiveness. Hence, the relationship between sustainability and competitiveness became a natural red line through all the work in SISVI work-package 1.

Through qualitative and quantitative research, investigations of the sustainability/firm performance relationship were undertaken and this sought to delineate in which cases sustainability strategies have a potential for increased firm competitiveness. In turn, research focused on whether companies are purely driving costs or take the role as ‘ad hoc’ marketing campaigns to improve their reputation on sustainability issues. Through a survey targeting the whole manufacturing sector in Norway, a general positive relationship was established between sustainability strategies and firm performance. Moreover, it was also established that the root causes of the ‘extra’ value creation were resource efficiency and environmental customer appeal. Through combining insight from qualitative and quantitative research in SISVI, a strategic toolbox based on strategic rationale from ‘Blue Ocean Strategy’ was created. Firms can use this toolbox to develop, assess and implement various sustainability strategies.

Based on this toolbox and other insights from the SISVI project, a program was developed for firms that seek to increase their competitiveness through sustainability. This program has been labelled “Green Planet Strategy” and was launched in May 2018 in collaboration with The Confederation of Norwegian Enterprise (NHO). The aim is that this program becomes available for all firms in NHO’s countrywide network in the near future.
INNOVATING for Shared Value Creation

Organizations, now more than ever, must redefine their purpose from pure value capture to creating economic value for themselves as well as for society by addressing its needs and challenges. Innovation is the key for unlocking the full potential inherent in shared value creation.

Social innovation is essential to break trade-offs between meeting social needs and maintaining business profits over time. The prospect of shared value creation is key to investing sufficiently to overcome the innovation hurdles.

The work undertaken in the SISVI project gave an overview of shared value creation, what it is, its antecedents and what it means for Norwegian industry. An innovation audit of participating companies provided each organization with an analysis-based evaluation of their organization’s innovation culture. These companies could then explore how each department or unit perceived six core elements: resources, processes, success, values, behaviors and climate—of the company’s innovation culture. This offered an opportunity to develop a toolkit to change for each firm.

Furthermore, the SISVI project developed a set of guidelines and metrics of innovation and shared value creation to aid managers and organizational members in their pursuit of sustainable value creation through innovation. A report titled “Innovation and Shared Value Creation: Balancing the Tensions Between Short-Term Exploitation and Long-Term Sustainability” explored in greater depth the link between innovation and shared value creation.

Twelve Master’s students at the Department of Industrial Economics and Technology Management (NTNU) completed their theses as part of the SISVI work-package for innovation. Students explored various aspects of innovation and shared value creation in Norwegian industry. Two of the Master’s students, in collaboration with an industry PhD student from Yara International, explored sustainable value-chains among coffee and rice producers in the Mbeya region of Tanzania.

In the course of the project period two international seminars for innovation were arranged with leading international scholars. The first took place in February 22nd 2016, with Professor Robert G. Eccles of Harvard Business School. He is one of the leading contributors to the social responsibility movement on “Innovating for a Sustainable Strategy”. The second seminar was held on February 14th 2017, with topic, "Teaming to Innovate: Leadership and Teaming in the Context of Innovation” with Professor Amy C. Edmondson from Harvard Business School.

Creating shared value in supply chains is an area of growing interest in both academia and practice. Recent years have seen companies increasingly understand the importance of sustainability and include an environmental and social agenda into their practices. The theme of interaction in the SISVI project aims to identify drivers and barriers to sustainable value creation in supply chains and networks. Research has sought to understand how Norwegian firms respond to these drivers and barriers, and suggest how firms can influence the complex interaction in supply chains with a view to creating sustainable and shared value.

Based on an inter-organizational and interactive perspective of the business landscape, a literature review was conducted to identify the main drivers and obstacles of achieving sustainability in supply networks. It was revealed that building long-term and trust-based relationships is essential for the creation of more sustainable supply chains and networks. A low level of inter-organizational interaction with insufficient transparency, commitment and communication is the main obstacle. The larger and resourceful customers like MNCs and governmental authorities with high sustainability ambitions are identified as two main driving actors in reaching sustainability in supply networks. Research also demonstrated the importance of management tools to conduct environmental assessments, such as life cycle assessment (LCA).

How Norwegian firms respond to the drivers and barriers was examined through in-depth case analysis of four organizations, namely, Plasto AS, Isiflo AS, Forsvarsbygg, and Wonderland AS. This revealed that the firms are increasing their awareness and knowledge on sustainability, along with adopting sustainable business models and pursuing shared value creation. Furthermore, a survey was held among Norwegian small and mid-sized firms (SMEs) capturing their view on the current drivers and obstacles towards creating shared value. The results align with the findings from literature, showing that shared value is more likely to be created together with local customers in close interaction, under conditions of flexible adjustments and long-term learning activities. The greatest challenge resides in the relationship with customers, when customers do not request sustainable products, or are not willing to accept an extra cost for sustainable options.

Building close business relationships with customers is one of the key drivers for shared value creation. Applying a process data analysis, an ‘interactive dynamic capabilities framework’ was developed. The framework combines industrial network theory and dynamic capabilities theory in order to specify how to develop and sustain competitive advantage through interaction of network partners. Teece’s dynamic capability model was expanded to three pairs of capacities: sensing and being sensed, seizing and being seized, and transforming and being transformed. Here, a firm’s business network can influence the reach and perceived value of those capacities. The framework aims to shed light on how firms could enhance their business performance and achieve sustainability targets through gaining and maintaining interactive dynamic capabilities.

Companies are facing the challenge on how to implement sustainability strategies in their different operational levels. Future sustainable business models (SBM) must serve to coordinate technological and social innovations with system-level sustainability. Systems thinking can identify the interactions between different parts of a system and ensures they deliver more than the sum of the parts.

For SDGs to shift the whole system onto a sustainable path, there is an increased need for joined-up thinking that goes deeper to address underlying causes of unsustainable practices. Innovations must introduce change at the core of the business to tackle unsustainable at its source rather than as an add-on to counter-act negative outcomes of business.

A good toolbox for systematic implementation of sustainability knowledge is organized in a stepwise progression through four levels: 1) process, 2) product/value chain, 3) organizational, and 4) systemic. The tools referred to in such a model span both quantitative and qualitative methods; from material flow analysis (MFA) and life cycle assessment (LCA), to cleaner production (CP) strategies and industrial symbiosis.

The level 1 tools target processes and identify potential improvements for firms through input-output analyses (I/O) and material flow analyses (MFA), setting targets related to resource use for sustainability. On this level, efforts are driven by economic incentives since better resource efficiency equates to economic gains. The majority of the partner companies in SISVI utilize lean production.

Level 2 tools focus on products and their value chain. The most recognized tool for mapping the potential improvements of a product’s sustainability footprint is Life Cycle Assessment (LCA). This tool quantifies material flows in the entire life cycle. Results from LCA can be classified into several environmental impact categories. Based upon a set of weighted criteria, the results can be used within supply chain management (SCM) through requirements upstream in the supply chain. Utilizing design for environment principles, achievements can be made which include end of life treatment of products. Quantitative information contributes to a better understanding of how to shift to more sustainable materials and design.

The third level tools are concerned with organizational and management of environmental system (EMS). The Environmental Lighthouse program or implementation of an EMS in accordance to ISO 14001 are the most common certification schemes. Depending on the size of the company, the largest corporations use the Global Reporting Initiative (GRI) for evaluating their performances against international branch standards. The wider focus through Life Cycle Management (LCM) is also another step into implementation of business models for sustainability.

The highest level in the model, level 4, represents a systemic focus whereby the principles of industrial ecology (IE) can be embedded into a systems engineering framework. The incorporation of stakeholders into a company’s strategies is critical for achieving sustainable and inclusive growth. One of the greatest challenges to successful implementation of environmental sustainability is stakeholder resistance. Solving technical aspects is only part of the puzzle. Understanding cultural settings is equally important in planning, design and operation of systems thinking.

Achievement of SDGs will require a switch in focus from ‘corporate social responsibility’ (CSR) and ‘shared value’ approaches, to also include ‘system change’ strategies based on big ambitions, new technologies, new business models, and active market shaping.
Towards sustainability:

Level 1: Process change/improvements
- I/O, MFA

Level 2: Product-change/value chain/improvements
- LCA, SCM, CFP, EPD, DFE

Level 3: Organizational change/improvements
- EMS, EPE, KPI, GRI, LCM, SBM

Level 4: System change/improvements
- IE, CSR, SE

I/O - Input-Output Analysis
MFA - Material Flow Analysis
CP - Cleaner Production
LCA - Life Cycle Assessment
SCM - Supply Chain Management
CFP - Carbon Footprints of the Product
EPD - Environmental Product Declarations
DFE - Design for Environment
EMS - Environmental Management System
EPE - Environmental Performance Evaluation
KPI - Key Performance Indicator
GRI - Global Reporting Initiative
LCM - Life Cycle Management
SBM - Sustainable Business Models
IE - Industrial Ecology
CSR - Corporate Social Responsibility
SE - Systems Engineering

Figure modified after Martina Keitsch, NTNU
CASE EXPERIENCES

PLASTO AS
Case Study by PhD Candidate Sigurd Vildåsen

Sigurd Sagen Vildåsen
PhD Candidate - Corporate Sustainability: Exploring Tensions Through a Case of Circular Business Model Development
Department of Industrial Economics and Technology Management
Faculty of Economics and Management
Norwegian University of Science and Technology (NTNU)

Sigurds PhD explores the role of business in society through the concept of corporate sustainability (CS). More specifically, the research emphasizes the tensions as perceived by actors when organizations adapt to social and environmental requirements of their stakeholders. In addition, the thesis complements the emerging research agenda regarding implementation of the Sustainable Development Goals (SDGs) in business operations.

Through the PhD research, empirical findings were drawn from a longitudinal single case study focusing on the company Plasto’s effort to develop a circular business model (CBM), as a process of organizational change responding to tensions between stakeholders’ requirements. The SDGs, representing social and environmental concerns, broadened the scope by bringing in a societal perspective on a business problem.

The case study period was from May 2014 – April 2018. The circular business model process took place in the context of the business relationship between Plasto and its main customer, AKVA group. More specifically, the case study reported on the drivers and barriers when introducing recycled materials in the production of plastic components to AKVA group.

The study drew on the perceived conflict between product quality and recycled materials, a concern expressed by both AKVA group representatives and internal actors of Plasto. The tension between quality and circularity led to a process of organizational learning through which Plasto presented experiences in dialogue with actors from other organizations. Plasto resolved the tension partly through technical advancements and dialogue with AKVA group.

The process of organizational learning indicates that the SDGs spur creativity by enabling the company to connect its specific circular business model project to a larger societal perspective. However, the risk is that the abstract and general nature of the SDGs attracts stakeholders with a superficial understanding of the specific feature of the circular business model challenge. This in turn make...
central actors, such as AKVA group in this case, question the credibility of the results. Theoretically, this case study reflects a situation where the central actors in the change process negotiate underlying tensions.

The practical result of the organizational change process was that AKVA group agreed to the usage of circular materials in certain product types, given that the technical testing indicated that quality requirements were fulfilled.

The case study illustrates the importance of actor collaboration throughout a change process. An important theoretical generalization concerns the delineation between actors and stakeholders. Any actor in a corporate sustainability context is per definition a stakeholder, but most stakeholders do not develop into contributing actors in an ongoing change process. Classical stakeholder theory overlooks this insight, which limits our understanding of how and why firms prioritize certain stakeholders in their daily operations.

The contribution of the PhD thesis has been to facilitate further debates on the role of different actors, for example those with non-financial purpose. The thesis suggests that further research belongs to a trans-disciplinary methodology, where academics and practitioners collaborate through research projects, in terms of designing and executing the research activities.

As this approach is centered on the role of contributing actors in processes of change, it has the potential to advance our understanding of how business organizations resolve corporate sustainability tensions in practice.
HEXAGON RAGASCO AS
LIFE CYCLE MANAGEMENT
Case Study by PhD Candidate Marit Moe Bjørnbet
& Researchers Jon Halfdanarson & Michael Jenssen
The goal of this case study was to perform a life cycle assessment to gain insight into the environmental impacts associated with the product. In addition, the study investigates how insight can be utilized to develop tools, preparing the Norwegian manufacturing industry for the green shift, integrating environmental management into core business activities.

Hexagon Ragasco AS is one of the core companies participating in the SISVI project. They produce composite LPG containers (liquefied petroleum gas) at their highly automated production facility located in the industrial area at Raufoss in Norway. LPG containers is used all around the world for many purposes (cooking, heating, at building sites, barbeque etc.). The LPG cylinders can be produced in metal (steel or aluminium) or composite materials. Hexagon Ragasco AS was aware of many benefits with their composite LPG cylinder before starting the SISVI project (rust free, safe and lightweight), but were lacking specific insights into the environmental impacts of their product, from production, use but also end-of-life. It was therefore decided to perform a life cycle assessment of the composite container, as well as for a steel container for comparison.

During the SISVI project period a life cycle assessment (LCA) was performed, to map the environmental impacts of the container throughout the entire life cycle, from raw material extraction to production, use-phase and end-of-life treatment. This in order to identify bottlenecks and as decision support to know where to focus the effort to improve the overall environmental performance of their products, and also to increase internal competence on sustainability work.

The gathering of data for the assessment proved to be extensive and required collaboration with several actors in the companies’ value chain. The case study illustrated the importance of working across the company’s boundaries to be able to gain needed insight and to be able to change key aspects for an improved environmental footprint. It also became more clear during the SISVI project that working to improve the environmental footprint of the product can be a competitive advantage as more customers are asking for information on environmental performance.

The case study has led to an improved understanding of the composite container’s environmental impacts throughout its entire life cycle. It has also contributed to increased focus on sustainability in the upstream supply chain and for Hexagon Ragasco, who has initiated a new project in collaboration with the Norwegian Research Council (NFR) and other actors within the composite industry. In this project they will continue to improve the LCA of their composite container, especially within the use- and end-of-life phase. The project will also continue to use life cycle management techniques to further improve the environmental footprint of the product.
Raufoss Water and Gas AS, often referred to as its leading brand name ‘ISIFLO’, is a Norwegian company established in 1965. The company develops and supplies brass and polymer reinforced couplings, more than 2000 tons annually, for water and gas distribution industries. ISIFLO, located at Raufoss Norway, has approximately 150 employees and is distributed over 28 countries addressing growing demand for rehabilitation of drinking water supply infrastructure.

An investigation on ISIFLO’s overall strategy was conducted. This included looking at the firm’s core competence, market position, logistics strategy, inter-organization relationships, and existing program for sustainability. Following on from this, environmental externalities and sustainability concerns of ISIFLO’s production and logistic processes were examined along with recycling efforts.

The collaboration between ISIFLO and NAV Vestre Toten was investigated to understand how ISIFLO achieved shared value creation. ISIFLO has included disadvantaged youth and marginal groups who need work training as a key part of their own assembly line workforce. Instead of using automated assembly, ISIFLO pays the same cost to get flexible local workforce in return. The workers get work training and job experience, which is very useful for future job application, while the municipality also get lower unemployment rate. The collaboration between ISIFLO and NAV Vestre Toten is a good example of how a firm can achieve shared value creation by developing profitable business strategies that deliver social benefits when making economic profit.

The project also touched upon technical challenges to help the company develop a more sustainable product portfolio by introducing polymer reinforced couplings to reduce the overall environmental impact.

Working together on the SISVI project has assisted ISIFLO to decrease the number of steps in the value chain, resulting in cleaner production, simplified assembly, and reducing risk for leaking metals to the drinking water. This new portfolio is part of the new sustainable business model.
ISIFLO Case Study with Students at NTNU

ISIFLO was the case company for two master theses in 2017 and 2018. Interviews and analysis of sustainable business operations were conducted with managers at Sintef Raufoss Manufacturing.

ISIFLO was also a case company for course in TIØ 4175 Purchasing and Logistics Management, spring 2016. There were five course assignments related to the ISIFLO case.

Coursework for students enrolled in the program on “Industrial Marketing and International Trade” (TIØ 4235) for 2015 had ISIFLO as the case company. 100 students worked for a week with challenges set by ISIFLO related to their sustainability and international strategies. Out of this intensive student exploration, 26 group assignments were delivered at NTNU.

Both TIØ 4175 and TIØ 4235 course are taught at the Department of Industrial Economics and Technology Management at NTNU.
The public sector is an important factor in creating innovative and environmentally friendly solutions for the best of society. In Norway, the public sector procures goods and services for over 500 billion NOK annually.

The SISVI project has looked closer into an innovative project, Visund, built for the Norwegian Armed Forces within the Haakonsvern Naval Base in Bergen. The building is built and operated by the Norwegian Defence Estates Agency (NDEA). It is presently one of the most energy-efficient buildings operating in Norway, with an energy consumption equivalent to a normal residential house.

The clue to successful implementation of green policy requirements on energy in this case was a combination of clear and defined targets and requirements combined with extensive cooperation between actors. This combination of being specific, functional and cooperative at the same time resulted in an innovative green building solution and an efficient construction process. Opening up for interaction gave room for innovative solutions with high environmental standards from the supplier side. At the same time, being clear on following up targets and requirements from the buyer side enabled a “green push” from the developers to the market.1

The project Visund, with environment and energy as the main focus areas achieved the goals of becoming a zero energy emissions building incorporating 350 m² solar panels on the roof, intelligent ventilation, solar shielding and connection to sea water heat pumps.
An important part of the SISVI project has been the seminars where researchers, company representatives and invited guests have been able to discuss key issues related to the innovation processes in firms and sustainability.

Over the course of four years, numerous seminars were held each with a unique theme that determined the location, agenda and topics of discussion. Norwegian based seminars held in Ålesund, Oslo, and Trondheim often incorporated company visits to reinforce the researcher/company interaction. Contact between the project partners has been a key element in knowledge exchange and creation.

Seminars also provided a channel allowing the researchers to present their results; this included the funded PhD candidates, master students and Post Doctorate research with external funding. This created a strong interface between the SISVI project and other relevant research.

Seminars focused on industry, scientific, or international knowledge sharing. The following pages provide a summary of only some of the seminars. The kickoff seminar was held in May, 2014.

A comprehensive list of seminars and reporting for this is listed under the publication section in this report.
INDUSTRY FOCUS

The goals of industry seminars were to:

- Enhance collaboration and learning between business and academics and share expertise amongst different industry partners.
- Meet the industry’s needs by implementing and integrating research results creating concrete tools;
- Bring expertise from industry into course subjects at NTNU by linking master students with industry.

In November 2014, SISVI held an industry seminar, at SINTEF Raufoss Manufacturing AS at Raufoss. The theme for the seminar was how the SISVI project can meet the needs of the participating companies, and how these companies have tackled competitiveness through innovation and with long-term strategic planning.

In Trondheim March 2015, an industry seminar took place with the theme being innovation and shared value creation. Companies and researchers discussed how to tackle innovation and their understanding of shared value creation.

In December 2015 the SISVI project held a workshop in Trondheim for Responsible Research and Innovation (RRI) to discuss existing and future approaches. Implementation of RRI in industry was a key topic, as well as in the structure of science and innovation practices in higher education organizations.

April 2016 there was a workshop together with industry in Trondheim focusing on uniting innovation and sustainability in Norway with the potential creation of a Norwegian Center for Sustainable Business Models.

In Ålesund September 2017, a seminar with industry focus discussed the topic of green competitiveness and circular business models. Industry leaders presented their companies and their approach to the topic. In addition, NTNU presented insights of digitalization and the business of the future.

SCIENTIFIC FOCUS

The goals of scientific seminars were to:

- Provide a forum for the presentation of new research in the field of sustainability science;
- Foster an exchange of knowledge and research practice between experts within all sustainability dimensions;
- Encourage critical and cross-disciplinary discussion on current projects and initiatives.

In September 2015 a scientific seminar located at Åndalsnes targeted the question of how green innovation could be implemented as a key business strategy for the promotion of sustainability. In addition to the research debates, industry partners also discussed the topic of green innovation.

In May 2016 in Ålesund, a scientific workshop took place addressing how sustainability aspects can be implemented in different innovation processes.

NTNU held a sustainability conference in October 2017 at which SISVI project played a key part of the program. The conference was a platform to share evidence-based research and implementable strategies for sustainable decision-making. Scientifically based strategies provide the foundation for practical innovation and implementation and influential decision-making. The theme, "Transitions to sustainable systems", highlighted the importance of finding ways to practically implement sustainability strategies across economic, social and environmental dimensions.

In March 2018, SISVI partners came together in Trondheim to collaborated with the Green Value Creation group, the SMART project and SFI Manufacturing, for a joint seminar on circular value creation in new business models. Topics discussed included: industrial value creation in a green economy; sustainable supply chains and shared value creation; state of the art on sustainable business models; sustainable governance model; and sustainability assessment tool.
INTERNATIONAL SEMINARS


A delegation of SISVI associates attended the Symposium arranged by the Center for International Manufacturing, IfM, at the University of Cambridge. There was a special session on sustainability, hosted by Professor Arild Aspelund, where SISVI researchers Malena Ingemansson Havenvid and Marit Bjømbe Moe held presentations. In addition Professor Aspelund discussed topics around the digitalization of industry. Many experts contributed to the dialogue on topics such as: integrated supply chain in the cloud; intelligent industrial automation in factories; and big data and supply chain management, to name a few.

Seminar “Creating Value From Marine Plastic Waste”, Utrecht University, 24 March 2017

SISVI, in collaboration with the University in Utrecht and the Circular Ocean project, hosted this seminar on how to create value from marine plastic waste. The seminar was held on campus at the University in Utrecht. Representatives from academia and industry came together to discuss challenges and possibilities concerning this topic. Participants were from NTNU, University of Utrecht, Wageningen University (NL), The Ocean Cleanup, Plasto, Sintef Raufoss Manufacturing, Forsvarsbygg, and Interface Inc. Key topics discussed were: regulation/policies as incentives and barriers; marine plastic waste; innovation; shared value creation; and circular business models.

Seminar “Innovating for a Sustainable Strategy” Professor Robert Eccles, 22 Feb 2016 Oslo

International keynote speaker Mr Robert Eccles, Professor of Management Practice from Harvard Business School presented on the “performance frontier” covering the topic of how to become a sustainable company. Professor Eccles is an expert on integrated reporting and leader on how companies and investors can create sustainable strategies. In the seminar, group session participants from industry, research, and students focused on challenges such as: integrated reporting, materiality, environmental and social governance, and becoming a sustainable company.


The theme of the conference: “Actions for a Sustainable World: from theory to practice”, aimed to emphasize the fact that we have reached a milestone in the concept and practice of sustainable development. The conference had multiple themes as the base for discussions on the opportunities and challenges for a sustainable future, and brought together the academic community and other stakeholders from around the world. The conference provided Sigurd Vildåsen the opportunity to presented his PhD work conducted in connection to SISVI.
“It is extremely valuable for us students to get access to these networking arenas. To be able to interview an international expert like Bob Eccles was very helpful for us”, says educational award winner Sunniva Bratt Slette.
For **PLASTO** the development of sustainable solutions is important as a local producers in a global market.

“We joined this project based upon long-term previous collaboration with the research group at NTNU. Sustainability has become an increasing challenge for our business, and the focus in the project on circular thinking and closed-loops strategies has helped us to turn these challenges into a business case together with our customers and suppliers.”

The **ISIFLO** business concept implements lasting values through the development and supply of environmental friendly products to meet all customer requirements related to water, drainage and gas distribution networks. ISIFLO holds the trademark “ISIFLO” - one of the leading brands on the European market for water and gas distribution.

“As an European market leader for water & gas distribution of couplings, we have supplied more than 200 million couplings so far. The SISVI project has been useful in the development of our corporate sustainability strategy. Shared value creation and social responsibility are among our core values”

**HEXAGON RAGASCO** is the world’s leading producer of composite LPG cylinders with over 12 million units in use worldwide. We are committed to quality, safety and innovative solutions that add value to our customers and preserve our environment.

“We respond to the sustainability challenges by analyzing the environmental footprints of our products. We have started to build an LCA-database for all materials used in our products, this to be used in future product development”.

Lars Erlend Stenerud - Chief Executive Officer

Skjal Sylte Stavheim - Managing Director

Lars Kristian Ølstad - Chief Executive Officer

Skjal Sylte Stavheim - Managing Director
SUSTAINABLE INDUSTRY OF THE FUTURE

The competitive innovative industry of the future has to meet numerous requirements – such as; sustainability, flexibility, information security, real time learning, zero defect manufacturing, knowledge base for utilizing enabling and new technologies.

For society and the globe, creating sustainable and climate neutral solutions for manufacturing is crucial, and we are certain that these solutions are about cross-disciplinary team work.

Collaboration with partners from industry and academic institutions speeds up innovation and the development of sustainable solutions.

The NTNU team is grateful to everyone that has contributed to the SISVI project. A special thanks goes to the core partners and network partners that contributed with financial support as well as their own time in meetings, discussions and guidance to our students.

SISVI also thanks current and past NTNU staff for their project contributions. A special thanks goes to Professor Elsebeth Holmen, Professor Geir Ringen, Associate Professor Malena Havenvid, and researchers Xinlu Qiu, Haley Knudson and Michael Jenssen.

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PUBLICATIONS

Seminar Reports and Working Papers are listed with downloads available on project website www.sisvi.no

- SISVI, GVC, SMART project and SFI Manufacturing International Seminar: Circular value creation and/in new business models. Trondheim, 6. March, 2018
- SISVI and Network for Green Growth Breakfast Seminar: Green competitiveness. Ålesund, 28. September, 2017
- Sætre, A.S.: Guidelines and metrics of innovation and shared value creation (KPIs). Trondheim, May, 2017
- Sletmo, S.N. & Halfdanarson, J.: Sustainability frameworks, tools and initiatives relevant for SISVI. Trondheim, August, 2016
- Aspelund, A. (2014) Literature review and modeling the relationship between internationalization and shared value creation/social responsibility
- SISVI LCA workshop. Trondheim. 20. November 2014

Publications with support of SISVI project published in international peer-reviewed journals and conferences

- Eide, A.E., E.A. Sæther and A. Aspelund (in review), “CEO’s Motivation and Leadership Style: Antecedents of Sustainability Strategy and Outcomes in Manufacturing Firms”.
TODAY’S STUDENTS ARE OUR FUTURE LEADERS

Masters students Synne Mari Pedersen and Sunniva Bratt Slette received an award by Forbundet for ‘Ledelse og Teknikk’ for their SISVI thesis. The thesis was supervised by SISVI’s Annik Magerholm Fet and Sigurd Sagen Vildåsen.

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