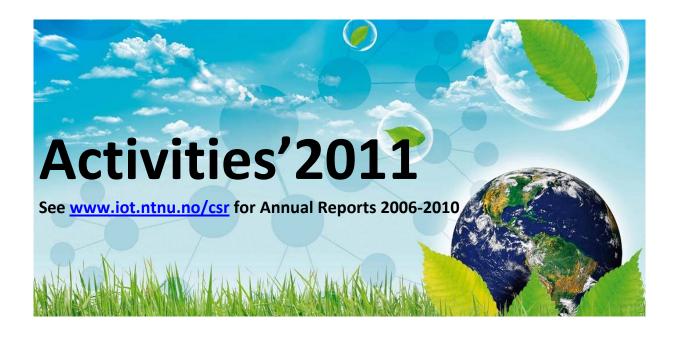
Strategic Research Program Environmental Management and Corporate Social Responsibility (EM&CSR) in Global Value Chains



Department of Industrial Economics and Technology Management Norwegian University of Science and Technology



Much of the information found in this report can also be found on the department website (www.iot.ntnu.no/csr) or under the IGLO-MP2020 site (www.iglo-mp2020.no).



Summary for 2011:

EMCSR research group was engaged in several activities to support research in Environmental management and CSR.

In 2011, some of the courses were restructured for the two-year master program in HSE and the two international master programs; master in Industrial ecology and master in globalization. A number of students have been affiliated to the EMCSR research group for their master project work and their thesis. Similarly, 5 PhD candidates are part of the EMCSR research-group through their PhD projects. Among the achievements in 2011 are numbers of Journal articles, conference papers and scientific presentations.

Research activities have been promoted by arranging workshops & internal seminars, continuing Involvement in different external activities and collaboration with national and international interested parties. The EMCSR research group joined in to a new cooperative project together with the Norwegian School of Management (BI) and the University of Stavanger with the topic "CSR as a Strategic Tool for Sustainability Focused Innovation in Small and Medium Sized Enterprises". In 2011 the initiative CSR-region was started with financial support fro the Norwegian Research Foundation and the core companies Sparebank 1MN, Fokus Bank, Pharmaq, NTE and other supporting companies. The aim of CSR-region is to increase the knowledge and to strengthen the collaboration on CSR in the region Mid Norway. However, the initiative has also a national focus.

Eight different research projects are currently running by the research group. These research projects are contributing to develop new tools and methods in the area of EM and CSR. In addition the aim of the research activities is to develop new knowledge on environmental management and corporate social responsibility.

The members of the EMCSR research group have also been involved in different external activities of relevance for the research in the group.

TEACHING AND SUPERVISION 2011

1. Courses 2011:

Based on the mainstreaming of the courses related to environmental management that are offered to the 2-year master in HSE, 2-year international master in Industrial Ecology and 2-year international master in globalization, the following courses are offered now:

Master level courses:

Courses in English

■ TIØ4195 - Environmental Management and Corporate Governance, coordinated by Annik M. Fet. Autumn 2011: ca 40 students



This course id mandatory in the Master of Technology I Global Production and Master program in Industrial Ecology.

■ TIØ5215 Corporate Social Responsibility and green supply management, Coordinator: Tim Torvatn and John E Hermansen (Annik M Fet 2012)

Courses in Norwegian

- TIØ4260 Bedriften Samfunnsansvar, organisasjon og miljø, coordinated by Annik M.
 Fet, Spring 2011: ca 40 students
- TIØ4300 Environmental Science, Ecosystems and Sustainability, coordinated by John Hermansen, Autumn 2011: ca 50 students., Kristin Svendsen (Kristin Svendsen 2012)

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In addition to IØT courses EMCSR is represented in the Experts in Team village "Corporate Social Responsibility", led by Associate Professor John E. Hermansen:

■ TIØ4853 – Experts in Team.- Social responsibility and creation of value. Coordinator: John E Hermansen (Cecilia Haskins is coordinator 2012), Spring 2011: 28 students in TIØ4853

Other courses:

- TIØ4520 HMS Fordypningsprosjekt
- TIØ4525 HMS Fordypningsemne
- TIØXXXX HMS-master
- TIØ4955 Industrial Ecology, Master Thesis
- TIØ5335 Industrial Ecology, Project
- Globaliseringsmaster

PhD level courses:

 IØ8503 - Environmental and Social Responsibility - Theoretical and Methodological Approach to Multi-Disciplinary Research, coordinated by Annik M. Fet

The PhD-course IØ8503 focuses on methodologies for multidisciplinary research. The course content covers central research methods: - qualitative and quantitative methods, - systems theory and engineering, - business research methods and action research. In addition the course gives an overview of environmental management, MFA, LCA, risk assessment, multi criteria decisions support, etc. as well as the implication of development and improvements on products, processes, organizations and value chains. Some attention is also given to writing for peer-reviewed journals.

2. Master thesis spring 2011:

1. 'Carbon Footprint and Environmental Documentation of Product – A Case Analysis on Road Construction', 2011, Laxmi Panthi. IndEcol program, Master Thesis (TIØ4955) - supervisor Professor Annik Magerholm Fet



- 'Indicators for managing and communicating eco-efficiency in the maritime industry', 2011, Aspen, Dina. Master thesis, IØT/Industrial Ecology - supervisor Professor Annik Magerholm Fet
- 3. "Communication of environmental impacts through environmental product declarations", Magerøy, Marina, IØT/Industrial Ecology supervisor Professor Annik Magerholm Fet
- 4. Human dimensions of natural resource management for the Vosso wild salmon population, Gajic, Nevena; IØT/Industrial Ecology supervisor Professor Annik Magerholm Fet/Cecilia Haskins
- 5. Sustainable Dwellings and Intergenerational Equality New applications for ecological economics Klar, David; IØT/Industrial Ecology supervisor Professor Annik Magerholm Fet / Cecilia HAskins
- 6. "Miljøstrategi og Gründerbedrifter Hvordan skape vedvarende konkurransefortrinn gjennom en internog ekstern miljøprofil", Truls Kristian Brataas, NTNUs Entreprenørskole, supervisor Roger Sørheim, co-supervisor Annik Magerholm Fet
- 7. "Systems Engineering in offshore sector", Alexander Walland, supervisor Ola Strandhagen IPK / Cecilia Haskins IØT
- 8. "Green Procurement practice in the perspectives of Industrial Ecology concept. Case: Norske Skog Skogn mill".Rina Farida Rosduany, IØT/Industrial Ecology supervisor John Hermansen
- 9. "The Norwegian Government Pension Fund Global (GPFG) and the exclusion principles", Hilde Kristine Iglebæk, IØT/Industrial Ecology supervisor John Hermansen
- 10. "Integration of Social Responsibility into the Norwegian Environmental Certification Schemes Eco-Lighthouse (Miljøfyrtårn). A comparison with the ISO 26000 Guidance on Social Responsibility". Heidi Maria KarlssonlØT/Industrial Ecology supervisor John Hermansen

3. Specialisations projects autumn 2011

- 1. 'Management of end of life treatment of ships', 2011, Madhur Ahuja. IØT, Project Management, Project (TIØ5230) supervisor Professor Annik Magerholm Fet
- 2. 'Green economy and its implications for central management disciplines', Ilze Garda. IndEcol program, Project (TIØ5335) supervisor Professor Annik Magerholm Fet
- 3. 'CSR-Reporting in Statoil', 2011, Karoline Budral Teien, Globaliseringsporgrammet supervisor Professor Annik Magerholm Fet
- 4. John's projects

5. Active PhD-projects 2011:

- "CSR in Global Value Chains," Christofer Skaar
- "Environmental life cycle assessments of fish food products with emphasis of the fish catch process", Erwin M. Schau (funded by Sintef)
- "Evaluation of the Impact of CSR on Competitiveness of Production Enterprises operating globally", Natallia Vakar
- "Methods for Sustainable Urban Coastal Area Management applied on Contaminant Sources", Magnus Sparrevik



- "Evaluation of the Effectiveness of Hexagonal Balanced Scorecard approach for Managing Corporate Social Responsibility (CSR) in Global Production Systems", working title, Caroline Cheng.
- "Life Cycle Management as a Tool for Sustainable Decision-Making in Maritime Value Chain", Dina Aspen

PUBLICATIONS 2011

1. Journal articles:

Sparrevik, M.; Barton, D.N.; Bates, M.; Linkov I. Towards sustainable decisions in sediemnt management by use of stochastic multi-criteria outranking. Accepted for publication in *Environ. Sci. Technol.* **2011,** DOI: 10.1021/es202225x

Sparrevik, M.; Saloranta, T.M.; Cornelissen, G.; Eek, E.; Fet, A.; Breedveld, G. D.; Linkov, I. Use of life cycle assessments to evaluate the environmental footprint of contaminated sediment remediation. *Environ. Sci. Technol.* **2011**. *45* (10), 4234-4241

Sparrevik, M.; Linkov, I. Use of life cycle assessments for improved decision making in contaminated sediment remediation. Integr Environ Assess Manag. **2011**, 7 (2), 304-305.

Linkov I.; Bates M.; Loney D.; Sparrevik, M.; Bridges T. Risk management practices. Cross-agency comparisons and tolerable risk. In Climate: Global Change and Local Adaptation, 135-158 **2011** Springer

Sparrevik, M.; Barton, D.N.; Oen, A. M.; Sekhar, N. U.; Linkov, I. Use of Multi-Criteria Involvement Processes (MIP) to Enhance Transparency and Stakeholder Participation at Bergen Harbour, Norway. *Integ. Environ. Assess. Manage.* **2011**, 7(3), 414-425

Sparrevik, M.; Ellen, G.J.; Duijn, M. 2011. Evaluation of Factors Affecting Stakeholder Risk Perception of Contaminated Sediment Disposal in Oslo Harbor. *Environmental Science and Technology*, 45(1): 118-124.

Fet, A.M., Michelsen, O., De Boer, L. (2011) "Green public procurement in practice - the case of Norway". *Society and Economy*, 33(1): 183–198.

Carson, S. G., Fet, A. M. and Skaar, C. "A Nordic Perspective of Corporate Social Responsibility (CSR)", Special issue on CSR, *Etikk i praksis*, May 2011.

Skaar, C. and Fet, A. M. "Accountability in the Value Chain: From Environmental Product Declaration (EPD) to CSR Product Declaration". *Corporate Social Responsibility and Environmental Management*, Accepted in April 2011.



2. Conference papers:

Fet, A. M. "Klimaspor - hvordan beregne og kommunisere?" på konferansen "Mot et lavutslippssamfunn - klimaspor en viktig brikke i arbeidet", arrangert av Standard Norge, 26. mai 2011, Oslo

Haskins. C. "Can Systems Engineering Support Sustainable Innovation?" Proceedings of the 9th Annual Conference on Systems Engineering Research (CSER). 14-16th April 2011. Los Angeles.

Fet, A. M. "From environmental product declarations to products development in SMEs", Sustainable Consumption 2011 Conference: Sustainable Consumption, Production and Communication, Corvinus University of Budapest, Hungary, 20th January 2011

Sparrevik M. "Towards sustainable management of contaminated sediment – an integrated approach based on Multi-Criteria Decision Analysis". SETAC North America Nov 7-11 2011

RESEARCH ACTIVITIES AND PROJECTS

1. Arranged workshops and guest visits in the EMCSR group:

Researcher seminar: Environmental Management & CSR, January 26th, 2011.

Internal PhD seminar at EMCSR group, August 24th, 2011.

2. National collaboration:

At the end of 2010 the EMCSR research group joined in to a new cooperative project together with the Norwegian School of Management (BI) and the University of Stavanger with the topic "CSR as a Strategic Tool for Sustainability Focused Innovation in Small and Medium Sized Enterprises". This project will assess the level of innovation in Norwegian "gazelle companies". The project will continue till the end of 2012 (see more details in 'Research projects' section).

Kickoff-meeting for the project "Midtnorsk kompetansenettverk på bærekraft og CSR: Bærekraftig utvikling og et ansvarlig, innovativt og fremtidsrettet næringsliv i Midt-Norge', May 4, 2011 in collaboration with partners for innovation (NTNU, NTE and SpareBank 1 SMN), Innovation Norge and NHO (see more details about the project in the 'Research projects' section).

External activities of Professor Annik M. Fet of relevance to the research group:

- 1. Leader of the Norwegian ISO-delegation on Carbon Footprints of Products,
- 2. Deputy board member Standard Norway,
- 3. Deputy board member BIA (NFR),



- 4. Leader of the technical committee EPD-Norge (until August 2011), Dina Aspen is a member of the technical committee EPD-Norge (since August 2011)
- 5. Member in the committee K 127 Environmental management, Standard Norway.

EMCSR Collaboration with the Fiskeridirektoratet, SINTEF and other research organizations and companies on the development of the national standard for PCR for seafood.

Annik M. Fet acted as a national PhD-evaluator and committee member: "Five perspectives on Corporate Social Responsibility (CSR) - an empirical analysis" by Caroline D. Ditlev-Simonsen, BI, Oslo.

Professor Annik M. Fet acted as an international PhD-evaluator (opponent) for the PhD defense at the University of Bodø.

3. International collaboration:

Sustainable Development, Production and Communication, Hungary (see more details in 'Research projects' section).

Professor Annik M. Fet was invited to visit the North Eastern Normal University, China, where she gave several lectures and speeches related to CSR (June, 2011).

4. Attended Conferences and other events:

August 28-31, 2011 – Dina Aspen attended on LCM Conference in Berlin, Germany. (Erwin M. Schau was part of the organizing crew).

January 18-21 - PhD Candidate Christofer Skaar participated in the development of ISO 14067, a standard for the quantification and communication of greenhouse gases (GHG) associated with products (goods and services) in the value or supply chain. The meeting took place in Trieste, Italy.

January 24-25, 2011 - Professor Annik M. Fet participated in the 14th EMAN Conference: Accounting for Climate Change – What and How to Measure on. On January 21, 2011 Annik Fet also took part in a Closing Conference of the Sustainable Consumption, Production and Communication project funded by the Norway Grant, where she opened the conference with a presentation on Environmental Product Declarations. Both events took place in Budapest, Hungary.

January 19-20, 2011 - PhD Candidate Erwin M. Schau and researcher Børge Andreas Johansen attended Traceability of Ecolabelled Seafood Conference in Copenhagen, Denmark.

June 25-July 1, 2011 – PhD Candidate Christofer Skaar participated participated in the ISO 14067 sessions at the ISO meeting in Oslo. Professor Annik M. Fet was a moderator of a public session



on "Towards low carbon societies – Need for efficient tools" at this meeting on 27 June (http://www.standard.no/en/externalSites/TC207/Public-Workshop/).

12-14th September, 2011 - Professor Annik M. Fet participated in the 4th International Conference on Marine Research for Environmental Sustainability, ENSUS2011, held at Newcastle University, Newcastle upon Tyne, United Kingdom.

29-30th September, 2011 - Professor Annik M. Fet participated in the 2nd International Conference 'SUSTAINABLE CONSUMPTION AND PRODUCTION: how to make it possible', Kaunas University of Technology, Lithuania.

Presentations

1. Guest presentations and invited speeches by the EM&CSR research group:

EM and CSR – tools and trends towards sustainability, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), 14TH EMAN CONFERENCE 2011: ACCOUNTING FOR CLIMATE CHANGE, 24-25 January 2011, Budapest

From Environmental Product Declarations to Product Development in SMEs, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), SUSTAINABLE CONSUMPTION 2011 Conference, 21 January 2011, Budapest

Klimaspor - hvordan beregne og kommunisere?, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), leder av Standard Norges arbeidsgruppe for produktrettet miljøstyring, Standard Norge, 26. mai 2011

CSR as an innovation driver, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), 18 June 2011, Yanbian University, China

Environmental management and CSR in a Scandinavian context, Professor Annik Magerholm Fet, , Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), 21 June 2011, Jingyue Campus, North Eastern Normal University, China

How to address CSR-challenges in global production systems?, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), 21 June 2011, Jingyue Campus, North Eastern Normal University, China

CSR and Woman in a Scandinavian context, Professor Annik Magerholm Fet, , Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology



(NTNU), 22 June 2011, Jingyue Campus, North Eastern Normal University, China

CSR og Midt-Norsk Næringsliv - status og utfordringer, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), NFKR Trøndelag, 7. september 2011 (kl 13:00 - 15:00), SINTEF Teknologi og samfunn

Water Footprint in the Maritime Sector, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), ENSUS2011-New Castle upon Tyne, UK, 12 September 2011

Green Procurement as a Driver for Sustainable Product Innovation, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), 2nd International Conference 'SUSTAINABLE CONSUMPTION AND PRODUCTION: how to make it possible', 29-30.09.11, Kaunas University of Technology, Lithuania

Water Footprint of Marine Technologies, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), Dialogue on Aquaculture – 3. October 2011, Rica Nidelven, Trondheim

CSR - samfunnsansvar og samfunnsengasjement, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), NæringsDriv, Sparebank 1 SMNs næringslivskonferanse 2011

Avfallsbransjen og omdømmebygging, Professor Annik Magerholm Fet, Institutt for Industriell Økonomi og Teknologiledelse, Norwegian University of Science and Technology (NTNU), HØSTKONFERANSEN 2011, 16.11.2011, Norsk AVFALLSFORUM, Kristiansund

ACTIVE RESEARCH PROJECTS 2011

1. CSR-Kompetansenettverk for innovasjon og verdiskapning

Project period: 2011-2012

Project manager: Professor Annik Magerholm Fet

Project secretary: Dina Aspen

Website: www.csr-region.no and www.csr-norway.no

In collaboration with partnere for nyskaping (NTNU, NTE og SpareBank 1 SMN), Innovasjon Norge og NHO - Nettverk finansiert gjennom NFR.

CSR Competence network aims to increase the CSR-competence in the intersection between education, research and the industry. The network is a collaboration-project between companies and knowledge partners from the region, where seminars, lectures and workshops are used to share and create new knowledge within the field. The network was established in 2011 and will last until the end of 2012.



2. Klimakalkulator for Statsbygg, -

Leveranse av klima-data for ulike materialer som inngår i bygg

(began in May 2011). Project period: 2011-2012

Project manager: Professor Annik Magerholm Fet

3. ShipSoft

Project period: 2011-2012

Project managers: Professor Annik Magerholm Fet and Dina Aspen

Website: www.iglo-mp2020.no

Oppbygging av softwareløsning for miljø og kostanalyser for maritim sektor, finansiert gjennom regional forskningsfond, RFF, Annik M Fet og Dina Aspen.

Project ShipSoft is a preliminary project where the opportunities for integrating system analyses in marine systems design is explored. By investigating the informational, computational and analytical requirements for assessing marine design, opportunities and barriers for adopting such methods in the industry is identified. The project is connected to IGLO-MP 2020 with partners from Ulstein Design and Solutions, Pon Power, Fiskerstrand Shipyard and Fjord1. The project period spans from 2011-2012.

4. Innovation in Global Maritime Production - 2020 (IGLO-MP2020)

(Website: www.iglo-mp2020.no)

Project periode: 2008-2012, budget 15 million Project manager: Professor Annik Magerholm Fet

Prosjektsekretær: Natallia Vakar

IGLO-MP 2020 is a knowledge-building project with user involvement (KMB) with collaboration between the Norwegian University of Science and Technology (NTNU), Marintek and the industrial partners Ulstein International AS, Pon Power AS, Siemens AS and Fiskerstrand Verft AS. The project draws on the expertise in international institutions, on Roll Royce Maritime and the Norwegian Center of Expertise Maritime in Ålesund (NCE Maritime). The overall focus of this KMB is to strengthen the competitive capabilities of the Norwegian maritime industry in order to improve competitiveness. IGLO-MP 2020 has identified a few key areas and themes, which the consortium members perceive as critical for future development and sustainability of the maritime industry in Norway. These are elements which are believed to provide Norwegian ship owners, ship designers, ship consultants and maritime equipment suppliers with competitive advantages in years to come.

5. Sustainable Development, Production and Communication in Hungary.

Project period: 2008-2011

Project leader at NTNU: Professor Annik Magerholm Fet,

Participants: Luitzen de Boer, Ottar Michelsen



This is a project financed by the Norway Grant mechanisms to Hungary. The Norwegian contributions are on the topics "From Environmental Product Declarations to Product Development in SMEs", and "Environmental Management in Global Value Chains". The project activities have focused on training session for industrial participants from SMEs on how to develop Product Category Rules (PCR) and Environmental Product Declarations (EPD) and transfer of experience between Norwegian and Hungarian practitioners EPD, their use in marketing and in product development. Through workshops case-examples from Norwegian and Hungarian industries are debated. Results are presented in seminar and in papers for scientific Journals.

6. CSR as a Strategic Tool for Sustainability Focused Innovation in Small and Medium Sized Enterprises

Project period: 2010-2012

Project leader at NTNU: Professor Annik Magerholm Fet Project participant: Natallia Vakar, case-studie I PhD

This project is a collaborative project between the Norwegian School of business (BI), University of Stavanger and NTNU. The project is headed by BI. The primary objective of the project is to strengthen the insight into how CSR contributes to sustainable innovation in small and medium sized enterprises and to contribute to building a Norwegian competency cluster capable of advising industry and policy-makers in this field. The secondary objective include the following:

1) To push the research frontier in the field and contribute to the international literature; 2) At the level of business, to contribute to useful practical insight into management tools, technology development approaches and innovation oriented business models for SMEs; 3) At the level of policy: to suggest additional policy tools and approaches to further innovation, sustainability and economic growth. The project is financed by Norges Forskningsråd.

7. Harmonization of PCR and EPD, organized through EPD-Norge

Project period: 2011

Project leader: Professor Annik Magerholm Fet

This project is a collaboration between NTNU, Sintef Byggforsk and Østfoldforskning. The aim of the project is to develop guidelines for development of product category rules (PCR) and environmental product declarations (EPDs) with the goal to make EPDs comparable for products with similar functional unit. The project is financed through EPD Norge.

8. Biochar on acidic agricultural lands in South-East Asia: Sequestering carbon and improving crop yield

Project period: 2010 - 2013

Project leader: Prof Jan Mulder, Norges Geotekniske Institutt Project responsible at NTNU: Professor Annik Magerholm Fet



NTNU will in particular contribute to Work Package 6 with our expertise and experiences on LCA and its application on social aspects as well as the traditional environmental LCA. A special focus will be on the development of environmental and social life cycle assessment for application on biochar, especially its contribution to the development of impact assessment and weight models for land use areas. NTNU will further contribute to the use of life cycle management and systems engineering in new project areas

WEBSITES

Dissemination of information related to EMCSR research activities through the following sources:

- www.iot.ntnu.no/csr
- www.csr-norway.no
- www.iglo-mp2020.no
- www.csr-region.no
- CSR-Forum at NTNU
- Twitter (csrntnu@)

Plans of EMCSR group for 2012:

- Following up on the research projects.
- Update the strategic goals of EMCSR with the focus on sustainable corporate governance principles and on supporting the IØT department strategic development.
- Working on the better integration of the rest of the HMS research group and recruit students with the specialization in HMS master program.
- Strengthen the business network collaboration by means of 'CSR-region' project, involving the industry partners and attracting them for taking HMS master program.
- Promote HMS etterutdaning kurs.
- Attract students from Globalization program and IndEcol for Master projects on EMCSR.
- Continue the collaboration with IPK, IMT and IPD (Institutt for Product design) and with different fagrupper (especially strategisk ledelse group) within IØT.

□ NTNU

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