THE CHALLENGES OF ECO-INNOVATION

FROM ECO-IDEATION TOWARD SUSTAINABLE BUSINESS MODELS

9:00 – 9:30	Welcoming participants	
9:30 – 10:00	Welcome speech • Presentation of the EcoSD Network (**Dominique Millet**, EcoSD president, Université de Toulon) • Presentation of the workshop (**Benjamin Tyl**, APESA, **Flore Vallet**, UTC, **François Cluzel**, CentraleSupélec)	

PART 1: ECO-INNOVATIVE DESIGN OF ECO-DESIGNED INNOVATION?

10:00 – 10:50	***The potential and the promise of eco-innovation: Trends and practices in a changing global industrial climate***	**Tim McAloone**, Technical University of Denmark & SIG Eco-design of the Design Society
10:50 – 11:15	Coffee break	
11:15 – 11:45	***ESM Explorer : 9 mechanisms to efficiently stimulate eco-ideation***	**Benjamin Tyl**, APESA **Flore Vallet**, UTC
11:45 – 12:15	***Eco-ideation and eco-selection of R&D project portofolio in complex systems industries***	**François Cluzel**, CentraleSupélec
12:15 – 13:45	Lunch	

PART 2: TOWARDS SUSTAINABLE BUSINESS MODELS AND TERRITORIES

13:45 – 14:35	***Sustainable Business Models for Eco-Design and Innovation – Where do we stand, where do we have to go?***	**Florian Lüdeke-Freund**, University of Hamburg
14:35 – 15:05	***Governance maturity grids: a transition method for sustainability?***	**Romain Allais**, UTT
15:05 – 15:35	***Sustainable business model based on upgradability***	**Olivier Pialot**, Université de Toulon **Justine Bisiaux**, UTC
15:35 – 16:00	Coffee break	

PART 3: INDUSTRIAL AND INSTITUTIONAL VIEWS ON ECO-INNOVATION

16:00 – 17:00	Round table chaired by **Bernard Yannou** (Centrale Supélec), with: • **Hélène Bortoli** (ADEME) • **Edouard Carteron** (Steelcase) • **Alexis Dousselain** (Mairie de Paris) • **Laurent Greslin** (Z.I. lab) • **Pierre Tonnelier** (PSA Peugeot Citroën) • **Maxime Trocme** (Vinci)
17:00 – 17:15	Conclusions (**Benjamin Tyl**, APESA; **Flore Vallet**, UTC; **François Cluzel**, CentraleSupélec)

PART 1: ECO-INNOVATIVE DESIGN OF ECO-DESIGNED INNOVATION?

THE POTENTIAL AND THE PROMISE OF ECO-INNOVATION: TRENDS AND PRACTICES IN A CHANGING GLOBAL INDUSTRIAL CLIMATE, BY TIM MCALOONE (TECHNICAL UNIVERSITY OF DENMARK)

Tim McAloone is Professor of Product/Service-Systems at the Technical University of Denmark. He works closely with Danish and international industry, creating new methods and models for a wide range of product development issues, such as product/service-systems, sustainable design and eco-innovation. He has many research activities, including projects such as the Innovation Consortium "PROTEUS", which focuses on the creation of product/service innovation methodologies for the Danish maritime industry, plus the UNEP Eco-Innovation manual. Danish and international industrial companies are Tim's main research object, where most of his work is carried out in the form of empirical studies of product development methodological activities and improvement needs in industry. Tim's international network spreads very broadly, where he has close ties to universities in particularly USA, Brazil, Japan, France, Germany, Sweden and UK. In 2011 Tim was guest professor at Stanford University, USA. He is regularly invited as keynote speaker at international conferences and is also frequently used within Danish industrial seminars and meetings.Tim received his PhD from Cranfield University in 1998, where he studied the integration of eco-design strategies into industry. His first degree is in Mechanical Engineering from Manchester Metropolitan University in 1993.

Abstract: It's a concept that has existed since the early nineties, yet eco-innovation seems first to be gaining a foothold in societies, companies and organisations in these years. The recognition that slight modifications to parts of products, processes or systems is a too deficient and unambitious goal, is currently causing thought-leading institutions to make bold steps to build, support and promote eco-innovation. One such institution, the United Nations Environment Programme (UNEP), even goes so far as to state that anything less ambitious than eco-innovation is simply 'tinkering around the edges'. But what does this mean in practice? How to be bold, how to be radically different, and how to effectuate systemic changes to the way in which we procure, operate, maintain and dispose of every synthetic creation that mankind is responsible for, in order to care for the ever-increasingly limited per capita natural resources the planet has to offer and the delicately balanced ecosystem within which we live? This speech will begin with the recognised drivers and pressures for eco-innovation as its platform, and will focus for the most part on the potential and the promise of eco-innovation. A short review of eco-innovation definitions and approaches will be presented and a number of promising cases will be demonstrated and reflected upon, to position ourselves in respect to the need for global change.

ESM EXPLORER: 9 MECHANISMS TO EFFICIENTLY STIMULATE ECO-IDEATION, BY BENJAMIN TYL (APESA) & FLORE VALLET (UNIVERSITÉ DE TECHNOLOGIE DE COMPIÈGNE

Benjamin Tyl is an eco-innovation research engineer at APESA. He obtained a PhD in Mechanical engineering for his work on eco-innovation, and more specifically on the contribution of creativity in the eco-ideation processes. He is now working at the technological center APESA, in the innovation department. His work is to support the research activity and to develop research projects with both private companies and public laboratories. His main research interests are eco-innovation, eco-ideation but also the local value creation approach. To do so, he develops micro-tools to support eco-innovation processes in companies.

Flore Vallet is an assistant professor in the Mechanical Systems Engineering at the Université de Technologie de Compiègne, affiliated to the Roberval Laboratory. She graduated in mechanical design at the ENS Cachan, and obtained a Master's degree in industrial design at UTC. In 2012 she completed a PhD on the dimensions of eco-design practices towards education of engineering designers. She is interested in integration of stakeholders' thinking into eco-design and eco-innovation. Active member of the EcoSD network, she is also member of the Design Society. She has recently coordinated the creation of an eco-design plugin for the EU-FP7 SuPLight project (Sustainable Production of Lightweight solutions) with the transportation industry.

Abstract: One of the main challenges of this eco-innovation process is the generation of ideas with high levels of originality and economical potential. The objective is that these new ideas take into account both environmental and societal positive impacts. Thus, the environmental and societal dimensions can be seen as an opportunity rather than a constraint as they can be used during the eco-ideation phase through adapted stimulation mechanisms. The success of the eco-ideation stages depends on the ability of the socio-economic partners to open new perspectives through stimulation mechanisms. Previous work clearly shows that the traditional stimulation mechanisms are irrelevant for environmental issues. Indeed, they propose either « macro-mechanisms », which give a too global vision of the problem and also rarely lead to innovative concepts, or « micro-mechanisms » focused on limited technical approaches that do not support the maturation process. This presentation introduces the concept of Eco-ideation Stimulation Mechanism (ESM), i.e. a 'meso' ideation mechanisms offering the designer a compromise between a broad and systemic reflection, and a technical-oriented vision to keep an efficient stimulation.The presentation describes a toolbox of 9 ESM toolbox which have been developed and enriched during the last two year, by three different research structures involved in eco-design and eco-innovation research field.

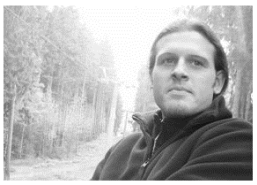
ECO-IDEATION AND ECO-SELECTION OF R&D PROJECT PORTFOLIO IN COMPLEX SYSTEMS INDUSTRIES, BY FRANÇOIS CLUZEL (CENTRALESUPÉLEC)

Engineer in Mechanics (2008), PhD in Industrial Engineering at Ecole Centrale Paris (2012), François Cluzel is an assistant professor at Laboratoire Genie Industriel (Industrial Engineering Lab) at CentraleSupélec. In the Design Engineering Team, his research and teaching projects deal with innovation engineering and design of sustainable systems. He is a member of the Design Society, of the International Society for Industrial Ecology, and of the French network of eco-design researchers EcoSD. He is also an editorial advisor for the book « Déployer l'innovation » (more than 100 practical sheets to deploy innovation in companies) edited by Techniques de l'Ingénieur.

Abstract: Eco-innovation methodologies and tools are applied in companies to an increasingly greater extent. None of them are however particularly adapted for complex systems industries, where the eco-design requirements are highly specific. These systems are characterized in particular by their large size and masses, and their relatively long and uncertain life cycle. The associated organization is also complex as there are multiple highly specialized experts, who rarely collaborate, much less on environmental aspects. We propose an adapted eco-innovation process based on the eco-design strategy wheel. We put together a working group of internal technical experts. A first phase involves generating a high number of potential eco-innovative R&D projects that are then analyzed and assessed using an appropriate multi-criteria grid. Three structured filters allow for an informed selection of the most promising projects that will then make up a balanced R&D projects portfolio. The whole process has been successfully applied at Alstom Grid on large electrical stations used in the primary aluminium industry.

PART 2: TOWARDS SUSTAINABLE BUSINESS MODELS AND TERRITORIES

SUSTAINABLE BUSINESS MODELS FOR ECO-DESIGN AND INNOVATION- WHERE DO WE STAND, WHERE DO WE HAVE TO GO?, BY FLORIAN LÜDEKE-FREUND (UNIVERSITY OF HAMBURG)



Florian Lüdeke-Freund is a Postdoctoral Research Associate and Lecturer at the University of Hamburg, Faculty of Business, Economics and Social Sciences, and a Research Fellow at Leuphana University's Centre for Sustainability Management (CSM). He obtained a PhD in Economics and Social Sciences for his cumulative thesis on "Business Models for Sustainability Innovation: Conceptual Foundations and the Case of Solar Energy". His main research interests are sustainable entrepreneurship, corporate sustainability, and innovation management with a particular focus on business models. Florian publishes regularly journal articles, book chapters, conference papers, and research reports on these and further issues. His article "Business Models for Sustainable Innovation" (2013), together with Frank Boons, is one of the top ten most read articles of the Journal of Cleaner Production. In 2013, he launched the collaborative platform www.SustainableBusinessModel.org as a hub for academic and practically-oriented research. Florian is currently involved in various research and transfer projects dealing with sustainable business models, such as a review and synthesis report for the international Network for Business Sustainability (NBS).

Abstract: With a view to the promotion of ecologically sustainable innovations, business models have two faces: they can be levers for new processes, products, and services; and they can be objects of innovation in themselves. While innovators and designers strive for increased eco-efficiency and effectiveness, e.g. through dematerialised offerings, closed material and energy cycles, or the promotion of localism and sufficiency, it is business models that connect these ideas to the markets which are to be transformed. Moving to the business model level challenges our imagination about where eco-innovation begins, and where it ends. Understanding the systemic, interrelated, and even co-evolutionary characteristics of business models – as models and logics of how organisations create multiple kinds of values – opens a perspective in which a single process, product, or service offering is only one of many components that have to be considered, besides supply chains, customer interfaces, and financial models, for example. Dealing with the two faces of business models – as levers for eco-innovations and as eco-innovations in themselves – opens up a challenging but at the same time extended space for dealing with our highly unsustainable and to-be-transformed beliefs, structures, and routines.

GOVERNANCE MATURITY GRIDS: A TRANSITION METHOD FOR SUSTAINABILITY?, BY ROMAIN ALLAIS (UNIVERSITÉ DE TECHNOLOGIE DE TROYES)

Coming from production engineering and automotive design, Romain Allais has slowly discovered research in eco-design. Through his PhD, he proposes a methodology for sustainability integration into product design process in industrial companies. The adopted strategy is to activate territorial tangible and intangibles resources thanks to organizational innovation. He has collaborated to the white paper « Immatériels, nouvelle gouvernance de l'entreprise» from the French Observatory of Immaterials. Since September 2014, he is involved as a research engineer in a research project on functional economy for small household appliance in the Research Centre for Environmental Studies and Sustainability (CREIDD) in University of Technology of Troyes.

Abstract: System innovation for sustainability requires innovation in corporate governance. The purpose of this communication is to detail the potential of governance maturity grid regarding the multiple dimensions of sustainability. Social, environmental, territorial, competitiveness and governance principles are integrated e' level maturity grid. It assists senior management integrate sustainability issues into the whole activities of their company. In fact, grid questions current strategic and operational management and proposes generic roadmaps for improvement. It also assists senior management reflection on their current strategies regarding value creation systems, supports them in the definition of their sustainable strategies and the means of governance to achieve them. Even if this low cost and rapid assessment and improvement tool has been tested in companies, the implementations of innovations derived from it are still problematic: barriers have to be overcome for effective system innovation for sustainability.

SUSTAINABLE BUSINESS MODEL BASED ON UPGRADABILITY, BY OLIVIER PIALOT (UNIVERSITÉ DE TOULON) & JUSTINE BISIAUX (UNIVERSITÉ DE TECHNOLOGIE DE COMPIÈGNE)

Mechanical Engineer specialized in innovative product design methods (PhD Thesis Industrial Engineering - Laboratory LIPSI-ESTIA and G-SCOP-INPG - "The PST approach as the design process streamlining tool innovative ") Olivier Pialot has worked as a Research Engineer in the team "Ecodesign and Optimization of Systems" of LISMMA (Supmeca-SeaTech) since 2010. Especially, his research focusses on product design and rationalization of the use of materials. Following the MacPMR Project design remanufacturables systems, he built with Pr Millet, works and co-manages the ANR Research Project IDCyclUM (2012-2015) involving 5 laboratories and 2 manufacturers on sustainable innovations with multiple upgrade cycles.

Affiliated to the COSTECH CRI laboratory (Knowledge, Organization and Technical Systems), Justine Bisiaux is a PhD student in sustainable Innovation at the Université de Technologie de Compiègne. The research work consists in characterizing business models compatible with the diffusion of sustainable innovations and building a methology to define these new business models for companies. She is also involved in the IDCyclUM project (Innovation Durables à Cycles d'Upgrades Multiples / Multiple Upgrades Cycles for Sustainable Innovations). It aims to apply the sustainable innovation in companies by working on the diffusion of evolutionary systems combining servicial business model and modular and upgradable products.

Abstract: The accelerating rhythm of products renewal causes accelerated exploitation of materials and energy. These current patterns of consumption and mass production are no longer compatible with sustainable development and it is necessary to imagine new paradigms of production / consumption. To go beyond Remanufacturing, recycling, PSS, optimized maintenance, we consider the concept of "optimized/enhanced/hybridized upgradability". From an approach by action research, key concepts of this new consumption/production paradigm have been defined and structured in three pillars: (i) successive functional enrichments (upgrade lines) are programmed to satisfy utilitarian, emotional, ethical and servicial value creation themes; (ii) high environmental gains from multiple principles of rationalization of the use of the material and energy (by extended lifetime, closed life cycle, eco-use) are formalized by an eco-scoring engaging both the company and the user; (iii) a sustained interaction customer-manufacturer, upgradeable systems offers that integrate multi-services packages and propose an increasing attractiveness for customer, and innovative contracts offering new and more frequent ways to earn money and integrating potential new partners force industrial company to reorganize its business model. This transformation of the value network over time implies developing trajectories of business models to facilitate the transition from current economic models centred on material goods to models that are more service oriented.

PART 3: INDUSTRIAL AND INSTITUTIONAL VIEWS ON ECO-INNOVATION

CHAIRMAN: BERNARD YANNOU (CENTRALESUPÉLEC)

Bernard Yannou is a Professor in Design Engineering and deputy director of the Industrial Engineering department (Laboratoire Genie Industriel) of CentraleSupelec, France, where he manages the Design Engineering Team. His area of expertise is design automation, design methodologies, product development, innovation engineering, ecodesign, artificial intelligence in design, design processes and organisation modeling. Bernard Yannou has conducted research for a number of industrial companies. He holds the chair of "Sustainable construction and innovation" of Bouygues Construction. He has supervised 20 PhD theses, authored or co-authored more than 60 international peer-reviewed journal papers, and coordinated 8 books on product design and innovation. He is member of the Advisory Board of the Design Society, member of the ASME, Associate Editor of the Journal of Mechanical Design and editorial board member of International Journal of Design Creativity and Innovation.

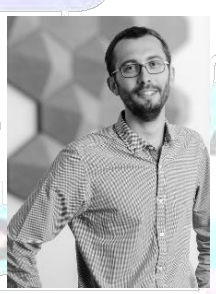
HÉLÈNE BORTOLI (ADEME)

Being an engineer in chemistry and urban planning, Hélène Bortoli-Puig has a 20 year experience in engineering, project planning in urban engineering, consultance on international projects and environmental communication. Since she joined the French agency ADEME (Agence de l'Environnement et de la Maitrise de l'Energie), she has been coordinating projects on environmental assessment and eco-design in the Product and Matter Efficiency department of the Circular Economy and Waste office.

LAURENT GRESLIN (Z.I. LAB)

Laurent Greslin is an industrial designer who started his career by experiencing the work with various forms of matter. After graduating in cabinet making, he discovers forging and fire crafts. In 2002, he obtains a Master's degree in art and design (ESAD Reims), and learns glass blowing. Between 2003 and 2010, he manages the industrial design for the SEB group in the DELO LINDO consultancy. He creates his own design studio in 2010, called Z.I.lab., with the ambition to question and articulate his practice, from arts and craft to high-technology industry. Deeply concerned with issues on our production patterns, he proposes a designer's vision relating crafting excellence and mass production, eco-design and integration of relationship between stakeholders.

EDOUARD CARTERON (STEELCASE)



Edouard Carteron joined the sustainability department of Steelcase in 2011 and has been an expert in design for environment for 4 years. After his Master of science in mechanical and design engineering and Master's degree in Eco-design and Environmental Management (ENSAM), he had a first experience as an environmental engineer in the French wood and furniture Institute (FCBA). In addition to working on industrial Life Cycle Assessment studies and supporting the product development teams on the sustainability topics and on eco-design, he was also involved on the new developments around Water Footprint, helping Steelcase to position about this issue in the furniture industry.

PIERRE TONNELIER (PSA PEUGEOT CITROËN)

Dr. Pierre TONNELIER is responsible of the Eco Design and Life Cycle Assessment team in the Environmental department of PSA PEUGEOT CITROEN since 5 years and has work during 7 years on vehicle projects as a specialist in recycling and end of life of vehicle. He works on many studies on Eco-design and DRF, and is member of the French network EcoSD.

ALEXIS DOUSSELAIN (MAIRIE DE PARIS)

Alexis Dousselain works at the Innovation and Businesses Office of the Economic Development Department of the City of Paris (Mairie de Paris). He is in charge of life sciences and green industries sectors (research, industries, SMEs). His area of expertise concerns incubators, funding, competitive clusters and experimentation. He also manages the promotion of companies from this sector for the COP21 (2015 United Nations Climate Change Conference) that will take place in Paris in December 2015.

MAXIME TROCMÉ (VINCI)

Maxime Trocmé is the Environment and Scientific manager of the VINCI group, in charge of environmental topics in the Corporate Social Responsability approach. He is the coodinator of research and innovation works on eco-design projects, through the management of an eco-design Chair.