



International Post-Master in Environmental Management ENVIM

Professional Thesis Abstracts



Academic year 2011-2012

BAI Fei

08/01/1988

Master in Environmental Science and Engineering

Tsinghua University, China

Eutrophication and toxin risk warning & management in Taihu Lake water risk management of taihu lake

Suzhou Environmental monitoring station – Chine

Cyanobacteria bloom has been the headache for worldwide freshwater management since 1960s, which exacerbates the water source shortages nowadays. For controlling cyanobacteria bloom, there were successful cases and general techniques with theoretical good performance. However, different water body is quite site-specific, which needs intentional consideration. If only utilizing the general techniques without scientific selection and integrated management framework, the performance usually cannot meet the expectation. That's the reason why the cyanobacteria bloom is still a troubling problem for freshwater environment management.

Taihu Lake, as the third largest freshwater sources of China, not only serves the ecological function, but as drinking water source for several large cities. The water crisis event happened in 2007 has stunned the government and great efforts had made to alleviate the cyanobacteria bloom. However, the result is not pleasing. The reason relied on the absence of integrated management proposal and scientific techniques selection for different zones.

In this report, an integrated management framework for Taihu Lake cyanobacteria bloom control was first proposed based on overall investigation on nutrients source, water body parameters (hydraulic, nutrients and biological), sediments and environmental factors. Through calculation of permissible quantity for pollutants according to the objective in 2012, as well as Fussy Synthetic Evaluation Model (FSEM) method and SWOT analysis, an efficient controlling techniques package was selected, which embodies source control (point source and non-point source), lake reduction (hydrological, physical, chemical and biological) and end-off-pipe treatment (materialization and safety treatment) measures. It not only offers feasible solutions to Taihu Lake cyanobacteria bloom control, but experience to other shallow, big fresh water body in the world on the basis of synthetical ideas and scientific methodology.

CUI Ru

08/10/1986

Master in Environmental Science and Engineering

Tsinghua University, China

Transportation structure and energy saving potential research in Wuhan, case study in Wuhan's transportation sector

Tsinghua University and ADEME

The study is dedicated to the transportation problem in Wuhan. The whole study contains 6 parts. The first part is the evaluation of road network in Wuhan, with which the basic information of road network system in Wuhan is provided. The second part is the vehicle stock estimation and projection, with which the vehicle information and the future trend in Wuhan is provided. In the third part, information of the travelling modal of citizens in Wuhan is provided. In the fourth part, the energy consumption of vehicle sector in Wuhan is calculated, with which a general look of how the energy demand from vehicle sector is provided. In the fifth part, the air emission caused by vehicle in Wuhan is estimated, with which the current emitting volume and future trend is provide. In the final part, information of the recommended solution to transporting problems in urban area is provided.

After 6 months' research, the results of the 6 parts are as following: 1) the road network structure in Wuhan is in bad condition and need to be improved in order fulfill the future traffic demand; 2) vehicle stock in Wuhan in 2010 is 760 thousand units, and the number will increase even faster in the coming 10 year and reach 4.3 million in 2050; 3) the main transporting modal in Wuhan is non-automobile, which will convert to auto-mobility as the vehicle stock increase in private sector; 4) energy consumption from transporting sector is about 4.7 billion liters in 2010, and it will increase as the vehicle stock grows; 5) major air pollutant from vehicle in Wuhan is NOx and PM10, and most of the pollutants emission will increase in the coming decade; 5) methods such as ITS, TMD can be used in Wuhan to solve its transporting and related problem, but great efforts both from the government and the citizens are needed.

CATRY Ugo

29/01/1987

Institut d'Etudes Politiques de Paris - Double diplôme IEP – HEC: Corporate and Public Management

The price dive in solar PV industry: is it just about technology? An experience curve analysis TOTAL S.A - Courbevoie France

The PV industry market has been experiencing deep changes for a couple of years. The most salient indicator of these changes is undoubtedly the pressure on selling prices since 2009: they decreased from \$1, 93/W in Q4 2009 to \$0, 55/W in Q4 2012. The author tried to determine and quantify the factors that enabled such a price dive. The author endeavored particularly to distinguish what comes within technologic improvements and what comes within market factors. The author identified and quantified the factors that impact the cost structure from 2009 to 2012: components prices, effects of scale, underutilization as well as processing costs. The author also analyzed the PV price and gross margin dynamics.

For a representative China-based facility with a standard technology, results show the decrease in gross margin explains 52% of the price dive. This tremendous drop leads to a negative margin value in Q4 2012: the facility loses \$17cents par watt sold. Meanwhile, processing improvements only account for 25% of the decrease in PV prices while the compression of component prices has a limited impact of 13%. Economies of scale justify 11% of the price decline. The price dive in PV industry is no longer caused by continuous technologic improvements, but brought about by macro-economic factors, of which over-production and over-capacity.

The author also assesses the impact of a "technologic shock" in 2012. Results show that in case of such a shock, processing cost decrease account for 43% of the price dive. This is a precious lesson for PV players: a way to alleviate the effects of the vertiginous dive in PV price, and its corollary the margin erosion, may be product innovation and implementation of a more efficient processing. If it is not all about technology any more, it can help greatly.

COUTANT Ludovic

17/07/1986

Engineer Telecom - TELECOM Sud Paris

Master of Strategic Leadership toward Sustainability

Benefits and threats of a voluntarist environmental innovation strategy AIR France

In the last decades, the demand for more responsible businesses from the civil society has been constantly growing. It pushes companies to innovate and to change the way they are doing their business and managing their operations. New regulations, constraints on resources and new consumption habits are now emerging. This new context challenges the private sector to adapt itself. Behind this new challenge lies an incredible new opportunity to both create growth, jobs and a positive impact on our environment. The aim of this thesis is to provide some key recommendations on how to implement environmental innovation in a concrete business context. This new discipline aspires to integrate environmental protection within corporate strategies through innovation and with a systemic approach. What does it concretely mean? What does it consist of? How can it be deployed? What are the competences required to make this approach a success? How can I convince my stakeholders? This thesis will try to provide lines of inquiry to address all of these questions through both a conceptual and a practical approach.

Innovation by definition aims to take to an end user a new concept or product. Environmental innovation is a specific branch of innovation where environmental protection is at the centre of all attention. It seeks to foster the creation of new products or services with minimized environmental impacts. In the light of theoretical concepts on innovation and environmental protection, we will present concrete examples of what could be environmental innovation in the aviation industry. Afterwards, works carried out at Air France will be presented in detail to provide even more concrete examples of what could be accomplished with an environmental innovation approach. These works targeted the products and services of Air France and have been carried out under the name of eco-design. Works on the new economy long-haul tableware and the loyalty program mailing campaigns will be presented for this purpose.

As an answer to our modern society's issues, environmental innovation represents an engaging and reality based solution. It is an endless process, which targets permanent improvement over time. It does not intend to solve the entire environmental crisis on its own but advances an inspiring move for the industry as well as a mean to accomplish both profitable and environmentally friendly actions at the same time.

DELEGUE Ahn hà

20/11/1985

Master in Mechanical Engineering

Ecole Nationale Supérieure des Arts et Métiers ParisTech

Georgia Institute of Technology-USA

WATER & CARBON FOOTPRINT DEVELOPMENT - Operational site assessment (soft drink manufacturer)

Véolia Water Malaysia Holding SDN BHD - Kuala Lumpur - MALAYSIA

Since 2009, Veolia Water, world leader in the field of water treatment and services, offers several tools to assess the environmental footprint of its clients: carbon footprint, water impact index, resources footprint and biodiversity footprint.

The development of those tools within the Malaysian Business Unit of Veolia Water occurred during two projects: the refurbishment of the waste water treatment plant of a soft drink production plant, the Permais site, for the carbon footprint tool and the pilot project with Tenaga Nasional Berhad, the Malaysian power utility, for the water impact index.

Implementing the methodology revealed different barriers in terms of communication, lack of interest from stakeholders, insufficient training on the tools that had to be corrected to develop the strategy in a sustainable way. This thesis gives some recommendations to tackle those issues through an action plan for Veolia Water Malaysia. While showing the limits of the carbon footprint and water impact index tools, the report highlights possible actions to reduce CO₂ emissions, alternatives that could provide actual improvement to the current situations

FANG Zheng

26/09/1986

Engineer in Physic Chemistry

Ecole Supérieure de Physique et de Chimie industrielles ParisTech

Environmental considerations related to the development of unconventional gas resources in China
SCHLUMBERGER - Chine

According to published estimates, China has one of the world largest shale gas resources and has thus set high goals for shale gas development in the next decades. This game-changing resource could release the pressure on China's sustainable development by providing abundant energy while reducing GHG emissions. For more than ten years, massive exploitation in the US raised environmental concerns and the lessons learned there can benefit China.

Advanced well construction and completion processes are at the centre of the discussion: they enable economical gas extraction from sub-micro Darcy shale formations, but risks of gas leaks in the atmosphere, aquifers pollution, and the large water volumes consumed have been highlighted. Some of these challenges could be more acute in China due to the particular geographic situation of shale gas reservoirs. This paper reviews the main environmental and technical challenges for shale gas development in the context of the Chinese shale gas basins and presents the benefits brought by the latest cementing technologies, hydraulic fracturing technologies, and directional drilling technologies and best practices to reduce environmental impact in sight of massive exploitation.

GHOSN Nicolas

05/09/1988

Engineer in Electric and mechanical
Engineers School of Beyrouth, Lebanon

Implementation of LEED Certification based upon American Standards in France, and perspectives in China

Bureau Veritas - Paris

A green building is a building that has been designed, constructed or operated with techniques that reduce its impact in the different fields of environment. Certifications have been created in order to frame and organize this concept and make it more accessible. We can count today more than fifteen certifications issued in the different countries Worldwide. The most important are LEED (Leadership in Energy and Environmental Design), the American Certification, BREEAM (Building Research Establishment Environmental Assessment Method), the British Certification and historically the first one to be issued and HQE (Haute Qualité Environnementale), the French certification.

LEED is today the most known certification worldwide, and the most used and demanded because they managed to penetrate on the market of almost all the countries thanks to their powerful marketing means. But the assessment of LEED is difficult because it is based upon the American laws, regulations and calculation methods that are very specific to the United States. That causes some problems in the countries such as France that have their own Green Building Certification based on their national standards and calculation methods, and BREEAM that proposes some French alternatives to the British standards. This is why, they decided to adapt the LEED upon its own advanced standards and calculation methods by proposing Alternative Compliance Paths.

Other countries like China that has newly issued their environmental regulations and their own certification the Three Stars. LEED is the most assessed on the Chinese market but is giving place to Three Stars, and the Chinese Standards are becoming very strict. The next big step in China will probably be to propose Chinese Alternative Compliance Paths to facilitate the assessment of LEED.

GRENIER Lucas

Né le 16/11/1987

Master in Management and Sustainable Development
Ecole Supérieure de Commerce de Toulouse

How to assess and exploit energy saving potential in China's large scale public and commercial building sectors? Case studies in Beijing, Shanghai and Wuhan

Tsinghua University and ADEME

With China's national rapid economic and urbanization growth, energy efficiency became one of the key factors for ensuring energy security issues and further development in the country. Thereby, as Chinese large-scale public buildings consume a great quantity of energy, the government has rolled out numerous programs to promote their retrofitting. Most of the retrofit technologies are readily available in China. However, there is uncertainty about technology effectiveness and which technologies are more efficient in which climate zone. In literature review, mostly non-comparable spotty analyses and summaries of real projects are available. Furthermore, their results remain limited to a set of buildings but do not estimate their potential at a city or provincial scale. With this in mind, this study aims analyze selected retrofitting technologies and provides some guidance in selecting economically effective approaches to retrofitting large office buildings in Hot Summer and Cold Winter Chinese climate zone. It also enlarges and completes a first large-scale investigation on energy-savings potential in Wuhan and Hubei province public buildings, carried out between 2007 and 2009 by the French Development Agency in partnership with numerous Chinese institutes.

The first section, which encompasses chapter 2 and 3, will introduce the subject with an overall review of China's buildings sector energy status and its related regulatory environment. This part allows to understand the scope of the study -large-scale public buildings in Hot Summer and Cold Winter climate zone- and situate it within the different China buildings energy issues and among main energy consumers' countries. Subsequently, a second section (chapter 4) sorts out a selection of common building energy saving technologies which are supposed to suit the specific needs of the studied climate zone.

Finally, the last section (chapters 5, 6 and 7) consists in applying the identified retrofitting methods to an existing real of large-scale office building case study in Shanghai, and present a practical, economical and ecological effectiveness analysis of the simulated energy-savings results. After having selected relevant provinces for Hot-Summer-Cold-Winter zone according to climate parameters, simulation results will be extrapolated to these areas and enable to estimate their potential energy savings at a large-scale. Recommendations for selecting retrofitting methods and their potential effects are given as a conclusion.

HE Ding

18/07/1988

Master in Dept. of Chemical Engineering and Technology
Tsinghua University, China

Process safety management **IRC company - Chine**

Starting the new millennium in 2001, the China economy still keeps on a rapid growth rate while the energy intensity of Chinese economy which means the amount of energy acquired to produce each unit of economic output started to increase sharply. If at the new increase energy demand rate, China will account for 20 percent of global energy demand, more than Europe and Japan combined, and easily surpass the United States as the world's largest energy consumer. In this background, Chinese government brought forward "the China energy 12th five year plan". In this report, a series of new technologies which are aim to use energy efficiently and clean are proposed. These new technologies or projects present a big process safety management challenge. How to control risks during the process that these new technologies are industrialization?

Risk management can be divided into four steps: risk identification, risk analysis, risk evaluation and risk treatment. This risk management concept is also the core content of process safety management defined by American OSHA. All the four steps need a scientific methodology to achieve. Hazard and Operability Analysis is a structured and systematic check and investigate the design of all facilities in order to identify any potential hazard and operability problems which could arise particularly through deviation from the design intent. Taking advantages of systematic methodology and experts' knowledge and experience, a set of necessary actions or recommendations is generated to improve the operability or mitigate the consequences caused by identified problems or hazards. In this report, the HAZOP theory and how to use the HAZOP will be discussed in detail. The effectiveness of HAZOP or risk management is proved by a real industry case which the author participated in November.

LAURIOU Simon

11/08/1987

Master of Health Risks in Indoor Environments
Université d'Angers

Optimizing energy & environment in the construction sector beyond production process: improving waste reduction and exploring new applications **Saint-Gobain - Courbevoie**

Whatever their business is, companies consume natural resources and generate environmental releases. In that sense, the equation production-sustainability is more than ever at the heart of all economic and industrial policies. However, environment concerns are still growing and the major issue for retaining the economic growth for a company is to improve its differentiation against competitors and this will go through further innovation and sustainability. The pre-requisite for this mind-changing challenge is the capacity to develop an "environmental innovation culture".

Innovation can come from many areas but some companies often see innovation as only focusing on improving their production process. Even though it remains an excellent source of differentiation, going beyond the manufacturing process can also enable companies to reach their objectives of innovation and sustainability. This thesis aims to describe and analyze how a company "optimizes energy and environment beyond the production process" and is illustrated through two projects carried out by the Saint-Gobain company, a leading designer, manufacturer and distributor of construction products. The first project has the goal to assess options in cement/mortar packaging to minimize the amount of construction waste generated on job-site. The second one assess opportunities in the cement well casing of shale gas wells to minimize the environmental impact.

The key for companies' survival and growth is a well-designed, clarified and shared vision of the future of environment. Working on improving production processes remains a must but optimizing energy & environment beyond production process – i.e. by improving waste reduction and exploring new applications - has become the differentiation factor for innovative companies of the 21st century.

LEMOINE Yann

24/01/1987

Engineer in Environment and Water Management
Agro ParisTech

Creation of a framework to assess the water footprint of energy producing companies EDF – CIH Technolac, Le Bourget du Lac

As water scarcity is becoming one of the most important issues facing mankind, understanding one's water uses and related impacts is necessary if this precious resource is to be managed in sustainable way. Energy utilities are concerned in particular by this consideration as water is vital in all energy production processes.

Many initiatives have been developed to help institutions assess this issue but it appears that expectations from reporting guidelines and standards are currently higher than what assessment tools and methodologies can provide. During the World Water Forum 2012, feeling that no existing framework was totally adapted to their specific situation, energy utilities took the initiative to launch an ambitious program focusing on the creation of a methodology which could answer their needs.

EDF took the lead in this project and, during these last six months, has been developing a first draft of the "Water for Energy Framework". This methodology proposes a comprehensive, practical, consistent and applicable methodology to assess both water uses and related impacts across all energy sectors. It might be added that no limits have yet been found for its use by other human activities.

The Framework will continue to be developed with the collaboration of an international working group composed of the World Water Council, the World Energy Council and most of the important energy related institutions. The objective of the project is for the framework to be presented during the World Water Forum 2015 in Daegu before being implemented by all energy utilities across the world.

LUPESCU Franck

25/07/1987

Engineer Aeronautic
Ecole Supérieure des Techniques Aéronautiques et de Construction Automobile, France

How can sectorial guides bring a support to companies for greenhouse gases emissions accounting Carbone 4 Paris

Greenhouse gas emissions accounting appears as a first and crucial step in the necessary transition to a low-carbon economy that needs to be undertaken. Several methodologies exist today in order to assess the emissions such as the Greenhouse Gas Protocol or the French "Bilan Carbone". These tools have the ambition to reach goals like counting the emissions in order to comply with existing regulation, understanding the vulnerability and the dependency of a business model, determining the major sources of emissions of an activity and initiating reduction through efficient action plan. However, due to inherent general aspect of these tools, emissions factors are lacking, perimeters are not well defined and reduction actions are not always appropriate.

ADEME (French National Environmental Agency) has decided to implement sectorial guides that bring a solution to these issues. These guides establish common rules and guidelines for specific sectors and have a tremendous potential. All the stakeholders of a sector are encouraged to work together in order to assess and reduce their emissions, which create a strong dynamic to tackle environmental issue. The sectors save money and time and strengthen its public position. It gains influence on the other sectors and prepare itself for the forthcoming regulation.

A list of the good practices developed by the 13 existing guide has been establish here in order increase the efficiency of the future guide and provide a valuable support for other countries like China, who are starting to take action in the carbon accounting domain. This offers a profitable opportunity to capitalize on French experiences.

Finally a list of new sectors for guide's implementation is proposed, based mainly on statistical study. It leads to underlining the fact that the lack of motivation, the lack of understanding of environmental issues and the lack of international cooperation are real obstacles that can only be overcome through an efficient and constraining regulation.

PENG Hui

15/02/1988

Master in Dept. of Chemical Engineering and Technology-
Tsinghua University, China

Life Cycle Analysis of aviation biofuel Petrochemical Research Institute, PetroChina - Chine

This study presents life cycle assessment of three types of biomass-based jet fuel in China, which are Jatropha, Pistacia, Xanthoeras. This life cycle process covers biomass cultivation; biomass transportation; vegetable extraction and refinery; vegetable oil transportation; jet fuel production; jet fuel transportation and distribution. The Energy consumption and GHG(greenhouse gas) emissions were examined through the overall process. The results indicate the fossil energy inputs are about 0.8-0.9 times the energy contained in the biomass-based jet fuel. All the three types of biomass can reduce the GHG emissions. The development priority of these three woody oil plants in China is first Xanthoceras, second Jatropha and third Pistacia. The main processes which contribute the most to energy consumption and GHG emissions are biomass cultivation and jet fuel production.

This study also presents a general supply chain model for decision-making, which enables the selection of biomass, biomass locations number and capacity of every type of factory in each province, capacities, and the logistics transportation of biomass, vegetable oil, and jet fuel. A mixed integer linear programming (MILP) model was constructed and solved using GAMSTM with CPLEX solver. These model includes (1) the amount of biomass, type of biomass, location of biomass (2) the optimal number, locations and sizes of different types of plants(3) the maximized net profit under specified energy limit and GHG emissions. The model was tested based on some supposed data in 2020 in China which includes the candidate biomass locations and available production, extraction and refinery factory locations, jet fuel hydrogenation factory locations ,final market locations and demands, as well as the costs associated with the various processing and transportation. The results were obtained by optimize this MILP supply chain model, which can be the reference of decision-making.

SALINGRE Laure

23/10/1988

Engineer in Water and Environment
Ecole Nationale du Génie de l'Eau et de l'Environnement de Strasbourg

Adsorbable organic Halides and toxicity in complex industrial wastewaters: Measurements and corrective actions

Givaudan - Suisse

Givaudan, world leader in the flavorings and fragrances industry, produces ingredients and compositions (mix of ingredients) for fragrances on its Vernier site (Switzerland). To treat its industrial effluents ("chemical effluents") along with local municipal wastewater ("domestic effluents"), the plant operates a 150,000 population equivalent wastewater treatment plant (WWTP). Since 2005, some operational and standards compliance issues have been detected, mainly biological treatment efficiency drops and AOX (adsorbable organic halides) discharge standard overruns. The local authority (Canton of Geneva) requested the plant to make an inventory of all waste streams from chemical processes treated in the WWTP. Vernier carried out this inventory coupled with waste streams analysis with AOX and standard ecotoxicity standards investigated, along with other physical and chemical parameters. The inventory has been achieved in 2011 and is now part of the waste stream management strategy as a decision criterion for disposal route choice: waste streams above in-house AOX or ecotoxicity threshold are incinerated off-site.

Thanks to the improved waste stream management strategy, overruns have disappeared. But the current situation is not fully satisfactory. Indeed, off-site treatment is costly and since threshold adapted from legal standards are low, a significant volume is sent for incineration. Cleaner production is on its way, but actions should also be taken at the downstream level to improve waste streams management efficiency. Two components of the management strategy for both AOX and ecotoxicity issues have been investigated: measurement methods and pollution reduction technologies.

Alternative analytical methods for organic halides (AOX, SPE-AOX, POX and EOX) have been investigated. Their relevance in terms of environmental and health impacts assessment, their standardization and their use in international legal discharge limits have been compared. Pollution reduction technologies have also been investigated; activated carbon and advanced oxidative processes (AOPs) have been identified as potentially promising.

A pilot tool has been adopted in 2011 as an alternative to standardized bioassay ecotoxicity measurement used to assess the biotreatability of chemical effluents in the WWTP, we carried on calibration tests and check its reliability and accuracy. We also explored alternative toxicity reduction and biotreatability enhancement technologies, preferably coupled with AOX removal, such as activated carbon and oxidation processes. On-site experiments, scholar and professional literature reviews along with interviews, provided basis for recommendations and some are being considered or set up.

THAI Roselyne

07/01/1983

DESS Méthodes Informatiques Appliquées à la Gestion des Entreprises
Université de Grenoble

How to integrate an eco-design approach within an industrial ecosystem

Schneider-Electric - Grenoble

In an approach toward sustainability, industrial ecosystems implement eco-design to tackle environmental issues at affordable costs. Eco-design relies on environmental, economic and design contexts. Within an industrial ecosystem, specific organizational issues have to be considered especially to interact properly with the rest of the ecosystem, anticipate different sources of evolutions. In this study, I reduce the scope to industrial eco-design considering three sources of influences: regulations and standards, design process and cognitive implication. In order to coordinate all those influences, I define a scalable method with some tasks and process to address eco-design within the company. Considering a company as an ecosystem, it can be scalable with a macro-level to cover the whole eco-design diffusion in the company, some micro-levels to cover specific entities like a design center and a process to integrate and coordinate those levels.

This approach is equivalent to concurrent engineering. A generic process can be deployed at each scale based on a system approach, even if terms can differ according to the stakeholders. Macro: assess current situation // micro: requirements, Macro: define solutions and means // micro: functional analysis, solution selection, risk management, Macro: develop solutions and means // micro: design, Macro: deploy solutions and means // micro: integrate, Macro: monitor, control and update // micro: verify and validate. Integration and coordination is ensured by project plan and change management plan. At micro-level of design centers, one specific process is considered based on life cycle thinking. It gathers six steps: 1. Life cycle definition, 2. Generic and specific rules, 3. Available evaluation methods, 4. Design indicators, 5. Mapping of all those issues, 6. Definition of means. As validation of the potential contribution of the three sources of influences: regulations and standards, design process and cognitive implication, and the use of the methodology, a confrontation within an industrial use-case at Schneider-Electric and a focus on appropriation with China's context are developed.

In conclusion, the development of eco-design approach is a large subject. From theory to practice, design centers lack of real integrated tools for efficient implementation. In complex ecosystem, it is more than necessary to scale the approach and segment some action plans to tackle all issues. For global context, integration of geographical specifications is a real challenge but necessary to have a successful return on eco-design project.

TIERCHANT Emilie

01/01/1989

Engineer in Optical Sciences Institut Supérieur d'Optique, France

Biodiversity Offsets From strategy to operational implementation within a mining group.

ERAMET - Paris

Biodiversity, the variety of all living things, is threatened by Man and his activities; it is vanishing at alarming rates. Since the Rio Summit in 1992, the awareness on biodiversity issues has kept on growing. As a consequence, the field of biodiversity conservation has been rapidly developing. One of the latest additions due to this development is the creation of biodiversity offsets, proposed to complement the mitigation hierarchy (Avoid-Minimise-Restore).

Industrials see the potential of offsets, for they are measurable actions based on science and ecological equivalence in addition to being applicable in situ. Contrary to preconceived ideas, the extractive industry in particular is very sensitive to environmental issues and has become a pioneer on biodiversity conservation. My work will be centred on assisting ERAMET, a mining and metallurgy company, on the design of its biodiversity strategy; more particularly on analysing how biodiversity compensation in the shape of offsets could be included to ERAMET's strategy. The first step was to review some of the most prominent international literature on biodiversity offsets and it was followed by an analysis of four existing offset programmes in mines around the world. These case studies provide a benchmark on the current best practice. Using the data collected and examined, the fundamentals of biodiversity offsets were identified. Furthermore, areas for further improvement which should be addressed as soon as possible have been enumerated. The current validity of biodiversity offsets is hard to assess as these conservation measures are still being developed. Experience will show their true added value. However, for the moment, offsets are expected to increasingly become common practice.

VENTURA Enrique

03/01/1988

Master in Governance of Organizations for the International Development
Institut d'Etudes Politiques de Grenoble

A case for environmental key performance indicators in a luxury goods company.

LVMH – Direction of Environment - Paris

Management of organizations widely relies on specific tools, designed to monitor performance and hence to implement strategies. Among those tools, Key Performance Indicators (KPI) are getting increasingly used to assess and improve key dimensions of the organization's activities. Meanwhile, private companies are challenged by their stakeholders (governments, society, non-governmental organizations, investors, consumers) to become more responsible and transparent about their operations' impacts, especially on environmental issues. Therefore, companies are developing KPI for environment, as part of strategic environmental management, closely related to their business operations.

Luxury goods companies have to address those challenges too, even if their business area is somehow different from other activities. Internal drivers related to the Brands' reputation, the search of cost-optimization or suppliers' monitoring, and external pressure from stakeholders drive the development of Strategic Environmental Management Systems (SEMS) in luxury goods companies. In China, the implementation of KPI for environment could be a positive driver to ensure business opportunities, to answer to both changing consumers' demands and increased environmental and sanitary regulations.

The development-process of KPI for environment has to go through 4 steps: stakes identification, environmental dimensions selection, indicators' characteristics choice and implementation and finally deployment. Each step has to be conducted very carefully in order to produce relevant KPI. Finally, the success of KPI implementation is based on a strong commitment from top-management, a continuous improvement process and cooperation between company's departments.