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3rd Chinese Roundtable on Sustainable Consumption and Production (CRSCP)

“Sustainable Products and Life Cycle Communication
in Business and Industry”

- Life Cycle Management for SCP -

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Meeting Report



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LIST OF ACRONYMS

CEC	Environmental Certification Centre of the Ministry of Environmental Protection
CGPN	China Green Purchasing Network
COD	Chemical oxygen demand
CSCP	UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production
EHS	Environmental, health and safety
ELCD	European Reference Life Cycle Database
GHG	Greenhouse gas
IES	Institute for Environment and Sustainability
ICMM	International Council on Mining and Metals
ILCD	International Reference Life Cycle Data System
ISO	International Organization for Standardization
JRC	European Commission Joint Research Centre
LCA	Life cycle assessment
LCC	Life cycle costing
LCM	Life cycle management
MEP	Ministry of Environmental Protection
MIIT	Ministry of Industry and Information Technology
NDRC	National Development and Reform Commission of the PR China
PCR	Product Category Rules
RJC	Responsible Jewellery Council
SCP	Sustainable Consumption and Production
UNEP-DTIE	United Nations Environment Programme – Division for Technology, Industry and Economics
WSA	World Steel Association



1. INTRODUCTION

The 3rd Roundtable on Sustainable Consumption and Production titled “Sustainable Products and Life Cycle Communication in Business and Industry” was held in Beijing, China, 14th November 2009. The specific topic of the roundtable was focused around Life Cycle Assessment (LCA) and Life Cycle Management (LCM) for SCP in China. The event was co-organized by Tsinghua University, Sichuan University, the Environment Directorate-General of the European Commission and the United Nations Environment Programme – Division for Technology, Industry and Economics (UNEP-DTIE). The Chinese National Development and Reform Commission (NDRC) and the Ministry of Industry and Information Technology (MIIT) provided official governmental support. The roundtable was chaired by Mr. Xiong Bilin from the National Development and Reform Commission (NDRC), Ms. Soledad Blanco, Environment Directorate-General, European Commission, and Mr. Guido Sonnemann, United Nations Environment Programme (UNEP).

Over forty participants attended the meeting, representing international organizations, Chinese national and local government agencies, Chinese companies from different industry sectors including minerals & metals, building & construction and ICT, and research institutes, from China and overseas (for details see participants list on pages 31/32)

The organizers of the 3rd Roundtable chose the topics of **Life Cycle Assessment (LCA)** and **Life Cycle Management (LCM)** because they are essential concepts and approaches for the realisation of sustainable consumption and production patterns. They are furthermore increasingly important business management approaches that can be used by all types of businesses to improve their products and thus the sustainability performance of the companies and associated value chains. LCA is used to analyse product-related information and identify hot-spots of environmental impacts along the value chains. Based on this information LCM is used to organize, analyze and manage business activities towards continuous improvement of products along the life cycle. LCM therefore is about making the often complex information resulting from LCA and product sustainability criteria operational for businesses which are aiming for continuous improvement of their operations. LCA and LCM not only help to reduce the environmental footprints of products and companies, they also maximize socio-economic benefits for the company using these tools.



2. BACKGROUND AND OBJECTIVES

The objective of the 3rd SCP Roundtable in China was to contribute to a better understanding of the potential of Life Cycle Approaches, particularly Life Cycle Assessment (LCA) and Life Cycle Management (LCM), and their wider adoption (e.g. in eco-design, cleaner production, eco-labelling and environmental declaration, green procurement) in China's national sustainable consumption and production (SCP) policies and of ways to address changes in consumption and production patterns in China's industry and society.

The roundtable built on the progress achieved in the two previous EC-supported SCP roundtables which took place in China (May 2006 and June 2008) and identified priority issues and gaps in the capacity to implement SCP policies and approaches, among a range of stakeholders from both the public and private sectors.

The selection of Life Cycle Approaches as a topic for the 3rd SCP Roundtable China was based on the evaluation of the priority areas identified for further collaboration and capacity building during the previous two roundtable meetings. These included:

- **enhancing eco-efficiency in resource and pollution intensive industries through cleaner production, accurate resource pricing and adoption of environmental standards; and**
- **improving waste management through waste prevention and minimization, re-using and re-cycling.**

These approaches to SCP involve LCA and LCM as key elements. Further activities which embed these elements in an overall Life Cycle Approach are of interest to the Chinese government and other stakeholders. Fostering the application of life cycle based approaches is also valuable in the context of sustainable public procurement, which was cited as another priority.

Further objectives of the roundtable were to identify needs, priority areas and gaps as well as means for the implementation of SCP and life cycle approaches in China, recognizing the crucial roles of the different stakeholders, particularly government, industry and research, and encouraging their commitment to sustainable consumption and production. Exchange of expertise on life cycle for SCP and sharing information about on-going activities between China and other regions, particularly Europe, was also considered.



The objective of the roundtable was to discuss the role of LCA and LCM for four main SCP approaches:

Cleaner Production is defined by UNEP as “the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment”.

Eco-design aims at integrating environmental aspects during the product’s design process as any other criterion. It takes into consideration the environmental impacts of a product throughout its entire lifecycle and aims to reduce the impact at the design stage.

Eco-labelling is a market economic instrument that focuses on the overall national targets of environmental protection, promotes green consumption and the sustainable development of society and economy, improving environmental quality and protecting consumers’ health.

Sustainable Procurement is the consideration of environmental elements when large organisations, such as government agencies, procure goods, services or works at all stages of the project and within the entire life-cycle of procured goods. It is a process of meeting organisational needs for goods, services, works and utilities that generates benefits for the organisation as well as society and the economy, whilst ensuring a minimized impact on the environment.

(For more detailed information about these SCP approaches please see Annex III Background Paper)

3. SCP ROUNDTABLE - SUMMARY

The 3rd SCP Roundtable took place in the run-up to the Second Chinese Life Cycle Management Conference, for which reason the thematic focus was life cycle assessment and life cycle management.

The roundtable meeting had one short opening ceremony and four thematic sessions. Session I was on the broader topic of SCP and what the international community and China are doing at the policy level towards creating resource efficient and environmentally friendly societies.

Session II and Session III were more focused on specific issues relating the LCA and LCM with Session II addressing how life cycle approaches could support the implementation of SCP in China, and Session III presenting life cycle based business cases, challenges, opportunities and needs. Session IV focused particularly on what applications are addressing consumption challenges and what opportunities and needs exist in China.

In each session presentations were given by experts from the relevant fields, followed by



short questions and answers sessions.

Following the expert presentations, the last session of the roundtable provided the opportunity and space for stakeholder discussions. Three groups from different industry sectors including metals & minerals, ICT and building materials & construction discussed the following questions relating to life cycle approaches:

What are the international community and China doing at the policy level toward resource efficient and environmentally friendly societies?

How can Life Cycle approaches support the implementation of SCP in China?

What are the Life Cycle-based business cases, challenges, opportunities and needs?

What applications are addressing consumption challenges and what opportunities and needs exist?

Based on the expert presentations and the outcomes of the group discussions, specific recommendations, identifying key challenges, policy recommendations and proposals for follow-up actions were presented and discussed.

4. OPENING SESSION

Mr. Xiong Bilin, deputy director general of the Industry Department of the National Development and Reform Commission (NDRC), opened the meeting and welcomed the participants to Beijing. He emphasized the significance of this roundtable meeting to China's current sustainable development challenge which includes addressing unsustainable consumption and production patterns. Against the backdrop of the global economic crisis China continues her sustainable development strategy and many measures have been implemented. Regarding LCA and LCM as the theme of the roundtable meeting Mr. Xiong expressed the hope to cooperate more closely with the EC and UNEP and to learn from other countries experiences.



5. SESSION I: What are the international community and China doing at the policy level towards resource-efficient and environmentally-friendly societies?

Session I was chaired by Mr. Wang Hongtao. Three presentations were given by international and Chinese experts summarising international and national SCP initiatives and policy frameworks. Common issues identified by all three speakers showed that even though many initiatives are currently underway in the EU, China and through UNEP, and significant progress has been made in reducing environmental impacts from industries, more efforts and further policy development are needed to move national economies onto a sustainable pathway.

Mr. Guido Sonnemann, from the Integrated Resource Management Unit, Sustainable Consumption and Production Branch at UNEP-DTIE, presented the macro, meso and micro perspectives addressed by UNEP towards a resource-efficient economy. As an introduction the presentation gave an overview of current thematic approaches of UNEP and the role of resource efficiency and sustainable consumption and production as strategic priorities. Facing increasingly complex and globalised value chains, he emphasised the importance and difficulty of realising cradle-to-cradle production and consumption systems. To address this and related issues, the Resource Panel on Sustainable Resource Management was established in 2007, which is currently working on the particular issue of global metal flows. The approach of life cycle thinking and life cycle management were introduced, as well as examples of how they can support eco-design strategies. Furthermore, examples of companies successfully applying LCM to create value and reduce costs were shown. Mr. Sonnemann further introduced the Marrakech Process and the current specific regional SCP priorities. In the Asia Pacific the current focus lies with energy, water and waste, whilst agriculture, transport, tourism and housing are not priorities. He concluded by expressing his hope that during the roundtable target areas in China would be defined for the implementation of SCP using LCM related activities.

Ms. Soledad Blanco, Director DG Environment of the European Commission, gave a presentation on the European perspective on SCP. The presentation opened with an outline of the most pressing challenges for the EU, which are the transition to an energy and resource efficient economy, the reduction of environmental stress, changing patterns of consumption and to transfer environmental challenges into economic opportunities. To address these challenges one of the main policy frameworks in the EU is the Action Plan on Sustainable Consumption and Production / Sustainable Industrial Policy, adopted in



July 2008, consisting of four main elements namely better products, smarter consumption, leaner production and action at global level. Life cycle thinking plays a fundamental role in this action plan which promotes life cycle thinking in business and public administrations. Regarding cooperation between China and the EU, Ms. Blanco introduced the SWITCH Asia Programme which was then further elaborated later on during the roundtable meeting.

The last presentation of this session was given by **Mr. Xiong Bilin, Deputy Director General of the Industry Department of the National Development and Reform Commission (NDRC)**, who presented sustainable development approaches in China's key industry sectors focusing on targets, policies, achievements to date and future challenges. Achieving sustainable consumption and production patterns has been declared one of the main goals of China's development strategy. SCP is being promoted through three main policies and measures, namely energy efficiency & emission reduction (*jie neng jian pai*), cleaner production and structural adjustment of industry. He then outlined the five main goals of the energy efficiency & emissions reductions policy to be achieved by 2010, which are the reduction of the use of coal by 20% per unit of economic value, reduction of major pollutants by 10%, industrial water consumption reduction by 30%, sulphur dioxide emissions and COD reduction, and raising the amount of urban household waste properly treated to a minimum of 70% and industrial waste to 60%. Mr Xiong presented a comprehensive summary of current measures taken, relevant policy frameworks, industry sectors targeted and goals achieved to date. For instance, regarding energy efficiency in construction projects, during the Eleventh Five Year Plan approximately 240 million tonnes of standard coal will be saved. Regarding cleaner production, he outlined a range of different policy measures of which the most recent one is the Promotion Law for Circular Economy from 2008. Over the last three years, emissions intensity has decreased by 10.1%. Since 2007, sulphur dioxide and COD had already decreased by 8.95% and 6.61% respectively. The presentation concluded with an outlook emphasizing three points: 1. SCP is an important global strategy to achieve sustainability is in line with China's development goals and policies. 2. Against the backdrop of an increasingly interconnected global economy, China will follow global sustainable development trends and use the approach of SCP to increase the country's competitiveness. 3. The complexity of consumption and production systems requires systematic analysis and coordination for effective policy design.



Ms. Soledad Bianco, Director DG Environment, and Mr. Xiong Bilin, Deputy Director General of the NDRC Industry Department

6. SESSION II: How can life Cycle Approaches support the implementation of SCP in China?

The topics of Session II, chaired by Ms. Virginie de Ruyt from the European Commission, focused specifically on life cycle approaches and the implementation in China. Three presentations were given in this session in which the speakers highlighted the potential of LCA as a suitable method to address a range of environmental issues. In addition, the presentations outlined further issues to be addressed to realise the full potential of LCA, in particular database development and methodological issues. Improved cooperation between EU and China on these issues is considered possible and necessary.

Mr. Wang Hongtao, Professor at the College of Architecture and Environment at Sichuan University, provided in his presentation a detailed overview of several issues relating to LCA, LCM and SCP, with a specific focus on the current status of LCA/LCM



application in China. First, he introduced LCA addressing issues of quantification, systemization, integrated assessment of environmental impact of products and international LCA standards. Mr. Wang demonstrated the benefit of LCA application to avoid the shifting of environmental burdens in production and consumption processes. Examples of burden shifting include the shifting of impacts resulting in new environmental problems, shifting impacts from one life cycle phase to the other, shifting the timing of environmental impacts and shifting geographic location of environmental impacts. Moving from LCA to LCM, two main trends were identified, namely that LCA is increasingly used as a method for effective LCM, and that market competition concerns have become a driving force for LCA and LCM application for many businesses. Mr. Wang Hongtao presented several examples how LCA informs SCP practices such as cleaner production and eco-design. Based on the example of electronic products the opportunities to improve both quality and environmental performance through LCA were shown. The issue to be addressed is how to make product designers use LCA in everyday design processes. Regarding the situation of LCA and LCM in China, at this point in time only a relatively small number of companies use LCA for assessing the environmental impacts of their products. While LCA research and publications are increasing, in comparison to other countries China is still lacking somewhat behind. He concluded the presentation showing the three most relevant difficulties facing LCA in China. These are foremost database issues, lacking awareness of domestic enterprises and lacking support of domestic policy.

Ms. Sonia Valdivia from UNEP-DTIE presented the UNEP/SETAC Life Cycle Initiative as a one-stop shop for Life Cycle Approaches. The presentation started with an overview of the systemic change necessary for achieving sustainable consumption and production systems and drawing attention to the unrealized opportunities along the life cycle, particularly in the upstream and downstream stages of the life cycle. Regarding life cycle approaches, globally the numbers of practitioners of life cycle approaches are continuously increasing, about 5000 worldwide in 2009. The results of a 2008 UNEP survey showed that LCA is the methodology commonly used by big companies. Data quality and availability continues to be one of the main challenges. Ms. Valdivia then introduced the UNEP/SETAC Life Cycle Initiative which tries to address these issues through a range of global activities including capacity development, workshops on data issues, etc. The three main objectives of UNEP/SETAC Life Cycle Initiative are expanding capability worldwide to apply life cycle approaches, to refine and facilitate methodologies for life cycle assessment achieved by international consensus, and to facilitate the use of life cycle based approaches in business, government and the society about natural resources, materials and products targeted at consumption clusters (food, housing and mobility). Regarding the issue of life cycle databases, the goal is to facilitate the access to transparent, free and good quality life cycle data worldwide. Ms. Valdivia referred to the LCA conference held in Boston in early October 2009, where the development of an outline of a global guidance for LCA databases was sketched. Other areas in which UNEP can provide support to Chinese stakeholders for further developing LCA and LCM capabilities include impact assessment indicators and methods, social LCA, and the



capability maturity framework for business.



Ms. Sonia Valdivia, UNEP-DITE SCP Branch, presenting the UNEP/SetAC Life Cycle Initiative

Mr. Marc-Andre Wolf, from the European Commission Joint Research Centre (JRC), Institute for Environment and Sustainability (IES), presented the recent developments of the International Reference Life Cycle Data System (ILCD). Currently, life cycle thinking and LCA play a key role in industry and policy, but life cycle approaches have not yet reached their full potential. This is mainly due to conflicting messages about inconsistent data and methods. What is required at this stage is guidance for more robust LCAs and better availability of consistent and quality-assured data – in the EU and internationally – with the ILCD trying to address this issue. Mr. Wolf pointed out current EU legislation, particularly the Integrated Product Policy Communication (IPP) from 2003 and Sustainable Consumption and Production Action Plan from 2008, and the importance of LCA for implementation. The functions and activities of the European Platform on LCA were introduced, emphasizing the new 2009 online version of the European Reference Life Cycle Database (ELCD). The development of a broader international approach to fulfil the needs for reliable data is realized through the ILCD and expected to be launched in early



2010. The ILCD will provide a Handbook including a series of technical guidance documents on LCI and LCIA and set up an ILCD Data Network which will be globally open for all data developers to join. Other advantages of the Data Network are that it will not stand in competition to any other databases and can provide coherence across business and policy instruments. The ILCD will thereby contribute to better decisions and better acceptance of life cycle based instruments and supports the transition to SCP.

Following the presentations several questions were raised by the audience:

Mr. Liu Wenqiang from NDRC inquired about the carbon emission calculation through LCA. In the context of climate change, should one focus only on carbon or also consider other factors? How can carbon accounting and LCA be combined and how should one handle the complexity of information? Is LCA a useful tool to allocate carbon emissions on city level? Mr. Wang Hongtao replied to this set of questions by drawing attention to the deficits of the current carbon accounting methodologies used under the UNFCCC and Kyoto Protocol as they do not consider geographical shifts of carbon emissions, so-called carbon leakage. LCA can provide answers to the problems and recommend where production should occur and which geographical areas are most efficient for low-carbon economic activity.

Mr. Tao Hongzhi from Lenovo asked about the specifics of carbon footprinting. His company was interested in doing carbon footprint analysis of their products, but is faced with a data collection problem as the data seemed to be scattered across databases of different countries. Where would Lenovo be able to get reliable and authoritative data from? Mr. Wolf confirmed that this is a critical issue, also for computer manufacturers in other countries such as Europe. As product components are manufactured in different locations, different data sets from different countries are required. The new ELCD would be able to address these issues. For China it would also be necessary to establish such a database and the EC JCR would be willing to offer technical support. Mr. Sonnemann added to this and confirmed that the use of EU data in other country contexts should be complemented by the use of local data. UNEP tries to facilitate the exchange of data through the development of various tools such as software converters, the open source project and the global guidance for LCA databases.

7. SESSION III: What are the Life Cycle based business cases, challenges, opportunities and needs?

In Session III three presentations introduced industry perspectives and experiences in LCA application. The session was chaired by Mr. Guido Sonnemann. The overview of the three industry sectors mining and metals, steel and ICT identified common challenges and



the potential of LCA and LCM for further progress towards eco-efficiency through sustainable product design, reduction of carbon footprints and increasing quality and availability of data.

Mr. John Atherton, Senior Program Director of the International Council on Mining and Metals (ICMM), started the session with a presentation on international best practices and experiences in metals and materials stewardship. After an overview of ICMM business practice requirements, thematic areas of focus and current membership status (19 of the world's leading mining and metals companies are members) were given. From an industry perspective the material focus is important as is the focus on maximisation the use of the resource. The ICMM's Materials Stewardship started in 2004 and has four aspects: 1. Taking a systems perspective to understand material flows and life cycle benefits, 2. Building new and strengthen existing relationships to effectively interact with other players in the value chain, 3. Optimising the production and use of minerals and metals by implementing Eco-efficiency, and 4. Contributing to a robust, accessible base of information to support decision making through transparent sharing and reporting of data and information. The Steel Stewardship forum is an example of applying material stewardship themes in practice. The current focus is on construction with the goal to design buildings considering recyclability of materials. The elements of the Responsible Jewellery Council (RJC) which also uses the approach of material stewardship as operating basis were introduced. Here independent third party verification to guarantee transparency is highly necessary for LCM's work for the jewellery industry. Particular challenges are the creation of common norms for certification. The presentation concluded by outlining some of the future challenges ahead for the metals sector which include delivering cost competitiveness whilst maintaining standards; building trust through reporting, assurance, verification; traceability of materials; complementarities among value chain partners; and involvement of public policy makers, particularly relevant for improving the recovery and recycling rates of metals.

Ms. Liu Yinghao from Baosteel presented on the relevance of LCA for achieving energy efficiency in steel production and consumption systems. As member of the World Steel Association (WSA), Baosteel participates in the LCA Forum of the WSA and regularly exchanges information on LCA data, methodology and application and on new developments of the industry. Regarding LCI data collection, the current data collection is carried out by WSA and Baosteel contributes to this process. Ms. Liu presented several case studies of product application as to how steel can contribute to low-carbon solutions for climate change mitigation. For 2009 WSA will complete a range of LCA case studies including rail, automotives, packaging, roofs, ships and construction. The LCA case study for automotives that compared advanced high strength steel (AHSS) and aluminium showed that over the life cycle of a vehicle, AHSS has lower GHG emissions than aluminium. Regarding the use of LCA for energy efficiency at Baosteel, Ms. Liu presented the different initiatives that have taken place since 2003 when Baosteel first paid attention to LCA. Since then Baosteel has developed methodologies, databases and LCA software



packages. LCA is used for making comparisons on plant level, shop level and identification and development of energy saving measures. Ongoing projects include cooperation on eco-product design together with steel can maker and car manufacturers.

Mr. Peng Jun from China Mobile introduced the “Green Action Plan’ of the company. The current activities focus mainly on reducing emissions through energy efficiency measures. The company target is to decrease energy consumption by 40% by 2010 over 2005 levels. New 3G technology systems and improved facilities reduce the need for air conditioning, further 20-30% efficiency improvements are deemed possible. The main innovation is that air conditioning systems in data centres are increasingly becoming customised, designed for the cooling of machines rather than for humans. China Mobile has also issued guidelines for reducing impacts from packaging and transport. Reusable assemble packaging that can be used 5-6 times has reduced packaging waste significantly. Options for recycling, reusing and repairing of batteries are being explored. To realise LCM China Mobile has recognised the need to cooperate more closely with the suppliers and other companies of the ICT sector. China Mobile has signed a memorandum of understanding with 53 major suppliers and set energy efficiency standards in addition to expanding the use of green package for communication products, and promoting the use of small and recycled SIM cards. Following recommendations by the Smart2020 initiative, China Mobile will also try to realise the low-carbon ICT challenge in China and explore options how IT can contribute to economy-wide emissions reductions.

8. SESSION IV: What applications are addressing consumption challenges and what opportunities and needs exist?

In this last presentation session of the day, chaired by Mr. John Atherton, the issue of how to achieve sustainable consumption patterns in China was addressed. The presentations highlighted the consumption challenges from different perspectives and approaches, including those of project-based approaches such as the SWITCH Asia Programme, international product standards and product declaration of building and construction materials, and sustainable green government procurement.

Ms. Virginie de Ruyt from the European Commission Delegation in Beijing introduced the EU SWITCH Asia Programme which has the objective to advance sustainable consumption and production in Asia and the Pacific. After giving an overview of the programme Ms de Ruyt explained the functions of the specific programme components. In addition to the projects on the ground the SWITCH Asia Network Facility is a new component with the task to provide networking among the projects, conceptual background research and support a successful overall programme outcome. An additional



policy component is currently under development. In China nine projects are currently under way targeting SMEs from a range of different industry sectors including wood processing, electric motor manufacturers, construction and interior renovation, ICT components, bamboo and rattan, and others. After the general introduction **Mr. Patrick Schroeder, consultant of the SWITCH Asia Network Facility**, presented more specific data about the projects on the ground. From a value chain perspective the focus of the current projects mainly lies with the pre-manufacturing and manufacturing stages, but also addresses companies as consumers downstream of the value chain. The SCP practices applied are mainly cleaner production, promotion of energy efficiency, greening supply chains and providing product information. One project was described in more detail. The Sustainable Public Procurement in Urban Administrations in China (Supp-Urb) works with public procurement centres in the cities of Tianjin, Lanzhou and Qinghuangdao to support the implementation of existing green procurement guidelines. Mr. Schroeder further introduced the Network Facility's current work on developing an input-output indicator framework for project impact assessment. The framework is based on life cycle thinking and will enable project evaluation to see along which stage of the value chain improvement were achieved.

Mr. Jiang Quan from the China Building Material Test and Certification Center (CTC) presented China's type III environmental declaration and low-carbon certification scheme for building materials and the construction industry. In the presentation Mr. Jiang focused on the communication of life cycle information along the production chain and introduced the first Chinese standard LCA specification. After an introducing background information about the development of green and low-carbon building materials and construction sector, Mr. Jiang gave a detailed evaluation of the current state of green building materials in China. He further gave an overview of current international building materials and construction Type III environmental declaration systems in China, such as ISO/TC59/SC17 and the European CEN/TC 350 'Sustainability of Construction Works'. The main work area of CTC is to establish a Type III environmental declaration system for building and construction materials to enable the eco-design for products and materials. CTC is also working with the PAS 2050 Standard to help businesses in managing GHGs in their production process, also looking at the product design. Regarding the prospects for CTC's future work, the centre will continue to expand its product category rules (PCR) for building and construction materials, and development of low-carbon product certification procedures. Furthermore, CTC will contribute to establish a basis for a national database for green building material products.

The last presentation of the day was given by **Ms. Zhang Xiaodan from the Environmental Certification Center of the Ministry of Environmental Protection (CEC) and the China Green Purchasing Network (CGPN)**, presenting on the current status of green procurement in China. Regarding the policy framework for GPP in China, a recent development in 2009 was the official statement by the State Council to accelerate progress towards GPP implementation. On a practical level, "The 4th list of GPP on



eco-labeling product” was issued by MOF and MEP in 2009. The GPP list in China now includes 21 product categories, 701 enterprises and 8619 product types. Ms. Zhang further presented recent developments of GPP, such as the national government automobiles procurement of around 500,000, of which about 80% automobiles meet GPP standards which require National Standard IV. MEP now plans to revise eco-labeling criteria in 2009 for light vehicles to further tighten emission limits to protect the atmospheric environment. A range of different barriers still exist in China’s public administrations to making implementation of GPP less effective, including among others lack of green products available on the market, higher budget requirements for GPP, lack of awareness and information of staff. The expectations for the future include the promotion of GPP development through governmental order or laws, further development of the eco-labeling programme, expansion of product lists to include low-carbon indicators, improvement of data analysis on GPP, and exploration of international cooperation for harmonization of GPP criteria, especially concerning low-carbon products development.



Mr. Wang Hongtao, Sichuan University, and Ms. Zhang Xiaodan, Environmental Certification Center (CEC) of the Ministry of Environmental Protection.



9. ROUNDTABLE WORKING GROUPS DISCUSSION

After the presentations of the first four sessions, the next session facilitated small group roundtable discussions. The small group roundtable discussions provided opportunities for participants to propose and discuss LCA/LCM approaches for SCP in an open dialogue between members of the group. There were three groups with different industry and sector background. Each group consisted of governmental, business and academic participants.

- **Group One: Metal extraction and processing industry**
- **Group Two: Building material and construction industry**
- **Group Three: Electronics, information and communication industry**

Participants were encouraged to discuss the following four themes.

- 1) **Typical good practices and lessons learnt about SCP in this industry**
- 2) **Identifying the emerging opportunities in changing production and consumption (procurement) patterns of this industry**
- 3) **Identifying the existing challenges in applying LCA/LCM approaches to change production and consumption (procurement) patterns of this industry**
- 4) **Identifying the potential needs and the way to promote LCA/LCM approaches in this industry**

Participants were actively engaged in the discussions and gave very constructive suggestions for promoting SCP through LCA/LCM in China. The following shows a summary of the discussion outcomes:

9.1 Group One: Metal extraction and processing industry



The metal extraction and processing industry in China is a major sector of the Chinese economy. The Chinese economy now accounts for almost 50 percent of the world's steel production, expected to produce about 600 million tons of steel in 2010. China is also the largest nonferrous metals producer in the world and largest consumer for six kinds of common nonferrous metals including copper, aluminum, zinc, lead, nickel and tin. From 1990 through 2006, the output of ten nonferrous metals increased eight-fold. The investment in the sector in 2006 was 118 billion RMB or US\$ 15 billion, six times higher than in 2002. From 1990 through 2006, energy consumption grew 450% for the nonferrous metals sector in general, 700% in terms of electricity, and 370% in coal. As a result of global economic downturn the consumption and production of many metals experienced a downward trend in 2008 and 2009. In the mid to long-term China's metals consumption and production will continue to increase as the economy has gradually gets a firmer foothold. The expectation for a rise in metals consumption will get stronger as a result of increasing auto sales, continuing infrastructure construction and a booming housing market.

Source: Wang, Y., Chandler, W. 2009. The Chinese nonferrous metals industry—energy use and CO2 emissions. Energy Policy (2009), doi:10.1016/j.enpol.2009.03.054

Mr. Guido Sonnemann presented the following results of the discussion on behalf of the group:

Typical good practices and lessons learnt about SCP in this sector:

Cleaner production and technology aiming at pollution prevention and energy efficiency through continuous improvement of processes are already being applied in Chinese companies. Occupational health and safety measures for workers protection are also being applied in the industry. Some product standards have been implemented, such as those for concentrate input (resulting in less As in Cu).

Identifying the emerging opportunities in changing production and consumption (procurement) patterns of this industry:

Many opportunities still exist in the Chinese metals sector, for example through material stewardship which supports a circular economy with a cradle to cradle approach, as also applied in industrial parks. Linking LCA to eco-design can contribute to more sustainable products. Other opportunities exist through downstream customer demand, particularly the car and building industry, asking for high quality metals for improved energy efficiency (resource productivity).

Identifying the existing challenges in applying LCA/LCM approaches to change production and consumption (procurement) patterns of this industry:

Challenges exist in terms of the need for clear policies to provide incentives for change in the industry. The efforts of the industry to make metals production greener are less appreciated by end consumers as compared to those of producing organic food, a



challenge therefore being how to increase consumer's awareness. As it is the case globally, the traceability of metals is also a big challenge for the Chinese metals industry.

Identifying the potential needs and the way to promote LCA/LCM approaches in this industry:

The industry has the need for good case studies from international experiences to show that there is a business case for improved and sustainable production and consumption of metals. Chinese companies need to publish results of their efforts in sustainability reports so as to provide more transparency. Finally, the access to clean technology, including knowledge about LCA application, continues to be a need for many Chinese companies.

9.2 Group Two: Building material and construction industry

Together with the scale and pace of China's urbanization, the country's building material and construction sector is experiencing rapid development. China's urban population is predicted to expand from 572 million in 2005 to 926 million in 2025 and hit the one billion mark by 2030. In the next 20 years, China's cities will have added more than 350 million people. China will then have over 200 cities with more than one million inhabitants. Unprecedented levels of construction of buildings are necessary to house the number of people migrating to the cities. It is estimated that about five million new buildings with about 40 billion square meters of floor space will be built by 2030. Other drivers for increasing demand of construction materials such as steel and cement are the massive government stimulus and infrastructure plans for rails, roads and bridges.

Source: Woetzel, J. *et al.* 2009. Preparing for China's Urban Billion. McKinsey Global Institute. March 2009.

Ms. Chen Sha from Beijing University of Technology on behalf of the group presented the following results:

Typical good practices and lessons learnt in SCP of this industry:

For this sector LCA application in China has already proven a useful method to achieve reductions in energy consumption and emissions in the identification and design of green building materials, low-carbon buildings and clean energy for buildings.

Identifying the emerging opportunities in changing production and consumption (procurement) patterns of this industry:

Policy has the opportunity to draw on the scientific findings from LCA studies to better implement energy efficiency in housing and low-carbon buildings. LCA can inform the design and use of economic instruments to improve environmental performance in industry sectors, awareness raising of enterprises, greener products, as well as promoting sustainable consumption patterns.



Identifying the existing challenges in applying LCA/LCM approaches to change production and consumption (procurement) patterns of this industry:

LCA still faces many challenges in China's building materials and construction industry. To gain the support of policy, and to be able to provide scientific inputs to policymaking, it is necessary for research organizations working on and with LCA to provide reliable data references and sources. Particularly current methodological issues resulting in different results of LCA reports for similar products requires work on technical standards to create the necessary unified evaluation standards and norms. This challenge is related to the differences in international and Chinese data sets. Solving these issues will also reinforce consumer trust in the product information systems built on LCA methods.

Identifying the potential needs and the way to promote LCA/LCM approaches in this industry:

More awareness-raising about the advantages of LCA in China's construction and building industries and among relevant policymaker groups is required. Training and capacity building through the relevant construction industry associations could improve capacity to effectively apply LCA and thereby promote sustainable housing. High level policy support, in addition to those existing policies promoting energy efficiency and low-carbon development, are required. The role of international organizations and the international LCA community is to increase cooperation on the issues that are also relevant for other countries many different levels with Chinese organizations.



Ms. Chen Sha, Beijing University of Technology, presenting results of the building industry and construction industry group



9.3 Group Three: Electronics, information and communication industry

China plays a key role in the global electronics, information and communication industry and produces a significant share of the worldwide output. For example, in 2006 China produced 77% of the global output of notebook PCs, 21% of desktop PCs and 50% of CRT televisions. Additionally, a large amount of China's exports from this industry sector are components and semi-finished products for final assembling in regional markets. The electronics industry is a major economic driver in China. Manufacturing of information and communication equipment makes up about 10% of the country's industrial output value and about 6% of the industrial profits. In 2005, the Chinese electronics industry generated a trade surplus of 65.5 billion US\$ or 64.2% of the country's total surplus. The export share of notebook PCs and LCD monitors is 94% and 88% respectively, for LCD TVs, mobile phones and CRT monitors the export share is higher than 70%.

Source: Eugster, M., Hischier, R., Duan, H. 2007. Key Environmental Impacts of the Chinese EEE-Industry: A Life Cycle Assessment Study. Final Report. St.Gallen, Switzerland and Beijing, China.

Mr. Tao Hongzhi from Lenovo presented on behalf of the group the following results:

Typical good practices and lessons learnt about SCP in this industry:

The good practices identified by the ICT group discussion include experience in dealing with different environments, external product declaration, use of renewable energies, product performance indicators include sustainability criteria, systemic view increasingly also considering the consumption phase of products. Environmental and product performance are considered to be correlated. If there is an improvement of product performance, improvement will automatically occur in environmental performance. Ecodesign is a standard practice and product design is often based on LCAs. The label "energy star" was mentioned as a good example; it is clear and consumers understand it.

Identifying the emerging opportunities in changing production and consumption (procurement) patterns of this industry:

Opportunities exist as ICT has high level government commitment and support. An example here is the recent commitment agreement between China Mobile and the Ministry of Industry and Information Technology. There is strong support for (sustainable) innovation even in times of economic and financial crisis. Moreover, ICT is seen as an opportunity to reduce the carbon footprint of the society.

Identifying the existing challenges in applying LCA/LCM approaches to change production and consumption (procurement) patterns of this industry:



A large challenge for the industry is to satisfy customer requirements for low prices and more environmental sustainability, demands which are often perceived to be mutually exclusive. In general, there is little awareness of consumers about the benefits of sustainable ICT products and less willingness to pay more for value added through sustainability. Regarding financing of sustainability improvements there is currently only little information on credits available. Furthermore, the market and products in the ICT sector change very fast. Durability of products is not the first priority of consumers or companies. The missing global common infrastructure to implement the best and most efficient technologies is an obstacle to in making ICT more sustainable. Data quality and availability is seen as a major challenge as the sector is too dynamic and involves thousands of suppliers in the value chain; therefore it is often complicated and costly to involve, in timely fashion, key actors of the product chain in getting relevant and accurate data.

Identifying the potential needs and the way to promote LCA/LCM approaches in this industry:

There is need to set up industry specific standards for ICT. This should be supported through a labeling scheme for green ICT products. In addition one should consider systematically how ICT can help to reduce carbon footprint during the use phase.

10. CONCLUSIONS AND RECOMMENDATIONS FOR FURTHER ACTION

Based on the expert presentations of Sessions I-IV and the results of the interactive group discussions several priority areas have been identified as key challenges to be addressed with reference to China’s needs. Across all three industry sectors there is urgent need for comprehensive, good quality data so that companies can make progress in improving the environmental performance of their products. Furthermore, reliable data are needed to support and inform China’s policymakers in the development of sustainable industrial policies for these three and other industry sectors!

In addition, several conclusions and recommendations for further follow-up actions were put forward:

Improve data reliability and quality

During the Roundtable it was stressed that it is highly important to improve reliability of LCA data so that policy decision for industrial development can be made on LCA. In the overall framework of promoting SCP in China, the circular economy approach is currently



the main policy. The method of LCA and life cycle thinking is in line with China's scientific approach to development.

Promotion of LCA and LCM necessary

In particular, participants stressed the importance of promoting LCA and LCM in specific industry sectors. This could be effectively achieved through industry associations. LCA committees should be set up in relevant industry associations and promote LCA and LCM. This is considered particularly relevant for the construction material and building sector.

Government policies to support green companies

Recommendations for the Chinese government include designing policy tools considering life cycle thinking, and based on scientific analysis of LCA, are both desired and required. The development and implementation of relevant policies and economic instruments was recommended, in particular for the support of green companies through subsidies and tax breaks in order to catalyze resources for SCP. Government can also play a facilitating role for increasing the availability of green credits.

Supporting appropriate standards and independent verification systems

The need for independent third part verification systems, coupled by the enforcement of policies and regulations will be needed to achieve shifts in creating stable markets for sustainable products and to ensure consumer trust in environmental declaration systems. This requires more work on the creation of appropriate standards and criteria for certification and labelling of products and services. Particularly carbon labeling is an area of interest for Chinese companies and consumers, but has so far not been addressed.

Exchange and cooperation between Chinese and international experts

More communication and exchange opportunities to promote database development, such as expert training and workshops, are required. Strengthening the cooperation between Chinese, European and international LCA and LCM experts and researchers in order to solve database and methodology issues is necessary. The exchange of best practices and know-how on different SCP issues, specifically case studies of businesses and effective policies, is strongly recommended.

Increase technology transfer

The most efficient and cleanest technologies necessary to implement cleaner production are still often not available. These longstanding issues can be addressed through increased international cooperation for technology transfer and capacity building, including 'soft skills' knowledge on how to use LCA software applications.



Summary of Challenges and Recommendations necessary for promotion of LCA and LCM application in China's industry

Challenge identified	Recommendations	Relevant Industry Sector
Need for clear policies and high-level support to provide incentives for industry to adopt LCA/LCM and improve companies' sustainability performance	Support of green companies through subsidies and tax breaks, need for international best practice examples, increased international cooperation (facilitated through UN and international LCA community)	All sectors
Lack of awareness and trust among consumers, policymakers and industry about potential of LCA	Need for international best practice examples, promotion of LCA, support of appropriate standards and independent verification systems	All sectors
Lack of LCA-based industrial policy advice	Improve data reliability and quality to gain confidence of policymakers	Building and Construction
Non-unified technical standards and norms	Improve data reliability and quality, support of appropriate standards and independent verification systems	Building and Construction, ICT
Lack of capacity among many companies, particularly SMEs	increased international cooperation for capacity building, exchange and cooperation between Chinese and international experts	Building and Construction
Little information on bank credits for sustainable investments	Government support to increase availability of green credits	ICT
Linking LCA to eco-design	Promotion of LCA and LCM, need for international best practice examples, improve data reliability	Metals
Most efficient and cleanest technologies often not available	increased international cooperation for technology transfer and capacity building	All sectors
Lack of traceability of metals across the value chain	Improve data reliability and quality, increase transparency through company reporting	Metals



Several proposals for follow-up actions to this roundtable were put forward:

Chinese authorities concerned and relevant industry stakeholders will follow-up on above recommendations looking for adequate ways and means to ensure their implementation on national level. Further international support will be needed in the areas of LCA and LCM and appropriate support of external partners such as UNEP and the European Commission is required.

Regarding the international cooperation, both north-south and south-south cooperation are needed, as the experiences from both developed and developing countries are very useful. The capacity building through UNEP and EU initiatives for LCA and LCM are very welcome and need to be strengthened to promote implementation of SCP beyond the circular economy approach in China.

Regarding progress towards realizing sustainable consumption and production patterns in China, closer cooperation and exchange of information between the SWITCH Asia Programme and related industries and government agencies is recommended. The project outcomes and best practices can inform industrial policy and help in defining new industry standards.

Utilising existing organizations operating in China, such as the UNEP/UNESCAP Asia Pacific Regional Helpdesk for SCP based in Beijing, should be used to promote the concepts of life cycle approaches and support capacity building for industry sectors to effectively apply LCA and LCM. Furthermore, the SCP Helpdesk can be used to facilitate promotion of LCA and LCM throughout the Asian region.



11. ANNEXES

Annex I: AGENDA

08:30	Registration and welcome coffee 会议签到	
08:55	Opening words 开幕辞	熊必琳 Xiong Bilin, 国家发展与改革委员会 National Development and Reform Commission (NDRC)
<p>What are the international community and China doing at the policy level towards resource efficient and environmentally friendly societies? 为建立资源节约型环境友好型社会，国际社会与中国的政策努力</p>		
09:00	Cradle to Cradle: Road to a Resource Efficient Economy 从摇篮到摇篮：资源节约型社会之路 <ul style="list-style-type: none"> Macro, mezzo and micro perspectives addressed by UNEP towards a Resource Efficient economy 联合国环境署的宏观、介观和微观视角 	Guido Sonnemann, UNEP-DTIE
09:15	European Perspective on SCP 欧盟的可持续消费与生产 <ul style="list-style-type: none"> Sustainable Consumption and Production and Sustainable Industrial Policy Action Plan in Europe 欧盟的可持续消费与生产及可持续工业政策行动计划 	Soledad Blanco, European Commission, DG ENV
09:30	Sustainable Development in Chinese key industrial sectors 中国重点工业领域的可持续发展 <ul style="list-style-type: none"> Targets, policy making, achievement and challenge 目标，政策，成效与挑战 	熊必琳 Xiong Bilin, 国家发展与改革委员会 National Development and Reform Commission (NDRC)



09:45	Question time 问答	
How can Life Cycle Approaches support the implementation of SCP in China? 生命周期方法如何支持中国的可持续消费与生产？		
10:00	Life Cycle Assessment and Management for Sustainable Consumption and Production in China 生命周期评价与管理服务于中国的可持续消费与生产 <ul style="list-style-type: none"> Potential contributions of LCA/LCM to Chinese SCP 生命周期评价与管理在中国可持续消费与生产中的应用潜力 	王洪涛 Hongtao Wang, 四川大学 Sichuan University
10:15	The UNEP/SETAC Life Cycle Initiative as a one-stop shop for Life Cycle Approaches UNEP/SETAC 的一站式生命周期方法服务 <ul style="list-style-type: none"> UNEP/SETAC Framework for Life Cycle Decisions in Business and Governments 为商业与政府的生命周期决策提供服务的框架 	Sonia Valdivia, UNEP/SETAC Life Cycle Initiative
10:30	International Reference Life Cycle Data System (ILCD) 国际生命周期基准数据系统 (ILCD) <ul style="list-style-type: none"> Working together towards robust life cycle based approaches 共同致力于强健的生命周期方法 Role of ILCD for EU SCP policy implementation ILCD 在欧盟可持续消费与生产政策实施中的作用 	Marc-Andree Wolf, European Commission's Joint Research Centre, Institute for Environment and Sustainability (JRC-IES)
10:45	Question time 问答	
11:00	Coffee break 茶歇	
What are the Life Cycle based business cases, challenges, opportunities and needs? 可持续生产活动中的挑战，机遇与需求		
11:20	Metals and Materials Stewardship 金属与材料行业的产品责任管理	John Atherton, International Council on Mining and Metals (ICMM)



	<ul style="list-style-type: none"> International practice and experiences 国际实践与经验 	
11:35	<p>LCA and Energy Efficiency of Steel 钢铁的生命周期评价与能源效率</p> <ul style="list-style-type: none"> LCA/LCM in International Iron & Steel Institute (IISI) and Bao Steel 国际钢铁协会和宝钢的生命周期评价与管理 	<p>刘颖昊 Liu Yinghao, 宝钢集团 Bao Steel</p>
11:50	<p>“Green Action Plan” in China Mobile 中国移动的绿色行动计划</p> <ul style="list-style-type: none"> Energy saving and pollution reduction in communication and information sectors 通讯信息行业的节能减排 	<p>彭军 Peng Jun, 中国移动 China Mobile</p>
12:05	<p>Question Time 提问</p>	
12:20	<p>Lunch Break 午餐</p>	
<p>What applications are addressing consumption challenges and what opportunities and needs exist? 可持续消费活动中的挑战，机遇与需求</p>		
13:30	<p>Type III Environmental Declaration and Low-carbon Certification for China Building Materials and Building Industry 中国建材及建筑行业III型环境声明与低碳认证研究</p> <ul style="list-style-type: none"> Communication of life cycle information along production chain 产品链上的生命周期环境信息交流 First product LCA specification as Chinese standards 首个产品 LCA 技术规范国家标准 	<p>蒋荃 Jiang Quan, 中国建材检验认证中心 China Building Material Test and Certification Center (CTC)</p>
13:45	<p>SWITCH-Asia program – Promoting sustainable consumption and production 欧盟 SWITH Asian 项目 – 促进可持续消费与生产</p>	<p>Virginie De Ruyt European Commission, DG ENV, Delegation in China</p>



	<ul style="list-style-type: none"> Current status and next steps 现状与未来规划 	
	<p>LCM application in SCP project development and implementation in China</p> <p>生命周期管理在中国可持续消费与生产项目设计与执行中的应用</p> <ul style="list-style-type: none"> Examples of how LCA and LCM are being used in the China SWITCH projects in different industry sectors 生命周期评价与管理在中国不同行业的 SWITCH 项目中的示例 	<p><i>Patrick Schroeder, UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production</i></p>
14:05	<p>The Status of Green Public Procurement in China</p> <p>中国政府绿色采购现状</p> <ul style="list-style-type: none"> Introduction, evolution, current status and next steps 简介，演进，现状与未来规划 	<p><i>张小丹 Zhang Xiaodan, 中国绿色采购协作网 China Green Purchasing Network (CGPN)</i></p>
14:20	<p>Question time</p> <p>问答</p>	
14:35	<p>Coffee break</p> <p>茶歇</p>	
14:50	<p>Roundtable discussion (coffee available)</p> <p>圆桌会议分组讨论</p> <ul style="list-style-type: none"> Introduction by UNEP on the results of previous roundtables 前两次会议的总结 (UNEP) Explanation on mechanisms of the following discussions and questions to be addressed (see below) 解释分组讨论的程序以及需要讨论的核心问题 (详见后面的分组讨论说明) Discussions in groups 分组讨论 	<p><i>Facilitators: UNEP, EC</i></p>
16:10	<p>Presentation of conclusions and action items</p> <p>分组讨论结果交流</p> <ul style="list-style-type: none"> Report from each group to present the conclusions 各小组报告讨论结果 	<p><i>reporters from all groups</i></p>



	<ul style="list-style-type: none"> Feedback will be provided by all participants 所有代表参与讨论与交流 	
17:00	<p>Wrap up and next steps 总结与展望</p> <ul style="list-style-type: none"> EC and UNEP will provide a summary of conclusions and next steps agreed 欧盟环境总署与联合国环境署做会议总结，并介绍下一步规划 	UNEP, EC
17:30	<p>Closing words 闭幕词</p>	China, UNEP, EC



Annex II: LIST OF PARTICIPANTS

	Organizations	Name of speakers (in order of speeches)	Email Address
1	UNEP 联合国环境署	Guido Sonnemann	Guido.Sonnemann@unep.org
2	European Commission, DG Environment 欧盟环境总署	Soledad Blanco	soledad.blanco@ec.europa.eu
3	National Development and Reform Commission, China (NDRC) 国家发展与改革委员会	Xiong Bilin 熊必琳	xiongbli@ndrc.gov.cn
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5	UNEP 联合国环境署	Sonia Valdivia	Sonia.Valdivia@unep.org
6	European Commission, Joint Research Center (JRC) 欧盟研究总署	Marc-Andree Wolf	Marc-Andree.Wolf@jrc.ec.europa.eu
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8	Bao Steel 宝钢集团	Liu Yinghao 刘颖昊	liuyh@baosteel.com
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10	China Building Material Test and Certification Center (CTC) 中国建筑材料检验认证中心	Jiang Quan 蒋荃	jq@ctc.ac.cn
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1	UNEP/Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (CSCP)	Patrick Schroeder	patrick.schroeder@scp-centre.org
2	UNEP/Wuppertal 可持续消费与生产联合研究中心		
1	Chinese Environmental Certification Center of MEP (CEC)	Zhang Xiaodan	zhangxd@mepcec.com
3	中环联合 (北京) 认证有限公司	张小丹	
	Organizations	Invited Participants	
1	Ministry of Science and Technology (MOST)	Wang Shunbing	wangsb@acca21.org.cn
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1	National Development and Reform Commission, China (NDRC)	Liu Wenqiang	
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3 7	中国全国工商联房地产商会	Zhao Fengshan 赵凤山	fengshan@chinahouse.info
3 8	UNEP/UNESCAP Regional Helpdesk on Sustainable Consumption and Production in Asia and the Pacific.	Wang Chuanrong 王川蓉	wangchr@cecp.org.cn
3 9	ERM China 伊尔姆环境资源管理咨询(上海)有限公司	Zuo Jane 左健	Jane.Zuo@erm.com
4 0	PricewaterhouseCoopers Consultants (Shenzhen) Limited, Beijing 普华永道顾问有限公司	Isabelle SPIEGEL	isabelle.spiegel@cn.pwc.com



Annex III: PRESENTATION SLIDES (SELECTION)

3rd China Roundtable on Sustainable Consumption and Production
Sustainable Products and Life Cycle Communication in Business and Industry
-Life Cycle Management for SCP-

Guido Sonnemann, PhD
 OIC, Integrated Resource Management Unit
 Sustainable Consumption and Production Branch
 Division of Technology, Industry and Economics

Global Metal Flows Group - Objective and outputs -

Objective:

- Provide scientific and authoritative assessment studies on the global flows of metals

This might contribute to the promotion of reuse and recycling activities of metals and the establishment of closed loops.

Envisaged outputs:

- Report 1 – Anthropogenic Metal Stocks (1st report ready for publication)
- Report 2 – The Recycling of Metals (2nd report ready for peer review)
- Report 3 – Environmental Impacts of Metal Flows
- Report 4 – Geological Metal Stocks
- Report 5 – Future Demand Scenarios for Metals
- Report 6 – Critical Metals and Metal Policy Options



The road ahead

The world cannot achieve sustainable economic growth (green growth) without significant **innovation in both the supply (production) and demand (consumption) sides** of the market.

- The focus is on **achieving increased understanding** and wide-scale implementation by public and private decision makers of policies and actions for a **resource-efficient (green) economy** and sustainable consumption and production based on **life cycle thinking**.
- Target areas in China** are to be refined for the implementation of SCP using LCM related activities.
- International cooperation** can boost the development towards a resource-efficient economy and SCP in China, promoting LCM in business and industry for sustainable products.

European Perspective on SCP

Chinese Roundtable on Sustainable Consumption and Production (CRSCP)
 "Sustainable Products and Life Cycle Communication in Business and Industry"
 Soledad Blanco
 Director DG Environment, European Commission
 Nov 14, 2009

LCA as the base

"Building on environmental life-cycle thinking"

- Advocating life-cycle thinking for products
- Continuous improvement of products
- Working with the market: economic incentives, standards, labelling, public procurement, voluntary agreements ...
- Stakeholder involvement
- Development of recommended international methods, indicators, reference data, and pilot studies to facilitate life cycle thinking in business and public administrations. <http://lca.jrc.ec.europa.eu>

The global scale: the Resource Panel

International Panel for Sustainable Resource Management

Providing independent, authoritative & scientific advice

- 5th meeting: 8-11 November Beijing
- Members (? 25): "world class" experts
- First reports:
 - Biofuels: published 16 October 2009
 - Metals: stocks & Recycling (2010)
 - Environmental impacts of consumption and production (2010)
 - Decoupling (2010)

switchasia

Reduce environmental and social impacts of consumption and production activities.

- reaching out to SMEs and consumers for adopting SCP practices; increasing demand and supply of green products

Move the SCP efforts from demonstration to replication to address regional priority issues.

- developing and disseminating knowledge for effective replication;
- Linking SCP with mainstream economic development practices

Catalyze norm shift in policy making towards sustainability

- supporting policy framework development for SCP in Asian countries;
- demonstrate effective policy instruments.



中国重点工业领域的可持续发展政策及成效

熊必琳
国家发展和改革委员会 产业协调司

2009-11-14

循环经济试点工程

“十一五”期间循环经济示范试点工程

重点行业	产业园区	再生资源回收利用
建设济钢、宝钢、鞍本钢、中钢、金川公司、鲁北化工等一批循环经济示范企业	建设资源循环利用产业园区	建设湖南汨罗等再生资源回收利用示范基地
再生金属利用	再制造	
建设若干30万吨以上的再生铜、再生铝、再生铅示范企业	建设若干汽车发动机、变速箱、齿轮和轴承翻新等再制造示范企业	
废旧家电回收处理		
建设若干废旧家电回收利用示范基地		

高扬 编制 新华社发
中华人民共和国国家发展和改革委员会
National Development and Reform Commission

取得的成果

- 全国单位GDP能耗逐年逐季降低，2006年下降1.79%，2007年下降4.04%，2008年下降4.59%，三年累计下降10.1%，节约2.9亿吨标准煤。
- 全国二氧化硫、化学需氧量(COD)排放总量不断降低，2007年分别下降4.66%和3.14%，2008年分别下降5.95%和4.42%，累计分别下降8.95%和6.61%。
- 2006~2008年期间，共计关停小火电3229万千瓦，淘汰落后炼铁能力9391万吨，炼钢能力6423万吨。
- 国家取消了600多项高污染、高耗能 and 资源类商品的出口退税，降低了2300多项商品的出口退税率，对钢铁、焦炭等142项“两高一资”商品加征或开征出口暂定关税。

中华人民共和国国家发展和改革委员会
National Development and Reform Commission

展望

- 1 可持续消费与生产是实现世界可持续发展目标的重要途径，也与中国现行政策目标、政策措施相一致。
- 2 随着中国与世界市场的逐步融合，中国的经济发展将顺应全球可持续发展的潮流，在向可持续生产与消费转型的过程中强化国家的核心竞争力。
- 3 面对复杂的生产消费体系、交织的资源环境问题、多样化的相关方需求，可持续生产与消费政策的制订过程需要强化系统性的分析与协调。

中华人民共和国国家发展和改革委员会
National Development and Reform Commission

生命周期评价与生命周期管理——服务于中国的可持续消费与生产

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2009.11.14

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Sichuan University

生命周期评价方法 LCA

- 评价产品生命周期过程中的环境影响
 - 量化：清单物质、影响类型、综合指标
 - 系统化：涵盖产品生命周期中的多个阶段
 - 综合性：涵盖各种资源环境问题
 - 国际标准方法：ISO14040系列

持续更新的国际标准

四川大学建筑与环境学院 College of Architecture and Environment, Sichuan University

LCA的价值：定量、系统、综合地揭示了生产消费活动与资源环境问题之间的联系

- 在不同资源环境问题之间转移
 - 火电脱硫：酸化与能源消耗和温室效应之间的平衡
- 在不同产品生命周期阶段之间转移
 - 氢能、生物燃油：生产阶段与使用阶段的平衡
- 在不同时间之间转移
 - 硅太阳能电池：一次性消耗化石能源(煤)和二次能源(电力)，在未来收获可再生能源
- 在不同地区之间转移
 - 碳排放的转移：京都协议与生命周期思想的矛盾
 - 碳减排问题：不是国家排放或减排多少的问题，而是能否比竞争对手更高效地生产的问题

四川大学建筑与环境学院 College of Architecture and Environment, Sichuan University

结论 Conclusions

- 生命周期思想、生命周期评价、生命周期管理为实现可持续消费与生产提供了核心的思想理念、分析方法、操作工具。
- Life Cycle Thinking, LCA and LCM play a key role in Sustainable Consumption and Production
- 推动生命周期方法在中国的研究与应用需要政府、企业和研究机构的共同努力
- Promoting LCA/LCM in China together

生命周期：是机遇还是阻碍？
Life Cycle: an opportunity or obstacle?

四川大学建筑与环境学院 College of Architecture and Environment, Sichuan University



ANNEX IV: BACKGROUND PAPER

Background Paper:

National Roundtable on
Sustainable Consumption and Production (SCP)

*Sustainable Products and Life Cycle
Communication in Business and Industry*

- Life Cycle Management for SCP -

Beijing, China

14th November 2009



Acknowledgments:

This paper was prepared by Sichuan University and the United Nations Environment Program (UNEP) for the 3rd China National Roundtable on Sustainable Consumption and Production (SCP) to be held on the 14th November 2009.

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This paper provides background information for the participants of the China National Roundtable on Sustainable Consumption and Production, 14th November 2009 Beijing.

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This paper is not an official UN or EU publication.



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1 Introduction

The National Roundtable on Sustainable Consumption and Production (SCP) to be held on the 14th November 2009 in Beijing, China, is the 3rd Chinese roundtable under the Marrakech process, of which China continues to play an integral role. The previous roundtables were seen by participants and governments as the launching pad for long term commitments in the promotion of SCP in the country, acting as the initial step in the development and implementation of focused activities and further strategies. Based on their economic weight and political importance, China has a significant influence within SCP and is playing a key role in the Asia-Pacific region. The regional “SCP Help Desk”



institutional home is located in the China Standards and Certification Centre in Beijing, which fosters innovative practices on sustainable consumption and production in Asia and the Pacific; conducts SCP research and studies; plays the role of information broker to support national and regional SCP initiatives; disseminates best practices through training; and designs and implements demonstration projects in partnership with global, regional and national stakeholders.

The first Chinese roundtable was held in 2006, with the outcome focused on the need to work on environmentally sustainable procurement and to provide support to China for the further development of the existing sustainable procurement legislation and technical support systems.

As a result, it was decided that the 2006 roundtable would be followed up by an expert workshop to design solutions that could help mainstream environmentally sustainable procurement in China. The workshop took place in June 2008 and included one plenary session and four thematic sessions on Green Public Procurement, Eco-labelling, Government Procurement and Environmental Protection Policy and International Approaches for Green Purchasing and Greening Supply Chain.

The Objectives of the 3rd roundtable are to:

- Contribute to a better understanding of the potential of Life Cycle Management (LCM) and its adoption in China's national SCP agenda.
- Identify opportunities for creating synergies with the local EC funded SWITCH-Asia Programme.

The roundtable will build on the progress achieved in the last two meetings and will focus on Life Cycle Management as a toolset to promote SCP. The roundtable aims to contribute to the adoption of LCA in China's national SCP agenda, by bringing better understanding of the potential of the life-cycle approach and its' wider application (e.g. in public procurement).

2 Sustainable Consumption and Production.

Sustainable Consumption and Production (SCP) can be broadly defined as reducing our environmental impacts, while maintaining or improving economic outputs and standards of living.

SCP is an integrated approach that encourages energy and resource efficiency, sustainable infrastructure, green jobs and to provide a better quality of life. It incorporates a broad multi stakeholder approach in order to achieve sustainable development objectives. SCP is fundamentally focused upon altering or changing our current production and consumption patterns to a more sustainable approach in order to realize the goals of reducing future economic, environmental and social costs, strengthening economic competitiveness and reducing poverty.



Sustainable Production (SP) refers to the creation of goods and services utilizing processes and systems that are: “non-polluting; conserving of energy and natural resources; economically efficient; safe and healthful for workers, communities, and consumers; and, socially and creatively rewarding for all working people”.

Sustainable Consumption (SC) relates to maximizing opportunities for sustainable livelihoods resulting from a reduction in environmental impacts of producing, using and disposing of goods and services in order to satisfy basic requirements of life and the aspirations for improvement for both current and future generations (UN CSD International Work Programme, adopted in 1995).

China has been growing rapidly in the last two decades; however, this development needs to be addressed properly in order to be more sustainable. Understanding SCP is crucial in attempting to decouple economic growth from environmental degradation, and the 3rd roundtable aims to build upon China’s understanding and involvement in SCP.

2.1 Vision Mission and Principles of SCP in China

China is one of the world’s largest producers of goods and as such a major participant in the consumption of raw materials, and production and transport of goods. China is home to approximately one-fifth of the world's population (over 1.3 billion people) with forecasts that their domestic markets and production base will establish China as the world's single largest economy by 2030. China's rapid and foreseeable economic growth places it in the unique position of being able to redefine its manufacturing base and trading relationships in accordance with the core principles of sustainable development over a relatively short time frame. Life Cycle Management has a large potential to effect change through addressing not only approaches such as ecolabelling and sustainable procurement, but also the design and production phases of products in order to reduce the consumption of raw materials and to realize more efficient production approaches.

3 The Marrakech process

The Marrakech Process is a global multi-stakeholder process to support the implementation of SCP and to develop a Global Framework for Action on SCP, the so-called 10-Year Framework of Programmes on SCP (10YFP). The 10YFP will be reviewed by the Commission on Sustainable Development (CSD) during the 2010/11 two-year cycle.

The Process responds to the call of the Johannesburg Plan of Implementation (World Summit on Sustainable Development 2002) to support the regional and national initiatives to accelerate the shift towards SCP patterns, thus de-linking economic growth from environmental degradation.

UNEP and UN DESA are the leading agencies of this global process, with an active participation of national governments, development agencies, business and industry, civil



society and other stakeholders. The first meeting devoted to developing the 10 YFP took place in Marrakech, Morocco in June 2003, hence the name.

Understanding that SCP has different meanings and presents different challenges in each region of the world, the Marrakech Process has taken a participatory and bottom-up approach, conducted in four over-lapping phases.

1. Phase 1: *Organizing regional consultations* to promote awareness and identify priorities and needs for SCP (through regional expert meetings and national/regional roundtables)
2. Phase 2: *Building regional strategies* and implementation mechanisms with regional and national ownership, to be endorsed wherever possible by the relevant regional institutions.
3. Phase 3: *Implementing concrete projects and programmes* on the regional, national and local levels to develop and/or improve SCP tools and methodologies (with the Marrakech Task Forces and the Cooperation Dialogue as main mechanisms)
4. Phase 4: *Evaluating progress*, exchanging information and encouraging international cooperation and coordination. This is done through bi-annual international meetings.

The Marrakech Process is a dynamic process based on a multi-stakeholder platform which includes regular [global](#) and [regional expert meetings](#), voluntary [task forces](#), a development cooperation dialogue, a Business and Industry Forum as well as an NGO Forum, and other activities designed to promote progress on SCP and the elaboration of the 10YFP. For more information on the mechanisms of the Marrakech Process see: <http://www.unep.fr/pc/sustain/10year/home.htm>

One of the major goals of the Marrakech Process is to present a solid proposal on the 10-year framework of programmes (10YFP) at CSD18/19 (2010, 2011), where it will be negotiated by governments, with participation from all the Major Groups involved in the deliberations. Next year (2010) is the first year of the CSD cycle, the review year. The Secretary General's report will focus on a review of progress in the implementation of commitments, targets and goals related to the sustainable development themes under consideration, including the 10-year framework of programmes on sustainable consumption and production.

The following year (2011) is the policy year. The Secretary General's report will focus on decisions on how to overcome constraints, obstacles and barriers to the implementation process. Negotiations on the 10YFP will begin in February 2011 at an inter-sessional preparatory meeting and conclude in April/May at the CSD.

The Marrakech Process provides a unique opportunity at the international level to develop a coordinated, global framework of programmes (10YFP) in a systematic and integrated manner.

The main objective of the 10YFP is to be a framework for action on SCP that countries and other stakeholders can endorse to accelerate the shift towards sustainable consumption



and production patterns, thus promoting social and economic development within the carrying capacity of ecosystems. For more information on the 10YFP please see http://esa.un.org/marrakechprocess/pdf/Draft10yfpniputtoCSDv2_281008.pdf

4 European Developments

4.1 Sustainable Development

4.1.1 EU Sustainable Development Strategy (EU SDS)

The European Council of June 2006 adopted an ambitious and comprehensive renewed [SDS for an enlarged EU](#). It builds on the [Gothenburg strategy of 2001](#) and is the result of an extensive review process that started in 2004.

The renewed EU SDS sets out a single, coherent strategy on how the EU will more effectively live up to its long-standing commitment to meet the challenges of sustainable development. It recognises the need to gradually change our current unsustainable consumption and production patterns and move towards a better integrated approach to policy-making. It reaffirms the need for global solidarity and recognises the importance of strengthening our work with partners outside the EU, including those rapidly developing countries which will have a significant impact on global sustainable development.

The overall aim of the EU Sustainable Development Strategy is to identify and develop actions to enable the EU to achieve a continuous long-term improvement of quality of life through the creation of sustainable communities able to manage and use resources efficiently, able to tap the ecological and social innovation potential of the economy and in the end able to ensure prosperity, environmental protection and social cohesion.

In July 2009 the Commission adopted the [2009 Review of EU SDS](#). It underlines that in recent years the EU has mainstreamed sustainable development into a broad range of its policies. In particular, the EU has taken the lead in the fight against climate change and the promotion of a low-carbon economy. At the same time, unsustainable trends persist in many areas and the efforts need to be intensified. The review takes stock of EU policy measures in the areas covered by the EU SDS and launches a reflection on the future of the EU SDS and its relation to the Lisbon strategy.

The review will be complemented by Eurostat's bi-annual monitoring report on sustainable development which will be published later in 2009.

To access the EU SDS, please see <http://ec.europa.eu/sustainable/>

4.1.2 The Sustainable Consumption and Production Action Plan

On 16 July 2008 the European Commission presented the [Sustainable Consumption and Production and Sustainable Industrial Policy \(SCP/SIP\) Action Plan](#). It includes a series of proposals on sustainable consumption and production that will contribute to improving the environmental performance of products and increase the demand for more sustainable



goods and production technologies. It also seeks to encourage EU industry to take advantage of opportunities to innovate. The Council endorsed the Action Plan in its [conclusions](#) adopted on 4 December 2008.

A range of policies at EU and national level already foster resource efficient and eco-friendly products and raise consumer awareness. The proposals complement these policy instruments and provide measures where gaps exist.

These proposals are an integral part of the European Union's renewed Sustainable Development Strategy (EU SDS) which reinforces the EU's long-standing commitment to meet the challenges of sustainable development and builds on initiatives and instruments at EU and international level such as the [United Nations' Marrakech Process](#).

For more information on sustainable development within the EC, access; http://ec.europa.eu/environment/eussd/escp_en.htm

4.2 The European Platform on LCA

The European platform on LCA (EPLCA) is a project of the European Commission, carried out by the Commission's Joint Research Centre, Institute for Environment and Sustainability (JRC-IES) in collaboration with DG Environment, Directorate for Sustainable Development and Integration.

Established in 2005, the European Platform has the mandate to promote the availability, exchange, and use of quality-assured life cycle data, methods and studies in policy and in business. The purpose of the platform is to improve credibility, acceptance and the practice of Life Cycle Assessment (LCA) in business and public authorities, by providing reference data and recommended methods for LCA studies. The European Platform supports the basis for coherent and quality-assured life cycle data, methods, and studies in the implementation of the Thematic Strategies on the Prevention and Recycling of Waste, the Sustainable Use of Natural Resources, and the Sustainable Consumption and Production Action Plan (SCP).

The main deliverables of the project are:

- The European Reference Life Cycle Database (ELCD) with European scope inventory data sets (which provides Life Cycle Inventory data representative for the European market for key materials, energy carriers, transport, and waste management).
- An internationally coordinated and harmonized ILCD Handbook of technical guidance documents for LCA
- LCA information hub to ease the access to data and methods and to facilitate knowledge exchange, comprising among others also a global LCA Resources Directory with software, database and service providers

The European Platform's activities and deliverables build on five guiding principles:



1. Best attainable stakeholder consensus
2. Starting from existing LCA practice and knowledge
3. Scientific robustness
4. Practical and affordable
5. Long-term support

For more information on the European Platform for LCA, please see

<http://lct.jrc.ec.europa.eu/eplca>

4.3 The SWITCH-Asia programme

In line with the EC Regional Strategy Paper for assistance to Asia (2007-2013), the SWITCH-Asia programme aims to promote the adoption of Sustainable Consumption and Production (SCP) among Small and Medium sized Enterprises (SMEs) and consumer groups in Asia. The programme contributes directly and indirectly to poverty alleviation by improving the living conditions of poor households in the surroundings and down-stream of sub-urban SMEs by reducing water pollution (particularly improving conditions of women who traditionally have to source drinking water), solid waste, and air pollution.

SWITCH-Asia also contributes to increased employment and incomes by increased production that meets international environmental standards and higher competitiveness, e.g. through resource savings and better access to supply chains of international companies. In addition, adoption of SCP will help in improving the conditions of both female and male workers promoting reasonable salaries, decent working conditions and protection of children rights (social corporate responsibility).

The SWITCH-Asia programme seeks to enhance the uptake of SCP by working simultaneously on the production and consumption sides, employing a multi-stakeholder approach with strong and intensive working relationships with SMEs, building upon existing structures and networks, and by scaling up results achieved in earlier projects. Projects will have to actively disseminate their results and facilitate exchange of good practices.

Under the SWITCH Asia programme, activities should aim to:

- Promote the use of environmentally friendly technologies and practices;
- Promote a change in consumption of less environmentally damaging products and services;
- Reinforce and implement legal environment and safety instruments;
- Develop and apply effective economic instruments that enhance sustainable consumption and production.

SWITCH-Asia awards grants to EU-Asia partnerships of non-profit making organisations interested in pursuing sustainable development, such as chambers of commerce, industrial and professional associations, regulatory bodies (regional and local authorities), research organisations and development agencies. These organisations must demonstrate an ability to reach out to large numbers of SMEs or consumer groups. Proposals where



intermediaries such as business associations, industry associations, retailers, and chambers of commerce will play an active role in the partnerships are especially welcome.

For more information, access the SWITCH-Asia website at <http://www.switch-asia.eu/>

5 2006 and 2008 China Roundtables on SCP

Both UNEP and UN DESA have been promoting and supporting the development of national strategies on SCP and coordinating the international cooperation of the 10YFP where each region identified its needs and priorities in terms of SCP. So far, in China two National Roundtables have been held.

Four priority areas were identified as key challenges to be addressed at the Chinese Roundtables on SCP in 2006:

- Promoting green/sustainable public procurement
- Improving the eco-efficiency of the seven most polluting and energy and resource consuming industry sectors
- Improving waste management focusing on waste prevention and minimization, re-using and re-cycling
- Promoting sustainable construction and building.

The first Chinese Roundtable held in 2006, provided the foundations on the key challenges to be addressed at the Chinese Roundtables on SCP, and identified the following four priority areas to be discussed:

- Improving the existing legislation and elaborating standards to promote green/sustainable public procurement
- Promoting cleaner production, resource pricing reform, and adopting environmental standards for industrial policies to improve the eco-efficiency of the seven most polluting and energy and resource consuming industry sectors
- Avoiding secondary pollution during reusing and recycling activities to improve waste management
- Promoting sustainable construction and building.

Policy recommendations that resulted from the 2006 Chinese Roundtable included:

- The establishment of an adequate and applicable set of legal, economic, voluntary instruments and environmental management tools to improve eco-efficiency of production processes, products and services throughout their life cycle.
- Improve, where necessary, legislative instruments, identifying appropriate policies and tools for their implementation, as well as ensure the implementation of the existing ones. Legislative instruments could be combined with the ongoing process of circular economy law making.
- Work on the creation of appropriate standards and criteria for certification and labeling of products and services.



- Improve awareness and knowledge on SCP among government, business, consumers, civil society and education system and specifically improve awareness on eco-labeling among consumers.
- Consider market instruments also in the context of global trade.
- Increase ‘North-South’ and ‘South-South’ cooperation.
- Encourage technology development and transfer, as well as technology adaptation, acquisition and diffusion also through public-private partnerships.

The complete report can be accessed at:

<http://www.unep.fr/shared/publications/pdf/DTIx0918xPA-RoundtableChinaIndia.pdf>

The second Chinese Roundtable held in 2008 identified key barriers to green public procurement in China, policy recommendations, and future follow up actions to ensure China is in a better position to achieve its long-term objectives of building a resource-saving and environmentally-friendly society.

The 2008 Chinese Roundtable built upon the previous findings from the 2006 roundtable and identified four priority action areas:

- Strengthening regulation and policy system
- Fostering market for green products/services
- Training and capacity building for procurers on regulation, operational procedure
- Establishing information platform to connect suppliers and procurers and for knowledge sharing.

The complete report can be accessed at:

http://www.unep.fr/scp/marrakech/consultations/national/pdf/NatRoundtable_China2008_FinalReportENGLISH.pdf

6 2009 China Roundtable on Sustainable Consumption and Production

UNEP together with the European Commission are organizing the 2009 Chinese Roundtable on Sustainable Consumption and Production, which intends to follow the vision and priorities identified by the previous two roundtables. It will be built on the previously achieved outcomes but also extended into the wider SCP realm, i.e. not only the SC side (ecolabelling and sustainable procurement), but also the SP side (eco-design and cleaner production), in order to promote the life cycle management of products. The vision, key focus areas and expected outcomes for the roundtable have been identified as the following:



6.1 Vision, Key Focus and Expected outcomes of the roundtable

6.1.1 Vision:

This roundtable will raise the profile of LCM as a critical toolset for all stakeholders in China, especially for policymakers. It intends to explore the need in Chinese policy-making and demonstrate the potentials of LCM for policy-making as well as a business strategy, and calls for policy support for the adoption of LCM approaches in China.

6.1.2 Key focus areas:

The roundtable is designed to strengthen China's involvement in Sustainable Consumption and Production through an exchange of information and expertise on the following:

1. SCP policy-making: challenges and needs
(presentations in policy session on status quo of international and Chinese SCP policy-making, challenge and need, e.g. UNEP's activities, EC SCP Communication, Chinese policy-making etc.)
2. Introduction to Life Cycle Management (LCM)
(presentations in methodology session on how LCM will support SCP policy and SCP implementation; where the policy support is needed for the adoption of LCM; by Sonia, Wang and JRC's talks)
3. LCM for Sustainable Production
(presentations in SP session on Ecodesign and Cleaner Production, e.g. EC EuP, EC/Chinese RoHS, WEEE and Chinese companies' practice)
4. LCM for Sustainable Consumption
(presentations in SC session on Ecolabelling and Sustainable procurement, e.g. French EPD, Chinese Type I eco-label and Type III declarations (PCRs and EPDs), sustainable procurement, retailers?)

6.1.3 Expected outcomes:

The expected outcomes of the roundtable are:

- Capacity of key stakeholders on SCP and Life Cycle Approaches reinforced, through a better understanding of China's efforts to implement Life Cycle based tools and of challenges and needs for changes of consumption patterns towards SCP;
- Chinese Life Cycle Management Network established with active participation by core groups and companies;
- A core group of 'multipliers' –intermediaries that work with key stakeholders– aware of the relevance of the application of Life Cycle Management and committed to disseminate Life Cycle thinking in the country;
- Policy recommendations drawn on ways of inclusion of Life Cycle based tools into sustainable public procurement in China;



- Opportunities identified for creating synergies with the EC funded SWITCH-Asia Programme.

The following provides background information of four key focus areas and topics to be addressed during the roundtable.

6.2 SCP policy-making: challenges and needs

China is the major manufacturing hub and most populous country in the world with ongoing fast urbanization. As a consequence, China is suffering from continuous resource/energy shortages and environmental degradation which has been undermining long-term economic growth and social stability. This has been widely perceived by the Chinese government as the major problems with Sustainable Development of China and many believe that switching to Sustainable Consumption and Production patterns is the most urgent requirement.

To this end, many policies have been developed and implemented in the last decade. Going back to the "10th Five-Year Plan" period (2000-2005), the environmental protection targets of the period had not been met with a 27.8% increase in SO₂ emissions and a 2.1% reduction of COD as compared with that of 2000, while the targets should have been a 10% reduction. Furthermore, it was anticipated that the population of China would grow at 4% during the "11th Five-Year Plan" period with rapid urbanization and more than 40% growth of GDP. It led to more strict and quantified energy efficiency and environmental protection targets in the National Eleventh Five-year Plan (2006-2010), which is the current general policy guideline at the national level. Among many other SCP-related policy targets, the National Eleventh Five-year Plans explicitly requires a 20% reduction of energy consumption per GDP, 10% reduction of annual SO₂ and COD emissions by 2010 as compared with that of 2005.

For the first time, these targets were named as "obligation indicators" of Chinese government. The Plan identifies the responsibilities and tasks of the government and environmental protection departments. It guides and mobilizes enterprises and civil society, and encourages a resource-efficient and environment-friendly society.

Guided by the national policy targets, China intensified energy conservation and pollution reduction efforts. In 2008, 42.3 billion Yuan from the central treasury was spent to support construction on major energy conservation projects, development of the circular economy, strengthening of China's energy conservation and environmental protection capacity. Energy was saved by the construction and transportation sectors and public agencies. Tax policy reduction for energy and water conservation and pollution reducing equipment were promulgated.



As one of the legislative efforts, the Chinese Circular Economy Law was passed in 2008 and came into force in January 2009. The Circular Economy refers to reducing, reusing, and recycling, improving the resource utilization efficiency, protecting and improving the environment and realizing sustainable development. Amongst others, the law requires the government to:

- Monitor energy consumption and pollution emissions in high consumption and pollution industries
- Promote recycling and increase energy-saving and waste-reutilization standards
- Develop policies to invest capital funds in environmentally friendly industries

This law is formulated for the purposes of promoting the development of the circular economy, improving resource utilization efficiency, protecting and improving the environment and realizing sustainable development. The government will allocate funds to promote innovation in recycling technologies and will provide tax breaks to encourage enterprises to use energy-efficient technologies and equipment.

However, it is always a huge challenge to meet these policy targets. In 2006 and 2007, China failed twice to reduce energy consumption and emissions as planned. Only 2008 saw positive progress. Based on the Report on China's Economic and Social Development Plan, the Chinese economy grew steadily and rapidly. "China's GDP topped 30 trillion yuan in 2008, a year-on-year increase of 9.0 percent and more than five percentage points higher than the average world economic growth rate. Economic performance continued to improve. National revenue reached 6.13 trillion Yuan in 2008, up 19.5 percent year on year. Energy consumption per unit of GDP continued to decline in 2008, down 4.59 percent".

In contrast, since many enterprises are facing difficulties and are not operating at full capacity, investment in technical upgrades and pollution reduction has reduced. This leads to a decline in their energy efficiency and ineffective operation of their pollution control equipment. To ensure economic and social development in 2009, China will focus on increasing domestic demand to ensure a keep a steady and fairly rapid economic growth. The report concludes that in the last two years of the Eleventh Five-Year Plan period, there will be great pressure exerted in order to achieve energy conservation and pollution reduction targets.

Therefore, one of key focus areas of the upcoming roundtable is to explore the challenges and needs in SCP policy-making, such as:

- Motivations for SCP policy-making,
- Obstacles in SCP implementation, such as how to balance conflicting targets between economic development and environmental protection, or between energy conservation and pollution reduction.



- Lessons learnt from international SCP policy-making

6.3 Introduction to Life Cycle Management (LCM)

LCM is the production and consumption of all goods and services that result in global resource/energy depletion and environmental degradation. The current patterns of production and consumption of all products, determined by enormous decision makers along products' life-cycles, such as designers, producers, service providers, consumers and researchers, are unsustainable in general. Therefore, SCP calls for switching the pattern of production and consumption to a more sustainable approach. In order to achieve this goal at the macro level, it is a must to change various decision makers by supporting their well-informed decisions in daily practice.

Life Cycle Assessment (which has been proposed as an analytical method since the early 1990s), is an approach by which the environmental performance and impacts along products life cycle are modelled and analysed. LCA is incorporated in international standards (i.e. ISO14040s) and widely practised in business and policy analysis. It is regarded as “the best framework for assessing the potential environmental impacts of products currently available” and a “science-based approach for developing production and consumption policies to improve the products and services provided”.

Based on life cycle thinking and assessment and combined with specific roles of decision makers, many operational methods have been proposed and practiced around the world, such as eco-design for designers, cleaner production for producers, eco-labels for customers' sustainable procurement, and so on. These methods introduce life cycle thinking and LCA into daily practice to enable continuous environmental improvement and to shape the methodology of Life Cycle Management.

LCM is a business management toolset that can be used by all types of businesses (and other organizations) to improve their products and thus the sustainability performance of the companies and associated value chains. LCM is a method that can be used equally by both large and small firms with the purpose to ensure more sustainable value chain management. It can be used to target, organize, analyze and manage product-related information and activities towards continuous improvement along the life cycle.

LCM is about making life cycle thinking and product sustainability operational for businesses that are aiming for continuous improvement. These are businesses that are striving towards reducing their footprints and minimizing their environmental and socio-economic burdens while maximizing economic and social values.

Several different strategies have been used by companies to implement LCM in their operations. Among these concepts and tools are (eco-) design methods, green procurement, Life Cycle Assessment (LCA), Life Cycle Costing (LCC), eco- and energy labeling, environmental product declarations, ecological and carbon footprint analyses, environmental performance indicators, and social sustainability assessments and



approaches, in addition to organizational strategies that are essential for actual implementation.

Just as each situation is unique, so too must be the path that will be followed, underlining the need for assembling a flexible toolset and the means to select the right tools. For more information on LCM and an overview of potential tools, please refer to the UNEP Life Cycle Management publications at:

http://lcinitiative.unep.fr/default.asp?site=lcinit&page_id=F14E0563-6C63-4372-B82F-6F6B5786CCE3

Life Cycle Thinking, Assessment and Management calls for supply chain involvement. The supply chain considers the interactions between businesses and their customers and suppliers. The areas at each end of the supply chain offer vast opportunities for improving environmental, social and business performance. The greatest opportunities are obtained by extending the focus as far as possible upstream towards the raw materials used, downstream towards the consumer and then back again as the product and waste material are recycled. In all sectors, traditional competitive differentiators (quality and costs) have become increasingly similar across numerous suppliers. One approach in order for corporations to differentiate themselves, whilst at the same time reducing costs and improving levels of service, is to consider environmental and social factors (and not just economic) relating to their supply chain. Corporations can really only achieve sustainable value chain management if they are also able to enhance sustainability with their supply chains.

In this key focus area of the coming roundtable, concepts and methods of LCT, LCA and LCM will be introduced and the global trend will be highlighted, such as

- Global life cycle initiative,
- European LCA platform for SCP

6.4 LCM for Sustainable Production

6.4.1 Cleaner Production

The concept of Cleaner Production was introduced by UNEP in 1989. It is defined as “the continuous application of an integrated preventive environmental strategy to processes, products, and services to increase overall efficiency, and reduce risks to humans and the environment”.

China has been highlighting and implementing Cleaner Production since the early 1990s. The Cleaner Production Promotion Law was adopted on June 29, 2002 and made effective on January 1, 2003. “This Law is enacted in order to promote cleaner production, increase the efficiency of the utilization rate of resources, reduce and avoid the generation of pollutants, protect and improve environments, ensure the health of human beings and promote the sustainable development of the economy and society.”



Cleaner production was introduced in China in 1989, initially via development aid projects. In 1989, the Law of Environmental Protection, Article 25: Applies to new enterprises or existing enterprises renovating their technology. These enterprises should use equipment and processes, which have high levels of resource efficiency, to reduce use and generate less waste.

The introduction of cleaner production methodology, training of personnel, and implementation of demonstration projects at the enterprise level was undertaken between 1992 and 1997.

In 1995, the Law of Prevention and Control of Atmospheric Pollution, Supervision and Management of the Prevention and Control of Atmospheric Pollution, Article 19 states: “Enterprises shall give priority to the adoption of cleaner production techniques that are instrumental to highly efficient use of energy and to reducing the discharge of pollutants so as to decrease the generation of atmospheric pollutants”.

In 1995, the Law of the Peoples Republic of China on the Prevention and Control of Environmental Pollution by Solid Waste, Article 3 states: “In preventing and controlling environmental pollution by solid waste, the State follows the principles of reducing the quantity of solid waste generated and its harmfulness, fully and rationally utilizing solid waste, and making it innocuous through treatment, in order to promote Cleaner production and the development of a circular economy”.

In 1996, the Law of the Peoples Republic of China on Water Pollution Prevention and Control, Article 22: Enterprises should adopt cleaner production technologies to achieve higher efficiency of resource use and to generate reduced levels of pollutants. Enterprises should strengthen housekeeping to reduce the generation of pollutants.

After 1997, China focuses on cleaner production policy-making. In 1998, The National Peoples' Congress, Energy Conservation Law of China, adopted on November 1997 and became effective in January 1998. “This law has been formulated with a view to facilitating energy savings throughout society, improving efficiency and economic benefits of energy use, protecting the environment, guaranteeing national economic and social development and meeting the needs of peoples’ livelihood”. The law also provides for energy-saving labeling.

Even though Cleaner Production has been widely implemented in China for almost 20 years, few LCA studies can be found for cleaner production cases or standards development. This is set to be discussed in the upcoming roundtable, and how LCA and LCM will enhance China’s Cleaner Production practices in the future.

6.4.2 *Ecodesign*



Ecodesign aims at integrating environmental aspects during the product's design process as any other criterion. It takes into consideration the environmental impacts of a product throughout its entire lifecycle and aims to reduce the impact at the design stage. For further information on Ecodesign, please see the UNEP Ecodesign factsheet at <http://www.teach sustainability.com.au/resources/resource.2006-07-07.2375932281/unep-eco-design-factsheet/download>

The European Commission's environmental directives, such as RoHS, WEEE and EuP, have been inspiring and fostering global ecodesign activities. Ecodesign in China is still at an early stage. The main motivators for ecodesign come from the European environmental directives, especially in the electric and electronic industry. In recent years, more and more local legislations and requirements have been found which inspired ecodesign. A good example is in the "Chinese code for waste electric and electronic equipment", a Chinese version of RoHS, the contents of six toxic substances are restrained under minimum limits, which can be fulfilled only by re-designing of products. In the "National standards on material recycling ratio of appliance", the minimum recycling ratio is defined for several house appliances, such as refrigerators and air conditioners. It calls for material selection during design. The technical criteria in China's Environmental Labelling program also impose specific requirements for different products. Most of requirements link with the product design.

However, the concept of ecodesign has been widely shared in China so far, even if few LCA studies can be found for ecodesign in China, partly due to lack of Chinese LCA databases. In order to promote ecodesign practice in China, the methodology and examples of ecodesign will be introduced in the upcoming roundtable and the obstacles are to be discussed.

6.5 LCM for Sustainable Consumption

6.5.1 *Ec labeling*

The environmental label is a market economic instrument that focuses on the overall national targets of environmental protection, promotes green consumption and the sustainable development of society and economy, improving environmental quality and protecting consumers' health.

The environmental labels in China are primarily Type I Environmental Labels. Eco-labels (Type 1) are voluntary, participatory, market-based and transparent economic tools that aim to decrease environmental impacts and improve resource efficiency of products while enabling consumers to make informed decisions based on products' environmental credentials. Type I Environmental Labels referred to a certification of products and services according to requirements based on their life cycle. They are multiple criteria-based, third party certified programs awarding a license authorizing the use of



environmental labels on products. These indicate the overall environmental preferability of a product within a particular product category based on life-cycle considerations.

In the last decade China has experienced continuous exploration and development that results in the need to further develop environmental labeling products. Environmental Labeling in China was founded in 1993 in response to the sustainable development philosophy put forward by the World Environmental and Development Conference in 1992. The China Environmental Labeling Program was launched in 2003 by the Environmental United Certification Center, Co., Ltd. (CEC).

The Ministry of Environment Protection (MEP), i.e. State Environmental Protection Administration (SEPA) before 2008, is the Chinese governmental department that provides policy support, leads technology, and provides scientific standardizing to environmental labeling products. MEP issues the guidelines and requirements for environmental labeling certification in order to launch research of environmental labeling technology and policies, and to oversee certificated activities according to the regulations of environmental management. The China Certification Committee for Environmental Labeling product (CCEL) investigates the developing situation and tendency of environmental labels both domestically and overseas, and suggests the types and developing directions of the Chinese environmental labeling products. China's CEC enforces the requirements regarding improvement of techniques and quality of the certification granted by MEP; ensures that the label is honored, managed and supervised properly; and cooperates with CCEL in publicizing and honoring the Environmental Labeling.

Technical requirements of the certification of environmental labeling products in China has gradually set up its overall framework with six pillars: issued by the state, with double advantages, management of the entire process, clear environmental performance, quantitative testing and matching with international practice. From 1994 to mid 2006, 12,000 products have been awarded the environmental label and assessments have been conducted for 800 enterprises. In order to counterpart with the international environmental label dynamically, China's environmental label has put forward the technical requirements of certified products. China introduced the advanced international environmental standard of products, positioning the groundwork for the mutual recognition of environmental labels in the world.

Projects are currently underway with the assistance of UNEP in order to improve access to markets, promote trade, increase international competitiveness, increase reliability, and to promote environmental awareness and perceptions in developing countries. For further information on eco-labelling and current projects, please see:

<http://www.unep.fr/scp/ecolabelling/>

Type III Environmental Declarations, also known as Environmental Product Declaration (EPD), are independently verified LCA results of products guided by predefined Product Category Rules (PCR). Unlike Type I ecolabels based on multiple criteria with life cycle thinking, type III declarations provide more quantitative environmental information which are comparable for sustainable procurement on the demand side and inspire continuous improvement on the supply side.



Two type III environmental declaration programs have been established recently in China by China Building Material Test and Certification Center (CTC) and Environmental United Certification Center, Co., Ltd. (CEC), which follow the principles and procedures set out in ISO 14025. Several products' PCRs have been drafted based on LCA studies and declarations will be verified and published in near future.

In the coming roundtable, the latest development of type I ecolabel and type III environmental declarations will be introduced. The way to apply them for sustainable procurement as well as for eco-design and cleaner production will also be discussed.

6.5.2 *Sustainable Procurement*

The European Commission defines Green procurement as “the consideration of environmental elements when procuring goods, services or works at all stages of the project and within the entire life-cycle of procured goods”. It is a process of meeting organizational needs for goods, services, works and utilities that generates benefits for the organization as well as society and the economy, whilst ensuring a minimized impact on the environment.

The Government Procurement Law (GPL) of the People's Republic of China was adopted in 2002 and went to effect in 2003. “The Law is enacted for purposes of regulating government procurement activities, improving efficiency in the use of government procurement funds, safeguarding the interests of the State and the public, protecting the legitimate rights and interests of the parties to government procurements and promoting honest and clean government”.

Chinese Green Public Procurement takes effect in 2007. It awards environmentally-friendly products extra credits in government procurement bids. The environmentally-friendly products are certified and listed in a dozen product categories according to the China Environmental Labelling program, a type I ecolabel program operated by the Environmental United Certification Center, Co., Ltd. (CEC) since 1993.

Chinese Green Public Procurement has remarkably stimulated many producers to fulfill the product criteria as required by certification program. The latest progress will be introduced and some obstacles, such as limited product categories, will be discussed in the coming roundtable.

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