Independent Evaluation

ICM Beijing

International Centre for Materials Technology Promotion (ICM)

Beijing, People´s Republic of China

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO EVALUATION GROUP

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The evaluation team would like to thank all those who contributed to the preparation and realization of the mission. We hope that this report, covering our findings, conclusions and recommendations, will be instrumental in discussions as regards (i) the project results, (ii) its follow-up and (iii) its possible replication and expansion, both in the People's Republic of China and elsewhere.

Acronyms and abbreviations

ACFIC	All China Federation of Industry and Commerce
APC	Asian and Pacific Countries
APP	Asian Pacific Partnership
CBMA	China Building Materials Academy
CCIP	China Council of Investment Promotion
CCPIT	China Council for the Promotion of International Trade
CICASME	China International Cooperation Association of Small and Medium Enterprises
CICETE	China International Centre for Economic & Technical Exchanges
CIPA	China Investment Promotion Agency
CP	Cleaner Production
CP	Country Programme
CSF	Country Service Framework
CSI	Cement Sustainability Initiative
EPA	Economic Partnership Agreement (EU and APC)
EU	European Union
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GNP	Gross National Product
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit
ICAMT	International Centre for Advancement of Manufacturing Technology
ICM	International Centre for Materials Technology Promotion
IDF	Industrial Development Fund
IFC	International Finance Corporation
IMAAC	International Materials Assessment and Application Centre
ITC	International Technology Centre
MOFA	Ministry of Foreign Affairs
MOFCOM	Ministry of Commerce
MOFTEC	Ministry of Foreign Trade & Economic Cooperation
MOST	Ministry of Science & Technology
MP	Montreal Protocol
NBSC	National Bureau of Statistics of China
NDRC	National Development and Reform Commission
ODA	Official Development Assistance
R&D	Research and Development
RBM	Results-Based Management
RO	Regional Office

SETC	State Economic and Trade Commission
SINTEF	The Foundation for Scientific and Industrial Research, Norway
SME	Small and Medium Enterprise
SPX	Subcontracting Partnership Exchange
SSC	South-South Cooperation
TAC	Technology Advisory Committee
TCDC	Technical Cooperation between Developing Countries
TT	Technology Transfer
UNCTAD	United Nations Conference on Trade and Development
UNIDO	United Nations Industrial Development Organization
US	United States
USAID	United States Agency for International Development
USD	United States Dollars
WTO	World Trade Organization

Glossary of evaluation related terms

Conclusions	Conclusions point out the factors of success and failure of the evaluated intervention, with special attention paid to the intended and unintended results and impacts, and more generally to any other strength or weakness. A conclusion draws on data collection and analyses undertaken, through a transparent chain of arguments.
Effectiveness	The extent to which the development intervention's objectives were achieved, or are expected to be achieved, taking into account their relative importance.
Efficiency	A measure of how economically resources/inputs (funds, expertise, time, etc.) are converted to results.
Impacts	Positive and negative, primary and secondary long-term effects produced by a development intervention, directly or indirectly, intended or unintended.
Indicator	Quantitative or qualitative factor or variable that provides a simple and reliable means to measure achievement, to reflect the changes connected to an intervention, or to help assess the performance of a development actor.
Institutional development impact	The extent to which an intervention improves or weakens the ability of a country or region to make more efficient, equitable, and sustainable use of its human, financial, and natural resources, for example through: (a) better definition, stability, transparency, enforceability and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Such impacts can include intended and unintended effects of an action.
Lessons learned	Generalizations based on evaluation experiences with projects, programs, or policies that abstract from the specific circumstances to broader situations. Frequently, lessons highlight strengths or weaknesses in preparation, design, and implementation that affect performance, outcome, and impact.
Logframe	Management tool used to improve the design of interventions, most often at the project level. It involves identifying strategic elements (inputs, outputs, outcomes, impact) and their causal relationships, indicators, and the assumptions or risks that may influence success and failure. It thus facilitates planning, execution and evaluation of a

	development intervention. Related term: results based management.
Outcome	The likely or achieved short-term and medium-term effects of an intervention's outputs. Related terms: result, outputs, impacts, effect.
Outputs	The products, capital goods and services which result from a development intervention; may also include changes resulting from the intervention which are relevant to the achievement of outcomes.
Recommendations	Proposals aimed at enhancing the effectiveness, quality, or efficiency of a development intervention; at redesigning the objectives; and/or at the reallocation of resources. Recommendations should be linked to conclusions.
Relevance	The extent to which the objectives of a development intervention are consistent with beneficiaries' requirements, country needs, global priorities and partners' and donors' policies. Note: Retrospectively, the question of relevance often becomes a question as to whether the objectives of an intervention or its design are still appropriate given changed circumstances.
Results	The output, outcome or impact (intended or unintended, positive and/or negative) of a development intervention. Related terms: outcome, effect, impacts.
Sustainability	The continuation of benefits from a development intervention after major development assistance has been completed. The probability of continued long term benefits. The resilience to risk of the net benefit flows over time.

Executive summary

Background and introduction

The ICM, established in collaboration between the Government of the People's Republic of China and UNIDO, has been operational since 2003. The UNIDO project supporting the establishment of the Centre ended in 2008. The ICM is hosted by the China Building Materials Academy (CBMA) and located in Beijing. The CBMA was founded in the 1950s and is the leading Research and Development organization for the building materials industry in China. The ICM staff have all been seconded by the national counterpart; the CBMA.

The ICM's mission is to:

- Set up a global framework and mechanisms to facilitate technology transfer and diffusion processes in new materials technologies
- Assist the developing countries to bridge the gap between market demand and technological base
- Strengthen South-South and North-South cooperation and meet the requirements of sustainable development in the materials industry

The project was designed with a total budget of approximately USD 500 000 and with a three-year duration. Additionally, the CBMA has supported the ICM through various (unforeseen) in-kind contributions, including staff time. This has enabled an extended operational period and in a way implied that the CBMA is actually managing the Centre. The evaluation of the ICM took place from May to July 2009 and was carried out by the Director of OSL EVA and a national consultant and buildings material expert. The evaluation was carried out within a larger exercise - the Thematic Evaluation of UNIDO International Technology Centres (ITCs) - conducted by the UNIDO Evaluation Group in 2009. The ICM is one of around 10 to 15 UNIDO ITCs.

Relevance

The building materials sector is an important sector in most developing countries and is relevant for industrial development both as input provider and with regards to industrial output. Moreover, it is a labour intensive sector with many technological advances and technology needs, due to its high propensity to energy use and the increasing concern for clean production and healthy buildings. The ICM caters to information needs about and access to new technologies, especially in the area of green technology and energy efficiency. It is relevant to China as it contributes to the promotion of Chinese technologies and is in line with development priorities such as South-South cooperation. The relevance for developing countries and to UNIDO could be enhanced through an increased demand orientation and more alignment to technology needs of developing countries.

Effectiveness

The ICM has been established as an institution and implemented a large number and range of activities. The main activities of the Centre have been international training programmes targeting developing countries in the field of cleaner production, energy efficiency, green building materials, a research projects with Vietnam and Germany, technology transfer and undertaking assignments for UNIDO and the Chinese Government.

It is difficult to assess to what extent the ICM has promoted competence or skills transfer. It has contributed to the strengthening of technological capabilities of primarily Vietnamese partners and mainly in the cement and concrete areas. The ICM has also contributed to Chinese technology being transferred to Southern countries. Moreover, it has functioned as a vehicle for South-South and North-South cooperation and implemented many valid training programmes. However, it is not possible to assess to what extent this will contribute to the industrial development of the recipient countries or to the sustainable development of their building materials industry. It has supported the green industry agenda through the provision of training programmes related to the promotion of cleaner production and energy efficiency but the actual or potential effects on policies, practices or the environment are not known.

The ICM itself, due to its small size and limited resources, cannot be regarded as a centre of excellence but the host organization on whose facilities and resources the ICM draws, clearly belongs to this category.

Efficiency

The Centre is part of the UNIDO network of International Technology Centres and has to some extent benefited from UNIDO's lager network of partners and from the tools developed for technology and investment promotion. There are today several UNIDO centres/offices/projects in China active in the field of investment or technology promotion but cooperation with other UNIDO entities in China, and elsewhere, has been limited.

The ICM itself is very small in terms of staff and capacity but has benefited from competent and highly motivated staff members, seconded by the CBMA and from the larger CBMA resource base. It has dynamic and competent leadership and has been implementing a large number and wide range of relevant activities. However, the absence of a strategy and annual work programmes and a clear intervention logic guiding the activities of the Centre, was noticed. The high level of activities, in spite a small project budget, has been possible through the support from and attachment to the China Building Materials Academy (CBMA). This has also contributed to the ICM being an active outward promoter of Chinese technology and activities have been closely linked to those of the host institution.

There has been limited substantial backstopping or management on the part of UNIDO. One reason is the fact that UNIDO does only have limited technical expertise and programmes in the field of building materials. However, the formal affiliation with UNIDO

has, undoubtedly, contributed to the high level of credibility that the Centre enjoys and has provided access to UNIDO's network of partner organizations/offices and Governments.

Sustainability

The strong commitment and ownership on behalf of the CBMA, as well as the possibility to draw on CBMA research and technical resources provide good prospects for ICM's long-term sustainability.

Conclusions

The ICM is today a functioning Centre, active in both outward and inward technology transfer and there is a high level of national ownership. It highly benefits from its close relationship with the CBMA but this also diminishes its ability to function as a neutral international technology broker. The substantial UNIDO backstopping has been at a low level and presently there is limited valued added of UNIDO to the ICM and of the ICM to UNIDO. The ICM has provided China with an important platform/instrument for both inward and outward technology transfer. A major strength of the project/ICM has been the focus on cleaner and energy efficient production methods. Identified weaknesses were the limited demand orientation of its activities and limited synergies with other programmes/offices/centres of UNIDO.

Recommendations

Recommendations to UNIDO

- *There is a need for a closer collaboration between UNIDO offices/centres/ projects in China*

There is a need to establish an investment and technology post at the Regional Office (RO) and Country Teams should be established for offices/centres/projects working in similar areas, such as technology promotion or green industry. There should be more exchange of information and the RO's role should be increased. Moreover, in view of the many UNIDO centres and offices operating in China, there is a need for a Delivering as One UNIDO Strategy. The development of such a strategy should encompass a review of the UNIDO's roles and responsibilities in relation to the present 13 supported centres/offices and the continued relevance of these centres.

- *The Regional Office should increase its management and monitoring function*

The roles of the RO, including management and monitoring, should be clearly spelled out in programme and project documents and addendums. Briefings and training programmes

should be organized for project staff on administrative and procedural matters and on RBM.

- *The strategic orientation of UNIDO's programmes, in China, in the field of technology promotion should be stronger*

An investment and technology transfer strategy as well as a green industry network strategy should be developed and feed into an overall Delivering as One UNIDO Country Strategy.

- *There should be a more substantial role of the Investment and Technology Promotion Branch and of relevant technical branches in capacity building (technology transfer to developing countries) and in quality control*

The role of the Technology Promotion Branch should be complemented by support from other technical branches, for instance the Environment Branch.

- *The mandate of the South-South Centre should be expanded*

The South-South Centre should serve as central UNIDO/China hub for demand-based technology transfer and support the International Technology Centres managed by or affiliated with UNIDO. This would entail rewriting the mandate of the South-South Centre and endowing it with appropriate human and financial resources. It is important that there will be one staff member with wide knowledge of UNIDO's thematic priorities and programmes. An alternative would be have the investment and technology staff member at the Regional Office (proposed above), as a programme manager and liaison officer for the South-South Centre and other investment/technology oriented centres and offices in China.

Recommendations to UNIDO and MOST/CBMA/ICM

- *The ICM mandate, the relation to the CBMA and CBMA's role in the management of the centre should be clarified*

- *Develop a proposal for a second phase UNIDO project*

A second phase project should focus on the strengthening of ICM capacities to promote technology transfer and technology diffusion and incorporate a long-term strategy for the ICM and an exit strategy for UNIDO.

- *The ICM should improve its strategic planning and reporting*

There should be annual work programmes and annual reports based on results based management principles

- *More attention should be given to needs and priorities of "southern" partners*

The needs and demands of developing countries for capacity building and technology information and transfer should be put in the forefront. A fellows or delegates programme should be introduced with the objective of contributing to capacity building of southern partners.

- *The area of activities of ICM should be widened*

The field of activity should not be limited to cement, but also include other building materials, relevant for developing countries, such as glass and ceramics.

- *The ICM should be guided by an international technical committee with members being internationally recognized for their competence in the core areas of ICM*

This is necessary in order to ensure the neutral brokering role expected from an international centre.

Lessons learned

- Project documents for all UNIDO Offices/Centres need to clearly specify the role of Field Offices in managing and monitoring projects and FOs needs to be properly equipped to take on these roles. There is also a need for clear Guidelines about reporting obligations and information obligations towards the Field Office and UNIDO Headquarters.

- "Hands-off" management (of UNIDO) of an ITC exposes UNIDO to risks, not the least of sub-optimal technologies being promoted in the name of UNIDO.

1
Introduction

The UNIDO Programme on Technological Advancement started in 1980 in the aftermath of the United Nations Conference on Science and Technology. A major function was to promote the transfer of technology to developing countries through expert group meetings and the establishment of International Technology Centres (ITC) with a cross sectoral mandate or with a clear area of specialization. Since then several UNIDO ITCs have been conceived and some still exist while others have ceased. The earlier centres were often well endowed in terms of resources, one example being the International Centre for Genetic Engineering and Biotechnology (ICGEB). The centres that appeared later on in the process had lighter structures (and funding requirements) and were mainly devoted to capacity building. The International Centre for Science and Technology (ICS) in Trieste belongs to this latter category. Furthermore, third generation technology centres have evolved, with few professionals but often attached to an existing institution with a clear technology transfer mandate. Both the International Centre for the Advancement of Manufacturing Technology (ICAMT) and the International Centre for Materials Technology Promotion (ICM) belong to this category.

The ICM was established in 2003 at the initiative of UNIDO and the China Building Materials Academy (CBMA) and with the support of the Government of the People's Republic of China. Since then the CBMA has acted as the national counterpart and host institution. The direct counterpart ministry is the Ministry of Science and Technology (MOST) but the ICM also falls under the auspices of the Government coordinating agency for international cooperation; the China International Center for Economic and Technical Exchanges (CICETE), under the Ministry of Foreign Trade & Economic Cooperation (MOFTEC). The ICM is located in Beijing and is the first and so far only international technology centre established by UNIDO in the field of building materials. The Centre has now been in operation for 5 years and forms part of the UNIDO International Technology Centre network.

The **mandate of the ICM** is to promote technology transfer and the diffusion processes in new materials technologies and to assist developing countries to access relevant technologies, to strengthen South-South and North-South cooperation and to promote sustainable development in the materials industry. While the mandate of the ICM seem to be related to materials technology in general, the ICM has in practice and due to its close affiliation with the CBMA entirely devoted itself to the building materials industry. Its main objectives have been defined as follows:

- To enhance the sustainability of the materials sector through promotion, transfer and absorption of technological advances and innovations and encouraging new investments, in this industrial sector, of developing countries

- To decrease the negative impact of the materials sector of industry on the environment (pollution, gas emission, energy consumption, etc.) through application of new technologies and innovations

- To facilitate the diffusion of new environmentally sound technologies and innovations in the materials sector in developing countries through building up/strengthening their institutional and technological capacity for technological diffusion and an international technology transfer framework

- To foster South-South and North-South cooperation and partnerships, enabling the developing countries to benefit from the technological advances in materials research and production, taking into consideration the environment and energy-saving requirements.

A first phase UNIDO project *Technology Transfer for Sustained Economic Growth and South-South Industrial Partnership* to support the establishment of the ICM was developed in 2002 with three-year duration and completed in 2008. Formally, however, the ICM project has been implemented through two separate projects - TF/GLO/02/006 and TN/GLO/02/006, both financed by the Government of China but through different currency arrangements. During this first project phase considerable emphasis has been put on verifying the concept, mission objectives and functions of the ICM and on establishing the basis for its effective and efficient operation. In parallel, the objectives to strengthen the institutional and technical capacity, research and manufacturing capabilities in developing countries to foster the promotion of new materials technologies and innovation, to enhance absorption capacity for industrial investments and promote South-South and North-South cooperation, have been pursued.

In March 2008, the UNIDO Executive Board mandated the UNIDO Evaluation Group (OSL/EVA) to, as part of its 2008/2009 Work Programme, undertake a Thematic Evaluation of International Technology Centres. The UNIDO-supported International Centre for Materials Technology Promotion (ICM), Beijing was selected by OSL/EVA as one of the centres to be covered by a field mission and independent evaluation. The evaluation of ICM was carried out between May and July 2009 and undertaken as a free-standing project evaluation but, at the same time, destined to serve as an input to the thematic evaluation. It was conducted in line with the Terms of Reference for the evaluation, provided as Annex A. The evaluation team consisted of two members: Ms. M de Goys, Director of the UNIDO Evaluation Group and Mr. Y. Bao, National Evaluation Consultant and building materials expert.

The purpose of the independent evaluation was to enable the Government of the Peoples Republic of China, the CBMA and UNIDO to have up-to-date information with regards to the following:

- the relevance of the ICM and of the activities and programmes promoted;

- the efficiency of implementation: quantity, quality, cost and utilization of resources, timeliness of UNIDO/CBMA/ICM inputs and activities, and ICM management and coordination in Beijing and from UNIDO HQ;

- the outputs produced and objectives achieved, as compared to those planned; and,

- the impact and sustainability of results and benefits.

It was envisaged that the evaluation would focus on the activities carried out and the results achieved so far by the project and by ICM. The evaluation would also seek to draw lessons of wider application for the replication of the experience gained by this ITC for UNIDO's international technology centre network and programme.

2
Methodology

The evaluation was conducted in compliance with UNIDO's Evaluation Policy and Technical Cooperation Guidelines and attempted to determine, as systematically and objectively as possible, the relevance, efficiency, effectiveness, impact and sustainability of the project. The evaluation assessed the achievements of the project against its objectives and outputs established in the project document, including re-examination of the relevance of the objectives and of the design. It also tried to identify factors that have facilitated or impeded the achievement of the objectives.

The evaluation was carried out through analyses of various sources of information, including desk analysis of relevant documents, interviews with various stakeholders, such as national counterparts, ICM clients in China, participants in an ICM training programme, ICM and UNIDO staff members and international partners and through the cross-validation of data. A list of persons consulted is found in Annex B and of documents reviewed in Annex C.

The analysis of relevant information included a review of UNIDO and ICM policies and strategies, activities carried out, management mechanisms applied (in particular planning, monitoring and self assessment) and project specific framework conditions (in particular policy environment, counterpart capacities, related initiatives of the Government and the private sector).

While maintaining independence, the evaluation was carried out based on a participatory approach, which considered the views and assessments of all parties. A presentation of preliminary findings took place at the UNIDO Headquarters and a draft report was circulated for comments and factual validation.

3
Background information on ICM Beijing

As mentioned above, the ICM was established in 2003 at the initiative of the national counterpart, the CBMA, and UNIDO. The idea was to create an international centre to foster the transfer of knowledge and technology in the field of building materials. It was believed that UNIDO could provide value added through its extensive network, not the least, in developing countries. The ICM's core budget has been funded by Chinese contributions to the Industrial Development Fund and contributions in kind from the counterpart institution - the CBMA. Capacity building or technology transfer activities directly targeting another country have been partly funded by this country and by UNIDO.

The ICM was established as an International Technology Centre (ITC), with ICAMT in India serving as a model. The UNIDO project can be said to have established the legal framework for the ICM. The project and ICM was set up with relatively lean structures and budgets, with the idea to rather serve in a catalytic rather than full implementation mode. From the very start there has been a heavy reliance on the host organization and staff of the ICM has been seconded by the CBMA. The only staff member who has been paid by the project was the ICM Director, who was paid a token fee.

The UNIDO project to support the establishment of the ICM started in 2002 and ended in 2008. A second phase project is being envisaged but there was no draft project document available.

ICM objectives

The objectives of the ICM have been defined as follows:

- To enhance the sustainability of the materials sector of industry through promotion, transfer and absorption of technological advances and innovations.
- To encourage new investments in this industrial sector in developing countries.
- To reduce the negative impact of the materials sector of industry on the environment (pollution, gas emission, energy consumption, etc.) through application of new technologies and innovations.
- To facilitate the diffusion of new environmentally sound technologies and innovations in the materials industry of the developing countries through building up/strengthening their institutional and technological capacity for technology diffusion and the international technology transfer framework.
- To foster South-South and North-South cooperation and partnerships and help the developing countries benefit from the research and technological advances in materials industry.

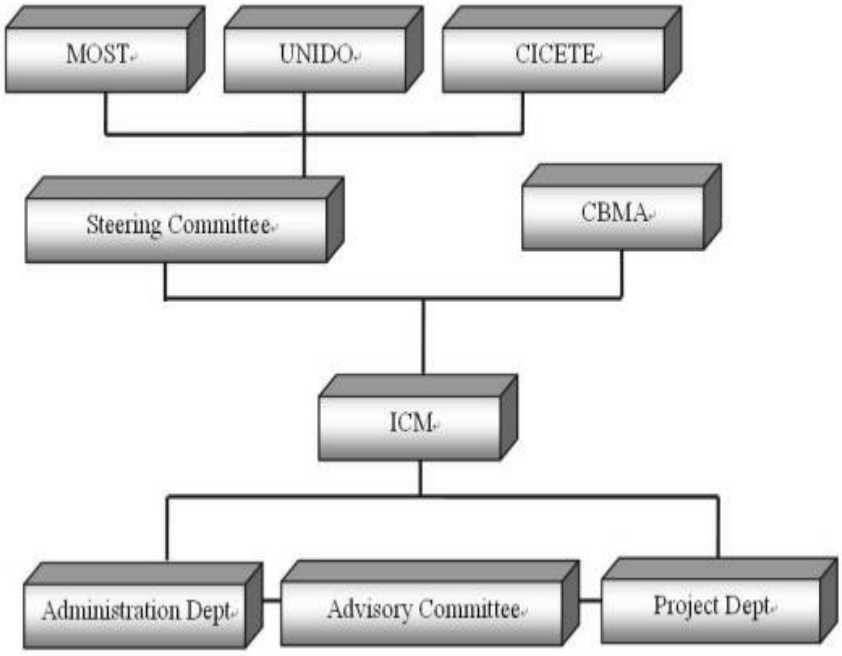
To this extent it should provide a series of services, as follows:

- Function as an international channel for technology transfer and promotion programmes/projects;
- Promote international industrial partnerships;
- Host international training programmes, seminars and workshops and organize study tours, fellowships and exhibitions;
- Establish demonstration centres; and,
- Provide advisory services and guidance on investments.

In addition to being active in the fields of technology transfer and training, the ICM also brokers productive and engineering services and has started to venture into project management.

Envisaged organizational structure

According to the Project Document, the ICM was to be managed by the CBMA and governed by a Steering Committee with representatives of the Government and UNIDO.



There were to be three separate functions; the Administrative Department, the Advisory Committee and the Project Department but this has not been implemented to the extent envisaged.

Location and staffing

The ICM is located at the premises of the CBMA Headquarters in Beijing. There is a very close, almost symbiotic relationship between the ICM and the CBMA and this is illustrated by the fact that the Director of the ICM is also the Vice President, International Cooperation, of the CBMA. It is difficult to get an accurate picture of the staffing situation of the ICM as all the staff members are seconded (for longer or shorter periods) from the CBMA and are often assigned momentarily or on a part time basis. There has never been any permanent project staff assigned to the ICM. At the time of the evaluation there were four CBMA staff members seconded to the ICM but on CBMA contracts.

The only ICM staff member, who has been under a UNIDO contract – a national consultant - was the former Director of the ICM, who was simultaneously and still is the President of the CBMA. According to the present ICM Director, this was more of a formality and the fees were channeled directly to the ICM activity budget.

In addition to staff resources, the ICM draws on a large number of technical experts and consultants, in all about 40 people, who are mostly retirees. These experts provide technical support to various interventions on a non-fee basis.

The CBMA

The CBMA, founded in 1950, is the largest comprehensive research organization in the field of building materials and organic non-metallic materials in China. It is mainly involved in higher education and research and has academic and commercial relations in more than 50 countries. Additionally, it undertakes overseas projects and promotes trade relations. It has, moreover, sponsored many international academic congresses and symposiums.

The CBMA is also responsible for national standardization of the building materials and light industry. It is considered as a renowned Research and Development Institute and has contributed to the technical advancement of the Chinese building materials industry and been actively promoting resource savings and environmentally friendly technologies. Nearly 100 engineering design and general projects of cement clinker production lines, float glass lines, other building materials and light industrial products, have been undertaken in Saudi Arabia, Pakistan, Vietnam, Indonesia, Bangladesh, Burma, Colombia, etc.

The institutional and academic capacity of the CBMA was expanded in January 2006 by integrating 12 additional institutes and companies, including the Hefei Cement Research & Design Institute, Bengbu Design & Research Institute for Glass Industry, Harbin Fibre Reinforced Plastics (FRP) Institute, China New Building Materials Industry Hangzhou Design & Research Institute, Qinhuangdao Glass Industry Research & Design Institute, Xi'an Research and Design Institute of Wall & Roof Materials, Xianyang Research & Design Institute of Ceramics, Hangzhou Project & Research Institute of Electro-mechanic in Light Industry, The Research Institute for Automation of Light Industry, Horological Research Institute of Light Industry, Mechanic & Design Institute of Light Industry and CNBM Waterproof Materials Corp. The CBMA now encompasses more than 3000 scientific researchers.

In addition, the CBMA encompasses 3 national industrial productivity centres, 11 national standardization technical committees, 30 state-level and ministerial-level quality supervision & testing centres and more than 20 branch committees of the China Building Materials Federation and the Chinese Ceramics Society. The CBMA has also affiliated a number of professional high-tech companies.

Five UN technology development and promotion centres were, according to the CBMA website, affiliated with the CBMA. The evaluation team looked into this matter and found that there had in fact, in addition to the ICM, been four other centres supported by UNIDO in the past and affiliated to institutions in the CBMA structure. These are, in addition to the ICM, the China Glass Development Center, the China Development Center of Wall and Roofing Material, the China Development Center of Architectural and Sanitary Ceramics and the China Development Center of Light-weight Building Materials. However, only the ICM is currently operational. The other four centres were founded in the 1980s and 90s but have since ceased their activities. According to information available at UNIDO Headquarters, the UNIDO projects supporting or establishing these former centres ceased in the 1980s or in the early 1990s.

The CBMA is formally separated from but still supported by the Government and has a non profit organization status. It considers the ICM as a platform to disseminate Chinese technologies and to implement South-South Cooperation projects.

Funding arrangements

The main source of the ICM project budget has been the Industrial Development Fund (IDF) as well as contributions in kind provided by the CBMA. In addition there has been funding provided by MOFCOM under its South-South cooperation funding window and, moreover, the UNIDO South-South Centre in China has financed specific ICM activities, such as missions to Afghanistan and Morocco. MOST has limited funding for South-South or technology transfer and has not been a major contributor but has supported the implementation of technical training programmes, co-organized and financed by the bilateral development cooperation programme.

The ICM activities carried out during the last two years have been initiated, organized and financed directly by ICM/CBMA and Chinese partners and funds have been channelled directly to the ICM for these purposes. In fact, there has been no UNIDO project disbursement during the last two years. The ICM management believes that funds will come forward for a second phase UNIDO project but is not sure from where.

There has been some collaboration with other international donors, for instance the GTZ funded a small project with a budget amounting to US$ 25,000. There is also collaboration with the Netherlands. This has not been formalized through an agreement or a project but there has been provision of expert services. Also SINTEF in Norway has provided expert assistance. A USAID Asian and Pacific Partnership (APP) project started in 2008 and was financed through Sino-US funds. It has been active in the promotion and adoption of three international protocols or tools in relation to energy efficiency as well as benchmarking on energy consumption and greenhouse emissions. The project will mainly work with Chinese cement plants. USAID reimburses ICM for costs for meetings and ICM has had a crucial role in the translation and adaption of protocols and tools. The activities have encompassed training seminars and on-site assessments and monitoring of 42 cement plants.

The future funding of an ICM/UNIDO project is uncertain. MOST representatives met by the evaluation team expressed the view that the ICM should now stand on its own feet and be self-sustainable. MOST could provide support through research grants but no core funding. The ICM has already applied for and obtained research funds from various Government sources. The research is mainly carried out by CBMA staff members and there is in fact no "in-house" ICM research or capacity for this.

Allotments and expenditures

Since many of ICM activities are undertaken jointly with the CBMA and with substantive inputs from the CBMA, it is not possible to make any assessment as to the actual resource requirement of the ICM. A transparent budgeting or expenditure system for the ICM is not in place.

4
The ICM context

The role of investment and technology promotion for the Chinese economy

The Chinese economy has substantially benefited from the inflow of Foreign Direct Investment (FDI) and in recent years FDI to China has accounted for between 25 and 30 per cent of the total FDI to developing countries. In fact, China became the largest FDI recipient in 2003 and reached an annual average of US$ 83 billion in 2007, thus becoming an important source for fixed asset investment. The FDI share of fixed asset investment was estimated at 6 per cent in 2007, down from the peak level of 12 per cent in 2006 before the Asian financial crisis. FDI to China takes the form of joint ventures or other collaborative arrangements as well as establishments of solely foreign-owned companies.

Moreover, China has become one of the world's largest outward investor to developing countries and its outward FDI flow reached US$ 22 billion in 2007. According to the UNCTAD World Investment Report 2008, the Inward FDI Potential Index is 0.304 ranking it 32 among 141 countries. As to UNCTAD's Inward FDI Performance Index, China scores almost 1 percent but this is down from 1.3 in 2000-2002 due to the difficulty to keep up with the high GDP growth rates. It still, however, ranks higher than Brazil and India. As concerns the outward FDI performance Index, China ranks around 58 to 60, slightly behind Brazil and India.

Overall, China can be categorized as a major inward FDI country with outward FDI also growing but in relative terms still being rather low. Some sectors are not yet in the position of having technology advantages that enable them to compete outside the country. Another feature is the somewhat uneven characteristics of the geographical distribution. Since the start of the "open door" policies in 1978, China has been growing between 8 to 10 per cent per year, but prosperity has been concentrated in eastern parts where the Economic Zones are located and FDI has been actively promoted. In the 11 western provinces, GNP per capita is only about half of the average national level. The Government has launched China's Western Development Initiative in order to stimulate economic growth in the western provinces.

The present global financial crisis also impacts on Chinese FDI and a decrease in utilized foreign capital has been observed and there is a concern that foreign investors are pulling back their resources from China. On the other hand, the outflow of Chinese capital continues to increase.

Venture capital is a relatively new concept in China but has proven to be an efficient instrument to support Small and Medium Enterprise (SME) development and technology transfer. FDI, in addition to capital transfers, also promotes technology transfer in the form of hard technology (plants and equipment) or "softer" technologies (know how, information and expertise). The Chinese Government has launched a number of large scale science and technology projects with components of foreign investment and research

and technology from the United States (US), the European Union (EU) and Japan etc. and this has contributed to the emergence of technology driven local economies, mainly in eastern China. There are today 56 so called "national high-tech industrial development zones", established to attract domestic and foreign investment in advanced technologies. These zones accommodate a total of 30,000 high-tech firms among which 8,000 are wholly or partly foreign owned.

China's IT industry is a good example to illustrate how foreign advanced technologies can generate positive spill-over effects in terms of raising the competence of human resources and improving the ICT infrastructure, thus benefiting all sectors of an economy.

There is an increasing recognition of the actual and potential role of SMEs in economic development and various instruments, targeting this sector, are being developed. Technology transfer policies are being closely linked to FDI policies. Foreign investors in high-tech industries enjoy preferential treatment, such as tax rebates, or low tariff rates as transfer of technology incentives. Most existing policies foster inward FDI and technology transfer and export-oriented industrial development. Policies on outward FDI and technology transfer fall under Official Development Assistance (ODA) or South-South cooperation frameworks. In recent years Chinese companies have been increasingly encouraged to invest abroad.

Existing strategies and institutions promoting FDI and technology transfer

Three Government bodies play the leading role in investment and technology promotion; the National Development and Reform Commission (NDRC), the Ministry of Commerce (MOFCOM) and the Ministry of Science and Technology (MOST).

The **NDRC** is the planning agency for foreign investment in China and, among other things, responsible for the Guiding Directory on Industries Open to Foreign Investment. It has a key role of approving foreign investment projects at national and provincial levels but the power of approving projects with a scale over US$ 30 million was decentralized from the NDRC to the Provincial Development and Reform Commission after China's WTO accession in 2002. Nevertheless, the NDCR still maintains the power of approval in key economic sectors such as energy.

In addition to its planning role, NDRC has a SME Department with the mandate to regulate and promote the development of SMEs in China. Moreover, it has a mandate to guide the operations of the China International Cooperation Association of Small and Medium Enterprises (CICASME), which was originally under the supervision of the State Economic and Trade Commission (SETC). After China's accession to the WTO, SETC was restructured to the State Owned Assets Management Commission with part of the domestic trade administering function merged with MOFCOM. The **CICASME** is a national non-profit organization with the mandate to promote the internationalization of Chinese SMEs. It establishes international platforms for SMEs, organizes commodity fairs, trade talks, technology exchange, marketing, financing among others.

The **Ministry of Commerce** or **MOFCOM** is responsible for formulating development strategies, regulations, guidelines and policies. It also administers China's domestic and foreign trade, economic cooperation and foreign investment through its Department of Foreign Investment and Administration. Additionally MOFCOM guides the development of

national economic and technological development zones that are promoted as hubs to attract foreign investment.

The "**China Investment Promotion Agency (CIPA)**", affiliated to MOFCOM, is China's investment promotion agency. It is in charge of "Inviting in" (FDI into China) and "Going global" (outbound investment), thus two-way investment promotion interventions in line with China's economic strategies. It is responsible for the cooperation with international economic organizations, foreign investment promotion agencies, chambers of commerce and business associations. In addition, the **China Council of Investment Promotion (CCIP)**, also established under the MOFCOM, is providing more concrete investment promotion services. Both CIPA and CCIP have extensive networks in provinces and municipalities, including provincial/municipal economic cooperation and promotion bureaus, foreign investment promotion centres (FIPCs), international investment promotion councils, etc.

The **Ministry of Science and Technology (MOST)** is responsible for technology and research and development (R&D) oriented activities for key sectors. As such they are responsible for 1) administering 56 technology zones in the country; 2) promoting hi-tech programmes through the China Torch High Technology Industry Development Center; 3) developing funds for technology innovation and venture capital for entrepreneurship, as well as venture capital firms and credit guarantee institutions to facilitate entrepreneurship

The hi-tech zones established since 1995 are products of the MOST "Torch Program" to promote industrial applications of technologies through accommodation of enterprises and investment in these zones. The National Science and Technology Venture Capital Development Centre has been jointly established by MOST and the Ministry of Finance to develop various funding and risk management mechanisms to support entrepreneurship. The MOST is supporting the CBMA through the provision of research funds.

In addition to the above institutions, **the China Council for the Promotion of International Trade (CCPIT)** and the **All China Federation of Industry and Commerce (ACFIC)** are entrusted with promoting trade, investment and technologies to their members through both inward and outward trade and investment promotion services. The CCPIT is the largest and most important organization for the promotion of trade in China while the ACFIC is a national union for private industrial and commercial enterprises.

Other institutions and agencies involved in investment promotion activities include Chinese Embassies (commercial departments) outside the country and other countries' embassies in China. In addition to UNIDO, other multilateral agencies such as UNCTAD and the International Finance Corporation (IFC) have been facilitating both funding and capacity building of Chinese companies. Moreover, UNIDO and the Chinese Government have established and supported various International Technology Centres in China, one of them being the ICM.

South-South cooperation

China has long regarded South-South Cooperation (SSC) as a corner stone of its foreign policy and still supports a variety of programmes in the area of policy guidance, trade, investment and science and technology. As Chinese private businesses are expanding their foreign operations, the Chinese Government is becoming more proactive in facilitating two-way flows of commodities, capital and knowledge between China and other developing countries.

SSC related interventions in China cover various fields and sectors, including economic cooperation and trade, industry, agriculture, health and education. The Ministry of Foreign Affairs (MOFA) is responsible for policy formulation, the Ministry of Commerce (MOFCOM) for foreign trade and economic cooperation, and the Ministry of Science and Technology (MOST) for the scientific and technological cooperation. MOFCOM is the ministry in charge of most of South-South activities, and its Foreign Aid Department is providing funds for trainees from other developing countries.

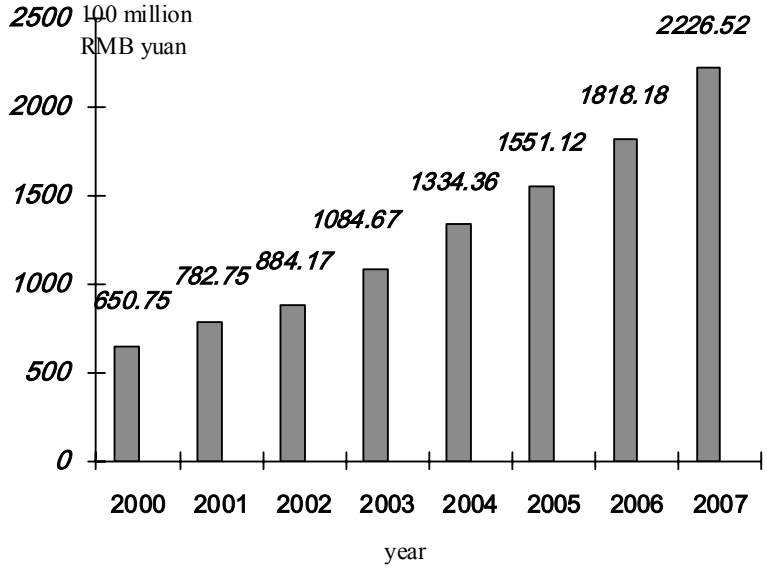
UNDP has allocated a special fund, functioning as a Technical Cooperation between Developing Countries (TCDC) umbrella project to support China's cooperation with other developing countries. In 1995 the Department of International Relationship of MOFCOM delegated its power of policy coordination to **CICETE** as well as the execution of UN-funded projects and CICETE has become the Focal Point for TCDC and South-South activities in China. CICETE is also responsible for formulation, implementation and monitoring of the UNIDO programme and projects.

The launch of the UNIDO-managed Centre for South-South Industrial Cooperation in Beijing, in 2008 is another sign of the commitment of China to South-South Cooperation. The Centre is expected to contribute to the participation of the developing countries in the global economy through the creation and strengthening of technical and business capacity, and thereby complement North-South cooperation.

Other ministries also engage in TCDC and South-South cooperation activities, mainly identifying and inviting foreign expertise and dispatching Chinese experts abroad. In 2006, a national strategy for technology transfer was developed ("Building an innovative country") and a national innovation and technology transfer promotion system was gradually established. Many universities, R & D institutions and local governments have subsequently established technology transfer centres and technology transfer activities have continuously been expanded. According to the National Bureau of Statistics of China (NBSC) there are today 335 Technology Exchange Markets at various levels, 40 Technology Property Transaction Agencies and about 10,000 Technology Brokers.

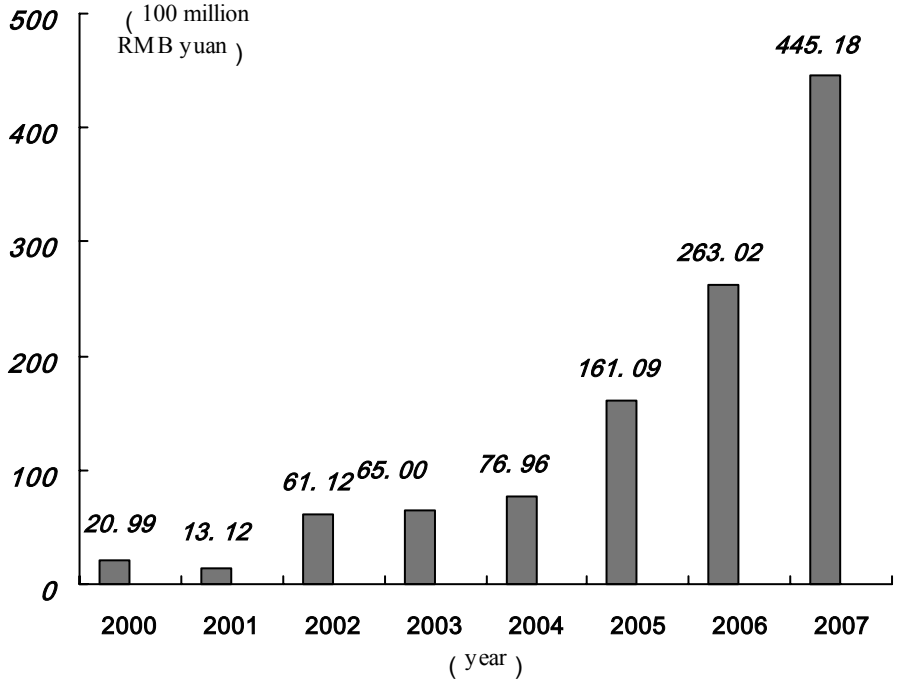
As a rapid growing economy with an enormous domestic market China has been able to mobilize foreign, in addition to, domestic investors and technology transfer (TT) agents. The increasing domestic TT volume, between 2000 and 2007, is shown in Figure 1 and the Transnational Transfer of Technology Transaction Volume from 2000 to 2007 is shown in Figure 2 .

Figure 1: Domestic Technology Transfer Transaction Volume of China, 2000 - 2007



Source: National Bureau of Statistics of China

Figure 2: Transnational Transfer of Technology Transaction Volume from 2000 to 2007



Source: National Bureau of Statistics of China

However, even though the proportion of the transaction value of technology contracts to GDP has been growing, the total value is still below 1 per cent of GDP.

Table 1: Transaction volume of technology contracts to GDP 2001-2007 as a percentage of GDP (in 100 million RMB Yuan)

	2001	2002	2003	2004	2005	2006	2007
GDP	109655	120333	135823	159878	182321	209407	246600
TT Value	782.75	884.17	1084.67	1334.36	1551.12	1818.18	2226.52
Value of TT/GDP (%)	0.71	0.73	0.80	0.83	0.85	0.87	0.90

Source: National Bureau of Statistics of China

The information on technology transfer includes two components; 1) Technology Transfer Contracts and 2) Technical Service (assistance) Contracts. Technology Transfer Contracts are mostly related to patents. For example, a patented technology of CBMA is transferred to a glass factory, the factory then pays CBMA a fee, according to the contract or agreement signed by both sides. Technical service is payment for specific assistance rendered in order to adopt, adapt or even develop a new technology. For example, in the case of the CBMA, a cement plant could want to improve its cement quality and asks CBMA for assistance. There is, however, not a clear or universally accepted definition about what technology transfer entails.

Technology transfer information is to be submitted by concerned Chinese institutions. For CBMA the technology transfer volume in 2008 amounted to 44.3 million RBM out of which 12.2 was technology transfer contracts and 32.3 was technical service.

The role of the building materials sector

The building materials sector is an important industrial sector worldwide, both in terms of outputs and inputs. It is thus a sector which, in addition to serving as an input to the industrial sector also impacts on other sectors and thus contributes to both socio-economic development and industrial competitiveness. New materials are constantly being developed and countries and individual enterprises need to have up-to-date knowledge on technological advances. At the same time, there is increasing concern about the sector's contribution to environmental degradation and about the impact of certain materials on human health. It is also estimated that the sector contributes significantly to carbon dioxide emissions and is, not only through the cement industry, a notably big energy consumer. Increasing emphasis is therefore being given to environmental effects and energy efficient production processes.

The sector plays an important role in the provision of shelter; one of the most basic human rights. Additionally labor intensity makes it a big employer. Generally the construction sector constitutes a relatively large sector for most countries and consequently imports of materials constitute a big share of most developing countries' imports. Many developing

countries need assistance in tackling energy and environmental issues and accessing the technology needed to develop a competitive building materials industry.

UNIDO's programme in China

The UNIDO Office in China was established in 1979 and is presently a Regional Office (RO) covering China, Mongolia, the People's Republic of Korea and the Republic of Korea. The current UNIDO programme in China is implemented through a Country Programme (2008-10), jointly formulated between the Government (Ministry of Commerce) and UNIDO. A high emphasis of the Country Programme is given to Environmental Protection and Sustainability.

Also, during the last decade, the focus of UNIDO's activities has been industrial energy efficiency and environmental sustainability, with Montreal Protocol projects forming the largest component. Other environmental programmes of major significance have been Cleaner Production and Energy Efficiency. Also interventions in the areas of Investment and Technology Promotion, Industrial Governance and Statistics and Private Sector Development have been supported.

In the investment and technology area UNIDO has supported the establishment of various Investment and Technology Promotion Offices and Technology Centres of Excellence. UNIDO is today, jointly with the Chinese Government, supporting thirteen government-funded UNIDO centres/offices in China. These centres/offices work within various priority areas such as investment promotion, technology transfer, environmental protection and South-South cooperation. The centres/offices are being administered through a UNIDO project mechanism and are individually backstopped from UNIDO headquarters by various project managers. There has been a demand from the Government and from the counterpart institutions for more capacity building and coordination in order to ensure synergies and enhanced efficiency and effectiveness. A recently developed UNIDO project proposal, with CICETE as the counterpart agency was designed to address these issues. The UNIDO Centre for South-South Cooperation was established in 2006 with the aim to mobilize the technical, financial, managerial and other resources required for projects and programmes contributing to industrial development and economic growth.

UNIDO's current portfolio of ongoing and pipeline projects/programmes amounts to approximately US$ 127 million.

5
Project design and management

The Project

The Project TF/TN/GLO/02 006 entitled **Technology Transfer for Sustained Growth and South-South Industrial Partnership** was formulated in 2002. UNIDO was the designated Executing Agency while the International Centre for Materials Technology Promotion (ICM) was the Implementing Agency and CBMA the national counterpart. There were two Government Coordinating agencies, CICETE/MOFTEC and MOST.

The project was supposed to start in June 2002, with duration of three years. It was designed as a pilot project with the aim to verify the concept of the ICM, define its structure and functions, develop a long-term work programme and lay the foundation for the effective operation of the Centre.

The Project Document puts great emphasis on sustainable development and discusses issues such as environmental protection and energy efficiency. It was pointed out that the materials sector of industry is one of the most polluting sectors and the need for technological development was stressed. It was also highlighted that developing countries were in need of new technologies and innovations, particularly in the materials sector and that this would require the encouragement and promotion of new investments in the production sector.

The new ICM was to be established to provide a springboard for new technologies and innovations, bridging the gap between market demand, industry needs in new technologies and innovations. Moreover, the ICM was to assist the developing countries in enhancing technological performance in the materials sector and to promote international cooperation and technology transfer for sustainable industrial development.

It comes out clearly, from the Project Document, that the purpose of the project was to establish the ICM but at the same time the ICM as implementing agency was responsible for implementing a range of activities. A two-phase approach would have been more appropriate with a first phase focusing on establishing the ICM as an institution and building capacities of the ICM and a second phase actually delivering services to developing countries.

The ICM was envisaged to be a broker of information and technology for the benefit of developing countries. In addition, it was to link research and development with production at the enterprise level and, finally, to foster the application of efficient technologies and innovations in developing countries. According to the vision presented in the Project Document, the ICM could act as a global focal point for new technology promotion and transfer of technological partnership development by tracking the latest worldwide developments, fostering research/industry partnerships and in fostering North-South and South-South cooperation. Emphasis was put on demand driven technology transfer and both inward and outward technology promotion.

Since its start the ICM has been one of UNIDO's International Technology Centres and belongs to the somewhat informal International Technology Centre (ITC) Network. The UNIDO project has, however, only to a limited extent promoted or participated in concrete networking activities. This is partly due to the absence of a UNIDO Networking Strategy and limited in-house (UNIDO) resources to manage and coordinate the ITC Network.

The national counterpart agencies are CICETE and MOST, which are both signatories to the Project Document. CICETE does not play the same role in UNIDO projects as for UNDP's where it is executing agency. The role of CICETE in the ICM project is more a supporting and facilitating one.

The project document lacks a detailed description of objectives and information on which countries and partners the ICM was to be targeting. Objectives and outputs were generally not quantified and there was an absence of indicators. A sharper focus on the institutional establishment of the ICM, as pointed out in the CSF Evaluation, would have been an advantage.

Budget information

The total allotment to the project was about USD 330,000.

Table 2: Project allotments and expenditures

Project No.	Total Allotment US$	Total Expenditure US$	% Total Implemented
TF/GLO/02/006	*206,545.01*	*126,237.86*	*61.12%*
TN/GLO/02/006	*125,000.00*	*121,246.89*	*97%*

Source and date of information: Agresso as of 16 March 2009

Even after 6 years of operation and despite a relatively small budget, there were still remaining project funds and there had not been any project disbursement during the last two years. This has maybe provided the "advantage" of enabling ICM to stay on as a UNIDO project and to continue the operation under a UNIDO umbrella. Formally, however, the project has come to an end and there are plans to develop a new phase UNIDO project.

The budget originally envisaged was USD 1 million out of which 50 per cent was to be provided in convertible and non-convertible currencies by the Chinese authorities. The remaining funding, in convertible currencies, were to be mobilized by the Centre with UNIDO's assistance but this did not materialize. The local non-convertible funding was to be managed and disbursed at the national level. This would reduce UNIDO demands on project administration and was provided as an argument for a reduced support cost rate of 10 per cent (exceptionally approved by the UNIDO Director-General). In addition to the above funds, there were to be a US $120,000 in in-kind contribution from the national counterpart, the CBMA. The counterpart contribution was to cover office space and maintenance costs, secretarial support, communication facilities and logistical support.

Table 3: Financial situation 2002-2008 (USD)

	TF (USD)	TN (RMB in USD)	Total
Trust Fund Agreement 2002	250,000	250,000	500,000
Government contributions 2003-2008	250,000	125,037	375,037
Project expenditures 2003-2008	126,240	121,247	247,487
Support costs 2003-2008	24,749		24,749
Balance at 31 Dec 2008	99,011	3,790	102,801
Interest until 31 Dec 2008	29,583	783	30.366
Funds available	128,594	4,573	133,167

Source: UNIDO Agresso March 2009

The Trust Fund contributions were received in June 2003 (USD 175,000) and in August 2005 (USD 75,000), thus with delays of about one year.

There is still an outstanding balance of USD 133,167 and a remaining installment (non-convertible contribution) for TNO/GLO/02/006 of USD equivalent 125,000. The projects have not been declared operationally completed despite estimated completion dates of December 2006 and August 2007 and the issuance of "Requesting Operational Completion Memos". According to the Project Manager, the unspent balance was to be used to launch the next phase of the project, while the Chinese stakeholders did not seem to be fully aware of the remaining funds.

Table 4 below provides information of main categories of expenditure.

Table 4: Structure of expenditures by budget lines (BL), TF/TN/GLO/02/006

BL		2003	2004	2005	2006	2007	2008	Total
TF/GLO/02/006								
12	National Prof.		1,163	435	4,660	240		6,498
13	Admin. Support		9,424	2,477	743			12,644
15	Project Travel		4,632		-2,874			1,758
16	Other Personnel			6,903	9,825	-682	3,668	19,714
32	Study tours				18,339			18,339
45	Equipment		26,057	-2,042				24,015
51	Sundries	9,165	81	12,600	24,652	-3,353	80	43,225
Sub-total		9,165	41,357	20,373	55,346	-3,795	3,748	126,194
TN/GLO/02/006								
12	National Prof.		52,250	13,750	25,178	3,500		94,678
21	Subcontracts			6,010				6,010
33	In-service training			4,000				4,000
51	Sundries	8,505		3,992	5,000	-937		16,560
Sub-total		8,505	52,250	27,752	30,178	2,563		121,247
Total		17,670	93,607	48,125	85,524	-1,232	3,348	247,441

Source: UNIDO AGRESSO, March 2009

Most of the budget has been spent on national experts and equipment and there has been no fielding of international consultants. The ICM International Coordinator has over many years conveyed the message that the procedures to recover costs from UNIDO are too cumbersome. This was given as one reason why the project stopped disbursing and why the ICM management instead resorted to other (internal) sources of funds for planned activities.

The Trust Fund Agreement

The ICM project was subject to a Trust Fund Agreement between UNIDO, CICETE and MOST, signed in June/July 2002. The Agreement specifies that UNIDO financial regulations and rules shall apply for management of the funds contributed to the project and that the project shall be subject to programme support costs of 10 per cent. The Agreement also calls for annual financial statements. The Project Document was attached as Annex A to the Agreement.

Management

The ICM has partly been managed as a UNIDO project under a Trust Fund Agreement with the Government of the People's Republic of China. It has been treated as an International Technology Centre under the auspices of UNIDO. In addition, the ICM and particularly its staff have been managed by the CBMA, as has been the case for other projects implemented by the ICM and financed by international donors. The ICM has been formally registered as a NGO.

Generally, the Project Document has not been used as a management tool. There has also been an absence of annual work programmes. Moreover, the formally established Steering Committee was never active and the foreseen Technology Advisory Committee (TAC) never established. In fact, there is only evidence that the Steering Committee met once, at the launching ceremony of the ICM. The evaluation team was told that the Steering Committee did meet in the beginning of the project's lifetime but was never able to access any minutes from such meetings. The Project Document foresees that the project should be reviewed regularly in order to adjust to changes in the environment or emerging needs and the TAC was supposed to play a role in this.

There are references in the Project Document that UNIDO should operate the ICM but the practice that actually developed was that the ICM was operated by the CBMA. However, in order for UNIDO to operate the ICM, specific additional budget allocations would have been needed for UNIDO staff missions. A highly competent International Coordinator (CBMA secondment) was appointed for the first two years but was never assigned to the ICM on a full-time basis.

The ICM can, as a UNIDO project, be said to formally fall under UNIDO's management but in practice the day to day management of the Centre has been handled by the CBMA. The project itself has been managed by a backstopping officer based at the UNIDO Headquarters. The Field Office has not had any direct role but has been kept informed about developments and activities. The UNIDO backstopping officer has visited China yearly and has always, on these occasions, interacted with the ICM. The Director of the UNIDO Investment and Technology Promotion Branch has also paid regular visits.

The Field Office has played an important role in informing UNIDO projects, including the ICM, about administrative procedures and UNIDO regulations. There has, for instance, been a circulation about the use of the UNIDO logo.

The project is a very small component of UNIDO's large-size Programme in China and is, understandably, not closely managed or monitored by the staff of the Regional Office. Moreover, the RO has limited capacities to monitor its large Country Programme. The ICM has not been specifically reported on in the Country Programme (CP) Progress Reports. As mentioned earlier, there are presently thirteen government-funded UNIDO centres/offices in China. To make it even more complicated, different centres are managed by different Branches or Units at UNIDO HQ. A positive development is the inclusion in the CP of a project entitled "Development Partnership and Addressing Key Emerging Issues" with a key objective to ensure coordination of UNIDO projects. More precisely, this project aims at strengthening the capacity of the CICETE to implement and coordinate ongoing projects and to monitor and evaluate their economic and social impacts. The project aims at leveraging UNIDO's extensive networks of centres. The new project is to create a mechanism to link the centres and promote synergies and pursue common tasks in areas such as trade and investment promotion.

The ICM funding has been channeled through MOST with which it has been in close contact. At times ICM was commissioned (through the CBMA) to implement MOST projects, for instance in the field of green material and energy conservation.

The ICM can be regarded as a risky set-up with relatively high UNIDO visibility but limited UNIDO control. The UNIDO logo is rather widely used and seen as providing credibility and trust. The fact that ICM is a UNIDO Centre thus brings about some legal, financial and reputational risks for the organization. At times the use of the logo is questionable, for instance on the front page of brochures that can be regarded as sales brochures for Chinese products.

Reporting

The reporting on the ICM project has generally been a weak area and has mainly been done in the form of "notes" or power point presentations. There have been neither progress reports, work programmes nor annual reporting to UNIDO. Quarterly letters have been submitted by the ICM to MOST, which finds the reporting satisfactory.

6
Relevance

The building materials sector has both economic and social dimensions and the right to shelter is often mentioned as a human right. Moreover it has a multidisciplinary and trans-sectoral aspect. As mentioned above, the sector faces many environmental and energy-related challenges and the decision to address various technology related issues of the sector was timely and appropriate. As numerous countries are facing similar sector-specific challenges, the establishment of an International Technology Centre was justified.

The buildings materials industry has gained considerable importance in the Chinese economy and the sector has made several technological advancements. It is well placed to disseminate knowledge, expertise and information to southern partners and has the potential to contribute to technological solutions to identified constraints and to enhance the competitiveness of the materials sector of industry in developing countries.

There is a general trend to adopt new technologies and eliminate outdated production lines in order to address efficiency and environmental concerns. In fact many related problems have a technology solution and can be addressed through technology transfer or diffusion of new technologies. This is also true for the materials industry. The ICM was to provide a springboard for new technologies and innovation bridging the gap between industry needs and the existing industry base. The establishment of a Centre to assist developing countries in enhancing their technological performance in the materials industry and promote international cooperation and technology transfer for industrial development is seen as relevant.

Relevance to developing countries

The ICM is relevant to developing countries in that it provides access to knowledge and information about building materials technology as well as linkages to potential investors, technology suppliers or potential business partners. In particular China is considered to have appropriate, low-cost building materials of high relevance to developing countries. In addition, international training programmes and seminars organized by the ICM contribute to the strengthening of skills and the development of knowledge.

The sector is universally important. There is a clear demand for technology. The ICM was relevant in that it would be in the position to assist the developing countries in accessing needed technologies and thus contributing to the development of indigenous competitive and sustainable manufacturing capabilities. The ICM was also relevant in that it would constitute an international forum for exchange on many of the problems facing the sector and for formulating environmental standards.

Numerous ICM workshops brought together international and Chinese experts to discuss various issues, such as sustainability and 'Safety, Durability, and Sustainability' with regards to cement and concrete industries.

Through the ICM, developing countries are able to access, mainly Chinese, resources and technology in the building materials field. There is a high demand for low-cost housing technology and this is a priority area in many developing countries. There have been requests for assistance and interest from many developing countries, not the least in the area of technology capacity building. At the same time, there is no certitude that the technologies promoted by the ICM are the best, most apt or appropriate ones and UNIDO has not been ensuring any quality control function of the outputs.

However, the "green industry" focus of ICM is highly relevant since negative effects on the environment are a major issue and increasing energy consumption and CO2 emissions are major concerns of many Governments. The materials sector of industry has been signalled out as one of the most polluting sectors and this concerns many developing countries.

ICM is active in both inward and outward technology promotion. There has been a certain switch during its lifetime from inward towards outward technology transfer thus the relevance to developing countries can be said to have increased.

Relevance to China and the CBMA

The UNIDO ICM project is seen as highly relevant by Chinese stakeholders as the project has provided a legal framework for the ICM and provided a platform for Chinese stakeholders to collaborate with other countries. In addition, the project contributes to the further development of Chinese technologies in the building materials sector and the dissemination of Chinese technologies to other countries. It fits into the opening-up China policy.

The building materials sector is a priority sector for China and MOST. With the rapid development of the construction sector and of decorative building materials, the building materials industry has become an important part of the national economy and is a key input provider to many development projects. It is estimated that building materials account for about 15 per cent of the construction industry's industrial added value and that the sector accounts for 3 to 5 per cent of the Gross Domestic Product (GDP). Furthermore, the building materials industry is a labour intensive industry.

In 2006, which constituted the first year of the 11th Five-year plan, the building materials export value was as high as USD 12.935 billion and had increased by 33 per cent since 2005. In 2007, the cement output in China reached 1.35 billion tons and during the first ten months of 2008, the output was 1.14 billion tons. In light of these performances it can be described as a mature sector.

Through the ICM, the CBMA and Chinese enterprises have access to UNIDO's larger network of Ministries, institutions, business associations and private companies in a number of countries. UNIDO can be said to provide an international platform for the industry and for the CBMA. The ICM is also in a position to tap UNIDO's technical resources and technical competence. However, since UNIDO has limited in-house technological capacities in the field of building materials, the actual technical support of UNIDO has been limited and mainly been in the field of technology transfer or investment promotion. There is, however, a potential for collaboration in the field of Cleaner

Production, an area actively promoted by the ICM and where UNIDO has strong technical competence. Nevertheless there has, so far, been no interaction with the Cleaner Production Unit, or its affiliated national centres.

The ICM is also seen as a vehicle to disseminate technology, in particular Chinese technology as well as to disseminate research results. The Centre has made the CBMA more visible and fostered development cooperation projects, for instance with the USAID, which found the ICM to be a suitable channel for its technical assistance. It has also been a useful instrument to implement training programmes under the (Chinese) international development cooperation programme.

The ICM is seen as an important vehicle for South-South Cooperation and for promoting Chinese technology. It functions as an extended arm of the CBMA and serves as a liaison with other countries. Some Chinese stakeholders see ICM as a broker between Chinese companies and foreign companies in search of a technology or promoting a turnkey project. Such a turnkey project has materialized in Vietnam for the cement sector. There has also been promotion of low cost housing in South Africa.

Relevance to UNIDO

UNIDO has been establishing International Technology Centres since the 1980s, in response to mandates of its governing bodies and requests from member countries. Technology Diffusion figured prominently in the UNIDO Corporate Strategy developed in 2003 and the ICM can be seen as a response to this. Access to technology was to be promoted as a key instrument to industrial development and market access. Moreover, the assistance in the establishment of the ICM is in line with UNIDO's mandate to promote sustainable industrial development. The ICM fitted and fits well into its programmes to promote technology for industrial development and the transfer of new and appropriate technologies for enhanced competitiveness as well as with its green industry agenda.

The building materials sector, although an industrial sector, is not a sector in which UNIDO is extensively involved. It is therefore difficult to justify UNIDO's involvement in this sector by referring to the UNIDO Business Plan, the Corporate Strategy or Medium Term Programme Frameworks. On the other hand, investment promotion and technology promotion are core areas of UNIDO.

Major areas of the ICM have been low cost housing and green housing, areas where various UNIDO projects have been active and there are potential synergies with the activities of the Cleaner Production (CP) Unit. There are also possible synergies with other ITCs such as the ICAMT, equally promoting low cost materials and with which ICM has collaborated and there are potential linkages with the Montreal Programme (MP). Moreover constructive collaboration has been established with the UNIDO South-South Centre in China.

The ICM and the other ITCs provide value added to UNIDO in that they represent additional channels for developing cooperation. They increase the UNIDO portfolio and outreach in China and elsewhere. The ICM has undoubtedly increased the visibility of UNIDO in China and functioned as an additional vehicle to promote issues such as cleaner and resource and energy efficient production.

Many ICM activities have been in the area of energy efficiency which is in line with the industrial energy efficiency focus of most of UNIDO's energy related efforts in China. In

fact one of the main objectives of the UNIDO energy programme in China is to contribute to efforts of the Government to reduce greenhouse emissions. Moreover, the upgrading of technology and technical change are central aspects of UNIDO's private sector development strategy in China and in line with the overarching UNIDO objective of diffusing best practices for sustainable industrial production.

7
Effectiveness

Effectiveness is the achievement of objectives to what extent envisaged outcomes and outputs have been delivered. This chapter will thus discuss the results of the ICM. In this respect it is necessary to stress that, due to the almost symbiotic relationship between the ICM and the CBMA, it is very difficult to distinguish between ICM and CBMA activities and outputs. As an ICM staff member put it "it is difficult to separate activities of ICM and CBMA because both of them are sponsors of the activities".

The main objectives of the UNIDO ICM project were:

- To establish an international framework for technology promotion, transfer and diffusion as well as for industrial partnership and cooperation (North-South and South-South)
- To verify the concept, mission, objectives and functions of the ICM
- To lay the basis for its effective operation through the development of an appropriate organizational and operational structure and framework
- To implement an initial work programme and demonstration projects
- To develop a long-term work programme for the second operational phase
- To mobilize sufficient financial and human resources for the implementation of its work programme.

It is noticed that the objectives are formulated as activities rather than the results or the status actually aimed for. It is assumed that the following results were the intended ones:

- An international framework for technology promotion, transfer and diffusion as well as for industrial partnership and cooperation (North-South and South-South) established
- The mission, objectives and functions of the ICM are established and in line with stakeholders' expectations
- An appropriate organizational and operational structure and framework are in place
- The initial work programme and demonstration projects have been successfully implemented

- A long-term work programme has been developed for the second operational phase

- The ICM has sufficient financial and human resources to implement its work programme

Below the achievement of these results are assessed:

An international framework for technology promotion, transfer and diffusion as well as for industrial partnership and cooperation (North-South and South-South) established

The Project Document foresaw a database and networking architecture but this has not materialized. UNIDO has been instrumental in establishing contacts between the ICM and partners in developing countries and notably, Morocco, Afghanistan and Bahrain in the field of low cost housing and contributed to establishing a network with other international partners.

The mission, objectives and functions of the ICM are established and in line with stakeholders' expectations

ICM is institutionally and functionally established but lacks a long-term strategy, work programmes, an operational Steering Committee, a partnership strategy and clear objectives and mission statements. Research on technology needs and of market opportunities and partners for ICM still needs to be carried out. Output 1.4 - an established database and information system - is still outstanding.

An appropriate organizational and operational structure and framework are in place

ICM exists mainly due to its symbiotic relationship with the CBMA. It cannot be regarded as a truly international centre since it has neither members nor international staff. The steering and advisory mechanisms have not been put in place.

The initial work programme and demonstration projects have been successfully implemented

Many worthwhile activities have been initiated and implemented and have produced tangible outputs. Several of these activities aimed at contributing to capacity building of Southern partners. Considering the pilot nature of this first phase, there is a need to monitor the results and identify best practices, to be fed into a long-term capacity building strategy and programme. In addition, the ICM still needs to undertake the research necessary to identify training needs and best international practices. Many seminars have been organized to increase awareness, for instance of Cleaner Production issues. A few partnership opportunities have been identified but there has been no use of the subcontracting partnership exchanges (SPXs). The ICM has only in the case of Vietnam provided advisory services to help build relevant institutional capacity. The evaluation team did not come across any analysis of the demand for advisory services.

Furthermore, the ICM has been active in the area of technology transfer and promotion of direct business linkages. Instruments promoted and used are licensing, direct investment and joint ventures.

The evaluation took note of the following **projects/interventions** that have been or are implemented by the ICM:

- 1st phase Sino-Vietnam project - Research on the Application of High Performance Concrete - co-funded by the Vietnamese and Chinese Governments- resulted in high performance concrete being introduced in Vietnam

- 2nd Phase Sino-Vietnam project – Research on the application of Nano technology in building coatings – on going and equally co-funded by the two Governments

- Sino-Germany (GTZ) project - Energy Efficiency retrofitting of existing buildings in China – entails technology transfer from Germany to China – working on energy reform activities

- Sino-Holland project – Green building and building efficiency – introduces Dutch practices on sustainable building

- Sino-Norwegian (SINTEF) project – Environmentally sound management of hazardous industrial wastes in cement kilns in China – cleaner production related activities

- Launching of Center of Excellence, Asia Pacific Partnership (APP) on clean development and Climate –Cement Task Force – China is one of 6 countries in the partnership

- Assisting Chinese supplier to implement a turn-key engineering contract of 1,000t/d cement clinker line in Vietnam

- Cement project in Angola – assisting Chinese suppliers to win a turn-key engineering contract

- Low cost housing technology – collecting information on low cost housing technologies and compiling a book – seen as tool for technology transfer

- Cooperation with Dow – introduced special Dow latex technology and carried out experimental study and materials performance testing

- UNIDO-financed visit to Germany of two ICM engineers to visit correlative research institutions and manufacturers and collect technical data relating to building materials/techniques.

The ICM has also carried out **specific UNIDO assignments**:

- Mission of an international expert to Thailand to prepare a feasibility study for rehabilitation and reconstruction

- Draft proposals – Post conflict rehabilitation of the housing sector in Afghanistan –Draft feasibility report of materials production lines for post flood reconstruction of Sudan. The ICM did develop project proposals for Afghanistan and Sudan but the projects have not been funded or implemented. There will be a study on the applicability and need for adoption of Chinese housing technology for Morocco and Bahrain.

- Expert mission to Peru and Bolivia to investigate local conditions for low cost housing

- Draft feasibility report of materials production lines for post flood reconstruction of Sudan

- Expert mission to Sudan to prepare survey on local conditions for low-cost housing

Finally, many relevant training programmes have been implemented:

- 2 training courses or Vietnamese engineers on high performance concrete, Nano technology on building coatings and correlative building materials technology

- Training in Thailand on cement manufacturing technology and equipment

- 3 training programmes for Iranian engineers on technology for cement manufacturing and cement plant administration

- Seminar on Green Building and Energy Efficiency (participants from 23 developing countries)

- Training course on Cement Cleaner Production Technology – sponsored by the Ministry of Commerce with participants from 22 developing countries

- International training on Cement Sustainability Initiative (CSI) Protocol on clean development and climate change for the China cement industry –organized under the Asia Pacific Partnership –Cement Task Force

- Training seminar on buildings regulations management and land resource planning and management for Cambodia

- Training course on cement cleaner production technology for Caribbean Sea and south East Asian region

Many training programmes have been organized through the "Foreign Aid Training Programme" of the Ministry of Commerce and these have so far, provided training to about 111 engineers from 30 countries. The training programmes combine lectures with, on-the-job training and on-site visits to best practice organizations, such as the National Key lab in CBMA, the Beijing Cement Plant Co., Ltd., the Beijing Liulihe Cement Plant, the China United Cement Corporation, etc. The content of the training includes Cement Cleaner Production, Concrete Sustainable Development, New Building Materials, Building Regulations & Management and Land Resource Use.

Training programmes have also been offered in the field of high performance concrete, cement manufacturing, low cost housing technology and Nano-coating technology. At times training programmes have targeted a specific country as in the case of Vietnam and Iran. Many of the training programmes are organized jointly by the CBMA and the ICM and it is not totally clear what the respective roles are.

Many pertinent subjects have been included in training programmes, including clean technology, energy efficiency, healthy materials (asbestos cement is still being produced

in many countries) and materials technology. The ICM has also been co-organizer of international symposiums, workshops and seminars, mainly dealing with environmental and energy issues for the cement sector.

The project stakeholders generally express a high level of satisfaction with the results of the project. One example was the Sino/France Lafarge company which stressed that the ICM has been instrumental in developing a joint research project between Lafarge China and CBMA on low CO2 cement. Lafarge benefited from the ICM in establishing contacts in South Africa and Morocco (technology transfer and materials supply/export).

In particular, the ICM was felt to facilitate the development of contacts with Governments in recipient countries. The ICM has thus performed a facilitating role and performed trade facilitation tasks but there have also been aspects of developing local production using Chinese existing or adapted technologies.

Private Chinese enterprises have been participating in training on CSI, green house gas emissions, environmental management, energy efficient production and clean cement production. The training had been highly appreciated and contributed to better awareness.

As far as research is concerned, major research areas have been the use of different raw materials and hazardous waste. ICM is presently working on standards for appropriate materials use. It also undertook applied research for the Vietnamese industry in the area of high-performance concrete and Nano-coating. The objective of the cooperation was to assist with the establishment of a Vietnamese laboratory and build capacities. A cement plant will start operating towards the end of 2009. ICM has been active in indicating suitable technology and equipment suppliers. Vietnamese researchers have been trained at CBMA facilities and the training /research has led to the development of high-performance concrete and the introduction of Nano-coatings. Otherwise the ICM has not received any researchers from other countries. Nano-coatings (anti-bacteria prone) are used in medical clinics and, in addition, improve air quality. A plant in Japan is supposed to be selected to receive this technology. ICM aided for most of the travel costs involved in facilitating the Sino-Vietnam cooperation.

The ICM has been providing information about Chinese technologies to other countries and provided technical information in early stages of project promotion and Chinese technology has been promoted in meetings and training programmes. Undoubtedly, the ICM has contributed to an increased availability of information on Chinese building materials technology outside China and to an expanding market of Chinese technology suppliers. In fact the ICM mainly engages in outward promotion of Chinese technology, which limits the international status and orientation of the centre. Also, only Chinese staff members are attached to the Centre. Study tours have been implemented in many countries in Latin America and Africa and are in the planning phase for Bahrain and Morocco. These study tours are being combined with surveys on local building materials. ICM has facilitated inward technology transfer; the introduction, to China, of special latex technology from the US as well as outward; transfer of Portuguese technology, through a Chinese company to Angola, of Chinese cement technology to Vietnam, of Chinese low-cost housing technology to Morocco (in progress) and of low-cost housing technology to South Africa.

The ICM has been able, often thanks to UNIDO, to establish a network of international partners, in the North and in the South. The CBMA and the ICM are also partners of the Asia Pacific Partnership on Clean Development and Climate Change, with the purpose to

accelerate the development and deployment of clean energy technologies. The partnership focuses on expanding investment and trade in cleaner technologies, goods and services. The ICM is a member of the public-private task force for cement.

Furthermore, the ICM is participating in a Sino-US Programme to Improve Energy Efficiency, Increase the Use of Alternative Fuels and Raw Materials and Reduce Emissions in the Cement Sector in China. The intention is to enhance the capacity of targeted cement companies, to improve their energy efficiency and reduce emissions. There is also a Cement Task Force "Centre of Excellence Project" under a Sino-Australia Programme. The project assists companies to implement best practice technologies in the area of energy reduction, greenhouse gas emissions reduction and in better utilizing alternative fuels and raw materials in cement production.

According to the project document, the vision was that ICM would provide access (for developing country partners) to and international network of practicing technology experts and to latest technologies and techniques through network agreements with developed country institutes and experts. This was an ambitious undertaking which has not materialized at the scale and scope envisaged. Through the ICM there has been enhanced access of Chinese stakeholders to international experts and technologies and of recipient country stakeholders to Chinese experts and technologies, but the full international dimension of the ICM is still to be developed.

It is obvious that ICM is an active centre, implementing a large variety and number of interesting activities. However, UNIDO is not always informed on what is going on due to limited interaction and also due to the fact that ICM is in the position, technically and financially, to work independently. There is however also the fact that a lot of (uncontrolled) activities are carried out under the UNIDO "name" and that development oriented results are uncertain.

A long-term work programme has been developed for the second operational phase

This has not yet been achieved and a general weakness of the ICM has been the absence of a strategy and annual work programmes.

The ICM has sufficient financial and human resources to implement its work programme

The CBMA has been contributing substantially to the ICM, mainly through the provision of office space and seconded staff. The Government has contributed financially but has not provided any core financing for the additional years the project has been ongoing. Foreseen contributions from donors and recipient Governments, enterprises, industrial associations and financial institutions have not been forthcoming for core activities but various donors have been using the ICM for delivering project activities or providing specific services.

The ICM has not yet reached the status of a recognized and fully competent international technology institute or been able to solicit support for core activities from the international community. A funding policy and a funds-mobilization strategy are still to be developed for the ICM. Moreover, and maybe even more important, a long-term work programme for the ICM still has to be conceived. As the financial sustainability of the ICM is not yet assured the ICM is at risk. Finally, it is not possible to assess whether or not the ICM has enough resources to implement its Work Programme since no Work Programme has been developed so far.

Concluding remarks on effectiveness

The achievements of Immediate Objective 1 **To verify the concept, mission, objectives and functions of ICM and lay the basis for its effective operation and implementation of its work programme** has been assessed and the conclusion is that there has been progress in these directions but some work still remains to be done. As concerns Immediate Objective 2 **To strengthen the institutional and technical capacity, research and manufacturing capability in developing countries to foster the promotion of new materials technologies and innovations, enhance absorption capacity for industrial investments and promote South/South and North/South cooperation,** the ICM has certainly contributed to developing countries having an improved access to needed technology and to strengthened capacities in areas of technology transfer. A new mechanism has been created for developing international partnerships and promoting technology transfer, within the building materials sector.

On the other hand, the results in terms of capacity building, technology transfer and how trained trainees are actually using the acquired knowledge have not been monitored. There are indications, however, that the ICM has achieved results in terms of technology transfer to Pakistan and Vietnam and from the United States.

8
Efficiency

In spite of a relatively small budget, the ICM has been able to implement a large number of activities. This is due to the high, de facto, counterpart contribution. The host organization, the CBMA is contributing various (often hidden) resources and inputs in kind. To this category belong premises, seconded staff, the organization of training programmes and research.

The activities of the ICM and the outputs produced have, by and large, been delivered in an efficient and cost effective manner and this can, to a large extent, be attributed to the CBMA which has been in a good position to host and support the Centre. The ICM has been able to take advantage of CBMA's advanced research programme and the highly qualified human resource base. At the same time, UNIDO has been providing tools for diffusion of knowledge, technology transfer and promotion to developing countries, an area where the CBMA had limited experience.

ICM like most of the other ITCs is financed purely through host country contributions and has enabled UNIDO to venture into a new area. The ICM has a highly competent Director, energetic and dedicated staff members and implements a wide range of activities. It has a large number of technical advisors, who for the most part are retired professors. They constitute a competent and free (in terms of monetary value) resource for the ICM.

UNIDO has developed "informal" standards and practices in relation to ITCs: host institutions should be well known internationally and at the top, nationally. In addition they should be a catalytic and have a flexible, competent and minimum structure. Generally, the ICM lives up to these requirements.

A negative aspect has been the limited attachment of ICM to and lack of coordination with UNIDO's technical branches and the absence of common objectives with UNIDO's Technical Cooperation programmes and projects. UNIDO has functioned as a door opener but done limited technological backstopping, which reduces its value added. The UNIDO larger network could also have been used more prominently and not only in China. UNIDO has a relatively large number of investment and technology related projects/centres/offices in China.

To this category belongs ITPOs, SPXs, South-South cooperation and ITCs active in the area of solar, small hydro power environment technology, IT technology, recycling as well as ICT parks. There is obvious scope for collaboration and synergies among these entities and between these entities and other projects falling under the UNIDO Country Programme. These potentials have not yet been harvested. There is presently rather limited collaboration due to the absence of a coordinated UNIDO strategy for investment and technology promotion on one hand and promoting green technology on the other.

It was also noted that the role of the Regional Office in monitoring and managing the centres/offices was not clear and needs to be reinforced and that the reporting guidelines were inadequate. There have been cases of overlapping activities carried out by the UNIDO Regional Office and Programmes managed at Headquarters and there is a need for better sharing of information, knowledge management and coordination. The fact that centres are managed by different branches and units and even divisions has not facilitated matters. This clearly reduces the efficiency of a centre such as the ICM and of the UNIDO Programme at large.

Coming back to the ITPOs, these are also mandated to work with technology transfer and we have today two existing and one emerging ITPO in China. Usually the ITPOs have a different modus operandi than ITCs, partly because they are often based in developed countries, while all the ITCs are based in a developing country. There are examples of ITCs and ITPOs interacting in the area of investment promotion, mainly ITCs tapping the ITPO expertise and network in this respect. The ICM has developed a good level of cooperation with ITPO Bahrain. It is often felt that ITCs add value by being present in ITPO-organized investment promotion forums.

It was also noted that there is no collaboration with the Chinese NCPC, although both institutions are working in the area of Cleaner Production. The NCPC has in-depth expertise and various instruments in the field of Cleaner Production as well as resource-efficient production and has been playing an active role in the development of Chinese Cleaner Production policies. There has been some cooperation with the UNIDO supported solar centre, including discussions about introducing low cost solar panels to low cost houses. There has also, as mentioned above, been cooperation with the South-South Centre (missions to Morocco and Afghanistan). This has led to a Moroccan trust fund project that will be managed by UNIDO Headquarters.

ICM is also active in the field of Nano technology which is an area where also other UNIDO centres are active, including the ICS in Trieste and ICAMT in India. There are also advanced plans for a UNIDO International Nano Technology Centre, with a focus on water purification, in Iran.

We thus find a rather limited use of UNIDO's resources and expertise in areas such as investment promotion, cleaner production and energy efficiency. Above all we find that there is limited coordination between UNIDO Centres working in similar areas. The ICM was not aware of the newly established recycling centre and an SPX visited by the evaluation mission did not know which UNIDO centres operate in China. In general many activities of the ICM are touching on areas that are dealt with other present and past UNIDO projects and institutions but there is no or little interaction.

The value added of UNIDO is not substantial at the present time and is mainly related to accessing the credibility the UN/UNIDO logo can bring and having access to the UNIDO expanded network and UNIDO tools and best practices. UNIDO is also appreciated because of it's neutrality but the neutrality can be questioned for the ICM. The technical backstopping from UNIDO has been limited. Moreover, representatives of the Chinese Government often argue that UNIDO's management is more costly (than UNDP's) because the project manager, based in Vienna, was far away and there is no national execution.

9
Sustainability

There is a very high degree of ownership of the host organization, the CBMA, which also plays an important role in managing the Centre and implementing activities. The Chinese Government is only marginally involved and feels it has less responsibility (than for instance in the case of UNDP projects) due to UNIDO's modality of execution.

The ICM has gradually been developing from a project into a national institution. It is not possible to assess the costs of ICM activities as there is no transparent accounting and many activities are sponsored by the CBMA. Neither is the cost recovery known but activities such as the implementation of training programmes are provided free of charge.

For the future, the likelihood of core Government budget funding for the ICM seems bleak but there seems to be opportunities to solicit funding for research projects or training programmes and to continue to draw on CBMA resources. There might be parallels with the way the Chinese National Cleaner Production Centre is operating. The UNIDO project supporting this Centre ended in 1998 and today the NCPC it is a self-sustaining centre with 25 staff members. It does not receive a Government core budget but can apply and also gets project funding, mainly for training programmes. As in the case of the ICM, the NCPC is hosted by a "Chinese Academy".

The strong institutional and technical back-up from the CBMA and the importance of the South-South cooperation agenda indicate a high level of sustainability despite the weaknesses of the Centre itself.

10
Impact

The development objectives of the ICM were to enhance the sustainability of the materials sector of industry, decrease its negative impact on the environment and strengthen the institutional and technological capacity for technology diffusion.

The ICM is regarded as a cross-sectoral input provider with a potential for cross-sectoral impact due to the nature of the building materials industry, being an input into infrastructural development, including industrial infrastructure. There is potential to add value in the area of low-cost housing, with a clear poverty reduction perspective. Evaluations of training programme indicate that the events have promoted increased awareness of technologies fostering sustainable development, including CO2 emission reductions in cement and concrete sector, but the actual or potential effects are not known.

Neither can it be assessed to what extent training programmes in the field of cleaner production lead to the adoption of new processes, technology or other changes and led to cleaner and more energy-efficient production.

In summary, today ICM is an established and operational ITC but making any assessment or predictions as to the effects of the ICM or its promoted activities is difficult. That is to what extent has or is the ICM likely to enhance technological performance of the materials industry in developing countries or countries with economies in transition and to what extent has technology been transferred? Equally important, there is no information as to what extent the ICM has promoted new investments into materials research or production or contributed to technological partnerships and capacity building. It should be stressed though that technological upgrading has often been an indirect objective and that many of the interventions have rather been of an awareness raising or training nature. The institutional and direct support to Vietnam is an exception.

11
Strengths and weaknesses

The perceived strengths and weaknesses of the ICM are presented below.

Strengths

- UNIDO support and guidance in the implementation of its activities
- Has access to a wide network of technology and information centres worldwide
- Continuous financial support from the Chinese government
- Strong technological and “in kind” support from the China Building Materials Academy
- Direct work in areas of industrial application and adaptation of technologies to local conditions
- Activities targeting the industrial sector as opposed to R&D institutions
- Features of capacity building and trainees are mainly coming from the industrial sector
- Funds go directly to activities and there are very low administrative costs
- The project has mobilized additional resources for development cooperation
- Promotes issues of resource (materials and energy) efficiency and cleaner production
- Has today developed into a sustainable organization implementing activities without any direct involvement of UNIDO.

Weaknesses

- UNIDO is not ensuring any quality control function
- There is no assurance that the technologies promoted are the best or most appropriate
- Limited accountability of the Centre to UNIDO

- UNIDO is exposed to risk due to the fact that many activities, with limited UNIDO oversight and management, are implemented under the UNIDO flag
- Biased promotion of Chinese technologies
- Insufficient focus on recipient country priority needs
- Small size in terms of structure and level of activities, thus estimated limited impact
- The international partnership network never materialized and opportunities for capacity development through a delegate's programme was not grasped
- Limited collaboration with UNIDO programmes and projects, including with other UNIDO centres/offices in China and with ITCs
- Lack of results orientation and no monitoring of the effects of the activities carried out.

12
Conclusions, recommendations and lessons learned

Conclusions

The project/ICM caters to the need for technology and investment for the materials industry in developing countries but has primarily been disseminating information on Chinese technology. It is in line with UNIDO's mandate to promote sustainable industrial development and technology diffusion. For increased relevance for developing countries more demand-orientation of the technologies promoted or capacities developed would be an advantage.

The activities implemented and results achieved by the ICM, so far, reflect the rather ambiguous role of the ICM as both an aid recipient and technical assistance agency and as a receiver and conveyor of technology. ICM has been and can be seen as a vehicle for both inward and outward technology promotion. The ICM mandate still needs to be defined, in relation to the CBMA and in the relation to UNIDO.

UNIDO has been supporting the establishment of the ICM with the provision of networking tools, contacts and instruments for capacity development. There has, however, been limited technical backstopping or quality control. The ICM has highly benefited from its attachment to the CBMA and many activities are carried out jointly. The ICM can be regarded as a cost effective instrument in that it implements a lot of activities with very limited project funding and only marginally tapping UNIDO resources. It is today an established institution with a high degree of ownership on behalf of the CBMA.

The value added by UNIDO has been limited the last few years and reduced to the accompanied credibility of a UNIDO project. The UNIDO logo and name provides ICM with a UN identity and this adds to its perceived credibility. However, as there is very little involvement of UNIDO and no screening of the technologies promoted, this puts UNIDO at risk. The UNIDO Brand is highly valued and UNIDO is regarded as a good "door-opener". The issue is rather for whom the door is being opened and for what purpose.

UNIDO has, on the other hand, not contributed in terms of technological back-stopping in the core area; building materials and there has been no quality control of technologies promoted. It could have offered technical expertise in areas of clean production or energy efficiency but this has not been solicited and linkages with relevant UNIDO projects have not been promoted. Cooperation between ICM and other UNIDO centres/offices/projects in China and elsewhere has been at a low level with the exception of the Chinese South-South Cooperation Centre, ICAMT and ITPO Bahrain.

ICM is becoming an active partner in the development of capacities and in disseminating technologies to the third world but does not need UNIDO to do this. Moreover, ICM is not

focusing on a UNIDO core area. Thus, the value added of the ICM to UNIDO and of UNIDO to ICM is limited.

There has been little monitoring of results or effects or of to what extent technology transfer to and from China has materialized and there has been limited results in South-South Cooperation. Around 150 international participants have been trained on new materials and cleaner production but no information on how imparted knowledge is being used. The demand orientation of the ICM activities could be higher for increased development effects.

The Project Document was optimistic about funds mobilization and the project was only partially funded. Progress reports have not been prepared and there has been no functional steering committee nor annual work plans. Opportunities to make use of UNIDO's technical expertise have been missed and UNIDO's substantial involvement was shallow. The backstopping of activities has rather been carried out by the host institution – the CBMA. As the project funding was also limited, most of the activities have been implemented in cooperation with the CBMA. The strategic direction, organizational structure and type of affiliation with the CBMA and with UNIDO still need to be defined.

Recommendations

We would also like to **repeat** some of the **recommendations** of the Evaluation of the Country Service Framework (CSF) (2005):

- *Field missions and technical backstopping of ITCs should be coordinated with relevant substantive branches at HQs*
- *Revisit the objectives of Medium Term Programme Framework, with the objectives of developing ICM interventions directly contributing.*
- *Improved governance and a better defined role of UNIDO.*

Recommendations to UNIDO

- *There is a need for a closer collaboration between UNIDO offices/centres/ projects in China*

There is a need to establish an investment and technology post at the Regional Office (RO) and Country Teams should be established for offices/centres/projects working in similar areas, such as technology promotion or green industry. There should be more exchange of information and the RO's role should be increased. Moreover, in view of the many UNIDO centres and offices operating in China, there is a need for a Delivering as One UNIDO Strategy. The development of such a strategy should encompass a review of the UNIDO's roles and responsibilities in relation to the present 13 supported centres/offices and the continued relevance of these centres.

- *The Regional Office should increase its management and monitoring function*

The roles of the RO, including management and monitoring, should be clearly spelled out in programme and project documents and addendums. Briefings and training programmes should be organized for project staff on administrative and procedural matters and on RBM.

- *The strategic orientation of UNIDO's programmes, in China, in the field of technology promotion should be stronger*

An investment and technology transfer strategy as well as a green industry network strategy should be developed and feed into an overall Delivering as One UNIDO Country Strategy.

- *There should be a more substantial role of the Investment and Technology Promotion Branch and of relevant technical branches in capacity building (technology transfer to developing countries) and in quality control*

The role of the Technology Promotion Branch should be complemented by support from other technical branches, for instance the Environment Branch.

- *The mandate of the South-South Centre should be expanded*

The South-South Centre should serve as central UNIDO/China hub for demand-based technology transfer and support the International Technology Centres managed by or affiliated with UNIDO. This would entail rewriting the mandate of the South-South Centre and endowing it with appropriate human and financial resources. It is important that there will be one staff member with wide knowledge of UNIDO's thematic priorities and programmes. An alternative would be have the investment and technology staff member at the Regional Office (proposed above), as a programme manager and liaison officer for the South-South Centre and other investment/technology oriented centres and offices in China.

Recommendations to UNIDO and MOST/CBMA/ICM

- *The ICM mandate, the relation to the CBMA and CBMA's role in the management of the centre should be clarified*

- *Develop a proposal for a second phase UNIDO project*

A second phase project should focus on the strengthening of ICM capacities to promote technology transfer and technology diffusion and incorporate a long-term strategy for the ICM and an exit strategy for UNIDO.

- *The ICM should improve its strategic planning and reporting*

There should be annual work programmes and annual reports based on results based management principles

- *More attention should be given to needs and priorities of "southern" partners*

The needs and demands of developing countries for capacity building and technology information and transfer should be put in the forefront. A fellows or delegates programme should be introduced with the objective of contributing to capacity building of southern partners.

- *The area of activities of ICM should be widened*

The field of activity should not be limited to cement, but also include other building materials, relevant for developing countries, such as glass and ceramics.

- *The ICM should be guided by an international technical committee with members being internationally recognized for their competence in the core areas of ICM*

This is necessary in order to ensure the neutral brokering role expected from an international centre.

Lessons learned

- Project documents for all UNIDO Offices/Centres need to clearly specify the role of Field Offices in managing and monitoring projects and FOs needs to be properly equipped to take on these roles. There is also a need for clear Guidelines about reporting obligations and information obligations towards the Field Office and UNIDO Headquarters.

- "Hands-off" management (of UNIDO) of an ITC exposes UNIDO to risks, not the least of sub-optimal technologies being promoted in the name of UNIDO.

Annex A
Terms of reference

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

Terms of Reference

Independent Evaluation of the UNIDO Projects

TF/TN/GLO/02/006
"Technology Transfer for Sustained Economic Growth and South-South Industrial Partnership- International Center for Materials Technology Promotion (ICM)"

I. BACKGROUND

In March 2008, the UNIDO Executive Board mandated the UNIDO Evaluation Group (OSL/EVA) to, as part of its 2008/2009 Work Programme, undertake a thematic evaluation of International Technology Centres. The UNIDO-International Centre for Materials Technology Promotion (ICM), Beijing has been selected as one of the centres to be covered by field missions. This independent evaluation of ICM will be undertaken as a free-standing project evaluation and, at the same time, serve as an input into the thematic evaluation.

The ICM was established at the initiative of UNIDO and the China Buildings Materials Academy (CBMA), with the support of the Government of the People's Republic of China and with the CBMA as the national counterpart and host institution. A first phase project, started in 2002 and is expected to be completed in 2009. The Government coordinating agency the China International Center for Economic and technical Exchanges (CICETE) under the Ministry of Foreign Trade & Economic Cooperation (MOFTEC), in cooperation with the Ministry of Science & Technology of the People's Republic of China (MOST). The main objectives of the ICM are the following:

- To enhance the sustainability of the materials sector through promotion, transfer and absorption of technological advances and innovations and encouraging new investments in this industrial sector of developing countries

- To decrease the negative impact of the materials sector of industry on the environment (pollution, gas emission, energy consumption etc.) through application of new technologies and innovations
- To facilitate the diffusion of new environmentally sound technologies and innovations in the materials sector in developing countries through building up/strengthening their institutional and technological capacity for technological diffusion and international technology transfer framework
- To foster South-South and North-South cooperation and partnerships, enabling the developing countries to benefit from the technological advances in materials research and production, taking into consideration the environment and energy-saving requirements

The projects TF/GLO/02/006 and TN/GLO/02/006 aim 1) at verifying the concept, mission objectives and functions of the ICM and lay the basis for its effective operation and implementation of its work programme 2) to strengthen the institutional and technical capacity, research and manufacturing capability in developing countries to foster the promotion of new materials technologies and innovations, enhance absorption capacity for industrial investments and promote South-South and North-South cooperation and 3) to further promote the ICM and mobilize the financial resources required for its operation. The centre has been in operation for 5 years and from part of the UNIDO International Technology Centre Network.

II. BUDGET INFORMATION

Project No.	Total Allotment US$	Total Expenditure US$	% Total Implemented
TF/GLO/02/006	*206,545.01*	*126,237.86*	*61.12%*
TN/GLO/02/006	*125,000.00*	*121,246.89*	*97%*

Source and date of information: Agresso as of 16 March 2009

III. PURPOSE

The purpose of the independent evaluation is to enable the Government of China, the CBMA and UNIDO to have up-to-date information with regards to the following:

(a) the relevance of the ICM and of the activities and programmes promoted
(b) the efficiency of implementation: quantity, quality, cost and utilization of resources, timeliness of UNIDO/CBMA/ICM inputs and activities, and ICM management and coordination, in Beijing and from UNIDO HQ
(c) the outputs produced and objectiveness achieved, as compared to those planned
(d) the impact and sustainability of results and benefits

It is envisaged that the evaluation will focus on the activities carried out and the results achieved, so far, by the project and by ICM. The evaluation will also seek to

draw lessons of wider application for the replication of the experience gained by this International Technology Centre for UNIDO's technology centre network and programme.

IV. METHODOLOGY

The evaluation is to be conducted in compliance with UNIDO evaluation policy and the Technical Cooperation Guidelines and attempt to determine, as systematically and objectively as possible, the relevance, efficiency, effectiveness impact and sustainability of the project. The evaluation will assess the achievements of the project against its objectives and outputs established in the project document, including re-examination of the relevance of the objectives and of the design. It will also try to identify factors that have facilitated or impeded the achievement of the objectives.

The evaluation will be carried out through analyses of various sources of information including desk analysis, survey data, interviews with various stakeholders such as national counterparts and ICM and UNIDO staff members and international partners and through the cross-validation of data.

The thorough analysis of relevant information includes a review of UNIDO and ICM policies and strategies, activities carried out, management mechanisms applied (in particular planning, monitoring and self assessment) and project specific framework conditions (in particular policy environment, counterpart capacities, related initiatives of the Government and the private sector).

While maintaining independence, the evaluation will be carried out based on a participatory approach, which seeks the views and assessments of all parties. It will address the following specific issues:

Ownership and relevance

The extent to which:

(i) The project is in line with the priorities and policies of the Chinese Government, the CBMA, Governments from participating countries and the institutional context
(ii) The private sector is using the ICM and finds its services to be in line with its needs.
(iii) The objectives of the project and the ICM concept are still valid
(iv) There is a UNIDO identity of the ICM and there are linkages to UNIDO HQ and to UNIDO thematic priorities
(v) The ICM mandate is relevant to developing countries

Efficiency of implementation

The extent to which:

(i) UNIDO and counterpart inputs have been provided as planned and were adequate to meet the requirements.

(ii) The quality of UNIDO inputs and services was as planned and timely
(iii) The ICM can be regarded as an instrument for development cooperation
(iv) The least costly resources and processes were used in order to achieve the objectives
(v) There was coordination with other projects and possible synergy effects
(vi) There is cooperation with the ITPO Beijing and ITPO Shanghai
(vi) The ICM complements efforts of other national or international institutions/organizations, public as well as private, involved in International Materials Technology Promotion

Effectiveness

The extent to which:

(i) The outputs and objectives were achieved or are likely to be achieved
(ii) The Centre contributes to the promotion, transfer, commercialization, adoption and diffusion of new technologies and innovations and particularly in the materials sector of industry
(iii) The ICM has been functioning as a springboard for new technologies and innovations and been able to bridge the gap between the market demand, industry needs for new technology and the existing technology base.
(iv) The ICM has contributed to reduced pollution in the materials sector of industry
(v) The ICM has strengthened the existing institutional framework for technology transfer at the country level and created new mechanisms at the global level.
(vi) The ICM has strengthened the institutional and technical capacity, research and manufacturing capability in developing countries to foster the promotion of new materials technology and innovations, enhance absorption capacity for industrial investments and promote South-South and North-South cooperation.
(vii) ICM has the institutional set-up, management resources and mechanisms necessary to fulfill its mandate.
(viii) There is a broader involvement of industry in the ICM programme.

Impact and sustainability

(i) Assessment of actual or potential enhancement in the technological performance in materials sector of industry, in developing countries
(ii) Identification of actual or potential long term developmental changes or benefits (economic, environmental, social and developmental) that have occurred or are likely to occur as a result of the project
(iii) Actual and potential benefits in terms of achieving development goals
(iv) The extent to which the ICM has contributed to environmental protection, energy savings and reduced industrial pollution
(v) The mobilization of sufficient funding and the prospects for institutional sustainability of the ICM

Project coordination and management

The extent to which:

(i) The national management and overall field coordination mechanisms of the project have been efficient and effective.
(ii) The administrative status of the SITPC is conducive to its role and function
(iii) The UNIDO HQ and field-based management, coordination, quality control and technical inputs have been efficient and effective.
(iv) Monitoring and self-evaluation were carried out effectively, based on indicators for outputs and objectives and there was monitoring of promoted investment projects
(v) Synergy benefits can be found in relation to other UNIDO International Technology Centers, South/South cooperation Centres, ITPOs, UNIDO tools and platforms as well as with interventions of UNIDO's technical branches.

The future

(i) Assessment on the future role of the SITPC
(ii) To what extent can the SITPC contribute to achieving UNIDO's strategic objectives and be part of "delivering as One UNIDO"
(iii) Identification of lessons learned, benchmarks and good practices, to guide the development of all international technology centres

V. EVALUATION TEAM

The evaluation team will be composed of the following:

- One representative of UNIDO (Director Evaluation Group)
- One independent international evaluation consultant
- One national evaluation consultant

The UNIDO Evaluation Group will be responsible for the quality control of the evaluation process and of the report. It will provide inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations and especially evaluations of ITPOs and International Technology Centres. The consultants will be contracted by UNIDO. The tasks of the team members are specified in the job descriptions attached to these Terms of References.

The members of the evaluation team should not have been directly involved in the design and/or implementation of the projects. The CICETE, the CBMA, the ICM as well as the UNIDO Regional Office in Beijing and the Investment and Technology Promotion Branch at UNIDO Headquarters will provide support to the evaluation team.

VI. TIMING

The evaluation is scheduled to take place in the period April to June 2009. The field mission for the evaluation is planned for 4 to 8 May 2009.

The draft report will be available within six weeks of completion of the field mission and will be submitted to the Government of China, the CBMA, the ICM, the UNIDO Regional Office in China and UNIDO HQ.

VII. REPORTING

The evaluation team will present its preliminary findings to representatives of the CICETE, the CBMA, the ICM, the UNIDO Regional Office in Beijing at the end of the field mission and at UNIDO Headquarters. A draft evaluation report will be circulated for comments. The reporting language will be English.

Review of the Draft Report: The draft report will be shared with the Government, the CICETE, the CBMA, the ICM, the UNIDO Regional Office in Beijing, the Project Manager and other UNIDO staff members for comments and in order to enable feedback on any factual errors. This consultation also seeks agreement on the findings and recommendations. The evaluators will take comments into consideration when preparing the final version of the report.

Quality Assessment of the Evaluation Report: All UNIDO evaluations are subject to quality assessments by UNIDO Evaluation Group. These apply evaluation quality assessment criteria and are used as a tool for providing structured feedback. The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality (Annex 1).

Annex B
List of persons met

Chinese Government

Ministry of Science and Technology:
Mr. WU Chunhui, clerk
Ms. ZHU Weili, clerk, Division of Materials

Ministry of Commerce:
Mr. SHEN Xiaokai, Deputy Division Director, Department of International Trade & Economic Affairs
Ms. XU Lan, Third Secretary

Chinese industry and academia

Chinese Research Academy of Environmental Sciences/*China National Cleaner Production Center:*
Prof. DUAN Ning, Deputy President, Chinese Research Academy of Environmental Sciences & Director, China National Cleaner Production Center
Mr. ZHOU Qi, clerk

Mr. LIU Guiping, Vice General Manager, *Beijing New Building Material (Group) Co., Ltd.*

Mr. FU Zhaoyang, Director, *Xi'an Productivity Promotion Center*

Ms. Marie FAN, Environment Manager, *Lafarge*, Public Affairs & Business Development, China Region

China Building Materials Academy (CBMA), Beijing:
Prof. SUI Tongbo, Vice President
Prof. JI Zhijiang, State Key Laboratory of Green Building Materials, Eco-building Materials Association, Beijing
Prof. BAO Yiwang, China Building Material Test & Certification Center R & D
Prof. SHEN Rongxi, International Center for Materials Technology Promotion
Mr. WANG Yehua, Vice Chief Engineer and Process Engineer, China Triumph International Engineering Co.
Mr. TAN Li, Director of Foreign Affairs Office, Senior Engineer

UNIDO

UNIDO Field Office, Beijing
Mr. Alessandro AMADIO, Officer-in-Charge
Mr. Jian MA, Programme Coordinator

International Centre for Materials Technology Promotion (ICM), Beijing
Mr. SUI Tongbo, Director, ICM, Beijing (also listed under CBMA)

Ms. LI Juan, engineer
Ms. Chunying ZHOU, clerk, ICM, Beijing
Ms. Jie HAN, clerk, ICM, Beijing

Investment and Technology Promotion Office (ITPO), Beijing
Mr. HU Yuandong, Head, ITPO, Beijing
Mr. Zhihui DENG, vice director, ITPO, Beijing
Mr. Dimitri DE BOER, Team Leader, EU Programs

Centre for South-South Industrial Cooperation, Beijing
Mr. TAN Weiwen, Director

International Institute for Monitoring and Management of Environment and Resources, Beijing
Mr. LI Jian Jun, Director, (also Chairman of Global Resource Regenerate Association, Beijing)

Industrial Subcontracting and Partnership Exchange (SPX) Xi'an
Mr. LI Guangxian, Executive Director
Mr. JIA Kai, Deputy Director/Sen. Engineer

UNIDO Headquarters
Mr. Sajjad AJMAL, UNIDO Representative and Head of UNIDO Field Office in Beijing
Ms. Fatou HAIDARA, Director, Special Programmes Group
Ms. LIANG Dan, Director, Investment and Technology Promotion Branch (ITP)
Mr. Yuri AKHVLEDIANI, Unit Chief, ITPO Coordination Unit, ITP
Mr. Masato TSUKIJI, Unit Chief, Technology Promotion Unit (TPU), ITP
Mr. Vladimir KOZHARNOVICH, Sen. Ind. Development Officer, TPU/ITP

Annex C
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