



PROJECT IDENTIFICATION FORM (PIF) ¹

PROJECT TYPE: Full-sized Project

TYPE OF TRUST FUND: GEF Trust Fund

PART I: PROJECT IDENTIFICATION

Project Title:	POPs and Chemical Pollution Solutions through Area-Based- Ecoeffective- Management		
Country(ies):	People's Republic of China	GEF Project ID: ²	4854
GEF Agency(ies):	UNIDO (select) (select)	GEF Agency Project ID:	120061
Other Executing Partner(s):	Ministry of Environmental Protection (MEP)	Submission Date:	2013-04-04
GEF Focal Area (s):	Persistent Organic Pollutants	Project Duration (Months)	60
Name of parent program (if applicable): ➤ For SFM/REDD+ <input type="checkbox"/>		Agency Fee (\$):	570,000

A. FOCAL AREA STRATEGY FRAMEWORK³:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
(select) CHEM-1	Outcome 1.1 Production and use of controlled POPs chemicals phase out	Output 1.1.1: Countries receiving GEF support to phase out the production or use of controlled POPs (other than new POPs)	GEFTF	1,290,000	5,190,000
(select) CHEM-1	Outcome 1.3: POPs releases to the environment reduced	Output 1.3.1: Action plans addressing unintentionally produced POPs under development and implementation	GEFTF	4,090,000	16,390,000
(select) CHEM-1	Outcome 1.5: Country capacity built to effectively manage mercury in priority sectors	Output 1.5.1: Countries receiving GEF support for mercury management and reduction on a pilot basis	GEFTF	370,000	1,420,000
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)			(select)		
(select) (select)	Others		(select)		
Sub-Total				5,750,000	23,000,000
Project Management Cost ⁴			GEFTF	250,000	1,000,000
Total Project Cost				6,000,000	24,000,000

B. PROJECT FRAMEWORK

¹ It is very important to consult the PIF preparation guidelines when completing this template.

² Project ID number will be assigned by GEFSEC.

³ Refer to the reference attached on the [Focal Area Results Framework](#) when filling up the table in item A.

⁴ GEF will finance management cost that is solely linked to GEF financing of the project. PMC should be charged proportionately to focal areas based on focal area project grant amount.

Project Objective: The project will generate and demonstrate an area-based chemical management replicable methodology based on a Cradle to Cradle [C2C]* management approach to systematically eliminate POPs and SAICM concerned chemical wastes from the total life cycles of products and industrial production systems. The two demonstration areas are the municipalities areas of Yiyang, Hunan Province and Tianjin, Northern Region PR China.

The project will catalyze the mainstreaming of C2C principles to counter-balance the dominant 'take,make,waste' industrial model and complement national and regional Circular Economy and Cleaner Production programs so that waste management investments can be channeled more effectively to curb increasing chemical negative impact on the environment and human health. While PR China is the location of the demonstration sites, the project addresses a global challenge that the take-up and replication of the methodology developed by this project, not only in China but in other developing economies and economies in transition, will have significant global environmental benefit [GEB].

C2C refers to bio-mimic production processes where products are developed for closed loop systems in which every output ingredient is safe and beneficial – either to biodegrade naturally and restore the soil [called a biological nutrient], or to be fully recycled into high quality materials for subsequent product generations [called a technical nutrient].

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Cofinancing (\$)
1.Introduction and incorporation of the area based C2C approach as a component of the Yiyang and Tianjin Municipal Level 12th 5-Year Plans for local 'green' industrial support initiatives	TA	Incorporation of C2C principles into green initiatives, plans, programmes and enhancement of rational decision making by Local Government	1.1 Training, knowledge exchange and delivery of experience on C2C promotion and sound chemical management from developed countries implemented. 1.2 Awareness raising on the C2C concept including access to experience and lessons gained intrernationally undertaken. 1.3 C2C strategy integrated into action plans at local level for the elimination of toxic chemicals.	GEFTF	900,000	3,600,000

<p>2. Creation of public-private-partnership institutional framework model to encourage knowledge transfer and investment promotion relevant to C2C and to ensure the related capacity building.</p>	<p>TA</p>	<p>Establishment of institutional framework and functioning incorporating Local Government and local enterprises technically supported by a network of international, national and local institutional and individual expertise.</p>	<p>2.1 Institutional capacity strengthened at Local Government level on C2C planning and actions. 2.2 C2C accreditation and certification model established. 2.3 Capacity strengthened in local research institutions [Yiyang and Tianjin] for the application of C2C concept and approach. 2.4 C2C awareness raised in industrial sectors in demonstration area and pilot to include selection of enterprises impacting local surface and ground water estuaries impacting larger transboundary water bodies. 2.5 C2C environmental management systems [favouring eco-design, green production and eco remediation], measurement indicators, environmental performance reporting systems, operation and evaluation systems developed and applied.</p>	<p>GEFTF</p>	<p>1,000,000</p>	<p>4,000,000</p>
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3. Pilot demonstrations at enterprise level to showcase C2C practical application to encourage wider investment in C2C solutions and access to appropriate technologies	Inv	Selection of 3 to 5 enterprises in each demonstration area and pilot application of C2C model to design out toxic chemicals from the total life cycle of the materials and production systems employed.	3.1 Sources of toxic chemicals identified, analysed and quantified through the total life cycle of materials sourcing, production and disposal. 3.2 Technical and technological strategies and methodologies to reduce or eliminate toxic chemicals through alternatives, substitutions, technologies, sound chemical management, etc. developed. 3.3 Technical and technological strategies and methodologies implemented in cooperation with the pilot entrepreneur. 3.4 C2C management system on a pilot basis certified. 3.5 Study completed on measures to support market access for C2C certified products. 3.6 Results of C2C pilot case studies and experience disseminated through publication and multi media channels.	GEFTF	2,950,000	11,800,000
4. Quantitative measurement of results of C2C chemical reduction measures in material, financial and commercial terms in pilot enterprises including monitoring and assessment of changes in impact on receiving ecosystems.	TA	Documentation of quantitative results of application of C2C approach to chemical management including case studies of changes adopted, new procedures, materials, energy, innovations and technologies. The financial and commercial aspects will be documented as well as the environmental monitoring results and interpretation.	4.1 Monitoring framework [Financial, Commercial and Environmental] and programme established. 4.2 Capacity of local technical institutions to acquire and interpret monitoring data built. 4.3 Replication of C2C model promoted beyond the demonstration municipalities.	GEFTF	600,000	2,400,000
5. Dissemination plan	TA	Planning and implementation of a dissemination strategy that will communicate to a wider global audience. C2C approach methodology documented and made available to wider audience	5.1 Dissemination tools and channels established 5.2 Dissemination program planned and delivered to global audience	GEFTF	200,000	1,100,000

6. Project monitoring and evaluation	(select)	Assessment of the impact of project activities including lessons learned	6.1 Impact indicators designed and applied 6.2 Project implementation and impacts evaluated	GEFTF	100,000	100,000
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
	(select)			(select)		
Sub-Total					5,750,000	23,000,000
Project Management Cost ⁵				(select)	250,000	1,000,000
Total Project Costs					6,000,000	24,000,000

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Cofinancing	Name of Cofinancier	Type of Cofinancing	Amount (\$)
GEF Agency	UNIDO	Grant	100,000
National Government	FECO/MEP	Grant	500,000
Local Government	Municipalities of Yiyang and Tianjin	Grant	5,900,000
Local Government	Municipalities of Yiyang and Tianjin	In-kind	6,500,000
Private Sector	Project Pilot Enterprises in Yiyang and Tianjin	In-kind	11,000,000
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
(select)		(select)	
Total Cofinancing			24,000,000

D. GEF/LDCF/SCCF/NPIF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY¹

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (a)	Agency Fee (b) ²	Total c=a+b
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)	(select)				0
(select)	(select)(select)	(select)				0
(select)	(select)(select)	(select)				0
(select)	(select)(select)	(select)				0
(select)	(select)(select)	(select)				0
(select)	(select)(select)	(select)				0
(select)	(select)(select)	(select)				0
Total Grant Resources				0	0	0

¹ In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table

² Please indicate fees related to this project.

⁵ Same as footnote #3.

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1.1 the [GEF focal area/LDCF/SCCF](#) strategies /[NPIF Initiative](#):

1. The Project focal area is Persistent Organic Pollutants [POPs] and specifically GEF 5 CHEM – Objective No 1, outcomes 1.1 Production and use of controlled POPs chemicals phase out; 1.3 POPs releases to the environment reduced; 1.5 Country capacity built to effectively manage mercury in priority sectors.
2. It is submitted that the application of a C2C methodology is to chemical management [specifically POPs and SAICM concerned chemicals] is consistent with GEF CHEM 5.
3. The authors of the publication ‘Cradle to Cradle: Remaking the way we make things’ define the first step in a C2C strategy as a ‘design filter’ to remove bio-accumulative chemicals from production and consumption cycles to include POPs, PVC, Cadmium Lead and Mercury. William McDonough & Michael Braungart.
4. The Strategic Approach to International Chemicals Management [SAICM DEC 2005] endorses the C2C management approach as follows:
5. Para 69- “Establish and implement national action plans with respect to waste minimization and waste disposal, taking into consideration relevant international agreements and by using the cradle-to-cradle and cradle-to-grave approaches throughout the total life cycle of products and production systems by building capacity at local level and by piloting the application in selected industrial enterprises in the two demonstration areas”.

A.1.2. For projects funded from LDCF/SCCF: the LDCF/SCCF eligibility criteria and priorities:

6. n/a

A.1.3 For projects funded from NPIF, relevant eligibility criteria and priorities of the Fund:

7. n/a

- A.2. national strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NIPs, PRSPs, NPFE, etc.:
8. The project is consistent with PR China national strategy and is embedded in the China NIP where the Executive Summary [Page 1] states that “by combining actions for [Stockholm] Convention implementation with the objectives of promoting the optimization and upgrading of industrial structure and constructing an resource-saving and environment-friendly society, set out in the Outline of the Eleventh Five-Year Plan for National Economic and Social Development (hereinafter referred to as the Outline of National Eleventh Five-Year Plan), adjust product and industrial structures, promote cleaner production, develop a cyclic economy, boost effective utilization of resources, create new economic growth openings and increase employment opportunities, improve the environment awareness of the whole society and the level of public participation, and ultimately promote sustainable development.”
9. This project is endorsed as a priority in their development plans by the National Government and is consistent with an undertaking in the PR China NIP that the Government will improve the policies and regulations designed to fulfill the objectives of Convention implementation, strengthen institutional capacity building, adopt relevant strategies and actions, and carry out Convention implementation activities in stages and by region and industry.
10. The Project is consistent national strategies, policies, plans, legislation, institutional planning and public expenditure: Further details are provided in Appendix 1 and special attention is drawn to Appendix 3 which details elements of the National Eco Civilization Programme much of which is consistent with the C2C approach.

B. PROJECT OVERVIEW:

B.1. Describe the baseline project and the problem that it seeks to address:

BASELINE PROJECT

11. The current waste management policy in PR China [and generally in other developing countries] supports a 'take, make, waste' industrial model and in response the 'Circular Economy' policy in China tries to deal with the unsustainable waste volumes through the promotion of 'reduce, reuse, recycle' measures, developing a 'waste economy' and finding better ways to use and dispose of the waste. The 'take, make, waste' industrial model is globally dominant and especially in developing economies and economies in transition. Significantly in China the un-sustainability of this model is increasingly realized and that the 'circular economy' response is simply not enough.
12. Welcome as these programs are, they aim to improve, but not change, the current industrial economic model and the associated mindset by typically targeting resource savings and waste reduction. These programs are inherently self-limiting because there comes a point when all the refining and improvements are made and still there are environmental inefficiencies which can also be quantified economically and financially.
13. The 'problem', which this project seeks to address, is the dominant assumption and mindset that waste is inevitable, that waste is the 'problem' and therefore has to be 'managed'.
14. The alternative strategy introduced by this project at demonstration level, places emphasis on the total-life-cycle of industrial products and production systems and not just on waste residue. The proposition is that by rethinking and redesigning the way things are made and by using materials more effectively, and by using all materials in a continuous cycle, we can eliminate wastes – and in this case chemical wastes- all along the total life cycle.
Using this approach [shorthand as Cradle-to-Cradle] the project will develop a replicable methodology that focuses on the elimination of POPs and harmful chemicals from the total life cycle of products manufactured and production systems in the demonstration areas.
It is submitted that the application of the C2C approach to chemical management is completely consistent with UNIDO's core comparative advantage of promoting sustainable industrial design and best practice. One of the key success indicators of the applied C2C approach to chemical management will be an anticipated reduced impact on the supporting ecosystem. This impact can be monitored and measured through systematic sampling and testing of specified environmental parameters.
15. A critique of the shortcomings of the PR China environmental policies, which are generally and globally applicable to other economies, include:
 - Major investment associated with current environmental programs, initiatives and measures are engineering led, profit driven with an underlying assumption that final wastes are toxic chemical free and safe for re-use in production and consumption cycles. In practice there is uncertainty about the chemical toxicity and weakening public confidence in the safety of recycled waste materials.
 - Current practices encourage the generation of large volumes of waste of uncertain safety leaving the only viable disposal options as incineration and landfill with the associated ecological consequences. The loss of this material, which cannot be reintegrated into the production cycle, represents not only a significant economic loss but also an unsustainable burden on ecosystems - a consequent loss to the economy and a depletion of environmental resources.
 - The concept of 'green strategies' – about which much is spoken and aspired to - is generally misunderstood. For example, during the preparation of this project discussions were held with enterprises in Yiyang that were manufacturing solar energy captors. These enterprises declared themselves as leading 'green enterprises' because the product they manufactured was alternative 'green' energy. The companies were blind to the presence and implications of toxic heavy metals in the production process.
 - There is a lack of appreciation of the specifics, capacity and vulnerabilities of the local ecosystem and its symbiotic relationship with local industrial activity. An area based industrial development model is advocated by this project as a basis to achieve environmental- economic equilibrium, which takes account of the supporting ecosystem's capacity to absorb and regenerate.

•The environmental programs, investments, initiatives and measures are invariably weighted towards large industry and generally ignore the medium and smaller enterprises that cumulatively present a significant environmental risk. This small and medium enterprise [SME] sector lacks the capacity and resources for environmental management and is dependent on external technical support and networks.

•By their own definition the baseline environmental programs aim to improve, but not change, the current industrial economic model and the associated mindset by typically targeting resource savings and waste reduction. These programs are inherently self-limiting because there comes a point when all the refining and improvements are made and still there are environmental inefficiencies which can also be quantified economically and ecologically.

**[A recent illustration of the weakening of public confidence in the control of wastes steams is the example of the use of waste leather to produce industrial gelatin which subsequently ended up as pharmaceutical gelatin encapsulation where significant levels of chromium, far exceeding food safety standards, was detected. This resulted in the withdrawal of products from the market the closure of manufacturing plants and erosion of public confidence.] Ref China Daily 17.04.2012 Chinadaily.com.cn*

16. The PR China 12th Five Year Plan 2011 -2015, and specifically the environmental subset of the plan, is seeking around RMB3.4 trillion of investment to protect the environment within the next 5 years. While a significant portion of this budget is earmarked for environmental infrastructure, nevertheless considerable financial resources are available for industrial development support at local government level and it is these financial resources that this project seeks to mobilize as co-financing for this initiative.
17. Each provincial, municipal, district and county authority is required to generate and implement a local version of the Central Government Five Year Plan and to fund the plan accordingly. The local version of the Plan will have many components including incentives and direct technical support to industry within the local authority area. These supports to industry are channeled through the local authority bureaus of Environmental Protection, Development and Reform, and Science and Technology.
18. The Environmental Protection Bureaus [EPB] in Yiyang and Tianjin municipalities have committed to earmarking and diverting Industrial Support funds to co-finance this project. Currently there are Circular Economy and Green Industrial Development initiatives being pursued in the two cities and these are embedded in the Municipal 5 Year Plans. Both municipalities have stated that finance can be allocated to the project through these committed budgets and USD 12,400,000 in project funding between both cities will be formally dedicated as baseline funding for this GEF project during the PPG phase.
19. This project will introduce the cradle-to-cradle [C2C] strategy to China in a pilot and demonstrable way to provide a new vision and a practical methodology for total product and production process life cycle management and in so doing help to redirect and reorient current investment towards the elimination of toxic chemicals in product and production cycles.
20. The project 'canvas' is the industrial economy in the two demonstration municipalities where exemplary total production cycles, from raw materials to process inputs to finished goods, will be isolated and critically subjected to fundamental rethinking and redesign and where soft solutions and hard technology innovations will emerge. The project restricts the focus to chemical management and specifically the elimination of POPs, heavy metals and SAICM concerned chemicals from industrial production cycles by applying the 7 principles of the C2C approach, namely: : [1] reduce material intensity, [2] reduce energy intensity, [3] reduce releases of toxic substances, [4] enhance recyclability, [5] maximize use of renewables, [6] extend product durability and [7] increase maintenance service intensity.
21. The project has selected two demonstration areas namely the Municipalities of Yiyang [Hunan Province] and Tianjin [Tianjin] as representative examples of many similar municipalities throughout China and covering a spectrum of challenges that will echo in many developing economies. Yiyang is a prefecture-level city on the Zi River, a tributary to the South Dongting wetlands and the Yangtze River, in Hunan Province with a population of 4.8 million while Tianjin is the third largest city in China with a population of 12.8 million and is an important industrial centre in north China facing the Gulf of Bohia and the Yellow Sea. **APPENDIX 2** provides an overview of the Project Demonstration Areas of Yi yang and Tianjin. Detailed empirical data will be generated during the **Project Preparation Phase**.

- B. 2. [incremental /Additional cost reasoning](#): describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated [global environmental benefits](#) (GEF Trust Fund/NPIF) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project:
22. This project will introduce the cradle-to-cradle [C2C] strategy to China in a pilot and demonstrable way to provide a new vision and a practical methodology for total product and production process life cycle management and in so doing help to redirect and reorient current investment towards the elimination of toxic chemicals in product and production cycles.
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 25. The project will develop and demonstrate a methodology that has the potential to reorient PR China national investment in waste management [in this case chemical waste] to achieve a more effective and eco efficient outcome. The C2C approach is complementary and does not seek to replace or compete with current ongoing nationally sponsored chemical waste management activities in China i.e. the baseline/ ground laying activities. Rather it is focused on redirecting the current significant investments at national, provincial and municipal level to more effective and sustainable outcomes through incremental activity for which GEF funding is requested. The demonstration municipalities will co-finance the incremental activities from already committed baseline / ground laying funds
 26. The incremental activities for which funding from the GEF is requested, will demonstrate a way to go beyond the baseline and to move from managing liabilities and hazards toward designing effective, ecologically intelligent materials, products and systems.
 27. The specific incremental activities can be indicatively outlined as the application of a C2C vision using refined tools or a methodology that typically contains the following elements:
 - Materials Assessment Protocol
 - C2C Life Cycle Analysis
 - Technological and Systems Response
 28. This framework will be developed in detail on foot of the empirical situation in the demonstration municipalities during the Project Preparation Phase.
 29. The Material Assessment Protocol would focus on the life cycle of chemicals in products and processes using risk criteria for human health and ecological health. Indicatively an assessment protocol could include the following parameters:

Human Health Criteria	Ecological Health Criteria
Carcinogenicity	Algae Toxicity
Teratogenicity	Bioaccumulation

Reproductive Toxicity	Climatic Relevance
Mutagenicity	Content of Halogenated Organic Compounds
Endocrine Disruption	Daphnia Toxicity
Acute Toxicity	Fish Toxicity
Chronic Toxicity	Heavy Metal Content
Irritation of Skin/Mucous Membranes	Persistence/Biodegradation
Sensitization	Other (water danger list, toxicity to soil organisms, etc.)
Other Relevant Data (e.g., skin penetration potential, flammability, etc.)	

30. The C2C Life Cycle Analysis framework incorporates the principles of Green Engineering that will be used as a guidance in this project to develop a practical internationally replicable methodology. The Twelve Principles of Green Engineering can be viewed as a toolbox of approaches to be used systematically to optimize a system or its components. As is the case in any complex multi-parameter system, there will be the need to contextually understand when to balance one principle or collection of principles versus another. Often an understanding of this type is not obvious or transparent and requires asking questions that apply locally and across the life-cycle. Applied thoughtfully, however, these principles can be useful tools for turning vision into reality.

- **Inherent Rather Than Circumstantial**
Designers need to strive to ensure that all materials and energy inputs and outputs are as inherently nonhazardous as possible.
- **Prevention Instead of Treatment**
It is better to prevent waste than to treat or clean up waste after it is formed.
- **Design for Separation**
Separation and purification operations should be designed to minimize energy consumption and materials use.
- **Maximize Efficiency**
Products, processes, and systems should be designed to maximize mass, energy, space, and time efficiency.
- **Output-Pulled Versus Input-Pushed**
Products, processes, and systems should be "output pulled" rather than "input pushed" through the use of energy and materials.
- **Conserve Complexity**
Embedded entropy and complexity must be viewed as an investment when making design choices on recycle, reuse, or beneficial disposition.
- **Durability Rather Than Immortality**
Targeted durability, not immortality, should be a design goal.
- **Meet Need, Minimize Excess**
Design for unnecessary capacity or capability (e.g., "one size fits all") solutions should be considered a design flaw.
- **Minimize Material Diversity**
Material diversity in multicomponent products should be minimized to promote disassembly and value retention.
- **Integrate Material and Energy Flows**
Design of products, processes, and systems must include integration and interconnectivity with available energy and materials flows.
- **Design for Commercial "Afterlife"**
Products, processes, and systems should be designed for performance in a commercial "afterlife."
- **Renewable Rather Than Depleting**
Material and energy inputs should be renewable rather than depleting

31. Technological and Systems Response is the C2C design that emerges [The butterfly from the chrysalis] to mimic nature's design. Human systems designed to operate by the same rules that govern the natural world can approach the effectiveness of the earth's diverse living systems, in which there is no waste at all. This response will emerge through the knowledge base created by the project through institutional capacity building linking the academic and technical resource network to generate innovative thinking and technological solutions.

32. The realization that more is required than the current waste management model is reflected in the recent PR China 18th Congress Report where the incoming General Secretary of the Central Committee of the Communist Party Hu Jintao, underscored the national commitment “of conserving resources and protecting the environment as well as the principle of giving high priority to conserving resources, protecting the environment and promoting its natural restoration, and strive for green, circular and low-carbon development. We should preserve our geographical space and improve our industrial structure, way of production and way of life in the interest of conserving resources and protecting the environment. We should address the root cause of deterioration of the ecological environment so as to reverse this trend, create a sound working and living environment for the people, and contribute our share to global ecological security.”
33. The fundamental challenge is to better spend the current investment in chemical waste management and the advantages of the C2C approach need to be demonstrated in order to gain acceptance and traction as a complementary strategy [and ultimately alternative strategy] to the current ‘take, make, waste’ approach.
34. The C2C methodology demonstrated in Yiyang and Tianjin will convince public authorities and enterprises that innovative environmental management is a two sided gain by showing and promulgating results that can be quantified in financial efficient terms and commercial advantage, as well as environmental and health benefits. At the heart of the C2C approach is mindset change that stimulates innovation and rethinking that can have advantages well beyond the immediate chemical management objective.
35. While PR China is the initial demonstration site , specifically Yiyang and Tianjin, the take-up of the C2C methodology in developing countries provides a template to reorient existing national budgets for industrial support and environmental protection to directly achieve better value for money, a better environmental and health outcome, and indirectly a stimulus for fresh thinking and innovation that can have far reaching positive outcomes.

PROJECT COMPONENT 1: Introduction and incorporation of the area based C2C approach as a component of the Yiyang and Tianjin Municipal Level 12th 5-Year Plans for local ‘green’ industrial support initiatives.

36. This component takes advantage of the environmental investment commitment of the Yiyang and Tianjin municipalities to implement national environmental policy through municipal plans and funding. It is stressed that the environmental investment commitment may straddle several municipal ‘bureaus’ [i.e. departments] beyond the Environmental Protection Bureau [EPB] to include the Municipal Development and Reform Commission, Science and Technology Bureau and the Bureau of Industrial Development. (The Municipal Development and Reform Commission is the senior local government bureau and is analogous at local level to the National Development and Reform Commission (NDRC) which is a department of the State Council. NDRC is macro-economic regulatory department, with a mandate to develop national economic strategies, long term economic plans and annual plans, and to report on the national economy and social development to the National People's Congress. NDRC has fourteen major areas of responsibility, one of which is China's sustainable development strategy, which includes cleaner production and pollution prevention. The important aspects of NDRC's mandate and responsibilities in the context of cleaner production/pollution prevention as described in NDRC's website are: (a) advancement of China's sustainable development strategy; (b) research and preparation of drafts into the comprehensive utilization and conservation of resources; (c) coordinate the establishment of a plan for rebuilding China's ecology; (d) policy creation for the comprehensive utilization and conservation of resources; (e) coordinate vital issues related to the rebuilding of the ecology and the comprehensive utilization and conservation of resources; (f) coordination of the environmental protection industry.
37. The project will work with, build capacity and encourage the planning executives in both municipalities to rethink current strategies and approaches and to integrate C2C principles into the municipal plans and to identify and secure project co-financing from existing budget lines.

PROJECT COMPONENT 2: Creation of public-private-partnership institutional framework model to encourage knowledge transfer and investment promotion relevant to C2C and to ensure the related capacity building.

38. This component will create a knowledge environment incorporating local authorities with local academic institutions supported by an international and national network of institutions and experts. Politecnico di Milano [Italy] will be a key stakeholder in this project acting as a hub for 23 other Universities throughout Europe and where multi disciplinary expertise will be drawn for to create specific specialist teams coupling with the academic institution in the demonstration area. [Ref: B.5 below] The knowledge environment created will facilitate institutional capacity building, development of pilot C2C accreditation and certification models, awareness raising and management systems development. The component will also bring together the project stakeholders to encourage joint and cooperative actions leading to public-private cooperation and partnerships. Strengthening of capacity for local management will be a core element of the project including training and awareness raising in environmental management, the relationship between efficient [C2C] industrial activity and environmental performance, the fragility of environmental and ecological thresholds, measurement of economic and environmental parameters, information management and statistics and all structural imperatives to underpin sustainable industry strategies.

PROJECT COMPONENT 3: Pilot demonstrations at enterprise level to showcase C2C practical application to encourage wider investment in C2C solutions and access to appropriate technologies.

39. Using dedicated expertise drawn from the stakeholders, including the international network, this component will comprehensively audit the selected enterprises product and production life cycles with a view to devising solutions and strategies consistent with C2C principles to eliminate toxic chemicals throughout the life cycle chains. The C2C design protocol calls for materials to be defined as technical or biological nutrients that are safe and healthy for humans and the environment. Working with the product manufacturer and suppliers, each product formulation is mapped out and broken down into its chemical constituents. A company's entire supply chain is mapped out identifying every chemical in the product above 0.01% (or 100ppm), These chemicals are then evaluated against 19 criteria for human and environmental health and given a toxicity rating of Red, Yellow, or Green. The toxicity of every material that goes INTO a product is examined and a path to help manufacturers improve product and process design is developed.

PROJECT COMPONENT 4: Measurement of results of C2C chemical reduction measures in pilot enterprise level in financial and commercial terms pilot ; monitoring and assessment of changes in impact on receiving ecosystems.

40. This component will link the effectiveness of C2C applied strategies at the pilot enterprise level to financial and commercial benefit and measure the changes of impact on supporting ecosystems through the monitoring of specified environmental parameters. The project activities are not sectorally driven but are focused on the control and elimination of chemical emissions within a geographically defined municipal authority area where all emission sources regardless of sector can be identified and mitigation strategies defined.

PROJECT COMPONENT 5: Dissemination plan

41. This component will plan and implement a dissemination strategy that will introduce the C2C approach to chemical management to a wider audience beyond the confines of the demonstration municipalities. The dissemination plan describes and defines a clear strategy of dissemination activities to be performed and how they are to be delivered in terms of responsibility, timing, dissemination tools and dissemination channels.

PROJECT COMPONENT 6: Project monitoring and evaluation

42. This component will assess the impact of the project activities including lessons learned

Global Environmental Benefit

43. The development and application of a C2C methodology to reduce POP and toxic chemical risks to human health and the environment through reducing and eliminating production, use and releases of POPs and

SAICM concerned chemicals will be the is of global environmental benefit generated by this project.

44. In order to communicate the potential scale of the Global Environmental Benefit on offer it is important to conceptualize the C2C approach as a framework for eco-effective solutions in industry, building design, spatial development and governance. The 'big picture' is a vision of a closed loop system where no harmful waste is generated. In this respect the C2C approach is similar to a continuous improvement, ever striving, management system that ultimately seeks to create a closed loop economy.
 45. This project is [modestly] concerned with C2C principles and building blocks in the area of industry and specifically the application of the first step in a C2C strategy which aims to remove chemicals known to be harmful from a product or production life cycle. An eco-effective approach takes the position that the quantity of the emissions is not the problem, it is the quality of the outputs that must be addressed by making the emissions healthy. The C2C approach is therefore concerned with the avoidance of harmful chemical releases rather than volume reduction of current chemical releases.
 46. How can this 'avoidance' be quantified and estimated at this stage of the project? Some sense of the potential can be appreciated if we consider the application of the C2C approach to the fiber and textile industry in the Yiyang demonstration municipality where inappropriate chemical usage is known to be widespread throughout the complete life cycle from crop pesticides through chemical use in pulping, beating, bleaching right through to chemical use in fabric weaving, colour dyeing to final product.
 47. During the Project Preparation phase a fuller understanding of the chemical use in the fabric life cycle will be established and quantified as a basis to quantify the potential 'avoidance' of POPs and SAICM concerned chemicals emissions. This is but one life cycle that will be quantified during the project preparation phase
 48. Project activities are designed to provoke mindset change towards chemical management in product and production life cycles in a way that stimulates innovative and fresh thinking through C2C application
 49. The ultimate outcome, and Global Environmental Benefit of this project will be the take up and replication of C2C as a strategy for chemical management in China and elsewhere in the world.
- B.3. Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCF/SCCF). As a background information, read [Mainstreaming Gender at the GEF.](#)":
50. This project is about the elimination of POPs and SAICM concerned chemicals from products and production life cycles [and therefore consumption [ingestion and inhalation] life cycles.
 51. The project therefore addresses the socio economic impact of exposure to POPs and hazardous chemical pollution.
 52. China's rapid economic development has been accompanied by chronic environmental degradation and worsening pollution which translates directly to a social and economic cost.
 53. The health costs of pollution in China amount to about 4.3 [World Bank 2010] of its GDP. By adding the non-health impacts of pollution, which are estimated to be about 1.5 percent of GDP, the total cost of pollution in China is about 5.8 percent of GDP.
 54. The burden of pollution is not distributed evenly across the country and China's poor are disproportionately affected by the environmental health burden.
 55. Chronic exposure to chemical pollution is likely to produce significant long-term health effects, including respiratory illness, heart disease, and premature mortality. High among the culprits is exposure and consumption of POPS and SAICM listed chemicals and to the health effects we can add cancer, damage to the central and peripheral nervous systems, reproductive disorders, and disruption of the immune system. The SAICM listed chemicals of lead, mercury, cadmium and arsenic are ingested or inhaled into

the human body and bio-accumulate in bone, kidney, liver and keratinous tissue.

56. The situation in China is a mirror image of what is happening or potentially happening in other parts of the world. The application of the C2C approach developed and demonstrated by this project and globally replicated will have Global Environmental Benefit.

57. In both the demonstration areas [Yiyang and Tianjin] there are challenges and situations that have universal relevance:

- Environmental health risks: In the Municipality of Tianjin mortality from environment-associated cancers rose by 2% per year for the past 20 years.
- Land degradation: In Yiyang and Tianjin chemical contamination [including pesticide pollution] of soil and water is a major issue and has led to the loss of safe arable soil, destruction of vegetation, the spreading of dust and ash by wind, and chemical seepage into the ground water systems.
- Air pollution: The air in Yiyang is frequently pungent from the emissions from pesticide manufacturing while the air quality in Tianjin is exceptionally poor due to a range of uncontrolled emissions from industries [including petrochemical industries] , households and vehicles burning low-quality fuels.
- Inadequate water supply and quality: Supplies are at risk from chemical contamination in Yiyang while citizens and industry in Tianjin suffers from chronic water shortages as ground water levels are falling by 1- 1.5 metres annually, and the remaining ground water is being polluted by infiltration from the polluted river system as well as recharge from contaminated industrial runoff.

58. The indirect effect of the C2C approach is the foundation of a knowledge based economy [rethinking and innovation] that potentially opens up socio economic opportunities for women.

59. Sound chemical management supported by C2C principles can yield socio environmental benefits in terms of better health and longevity and stimulate innovation and economic sustainability.

B.4 Indicate risks, including climate change risks that might prevent the project objectives from being achieved, and if possible, propose measures that address these risks to be further developed during the project design:

60. The particular risks that maybe encountered in the implementation of the project as well as the measures that maybe carried out to mitigate, are given in the following table:

Outcome	Risk	Rating	Mitigation measures
Establishment of an area-based free-toxic model, innovating and adapting eco-effectiveness principles to ensure compliance with environmental laws and regulations and also encourage industrial activities concerned with POPs and other toxic chemicals to improve environmental performance and go “beyond compliance”	Difficulty in communicating the eco-effectiveness concept to stakeholders	Low	Involvement of all relevant stakeholders in the construction and ownership of spatial environmental management model
	Resistance to change entrenched management culture	Moderate	Design and support of locally appropriate incentives to promote cultural change
	Inability to visualize long term economic benefits from environmental performance investment	Moderate	Pilot demonstration projects to show efficient economic/environmental production systems and opportunities for new market access
Introduction of international experience in eco-effectiveness in the demonstration municipalities of Yiyang and Tianjin, identification and risk	Inability to transform accessible information into technical knowledge appropriate for addressing the identified problems on	Moderate	Human resources to guide transformation of information into area specific and applicable technical knowledge

assessment of the major industrial emission sources of POPs and implementation of eco-design, green production and environmental management system in the related industrial sectors	non-point sources in the project demonstration areas		
	Scale and complexity of emission sources versus project resources	Low	Strict prioritization of actions focused on POPs and other concerned chemicals. Leveraged funding from public and private sectors will be utilized.
	Accessibility on appropriate and alternative POPs mitigation technologies	Low	Assistance through UNIDO and other UN agencies clean technology centers, technology transfer and investment promotion centers
Area-based circular economy development and toxic-chemical free management by replication and promotion of the eco-effectiveness approach	Fear and resistance to untried strategic eco-efficiency policy for the project area	Moderate	Build on stated the local governments commitment to create a green economy that exceeds current laws and regulations
	Misunderstanding and fear generated among local population	Low	Appropriate and clear communication strategy and public education implemented
	Inadequate and immature appreciation of the foundations necessary and complexity of a “green” economic structure and for POPs free environment	Low	Conversion of project inspired incentives to tangible economic benefits in the short-term to ensure sustainability.
Climate change risks	The project will promote eco-effectiveness and help its integration with China’s current practices on Circular Economy and Cleaner Production. As the CE& CP are major instruments for energy saving and pollution reduction, the potential risk of the project to climate change is very little or non-existent.	Low/non-existent	BAT/BEP with co-benefits to the avoidance of the production of greenhouse gases will be used.

B.5. Identify key stakeholders involved in the project including the private sector, civil society organizations, local and indigenous communities, and their respective roles, as applicable:

61. The following will be the key stakeholders of the proposed project and the organ gram is given in APPENDIX 5:

62. Ministry of Environmental Protection PR China

The project is under the aegis of the Ministry of Environmental Protection. The Foreign Economic Cooperation Office [FECO], an institution affiliated to the Ministry of Environmental Protection (MEP) of China, will act as National Counterpart for the proposed project. FECO is mandated to coordinate and manage the funds of projects in cooperation with international financial organizations and for implementation of multilateral environmental agreements (MEAs) and bilateral assistances, as well as other foreign cooperation activities in the field of environmental protection. In over 20 years of development, FECO has established an operation pattern focusing on the focal areas of [1] Implementation of Multilateral Environmental Agreements [2] Bilateral and Multilateral Cooperation and [3] International Consultancy and Services.

63. Municipality of Yiyang

The first of two demonstration areas for the project is the local authority of the Municipality of Yiyang in Hunan Province. Within the municipal jurisdiction there are 3 districts (Heshan, Ziyang and Chaoyang), 3 counties (Taojiang, Anhua and Nanxian), one county-level city (Yuanjiang) with an area of 12,144 sq. km and a population of 4,460,000.

The Environmental Protection Bureau [EPB] of Yiyang will be the Yiyang Demonstration Area Focal Point and will be a key component of the project knowledge environment.

64. Municipality of Tianjin

The second demonstration area is the Municipality of Tianjin which as a direct-controlled municipality, one of four such designations, and is, thus, under direct administration of the central government. This status is seen as important for the visibility and replication of the demonstrated practices and results. The population currently stands at 10.43 Million.

Similarly, the Environmental Protection Bureau [EPB] of Tianjin will be the Tianjin Demonstration Area Focal Point.

65. Politecnico di Milano [POLIMI] Italy

Politecnico di Milano [POLIMI] is the leading University in Italy but critically is a network hub of an additional 23 EU Universities. It therefore provides a significant international reservoir of international expertise to the project. The University will join the project at the centre of the project knowledge environment providing particular international expertise in the fields of chemical management, energy, systems engineering and other relevant disciplines where the University has particular strengths. Significantly, the University is a co financier to the project.

The project knowledge environment centered around POLIMI and the University of Hunan [Yiyang Demonstration area] and Tianjin Academy of Environmental Sciences [Tianjin Demonstration area] is critical to mindset change and capacity building at local municipal and academic institutional level.

66. University of Hunan

The University of Hunan will be the knowledge environment focal point for the demonstration area of Yiyang. It will collaborate with POLIMI, Yiyang EPB and local enterprises to resource and practically apply the C2C concept to chemical management and parameter monitoring in the Yiyang demonstration area. Hunan University is one of the key universities affiliated with the Ministry of Education and is now included in the state's "Project 211" and "Project 985" for priority investment and construction. It has a staff of over 4,700 with a faculty of nearly 1900, of which, nearly 1,200 are professors and associate professors. The student body totals nearly 30,000, of which over 20,400, are undergraduates and 11,000 are graduates.

67. Tianjin Academy of Sciences

Tianjin Academy of Environmental Sciences will be the knowledge environment focal point for the demonstration area of Tianjin. Founded in 1975 the academy has become an important advice center for the Government at all levels including National Development and Reform Commission, the Information Commission, the Environmental Protection Agency and others. The Academy in the Tianjin Eco-city Construction Plan, pollutant control programs and other major technical support projects for climate change and low carbon emission. Other critical areas include environmental impact assessment, cleaner production audits, energy audits and other technical consulting services.

68. Public Services and Private Sector Industry – Yiyang and Tianjin Demonstration Areas

As stated the project is not sectorally based but rather will establish the critical emission sources of POPs and SAICM concerned chemicals. These sources could be public services or private sector and not sector specific. The project will prioritize and focus on the application of a C2C strategy as a 'design filter' to remove [design out] bio-accumulative chemicals from production and consumption cycles in pilot enterprises [public or

private]. The impact on international waters will be monitored. The pilot strategies will be published and disseminated widely.

B.6. Outline the coordination with other related initiatives:

69. The project will utilize the capacity already built up through the UNIDO NIP and SIRE projects in PR China to encourage the two demonstration municipalities to develop their own implementation plan in line with international environmental agreements on toxic chemicals of global concern.
70. The trained personnel of the SIRE project will play an important role in learning international practices for C2C promotion, providing the related technical consultation and promoting the related public awareness.
71. Currently there are a number of ongoing projects, either being implemented or being further developed in China, including Reduction of POPs and PTS Release by Environmentally Sound Management throughout the Life Cycle of Electrical and Electronic Equipment and Associated Wastes in China, Demonstration of Alternatives to Chlordane and Mirex in Termite Control, Demonstration of PCB Management and Disposal Demonstration, Environmentally Sustainable Management of Medical Waste in China, Alternatives to DDT Usage for the Production of Anti-fouling Paint Project, China Environmentally Sound Management and Disposal of Obsolete POPs Pesticides and Other POPs Wastes Improvement of DDT-based production of Dicofol and introduction of alternative technologies including IPM for leaf mites control in China, Dioxins Reductions from the Pulp and Paper Industry in China, Municipal Solid Waste Management POPs. The project will cooperate with these projects and complement their work by integrating their individual, isolated, and piecemeal efforts, at a local spatial level within the two demonstration areas.
72. The project will promote a fundamental mindset change towards toxic chemical management, demanding a more comprehensive and systematic approach; demanding fresh thinking and innovation to boost and reorient the many related national initiatives.
73. The project will coordinate and develop synergies with the National Eco Civilization Program (see APPENDIX 4).

C. DESCRIBE THE GEF AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

74. The strategy being introduced and demonstrated by UNIDO in this project is an alternative to the 'Take, Make, Waste' industrial model that places emphasis on the total-life-cycle of industrial products and production systems [and by inference on consumption] and not just on waste residue. The proposition is that by rethinking and redesigning the way things are made and by using materials more effectively, and by using all materials in a continuous cycle, we can eliminate wastes all along the total life cycle.
75. Using this approach [shorthand as Cradle-to-Cradle] the project will develop a replicable methodology that applies to the elimination of POPs and harmful chemicals from the total life cycle of products manufactured and production systems in the demonstration areas.
76. It is submitted that the application of the C2C approach to chemical management is completely consistent with UNIDO's core comparative advantage of promoting sustainable industrial design and best practice.
77. One of the key success indicators of the applied C2C approach to chemical management will be an anticipated reduced impact on the supporting ecosystem. This impact can be monitored and measured through systematic sampling and testing of specified of environmental parameters.
78. This positive environmental impact is the bridge between industry and the ecosystem ; and UNIDO defends its core comparative advantage in the identification and quantification of industrial environmental parameters as indicators of sustainability I
79. UNIDO has access to expertise [staff and consultants] in project management, industrial design, process engineering, materials, chemical management, environmental management any other disciplines that will be required in the design and roll out of this project.

80. Additionally UNIDO has augmented these resources with those of Politecnico di Milano [Milan, Italy] for this project which is a partner and project stakeholder.
81. As shown at B.5 above UNIDO will incorporate the technical capacity of the University of Hunan and the Tianjin Academy of Environmental Sciences as well as the professional expertise of the technical bureaus of the municipalities of Tianjin and Yiyang [Science and Technology, Development and Reform, Environmental Protection].
82. Please see APPENDIX 5 for the Organizational Chart of Project Stakeholders

C.1 Indicate the co-financing amount the GEF agency is bringing to the project:

83. UNIDO will contribute in-kind contribution of US\$ 100,000 for monitoring and project management.

C.2 How does the project fit into the GEF agency's program (reflected in documents such as UNDAF, CAS, etc.) and staff capacity in the country to follow up project implementation:

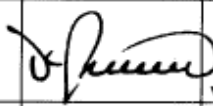
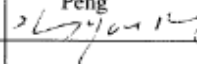
84. The UNDAF 2011-2015 reflects the agreement between Government of China and the UN to focus the UN-China partnership over the coming five years and give the top priority to the area of the work relevant to ensuring environmental sustainability, addressing climate change, and promoting a green, low carbon economy. The project is to control the release of hazardous and toxic chemical, especially the POPs through promoting area-based C2C management, which is expected to bring new visions and methodologies to supplement, strengthen and improve China's current programs relevant to cleaner production and circular economy, thus systematically bringing about co-benefits for pollution reduction and carbon release deduction with global benefits to international waters. The project contributes to the implementation of the above UNDAF considerations and helps China move towards a sustainable development path of less pollutant, low carbon and more environmental and ecological benefits.
85. The Project management capability will come from UNIDO technical staff and consultants. The technical capability will come from UNIDO staff and international consultants and it should be noted that a dedicated senior and a junior staff have been working on POPs related issues in the local office in Beijing.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S): (Please attach the [Operational Focal Point endorsement letter\(s\)](#) with this template. For SGP, use this [OFP endorsement letter](#)).

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Jiande Ye	GEF Operational Focal Point of China, Internal Department	MINISTRY OF FINANCE	01/03/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation.					
Agency Coordinator, Agency name	Signature	DATE (MM/dd/yyyy)	Project Contact Person	Telephone	Email Address
Mr. Dmitri Piskounov Managing Director PTC UNIDO GEF Focal Point		March 13 2012	Mr. Zhengyou Peng 	+431 26026 3831	Z.peng@unido.org