



Europe-China Eco-Cities Link  
中欧低碳生态城市合作项目

# Green Municipal Finance

EC-Link Position Paper

July 2018

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## What is EC-Link?

Europe-China Eco cities link project (EC-LINK,) is a European Union founded project, a key element of the EU-China Partnership on Sustainable Urbanisation, which was signed by the European Commission and the Chinese government in May 2012.

It aims to assist Chinese cities in implementing energy and resource-efficient measures by sharing European cities' experiences in sustainable urbanisation. Meanwhile, EC-Link has created a platform of experience for easy accessible exchange between Chinese and European cities on low carbon/eco city development issues.

Enhancing communication and providing training to Chinese related organizations and its' staff on policy making, giving technical advices on specific sustainable urban development projects will contribute a lot to China sustainable urbanization.

EC-Link has produced Eco city toolboxes, a Knowledge platform and is organising city-to-city cooperation in the frame of City Network Units' activities (CNU's). CNU's activities are focussed on pilot actions implementation based on the joint work of Chinese and EU experts for a common objective, chosen in the frame of sustainable urbanisation issues.

Our aim is to increase learning curve from European cities' good examples & techniques, strategy and methods. These activities enhanced the communication between Chinese cities and European cities, which formed a solid base for the further cooperation. <http://eclink.org/en/>

# Table of Contents

1	The Green Financing Challenge .....	4
1.1	Context.....	4
1.2	Green municipal finance and green investments .....	5
2	GMF Goals and Implementation.....	9
2.1	Implementing green revenue strategies .....	9
2.2	Overview of Major Green Financing Instruments: .....	12
2.3	Bringing together appropriate financing and funding strategies .....	15
3	EU Enabling Framework and Investments .....	17
3.1	EU funding and financing systems .....	17
4	Lessons Learnt and Conclusions .....	19
5	ANNEX GMF Tools .....	22

# 1 The Green Financing Challenge

## 1.1 Context

**China's Commitment to Mitigate Climate Change.** In 2015, China was one of the first Asian countries – besides Japan and South Korea – to come out strongly with a commitment to combat climate change, and to adapt to eventual future impacts. With its population of about 1,300 million people, China is one of the world's major emitters of greenhouse gases (GHG), and at the same time it is also one of the most vulnerable countries to the negative impacts of climate change. In preparation for the 2015 United Nations Climate Change Meeting (COP21) in Paris, the government of China has announced that its GHG emissions will peak in 2030. Equally, it is committed to reduce by 2030 by 60-65% the intensity of its carbon usage in relationship to its gross domestic product (GDP), compared to 2005 levels. It will take on the responsibility to increase substantially its forest cover and will ensure that by 2030 some 20% of its energy requirements will be covered by renewable energy.

**Cities and green-house gas emissions.** Cities occupy 2% of the world's landmass, but are responsible for more than two-thirds of global energy use and greenhouse gas emissions. The majority of people already live in urban areas and in 2050 it is expected that two-thirds of the entire global population will be urban. Cities therefore have to exercise leadership to cope with the increase in population, and expansion of urban infrastructure needed to cater for these people, but also with the environmental impact of this development. The International Energy Agency (IEA) estimated, in its World Energy Outlook 2008, that in 2006, cities accounted for 67% of world primary energy demand and is expected to grow to 73% in 2030. This implies that cities were responsible for 70% of GHG emissions in 2006, and this will increase to 76% in 2030.

**China's Urban Challenge.** The transition to a low-carbon economy in China will require huge investments, but these investments will provide benefits in the form a more energy efficient and a more energy secure society. China's transition to a low-carbon economy is an integral part of the modernization of China and the process of transition from an industrial to a post-industrial (service-driven) economy. The challenge is clear: the foundations for green growth will lie primarily in the development of low-carbon cities, cities that combine integrated solutions for their energy provision, the development of transportation networks, for waste recycling, for energy efficient buildings. The financing requirements will be enormous and municipalities in China will require new financial instruments to respond to the challenge.

**1 Trillion USD Investment Needed in Five Years to Build Low-Carbon Cities in China.** A new research report series Green Finance for Low-Carbon Cities, authored by the Paulson Institute, Energy Foundation China and the Chinese Renewable Energy Industries Association, estimates that 6.6 trillion RMB (\$1 trillion) will be required over the next five years to build low-carbon cities in China. This includes investments in efficient buildings, low-carbon transportation and clean energy see Figure 1.<sup>1</sup>

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<sup>1</sup> Source: <http://www.bloomberg.org/press/releases/1-trillion-usd-investment-needed-five-years-build-low-carbon-cities-china/>

**Figure 1: Investment demand estimate for key sectors in the 13th Five Year Plan (2016-2020)**

	Project Category	Required Additional Amount	Investment Needs (billion RMB)	Investment Needs (billion USD)
 <b>Efficient buildings</b>	 New green buildings	3080 million square meters	224.8	34.58
	 Existing building retrofit	2080 million square meters	1,426.2	219.42
 <b>Green transportation</b>	 Rail	3,000 km	2,400	369.23
	 Bus	181,000 public buses	627.1	96.48
	 Electric vehicles	4.8 million charging spots	132	20.31
	 Bike	171,350 public bikes	0.86	0.13
	 Urban roads	64,600 km	1292.1	198.78
 <b>Clean energy</b>	 Distributed solar PV	64 GW	500	76.92
	Total		<b>6,603.06</b>	<b>1,015.85</b>

Source: Bloomberg Philanthropies et al. 2016. Green Finance for Low-Carbon Cities. p.12 <http://www.bbhub.io/dotorg/sites/2/2016/06/Green-Finance-for-Low-Carbon-Cities.pdf>

This paper will canvass international best practice – both in terms of institutions and instruments – to help bolster revenue and expand financing options so that this level of investment is achieved.

**1.2 Green municipal finance and green investments**

**Financing city Investments.** Over the last 20 years many other countries also started to give more powers to local governments, decentralizing health, educational and infrastructure responsibilities to lower levels. As in China, worldwide revenues of cities have not kept pace with expenditure needs. Local governments own revenues are insufficient and they are forced to rely on intergovernmental transfers from higher levels of government. Conventional local funding sources for cities are property tax and user fees, and these have not been “buoyant” ie keeping up with funding needs. And this is before additional burdens of combatting climate change have been placed on them. Additional financing mechanisms can help – for example, some cities have been allowed to issue bonds in the local capital market. But unless they can tap additional sources of funding to repay that financing it is of no use in terms of increasing the investment spend. In order to provide sustainable long-term finance for cities, a change of the institutional and regulatory framework around funding is needed. The objective of this transformation process is to increase the options available to cities in relation to both funding, preferably from own-source revenues, and in financing sources, in order to implement green or climate-related investments (hereinafter referred to as “green investments” for simplicity).

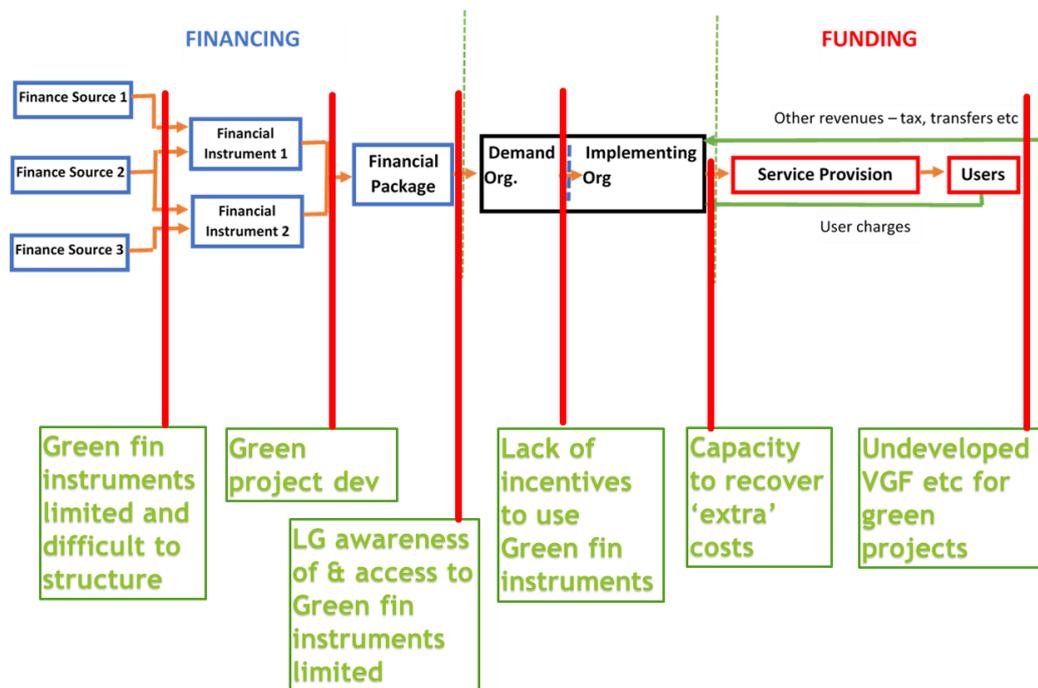
Cities need to focus on two issues in relation to implementing investments generally and green investments in particular. Cities need to be able to:

- tap a broad base of **finance** sources for these investments; and
- to identify and tap appropriate **funding** in order to repay any debt financing and to pay for operation and maintenance costs.

BOTH of these elements are necessary components of any city/ municipal finance strategy in general and of a Green Municipal Finance (GMF) strategy in particular. The figure below shows key issues in relation to financing and funding green investments.

GMF thus encompasses both the financing and funding activities of green investments.

**Figure 2: Green Finance and Funding**



Source: M. Lindfield, EC Link

Significant in the figure is the centrality of project development and the capacity of the borrowing/ fund mobilizing entity. Unless the development process is rigorous, the local government may pay too much for the wrong investments. Unless the implementing agency is well structured, its performance may be sub-optimal, increasing the operating budget of the local government and/or loading it with increased liabilities. Thus, **the ability to structure projects for financing and to structure the implementing entity such that it has stable sources of funding** constitutes another central consideration in GMF.

**The definition of “green” and “green finance”?** Green Finance as defined internationally is the actions of the financial sector in support of the reduction of GHG emissions and the creation of a climate resilient economy. It includes all parts of finance such as green banking, green stock markets, green bonds, green financial ratings, and green insurance companies. Qualifying green financial instruments have to follow “green” standards and criteria.<sup>2</sup> These standards vary significantly. Nuclear power is “green” in China but is not “green” in Germany. In China “green” generally includes, even focuses on, pollution abatement which accounts for much of the difference in approach.

<sup>2</sup> For example PBoC issues green criteria for bonds

**Limited access to green and climate finance.** The figure above shows several layers of constraints to cities accessing the finance they need for green projects. Each of these constraints needs to be addressed and this paper will give examples of how this was achieved in a range of cities. In particular, the mobilization of private sector investment is of paramount importance for green investment. This can be seen in the global structure of climate finance:

- According to the Climate Policy Initiative<sup>3</sup> global climate finance reached USD 331 billion in 2013.
- The private sector was the largest contributor to global climate finance with 58% equaling USD 193 billion, leaving the public sector (excluding domestic allocations) with USD 137 billion and 42%. Almost 3/4 of the total flows were invested in the country of origin. Especially private sector investments stayed in the home countries where national climate change frameworks are well established and understood.

International climate funds can be difficult for cities to access. The Cities Development Initiative of Asia (CDIA), as a project development entity focused on linking city investments to finance, did a comprehensive assessment<sup>4</sup> of the barriers for cities to access/attract International Climate Finance. Their conclusions were that the major barriers for cities to access international climate finance fell into three categories:

- Challenges in Project Development;
- Institutional and Governance Barriers; and
- Financial barriers.

More recent, but more general, analysis has confirmed the thrust of the CDIA analysis.<sup>5</sup> The Cities Climate Finance Leadership Alliance has also identified several similar ‘challenges’ to city climate finance.<sup>6</sup> In general, there are four dimensions which constitute structural shortfalls in existing climate finance mechanisms and which prevent them from effectively engaging with cities. Climate finance mechanisms need to address the shortfalls in these dimensions to be applicable to cities. They need to address:

- **Structures of access.** In many countries, assistance to negotiate with the main entry points for climate finance is needed by most cities. Local governments have few structural relationships with such agencies and speak a different technical language. Although local governments increasingly have environmental officers, they are generally institutionally removed from financing units. The structure of access to financing requires, in the first instance, applications which relate to objectives couched in language familiar to city officials and require data possible for them to collect. Such information can be supplied by specialised consultants, but cities have limited consultant budgets. More consultant inputs may be required to verify performance during implementation, requiring more consultant budget and budget for collecting the information required. There are long lead times and approval

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<sup>3</sup> Climate Policy Initiative (CPI). 2014. *Landscape of Global Climate Finance 2014*; these numbers do not include domestic funding. The volume of total climate finance worldwide remains opaque. No official registry exists to which climate finance is reported, especially funds from the private sector, other development aid under a different heading than climate finance and flows from domestic climate actions are difficult to detect. Subsequently the international community is found to quote different figures.

<sup>4</sup> See footnote 29.

<sup>5</sup> For example, see The Global Commission on the Economy and Climate. 2014. *The New Climate Economy Report 2014*. Chapter 2 Cities.

<sup>6</sup> See CCLA. 2015. *The State of City Climate Finance 2015*. City Climate Finance Alliance. New York.

processes – difficult when officials are elected for 3 years. In summary, it is necessary to reduce the very high transaction costs of access to climate finance for local governments and groups of local governments.

- **Planning and Project Development for access.** Cities' planning processes did not, in general, consider climate issues and thus provided a poor basis for funding applications. This is changing, but cities still need support. Similarly city project development systems need to be structured to include climate finance into the design of the funding mix and the required Monitoring Reporting and Verification (MRV) systems into the project design. These are specialist skills that many cities will never need 'in house' – but must be available to them if they are to access climate finance.
- **Types of instrument.** Once approval has been secured, financing comes for, and as an integral part of, a specific project, normally as a grant. Failure may involve (as with CDM) paying back financing, success means that you can apply for another grant – with the same transaction costs. Where finance is dependent on market pricing, uncertainty deters private sector investment – as does the long approval times. Cities often also require help in putting together the underlying financing of the project. In summary, the financing provided needs to be scalable and, where appropriate, Public-Private Partnership (PPP)-friendly (see Section 2).
- **Funding partnerships** – flexibility, compatibility and capacity to leverage. Given most available sources of funding do not cover all aspects of project preparation and implementation, cities have to cobble together a combination of funding sources to develop and construct the project. This is difficult given varying objectives and access criteria. Cities need to be able to access appropriate funds and to have the ability to leverage/ combine them for more impact.

There is a strong case for providing support to cities in overcoming these constraints.

**Funding city green investments.** Figure 2 above also illustrates constraints cities have on the funding side. This is a major problem because, in the end, any investment financing other than financing through current revenue, savings or some form of privatization, will need to be repaid. ***Funding thus ultimately constrains the capacity to invest.*** Capacity to recover costs through user charges is often constrained, as is the city's ability to increase the taxes it levies on its citizens. National government compensating funds – such as Viability Gap Funds (VGFs) – are often inadequate to make up the difference and difficult to access.

In China, local governments have been at the forefront in investing in their cities. Advances in public transport, water and sanitation, and other infrastructure have been remarkable. But, as set out above, the funding model used to date is currently under some stress.

## 2 GMF Goals and Implementation

GMF has two main goals:

1. Revenues should come from environmentally friendly or green sources and/or promote green outcomes where possible;  
and
2. Expenditures need to be channeled to low carbon and climate resilient investments – this can either happen through a) recurrent expenditure – where green procurement can ensure that the inputs to projects are environmentally positive; and b) capital expenditure where city investment projects are explicitly designed to address climate and other green issues.

### 2.1 Implementing green revenue strategies

**Sources of funding.** Green revenue sources include public sector finance (intergovernmental transfers and municipalities' own revenues), private sector finance (through investment in environmentally-positive services such as public transport) and external finance (through climate finance, carbon markets and other sources).

The main sources of local government revenues are intergovernmental transfers, taxes, fees and charges. The greening of these revenues requires a focus on transforming conventional instruments. Raising revenue can either hinder or promote an environmentally friendly policy. If a tariff system charges less as more water is used, it is counter to promoting resource efficiency. Another example of charging regimes that lead to non-green outcomes are subsidies that lower the price of natural resources and thus encourage consumption (in for example, the energy, water and petroleum sectors).

Positive examples for taxes, fees and charges which promote green outcomes are property taxes that restrict urban sprawl, transportation fees that reduce car traffic, and user charges that reduce water consumption. The main sources of local revenues are from land/ buildings, transport, water, waste collection, and other environmental fees. Income from transportation and land/ buildings are usually highest – in the form of transportation fees (e.g. parking fees) and property taxes. All forms of revenue can contribute to green outcomes.

**Greening property tax**<sup>7</sup> Property taxes are one of the major income sources of local governments and are a highly effective tax if used intelligently. Property Taxes (PT) are levied on land and improvements or on the underlying land (of course at a higher rate). “Improvements” meaning buildings, infrastructure and other investments made on the land. The way a PT is levied can strongly influence the way land is used. If levied on land and improvements, a higher tax discourages and a lower tax encourages land use. If levied on land on the basis of “highest, best use”, it does exactly the opposite – higher taxes encourage maximization of development potential. This can have an effect on urban sprawl, depending on the manner the PT is structured.

Currently PT usually does not reflect any externalities such as cost of environmental degradation or the cost (financial and environmental) of extending public infrastructure services. Few governments have tried to internalize the “external” cost of development in PT, for example the infrastructure that needs to be built to connect to new developments or remote areas to public services and transportation, although Australia and other countries do this routinely through development charges (see below). The US and Canada are in the forefront of testing different forms of PT. In Toronto the city government taxes multi-residential buildings at the same rate as single-family homes to discourage a further spreading of the city. PT can also be reduced for those who install certain energy efficient measures or renewable energy devices.

Another way to use PT for green outcomes is to use it as a financing mechanism. In the US, PT is surcharged to pay for green investments undertaken by the householder through the Property Assessed Clean Energy (PACE) program – thereby avoiding the disincentive to such investment resulting from the lack of full benefit being recognized in the sale price of a house. Although China’s property tax regime is very weak, while waiting for substantive action in this area, alternatives and proxies for such a tax can be found and can utilize many of these techniques.

**Value capture tax.** This tax is levied on businesses, the industry and private land owners who directly benefit from municipal improvements in infrastructure in their area. The logic behind it is, for example, if a new public transport hub is created, surrounding shops and small services will benefit due to the increased number of potential customers in their neighborhood. The same goes for industries or private home owners, who benefit from increased accessibility. This benefit, in so far as it is not reflected in increased tax yield, generate windfall gains to private individuals and entities through public infrastructure improvements.<sup>8</sup>

A more proactive form of value capture, which can both encourage, and pay for, green infrastructure investments is ‘plus value’ tax. Under this scheme, an area of land, for example along a public transport corridor, is rezoned for higher density (the rezoning may include provisions requiring increased energy efficiency and “greenness”). The local government takes some of the increased value of the property either upfront (as in Colombia) or as a tax on the rental of developed properties (as in China). This increased revenue can be used as the funding base for the finance of investments (as in TIF below)

**Tax Increment Finance (TIF).** TIF is a mechanism which allows local authorities to borrow against locally raised future income. The cost of building infrastructure will be paid for through future extra taxes generated by the property development. Local governments take up finance against this new source of income generated by TIF area revenues. These areas are usually designed to renew degraded, poor areas or brownfield developments of obsolete industrial areas. Cities designate a

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<sup>7</sup> The following relies on: Brandt, N. 2014. *Greening the Property Tax*. OECD Working Papers on Fiscal Federalism, No. 17, OECD Publishing. <http://dx.doi.org/10.1787/5jz5pzw9mwzn-en>

<sup>8</sup> The theoretical justification for such taxes/ levies is set out in “Land Value Capture: Treasury Working Paper ....”

certain area as TIF district and earmark all future increases in PT and other revenues to service loans or bond issues. The bonds could be green bonds depending on the usage of funds.

**Fees and Charges.** In addition to taxes, municipalities are mandated to collect certain fees and charges. As discussed above, detrimental effects on the environment should be avoided in designing such fees and charges. In a more proactive manner, they may be used in innovative ways to safeguard natural resources and provide incentives for climate positive investments and behaviour. The instruments used must be well planned and provide the right incentives. The measures should be well targeted in what they address, transparent and easy to understand and implement. For example in Singapore the congestion charge is not a flat fee, but varies by the time a car passes through a specific area, by the type of car, by the type of area the car passes etc. The price is highest where the action is least desirable. This level of detail is necessary to set the right incentives, discouraging driving alone in your car during rush-hour! Other examples of innovative charges<sup>9</sup> are:

- User charges that cover the full cost of services, such as water and electricity, including the cost of providing the supply and the environmental impact of the supply, usage and disposal;
- Emission (effluent) charges based on quality or quantity of waste (usually wastewater);
- Charges on products that pollute surface or groundwater during or after consumption, based on the actual value of damages caused by their use;
- Tradable rights to use a quantity of a resource (usually water or air shed for emissions) and the establishment of a market for such rights;
- Marketable permits entitling an entity to treat its waste, providing incentives either to reduce waste and sell its permit, or to not treat its waste and purchase more permits; and
- Refund systems for commodities and goods to ensure that their containers and packaging these are returned for proper disposal or reuse.

**Development charges.** Development charges are a one-time payment levied on developers to finance the cost of infrastructure provided by the municipality due to the growth impacts new and redevelopment areas have on the immediate surroundings. These costs would include the extension of roads, water and wastewater systems as well as the enhancement of schools and hospitals. Development charges can also recover environmental costs that occur due to the new occupation of land. It would represent a targeted approach to internalize externalities. Also, the level of development charges can be used as a political instrument to manage urban sprawl, the higher the development charges the less financially attractive it becomes. In Canada, the Ministry of Community Services has issued a Best Practices Guide for development charges, based on feedback from local governments and the development community<sup>10</sup>. It provides a good insight up to which level the development charges can be differentiated to target the environmental purpose efficiently.

**Shared Taxes** In some countries, local governments can surcharge income, profit or sales taxes (eg Value Added Taxes). Such surcharges (and indeed the underlying tax if higher levels of government cooperate) can be structured so as to provide green benefits or incentives – such as through allowing a tax deduction for green investments, the loss of revenue needs to be carefully and transparently weighed against the environmental benefit attained.

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<sup>9</sup> The list does not claiming to be complete. It is amended from: Lindfield, M., Latay, V., Docta, V.M. Financing Sustainable Cities. in: Lindfield, M. and Steinberg, F. (eds.). 2012. *Green Cities*. Manila: Asian Development Bank. Urban Development Series. Manila. pp. 296-372. <http://www.adb.org/publications/green-cities>

<sup>10</sup> See [http://www.cscd.gov.bc.ca/lgd/intergov\\_relations/library/DCC\\_Best\\_Practice\\_Guide\\_2005.pdf](http://www.cscd.gov.bc.ca/lgd/intergov_relations/library/DCC_Best_Practice_Guide_2005.pdf)

## 2.2 Overview of Major Green Financing Instruments:

To meet the challenge of green development, and in the context of the national and state/ provincial enabling framework, local governments, having worked to maximize their revenue available to support investment, must spend it effectively and transparently on priority investments. The range of instruments and their possibilities available are much wider than generally perceived. They are simply little known or have been insufficiently explored because change in implementation and investment systems is highly political and potentially requires not only changes in laws and regulations, but also reform of the institutions collecting and spending revenues and those monitoring the revenue flows. But the need to make green investment sustainable is pressing and there are many examples of successful innovation in financing. They include better:

- Instruments for managing inter-governmental transfers;
- Debt instruments – including those utilizing the capital markets;
- Risk mitigation instruments;
- Partnership-based instruments (PPPs etc); and
- Asset management instruments.

Examples of these instruments are set out below.

### *Debt Instruments – Green Bonds*

The issuance of bonds increases the level of indebtedness of cities and at the same time helps to leverage private finance. To make these “green” bonds, cities have to use the proceeds of the bond to finance green projects. Often such bonds finance a range of green investments, from greenfield developments to the renovation of existing infrastructure. The use of proceeds must be monitored and reported on, increasing the cost of issuance. This cost may be offset by the keen pricing of such bonds – institutions are very keen to finance sustainable development. Since the bond has to be repaid, cities often prioritise projects that are income earning for finance under such a bond and thus this mechanism can favour mitigation investments. When national government support the bond issue (through tax exemptions or subsidies) adaptation projects are more likely to be included.

### *Partnership Instruments – PPPs: Leveraging private sector finance.*

For municipalities to attract private sector co-finance for infrastructure measures requires:

- The business case for the private sector needs to be convincing (value for money);
- The return on equity needs to be clearly defined; and
- The risk for the private sector needs to be manageable.

Because the municipal market as compared to the national market is relatively small, municipalities are well advised to communicate their aspirations well. To create a win-win situation meaning that the advantages for the municipalities and the private sector are clearly defined, this process needs a long and thorough planning period. It must be analyzed for what reason the private sector is invited to participate (financial reasons, operational efficiency, and technical innovation). This will determine the sort of arrangement between the public and the private sector. Below the most common forms are introduced.

Conventional PPPs are based on concession contracts such as BOTs (build-operate-transfer) or BOOTs (built-own-operate-transfer) and other forms determining the role of the private sector. As opposed to traditional public sector procurement, where the private sector simply executes as per public sector orders, in PPPs the private sector bids for a certain project and the role they play at

different stages (design, construction, completion, operation etc.). For this the private sector receives a fee over the lifetime of the contract.

To green PPPs, the objectives must change. A good example is the need to include energy efficiency obligations (EEOs) for utilities or to set qualitative targets such as the amount of water that need to be reused. The PPP arrangements are still applicable, but the objectives are formulated in a way that internalizes (environmental) externalities. EEO-based PPPs implement demand side energy efficiencies that energy companies and utilities are obliged to undertake – leading to energy or carbon impact reductions. A penalty will be levied on the company if energy savings targets are not met.

An innovative form of PPPs used to address EEO targets is energy performance contracting (EPC). Specialized companies, so called energy service companies (ESCOs) enter into a contract with the local community to undertake energy upgrades that are funded from saved costs. The contracts may cover energy efficiency upgrades and the switch to renewable energy. The idea behind both is that either the saved operation costs or the sale of the newly produced renewable energy will finance the investment costs. The ESCO will only get paid once the energy savings are achieved. There are different contractual models - guaranteed savings and shared savings – which reflect the level of risk allocation between the two contracting parties.

### ***Asset Management Instruments***

While still somewhat in its infancy, better understanding of the utility of asset management is gradually spreading. Cities can leverage the value of their assets - mainly land - to finance public infrastructure. An advantage of land-based financing over other sources is that it usually generates more cash up front.

Auction mechanisms are often used to sell land in developing countries that lack systematic land valuation systems. Some countries even use land auctions as a standard element in land management. Land auction data are not widely available, but the three recent large transactions below illustrate the revenue potential:

- In Cairo, in 2007, the auction of 3,100 hectares of desert land for a new town generated \$3.12 billion; an amount 117 times greater than the country's total urban property tax collections and about one-tenth of the national government annual revenue. The proceeds were used to pay for these new towns' internal infrastructure and to build a connecting highway to Cairo's ring road;
- In Mumbai, in 2006/7, the auction of 13 hectares of land in the new financial center generated \$1.2 billion; more than ten times the total 2005 fiscal spending of the Mumbai Metropolitan Regional Development Authority, and six times the total value of the municipal bonds issued by all urban local bodies and local utilities in India over a decade. The proceeds primarily financed projects identified by the Metropolitan Transportation Plan; and
- In Istanbul, in 2007, the auction of an old bus station and government building generated \$1.5 billion; more than the city's total 2005 fiscal expenditures and infrastructure investments.

### ***Risk Management Instruments***

These instruments usually involve a third party guarantee. Such instruments can be useful even for very poor cities. In 2014, the City of Dakar, Senegal, developed the first ever non-sovereign backed

municipal bond in Sub-Saharan Africa outside of South Africa. This issuance is directly supported by a 50 per cent guarantee over seven years provided through USAID's Development Credit Authority and supported by a technical assistance partnership with the Gates Foundation. The guarantee will enable the city to raise USD 41.8 million on the regional stock exchange for the construction of a retail marketplace for vendors in Dakar.

Local governments should have the mandate and be encouraged to borrow for capital expenditures (capex) up to a debt ceiling proportional to their stable cash flow base. Lending can be facilitated by a number of instruments – 'intercepts' of national block transfers as in the Philippines, 'pledging' of a proportion of stable cash flows (such as property tax) as used in the USA, and the 'pooling', or grouping, of local governments to provide "joint-and-several-liability" for repayment as in the 'pooled lending' arrangements used in India by the Tamil Nadu Urban Development Fund.

But even for sustainability goals, many local governments may be reluctant to borrow. However, support can be available through international and, increasingly, also local institutions. The Asian Development Bank (ADB), for instance, provided a partial-credit guarantees to Shanghai Pudong Development Bank (SPD Bank) to support private sector financing of energy-efficient buildings. Under its Energy Efficiency Multi-Project Financing Program, the ADB is partnering with Johnson Controls, a private sector energy management company listed on the New York Stock Exchange. Johnson Controls identifies buildings with energy-savings potential, while ADB shares project credit risks with financial institutions. Although improving the energy efficiency of buildings is a high priority for China, companies have found it difficult to access finance for such purposes given the little collateral they can offer. For their part, banks have little experience in financing energy-efficiency projects. Supported by the ADB, SPD Bank was the first PRC domestic bank to offer a full range of green credit solutions to companies.

#### ***External Public Source Instruments***

National governments often provide grants for projects that are considered national priorities. The EU provides regional funding to poorer areas in Europe to help overcome disparities of opportunity across the Union. National governments often channel such grants or interest rate subsidies through development banks – such as the European Investment Bank (EIB) for Europe or national development banks such as KfW in Germany. The issue for cities is to maximise their access to these sources and use their funds effectively. In this they often need support. Mechanisms such as specialist, city-based funds may be required to aggregate and monitor such funds (see next section).

In addition there are a range of international mechanisms that subsidise climate-related investments. These are summarised below.

***CDM.*** Carbon finance under the United Nations Framework Convention on Climate Change (UNFCCC) provide under the Kyoto Protocol for two methods to offset GHG emissions, one being the Clean Development Mechanism (CDM). CDM allows developed countries to offset their emissions by buying certified carbon credits from developing countries. It has not had a significant impact on GMF. Urban projects do not easily fit the current CDM framework. The extension of the CDM mechanism through the concept of Program of Activities (POA), which allows the bundling of different projects, points in the right direction. However, only different projects that use the same methodology and technology can be clubbed in a program, limiting its utility to cities. This experience has lessons for city access to China's fledgling national carbon markets.

***External Development Bank and Climate Finance.*** A number of development banks and climate funds support municipalities in financing green infrastructure. It should be noted that these

funding sources usually are approved by national governments and are then on-lent or passed through as grants to the municipalities. Rarely these funds would cover all costs, but they will definitely lower funding cost and thus make the difference between viable and not viable projects. Some additional sources of grant technical assistance can be accessed to help prepare projects and to structure financing. In some cases they may be able to access capital grants or guarantees. For example such funds used by the ADB are:

- Cities Development Initiative for Asia (project development funds); and
- The Urban Financing Partnership Facility (grant finance for studies, guarantees and capital subsidies)<sup>11</sup>.

Bilateral development banks and development assistance agencies also operate dedicated facilities. For example, GIZ operates the Cities Finance Facility with the C40 (project development) and KfW and AfD both have a focus on climate-related lending for which they can mobilise grants in certain circumstances.

Other external funds include the well-known climate funds such as those under the leadership of the UNFCCC. The Financial Mechanism was founded to facilitate the agreement that developed countries shall provide financial resources to assist developing countries. The operation of the Financial Mechanism is partly entrusted to the Global Environment Facility (GEF). In addition four special funds were established: the Special Climate Change Fund, the Least Developed Countries Fund, the Green Climate Fund (GCF) and the Adaptation Fund.

In summary, although there are a large number of potential financing sources for climate-related projects, cities often need support to assess their relative merits and the best use for available finance.

## 2.3 Bringing together appropriate financing and funding strategies

**Local funds and initiatives.** A number of cities around Europe and in other countries have established their own specialist funds to attract and manage finance for climate-related investments. These are both undertaken on their own or in partnership with other actors. More in more local and regional authorities try to create permanent budget lines or revenues from specific local taxes or other income and earmark them for climate related projects – and some of this money can effectively be channeled through specialist funds.

**Example: London Green Fund** (See EC-Link Municipal Finance Position Paper this fund illustrates the use of local government and EU transfers to catalyse PPP for environmental investments in several sectors

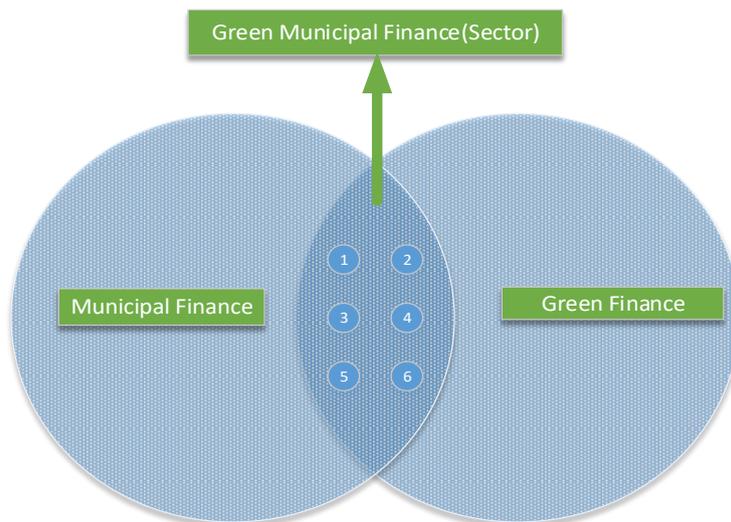
**Typical investments of cities.** Municipalities typically target green investments in the sectors set out below. They are listed by sector, but more detail on key financing issues related to them and highlights applicable revenue generating opportunities can be found elsewhere<sup>12</sup>. The objective is to maximize the finance and funding options available for projects and to minimize costs.

### Figure 3: Typical Sectors covered by GMF

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<sup>11</sup> Source: <http://www.adb.org/site/funds/funds/urban-financing-partnership-facility>

<sup>12</sup> See Working Paper ... and Lindfield, M., Latay, V., Docta, V.M. Financing Sustainable Cities. in: Lindfield, M. and Steinberg, F. (eds.). 2012. Green Cities. Manila: Asian Development Bank. Urban Development Series. Manila. pp. 296-372. <http://www.adb.org/publications/green-cities>



- 1 Green /low carbon/clean public transport
- 2 Green buildings
- 3 Clean energy
- 4 Water supply/waster water
- 5 Drainage and flood control
- 6 Solid waste management

Source: Yao Zhuo, EC-LINK

The investments specifically recognised in China include:

- Green/low carbon/ Clean Public Transport: railway transportation, urban rail transit, public transportation, waterway transportation, promotion of clean fuel/ new energy automobiles, smart logistics/ transportation, green buildings, and IT for improvement for energy saving and emission reduction in the buildings (smart buildings).
- Clean Energy: wind power generation, solar Photovoltaic (PV) power generation, smart grid and energy internet, distributed energy resource, solar thermal applications, hydropower generation, and other new energy application,
- Water supply/ Waste water:water saving and unconventional water use, and recycling, processing and utilisation of water.
- Green building
- Drainage and flood control: environmental restoration projects.
- Solid waste management: redevelopment and integrated utilisation of tailings and associated mine by-products, recycling and utilisation of industrial solid waste, recycling, processing and utilisation of renewable resources, remanufacturing of electromechanical products, and recycling and utilisation of biomass resources,

The following examples set out the funding and financing approaches taken in EU projects. They are described in more detail in the EC-Link Position Paper.

### *Mitigation Investments*

Best practice examples include:

- **London CrossRail.** CrossRail combines PPP with value capture funding.
- **London Congestion Charge.** A traffic management fee that reduces GHGs and pollution and raises money for public transport.

- **Stuttgart Internally financed energy saving.** "Interacting" a city's internal contracting to save energy – using the ESCO model within a local government.

#### *Combined Mitigation and Adaptation Investments*

Best practice examples include:

- **Copenhagen Nordhaven.** Coordinated by a dedicated development corporation, diverse public and private funding is used to develop a green city.

#### *Green Industry Investments*

Best practice examples include:

- **Kalundborg Symbiosis.** Supported by a dedicated NGO, mainly private investment has created the industrial symbiosis and enabled diverse public funding to develop a green industrial complex.

These projects constitute models of financial structuring that can stand as examples to Chinese regulators and cities in order to assess the effectiveness of current systems of GMF. Key elements of these project development processes and structures are:

- *Comprehensive project planning and development with an eye to involving a range of stakeholders in the development – ie inclusive cities;*
- *Project structures that can "crowd in" the private sector – usually through PPPs;*
- *Careful assessment of the means to fund financing instruments and the use of a range of funding sources; and*
- *Well-structured implementing entities – development corporations or such – capable of utilising a wide range of financing and funding models and having flexibility in structuring projects.*

The system works best if all these components are present, coordinated and functioning effectively.

## 3 EU Enabling Framework and Investments

### 3.1 EU funding and financing systems

To see the various policies through, the EU provides funding in support of the EU 2020 strategy. At least 20% of the EU's €960 billion budget for 2014 to 2020 (about €180 billion) should be spent on protecting the climate. This is on top of funding from individual EU countries.

To comprehend GMF in Europe it is important to understand the leverage effect and impact EU funds have. Most EU funds are designed to either co-financed or supporting financial instruments that attract a multiple of funds from financial institutions and other investors. This lead to an "EU mobilized size" of funds of €2 trillion or 2% points of GDP, i.e. two times the investment<sup>13</sup>. Based on this experience e.g. the energy and external action related funds such as the European Energy Efficiency Fund and others are expected to increase the fund size from €1 billion in EU support to €25 billion. Funds and projects under the EU-funds are therefore measured as to the leverage effect they have.

The European Investment Bank (EIB)<sup>14</sup> plays an important role in financing GMF as it is the bank for the European Union representing the interest of the EU. More than 90% of the overall activity

<sup>13</sup> Source: <http://www.ceps.eu/system/files/SR%20No%2086%20Effects%20of%20the%20EU%20Budget.pdf>

<sup>14</sup> Source: <http://www.eib.europa.eu/about/index.htm>

is focused on Europe, where the multilateral bank finances sustainable investments as part of the EU policies. The instruments used are

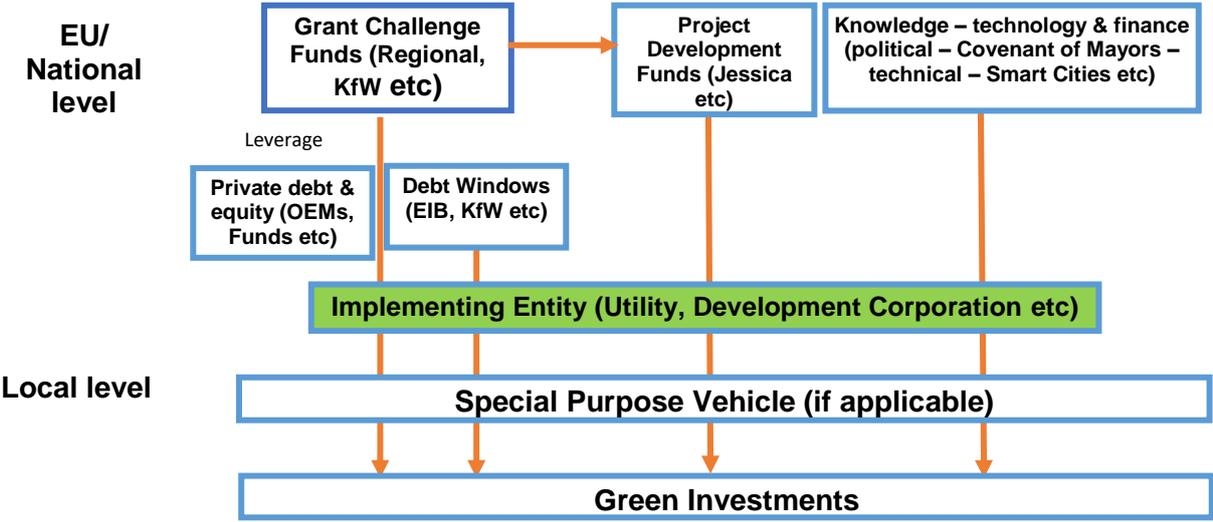
1. Lending: The vast majority of the financing is through loans, but guarantees, microfinance, equity investment, etc. are also offered
2. Blending: Through the EIB support financing from other sources is unlocked, particularly from the EU budget. This is blended together with banks' own funds to form the full financing package.
3. Advising: EIB takes to role of an advisor to help with administrative and project management capacity which facilitates investment implementation.

Climate finance is one of their four strategic focus areas. Project development support and catalyst finance for regard to urban environment, sustainable transport, energy and water projects are available through two main EU funds – the Joint Assistance to Support Projects in European Regions (JASPERS) and the Joint European Support for Sustainable Investment in City Areas (JESSICA). At the same time the EIB is manager of a number of municipal funds in other countries such as Turkey<sup>15</sup>. These funds are partly funded by the EIB and leverage with national resources.

Another major European bank is the European Bank for Reconstruction and Development (EBRD). It was founded in 1991 to create a new post-Cold War era in central and Eastern Europe, furthering progress towards 'market-oriented economies and the promotion of private and entrepreneurial initiative. It is owned by 64 countries, the European Union and the European Investment Bank. As such, part of the funds used by the EBRD are also EU budget related financial sources<sup>16</sup>. The Figure below gives an idea on how complex (and confusing) EU funding can be:

The key enabling institutions for EU GMF are described in the following figure.

**Figure 4: Key Institutional Supports to EU GMF**



Source: M. Lindfield, EC Link

<sup>15</sup> Source: [http://europa.eu/rapid/press-release\\_BEI-13-130\\_en.htm](http://europa.eu/rapid/press-release_BEI-13-130_en.htm)

<sup>16</sup> Source: <http://www.ebrd.com/home>

While not perfect or fully resourced, this structure constitutes a model that can be discussed with Chinese regulators and cities in order to structure their approaches to green/ climate investments. Key elements of the structure, at its best, are:

- *Grant challenge funds to address, inter alia, the issue that there are Viability Gap funding issues relating to environmental investments with external benefits;*
- *Project development facilities to ensure appropriate design and structuring of projects/ programmes;*
- *Knowledge networks – at both the political and technical levels;*
- *Large scale financing institutions with capacity to “crowd in” the private sector; and*
- *Well-structured implementing entities – many “off balance sheet” of local governments – capable of utilising a wide range of financing and funding models and having flexibility in structuring projects.*

The system works best if all components are present, coordinated and functioning effectively.

## 4 Lessons Learnt and Conclusions

### GMF Enabling Framework

The key success factors in an enabling framework at national level are set out below.

#### A. Political and Institutional Support

- Political support and coordination across all levels of government is needed,
- supported by structures that can conduct a thorough planning process which is aligned across government levels, and
- informed by institutions that can develop and retain a knowledge base and network of human resources including a mix of relevant skills (political-technical-financial across all stages of project development and implementation).
- Use established national institutions to implement new policies where possible.

**B. Establish and strengthen legal frameworks** – including environmental laws and law enforcement that contribute to the demand for green finance which are consistent across jurisdictions, transparent and practical.

**C. Improve coordination and information** sharing between environmental, financial and industrial regulators and with relevant third-party institutions through the use of appropriate networks.

#### **D. Develop comprehensive policy support for green finance**

Key actions are:

- Align monetary policy with sustainable development goals;
- Strengthen green credit and rating policies in banking;
- Provide incentives to grow the market for green securities, including green bonds;
- Expand the scope of green insurance and strengthen environmental liability insurance regulations; and
- Use fiscal incentives, encourage policy banks to focus on green finance issues and instruments, and if necessary establish dedicated financing institutions such as green banks, to accelerate the development of green finance markets and to crowd in the private sector.

#### **E. Comprehensive support for project development**

- Provide project development technical and financing support for green projects.
- Fund preparation costs of projects/ design of financing structures
- Ensure cities review the demand situation carefully, start create a project pipeline at an early stage and review it frequently; and
- Ensure a rigorous project prioritization process is conducted across sectors and includes funding considerations.

China has commenced reforms in almost all of these areas. Two key areas where insufficient progress has been made are in networking structures to establish and disseminate best practice and in support to project development (B and D above).

## **GMF Framework for Action**

Specifically in relation to GMF, the key issues to be addressed and recommendations are set out below.

### **A. Funding issues**

- National policy framework needs to foster GMF, in particular there needs to be an explicit link between NAMAs/ NDCs to investments and budget for implementing them. GMF needs to be integrated in overall Green Finance policy by central banks.
- Transfers for local governments need to be more effective, in particular they need to use performance-based challenge funds and foster the leverage other funds including funds from the private sector.
- Low carbon, climate resilient cities place an extra burden on cities and current revenues insufficient and so the funding base of local governments needs to be enlarged in light of investment needs and the level of indebtedness of cities – this base needs to be derived from sustainable sources.

### **B. Financing issues**

- Financial programs complicated and not easy to access – especially green/ climate change finance and thus cities’ capacity to assess and access finance needs to be increased.
- The private sector is often not interested in investing in city projects (projects not commercial) and thus cities need to be able to develop attractive business cases that are risk reduced and provide a clearly defined profit.
- Urban PPPs are often not well structured and based on quantitative objectives, which ignore environmental outcomes and thus there is a need to change the structure of such projects to include incentives to attain qualitative and/or environmentally relevant targets.
- Key climate finance issues for cities are:
  - Adaptation for cities difficult to finance; and
  - CDM financial potential limited.

In response:

- Adaptation is a public good - national government support is thus needed; and
- Cities need to be included into local carbon markets and to be able to assess the feasibility of local cap and trade schemes.

### C. Institutional/ process issues

- High upfront cost of climate-related infrastructure measures keep cities from investing despite high CO2 reduction potential so national governments to support knowledge base, foster good practice examples, set targets and provide appropriate incentives for appropriate investment (including for private participation).
- New climate technologies difficult to finance and thus knowledge of new technologies needs to be better disseminated – this needs to be supported by a technology-agnostic (performance-based) procurement processes
- Lack of structures and capacity to develop projects for:
  - Sustainable finance; and
  - Implementation and sustainable funding
 There is thus a need to assist cities in project development and financial structuring.

### Value added

This paper has:

- Made clear distinction between financing and funding activities relating to green investment and the linkage between these two functions – particularly in the context of deteriorating local government finances.
- Emphasized that, in the context of city climate plans, city planning systems need to include consideration of the investment implications of national climate policy and of consequent financing/ funding implications.
- Set out the requirements of a system of institutions that are needed to support such investment, in particular:
  - Grant challenge funds;
  - Project development facilities;
  - Knowledge networks – at both the political and technical levels;
  - Large scale financing institutions with capacity to “crowd in” the private sector; and
  - Well-structured implementing entities utilising a wide range of financing and funding models and having flexibility in structuring projects.

- Identified two areas – funding and financing – where practical tools are needed to assist local governments to plan financing and funding activities for investments in general and green investments in particular. An outline of proposed Tools is found in the Annex.

## Priority Activities in GMF

There is an urgent need to:

- Investigate and recommend sustainable funding mechanisms for local governments, particularly in relation to their capacity to fund/ catalyse green investments designed to implement climate policies – the use of a “Green Bonus” system should be considered..
- Establish an “ecosystem” of inter-relating institutions to produce a pipeline of viable green investments in cities, that ensures;
  - Project development systems generate and effectively structure such projects;
  - Financing models are appropriate to the type of project, in particular they will be different for adaptation and mitigation projects;
  - Financing models are designed to maximise the leverage of private sector investment in green infrastructure; and
  - Capacity and coordination among existing and proposed knowledge platforms is strengthened.
- Test, refine and then institutionalize tools as standard approaches to local government funding and financing of investments in general and of green investments in particular.

It is suggested that the China Eco-Cities Centre under the Ministry of Housing, and Urban-Rural Development (MoHURD), supported by the European Union (EU) through the Europe-China Eco-Cities Link Project (EC Link) take a lead in catalysing work on these priority activities. It could be done by establishing an open “Urban Green Finance Network” inclusive of all relevant stakeholders – including international stakeholders. Such a network would potentially receive support from development banks and other development assistance agencies. It could also serve as a channel both for international knowledge to reach China AND also as a vehicle to disseminate China’s increasingly sophisticated approaches to green finance to the world. This agenda fits very well with all the four areas of strategic support under the project vis

- 1) Demonstrate best approaches to implement low carbon solutions by introducing appropriate tools;
- 2) Serve as testing ground for innovations in specific low-carbon policies;
- 3) Improve Chinese Municipalities' potential to finance low carbon solutions and notably their ability to attract private sector financing in the form of public private partnerships; and
- 4) Establish knowledge networks and test the functionality of support mechanisms.

## 5 ANNEX GMF Tools

### Funding Tool MF 1 –

### GREEN INVESTMENT RESOURCES PLAN<sup>17</sup>

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<sup>17</sup> This tool is substantially based on the framework, adapted for Chinese conditions, provided by the GIZ Revenue Enhancement Planning methodology used in Ethiopia.

## Structure of the Tool

The tool is structured by the main steps in the preparation of a GIRP:

- Step One sets out key issues relating to the policy and legal framework which need to be considered before beginning detailed planning.
- Step Two studies past revenue performance and emphasises past difficulties. The trend analysis gives important inputs for further planning and is the basis for the coming gap analysis.
- Step Three critically examines past expenditures. The aim of revenue enhancement is to cover the cost of essential services for citizens. Therefore, revenue generation and expenditure are directly linked.
- Step Four provides recommendations on areas for improvement of revenue administration. Based on the previous step, lessons learnt that need to be transformed into strategies should be developed.
- Step Five presents a way to allocate costs among city services.
- Step Six offers an assessment of potential additional means increasing municipal revenue.
- Step Seven critically analyses the space for financing to cover running and future costs.

## Financing Tool MF 2 –

### GREEN INVESTMENT FINANCING PLAN

#### Structure of the Tool

The tool is structured by the main steps required to prepare a GIFF:

- Step One sets out the key information that needs to be assembled by the unit coordinating the GIFF, in particular: the estimated project costs, broken down by major component; the sectoral priority of the project (derived from a structured project prioritisation exercise);<sup>18</sup> documents potential financing sources and funding context (see Tool 1 GIRP) including the flow of grant finance linked to particular types of project types.
- Step Two is a structured analysis of all projects and their main components to determine which projects and/or components could recover their costs from user charges or other means and could thus be implemented/ financed by the private sector.
- Step Three classifies and prioritises projects by investment size into those that are a) small and urgent and thus must use current revenue, and b) those that are large or that are small but less urgent and can be “bundled” into larger investment packages - these will need to be at least partially financed.
- Step Four is a “market sounding” relating to a) the likelihood of attracting private investors and/or finance to those projects identified for private sector implementation<sup>19</sup> and b) the cost and timing of potential private and public financing (international – including all costs – and national) of non-private investments.
- Step Five plots needed financing for prioritised projects (net of small urgent projects) and potential tied external grants, among projects according to their economic IRR and

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<sup>18</sup> Potentially a Tool 3 similar to CDIA’s City Investment Programming and Prioritisation Tool.

<sup>19</sup> If there is no interest, or if the likely charges are deemed unacceptable, then the project(s) revert to public sector implementation and the process reverts to Step 2.

urgency as determined by the GAM approach in Step 3 over the investment period (including phasing of projects/ components).

- Step Six allocates recurrent revenue surplus (net of small urgent projects) and potential tied external grants, among projects according to their economic IRR and urgency using a GAM approach – the GIFP.
- Step Seven describes the process of establishing the legal and other structures required to implement the plan – and for monitoring the performance of financing, evaluating its effectiveness and reallocating resources as circumstances change (on a quarterly basis).



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