FELICITY'S PROJECT IDENTIFICATION AND SELECTION PROCESS

Overview and Lessons Learned

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European Investment Bank The EU bank

On behalf of:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

of the Federal Republic of Germany

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LIST OF ACRONYMS

100RC	100 Resilient Cities
AALMAC	Mexican Association of Local Authorities (*Asociación de Autoridades Locales de México*)
AFD	French Development Agency (*Agence Française de Développement*)
AMIMP	Mexican Association of Planning Institutes (*Asociación Mexicana de Institutos de Planeacion*)
ANAC	National Association of Mayors (*Asociación Nacional de Alcaldes*) – Mexico
BANOBRAS	National Bank for Public Works and Services (*Banco Nacional de Obras y Servicios Públicos*) – Mexico
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (*Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit*) – Germany
BNDES	National Development Bank (*Banco Nacional de Desenvolvimento*) – Brazil
BRDE	Far South Regional Development Bank (*Banco Regional de Desenvolvimento do Extremo Sul*) – Brazil
C40	C40 Cities
CAF	Latin American Development Bank (*Banco de Desarrollo de América Latina*)
CCFLA	City Climate Finance Leadership Alliance
EIB	European Investment Bank
EnRes	Converting Solid Urban Waste into Energy (*Aprovechamiento Energético de Residuos Urbanos*) – Mexico
FELICITY	Financing Energy for Low-carbon Investment – Cities Advisory Facility
FENAMM	National Federation of Municipalities of Mexico (*Federación Nacional de Municipios de México*) – Mexico
FGV	Getúlio Vargas Foundation (*Fundação Getúlio Vargas*) – Brazil
FNP	National Federation of Mayors (*Federação Nacional de Prefeitos*) – Brazil
FONADIN	National Fund for Infrastructure (*Fondo Nacional de Infraestructura*) – Mexico
FORTAMUN	Fund for Strengthening Municipalities and Districts (*Fondo para el Fortalecimiento Municipal y de las Demarcaciones*) – Mexico
GGGI	Global Green Growth Institute
GHG	Greenhouse gases
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
ICLEI	Local Governments for Sustainability
IDB	Inter-American Development Bank
IFI	International financial institution
IIED	International Institute for Environment and Development
KfW	German Development Bank
LRG	Local and regional government
MBT	Mechanical and biological treatment
MDB	Multi-lateral development bank
MoHURD	Ministry of Housing and Urban-Rural Development

NDC	Nationally Determined Contribution
PPF	Project preparation facility
PPP	Public-private partnership
PV	Photovoltaic
TA	Technical assistance
TAP	Transformative Actions Program
US EPA	United States Environmental Protection Agency
USAID	United States Agency for International Development
WRI	World Resources Institute

EXECUTIVE SUMMARY

Background

FELICITY (*Financing Energy for Low-carbon Investment – Cities Advisory Facility*), has the long-term mission of closing the gap between urban development planning and infrastructure project financing. The initiative is implemented by the *Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH* (GIZ) in cooperation with the *European Investment Bank* (EIB) and commissioned by the *Federal Ministry for the Environment, Nature Conservation and Nuclear Safety* (BMU).

The initiative is currently active in China, Brazil and Mexico. It includes projects in a wide range of urban infrastructure sectors that provide a potential for lowering carbon emissions, such as transport, district heating/cooling, public lighting, waste management, energy efficiency and renewable energy.

In 2018, FELICITY has finished its first round of identification and selection of projects to receive technical support under FELICITY. In this report, FELICITY assesses the results of this process and extracts lessons learned that could improve subsequent cycles of project identification and inform the work of other *Project Preparation Facilities* (PPFs).

Project Selection

FELICITY evaluated applications for technical assistance by cities and the proposed projects as well as the context in which they would be implemented. A set of criteria formed the basis for the selection of projects, which were assessed via a questionnaire filled out by applicants and further consultations held with them to clarify certain questions. The criteria included relevance towards the fulfilment of *Nationally Determined Contributions* (NDCs); the city's commitment and capacities; mitigation potential; additionality of technical assistance; socio-economic and environmental impacts; financial and technical viability; and replication potential and scalability. This process ensured that engagement would be meaningful for FELICITY as well as for the other stakeholders involved (e.g. local governments) and that the ultimate goal of contributing to low-carbon infrastructure development is met.

Each target country had a FELICITY's national focal point who was responsible for disseminating information regarding the initiative amongst relevant stakeholders and consolidating the first pipeline of potential projects. FELICITY decided against an open call for projects as a starting point for project identification, mainly to avoid a large number of applications that did not fit its requirements.

Overall, the main channels through which FELICITY sought potential projects were GIZ and partner networks within each country, particularly those linked to the EIB (i.e. regional development banks). These included stakeholders at the national level (e.g. ministries), national and international city networks (e.g. C40 and 100RC) and international organisations (e.g. WRI and UN-Habitat). FELICITY's national focal points also reached out to their professional network, including cities, companies and professionals working in the field.

In addition to the above, in Brazil FELICITY worked with local consultants with experience in the private sector, who provided information on private-led initiatives which were, however, either too immature or not yet endorsed by the public authorities. A particular setback in the country was the complex legal array of fiscal policies and procurement processes that had to be evaluated as part of the process.

In China, a limitation to project selection was the international criteria for climate financing, which are stricter than the local stakeholders are used to. Additionally, political structures (e.g. in terms of hierarchy and autonomy of project owners) made engagement more difficult. Nevertheless, after overcoming these constraints, more than 20 projects were identified.

In Mexico, FELICITY collaborated with ICLEI's *Transformative Actions Program* (TAP), a project pipeline and preparation facility also active in Mexico, to gather initial data on projects. Through ICLEI's city network in the country, 11 applications were submitted via TAP; however, they were mostly too premature (i.e. early pre-feasibility) or focused on adaptation rather than mitigation. Particularly noteworthy was the fact that local elections were held in Mexico during the screening period, which meant that particular attention had to be paid to ensuring that projects considered for selection would not be discontinued.

Project identification results

As of June 2018, FELICITY had received 82 applications for support: 22 in Brazil, 27 in China and 33 in Mexico. The indicative cumulative investment volume amounted to more than € 4 billion, of which more than € 450 million was climate-related. Waste and renewable energy projects accounted for almost 50% of the applications (roughly 25% each), followed by mobility, water and district energy.

More than half (57%) of the projects were reported to be framed within a development or master plan at the local level, whilst more than a third (36%) also referred to a national framework. Geographical coverage in countries was influenced by an imbalance in regional development (e.g. less developed regions in Brazil and China had no applicants; in Mexico applications came from all over the country) and the consequent reach of FELICITY's network.

More than two thirds of applicants reported their projects as being in the pre-feasibility stage, with just 20% in the feasibility study phase or beyond. Accordingly, applicants either requested assistance to finalise viability studies, develop a business model or access finance.

Half the projects were in the mid-range in terms of investment size (i.e. from € 5 million to 30 million), and overall investment figures ranged from € 500 thousand to € 500 million. Most applicants reported that initial studies (e.g. conceptual design and pre-feasibility) were either funded by own resources of the municipality or another lead entity (e.g. private operator) or by grants from national

government, development banks or international aid organisations. For *Operation and Maintenance* (O&M) *Costs*, applicants mostly envision the use of user fees, either on their own or in combination with subsidies (as is the case for most large mobility projects).

The mitigation potential of the different projects varied greatly, with figures of up to 50,000 tonnes of CO_2e/year in all sectors. Projects exceeding this figure were mostly in the waste management and energy sectors. The average investment per tonne of CO_2e/year avoided was just over € 7,000. The two main socio-economic impacts cited in applications were cost reduction potential for both end users and operators (particularly for energy and transport projects) and the potential for job generation.

Out of the 82 applications, FELICITY proposed eight potential projects for evaluation by BMU. Finally, five projects were selected for assistance: three in Brazil (Clean and integrated public transport system in Florianópolis; Energy efficiency and solar energy at schools in Porto Alegre; and Modernisation and energy efficiency for public lighting in Curitiba) and two in Mexico (Urban waste management and conversion into energy in Naucalpan; and Energy transition for public buildings in Mexico City).

Findings and recommendations

The first finding resulting from FELICITY's first project selection round is that there is a high demand for project preparation support. FELICITY's strategy of not using open calls for project identification was proven correct, as it avoided the submission of an even higher number of applications that would not have been a good fit for the initiative. The networks of GIZ, the EIB and FELICITY within each country provided a much more suitable project pipeline.

In this regard, it was verified that there is a need for consolidation of the application process for PPFs, not only to facilitate project identification and increase cooperation and synergies among initiatives, but also to ease the burden on cities of having to apply with the same project on multiple occasions. It was clear that numerous cities and other stakeholders did not fully understand FELICITY's approach, despite efforts made in that regard, including webinars, presentations and other engagement activities. Most notably, institutions expected FELICITY to provide some sort of loan as part of the collaboration and did not accord as much value to technical assistance.

The main reason for project non-eligibility was the level of maturity, with eligibility vis-à-vis financiers ranking second (in particular for China). As FELICITY is associated with leveraging finance, engagement should ideally happen towards the end of the pre-feasibility stage; however, most applicants struggle to find the resources required to reach that point.

Based on the above findings, the following recommendations are made:

- **Improvement of Communication,** directing efforts towards clarifying PPFs' approaches, reach and eligibility, including partnering up with local institutions in order to adapt language and the approach.

- **Standardisation of the Application Process,** building trust between initiatives in the same field, with a view to developing an approach to identify and consolidate project pipelines.

- I**dentification of Local Partners** that could provide valuable information on project pipelines of interest to PPFs, once more stressing the need for an improved communication strategy.

- **Consideration of Selection Timing,** particularly when it comes to government-initiated projects, taking into account annual municipal budgeting and political cycles.

In addition, in the overall framework of PPFs, the design of broader initiatives in terms of scope, sectors and geographical coverage is recommended, so that the PPF sector develops in such a way that it includes a wider array of projects in need of assistance leading to accelerated support to cities at scale.

1.0 INTRODUCTION AND OBJECTIVES

The challenges of developing infrastructure projects that are attractive to investors are well documented, with subnational entities facing significant difficulties in this regard. *Project preparation facilities* (PPFs) such as FELICITY, which aim to assist *local and regional governments* (LRGs) in improving the bankability of infrastructure projects, are a relatively recent phenomenon, particularly in the field of climate mitigation and adaptation. Therefore, it is crucial for these initiatives to perform assessments of the successes and challenges of each of their activities to ensure that their overarching objective is achieved efficiently.

Identifying and selecting the projects that will receive assistance from a PPF is the first key step in the process. It is a decision with long-term consequences and usually taken based on a limited amount of information (be it technical, financial or institutional).

Having finished its first selection round, FELICITY assessed the results of its selection process and formulated lessons learned that could improve subsequent cycles and inform the work of other PPFs. Based on this, the objectives of this report are to:

- → understand and evaluate FELICITY's project identification and selection process and associated successes and challenges
- → consolidate and assess the results of FELICITY's project identification and selection process regarding the main features of the applications and chosen projects
- → identify lessons learned and provide recommendations not only for improving FELICITY's project selection process itself but also on how FELICITY can adapt to reflect cities' needs
- → provide information that can assist the work of other PPFs and associated initiatives.

CLIMATE FINANCE GAP

US$ 93 TRILLION

worth of low-carbon, climate-resilient infrastructure.

70%

of this Infrastructure will be built in

CITIES

Only **10 -30%** is currently directed to

Local Level Projects

Figure 1 | **Climate Finance Gap** (Source: elaborated by the author based on Bhattacharya et al., 2015; IIED, 2017; CCFLA, 2015)

2.0 BACKGROUND

Cities are at the frontline of climate change mitigation and adaptation. While they concentrate a great deal of population growth and carbon emissions, they are the best positioned to tackle climate change by incorporating mitigation and adaptation into infrastructure development. Over the next 15 years, roughly USD 93 trillion's worth of infrastructure designed to be low-emission and climate-resilient will need to be built globally.[1] More than 70% of this infrastructure will be built in urban areas at a cost of USD 4.5 trillion to USD 5.4 trillion per year. The value of infrastructure required in urban areas over the next 15 years could be greater than the USD 50 trillion, being the value of all the infrastructure in the world today.[2]

However, LRGs (and private companies) experience legal, regulatory, technical capacity, risk mitigation and financial challenges (including high levels of debt and limited credit worthiness) that limit their ability to develop or finance urban projects.[3] Estimates show that only 10% to 30% of climate finance is aimed at sub-national projects. In addition, project preparation support remains limited and mostly dependent on grants that are typically provided by national public financial institutions.[4]

PPFs come as a response to those challenges. Although with varying structures and approaches, they assist cities and other entities in improving their technical and financial capacities, in particular in the feasibility stage (i.e. completing viability studies, preparing business models and evaluating financing alternatives). Ultimately, they aim to foster a longer and better pipeline of infrastructure projects with maximum mitigation or adaptation impact, which can respond technically to the challenges cities and citizens face and at the same time be financially attractive to investors.

1 Bhattacharya et al., 2015.
2 International Institute for Environment and Development (IIED), 2017; City Climate Finance Leadership Alliance (CCFLA), 2015.
3 IIED, 2017; CCFLA, 2015.
4 CCFLA, 2018.

3.0 FELICITY

FELICITY (*Financing Energy for Low-carbon Investment – Cities Advisory Facility*), has the long-term mission of closing the gap between urban development planning and infrastructure project financing. The initiative is implemented by the *Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH* (GIZ) in cooperation with the *European Investment Bank* (EIB) and commissioned by the *Federal Ministry for the Environment, Nature Conservation and Nuclear Safety* (BMU).

FELICITY is currently active in China, Brazil and Mexico and provides tailored support to financial intermediaries and promoters to make their low-carbon infrastructure projects bankable for lending from the EIB in accordance with its Climate Strategy and due diligence requirements. Where useful, FELICITY can also provide assistance at the national level to improve framework conditions for investments at the sub-national level. FELICITY also aims to contribute to knowledge exchange on project preparation at the global level by cooperating closely with a series of partnerships and networks (such as the *City Climate Finance Leadership Alliance* – CCFLA).

FELICITY can assist projects in a wide range of sectors that provide a potential for lowering carbon emissions, such as **Transport, District Heating/Cooling, Public Lighting, Waste Management, Energy Efficiency** and **Renewable Energy**.

Figure 2 | FELICITY's Objectives

PHASES

PROJECT IDEA

PROJECT DESIGN

FEASIBILITY

TECHNICAL ASSISTANCE

UPSTREAM

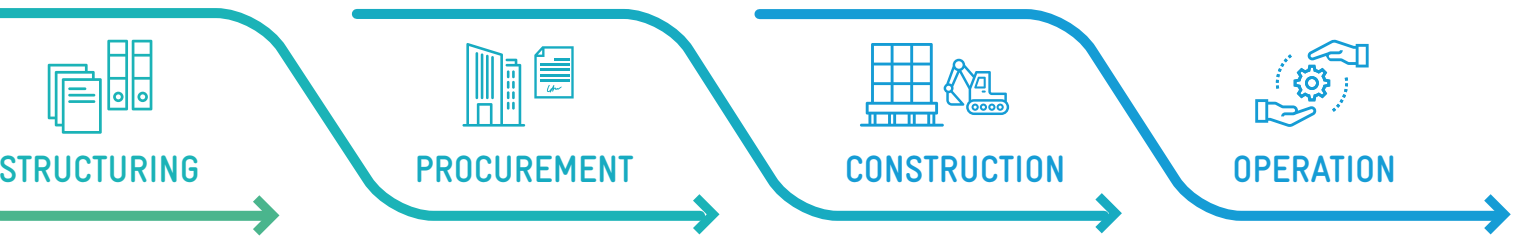
- Investment planning and prioritisation
- Project identification and screening
- Assessment of existing project documentation following the EIB's financing criteria
- Support an enabling environment.

PREPARATION

- Enhancement of studies
- Alignment of pla procurement, en social and other
- Support to execu and process, ten
- Establishing pro Implementation

OUTCOME

HIGH-QUALITY CONCEPTS



(pre-)feasibility

ans with EIB's
vironmental,
standards

ution planning
der

oject
units.

IMPLEMENTATION

- Capacity development for implementation and quality control
- Technical backstopping of contractor's work (design, standards, etc.).

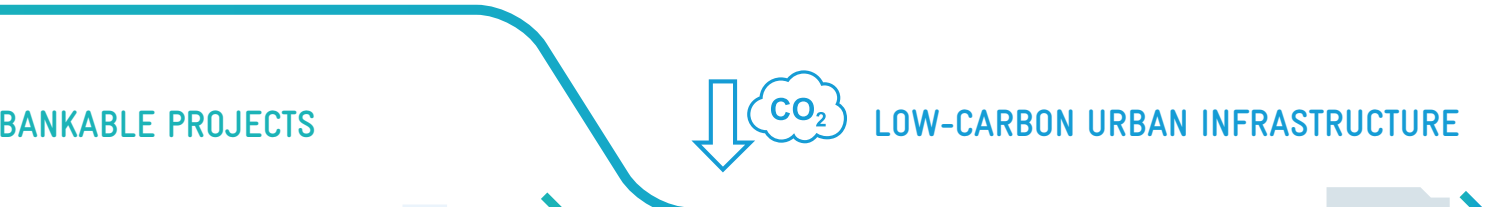


Figure 3 | FELICITY's Activities

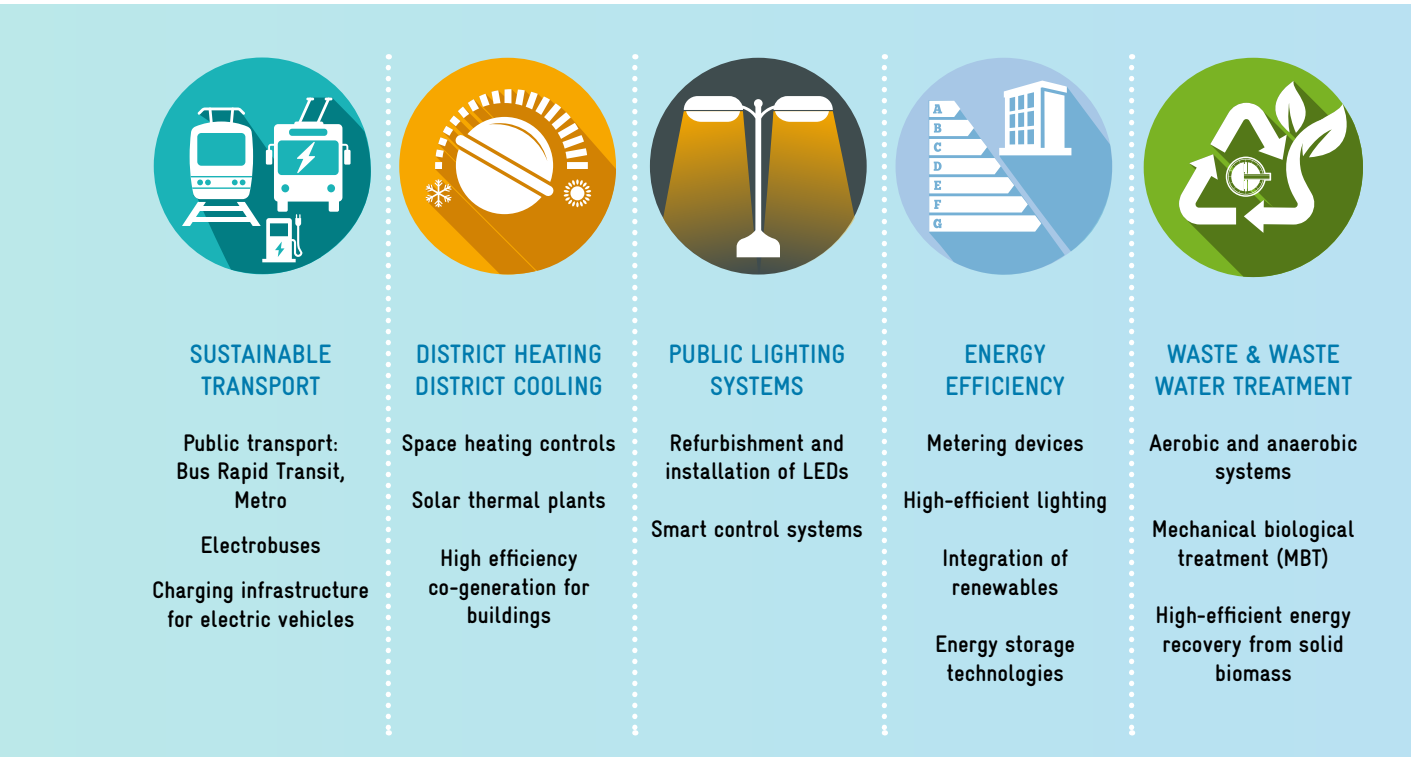


Figure 4 | Eligible sectors

4.0 PROJECT SELECTION PROCESS

Selecting the projects that FELICITY will support is a crucial first step. It is therefore necessary to evaluate a series of aspects regarding the project itself as well as the context in which it will be implemented (e.g. legal and institutional framework). The selection process aimed to ensure that providing assistance would be meaningful for FELICITY as well as for the other stakeholders involved (e.g. local governments) and that the ultimate goal of contributing to low-carbon infrastructure development is met.

Naturally, the sine qua non condition for engagement is the willingness/interest of the project developer to gain access to international finance (in some cases through local intermediaries) with FELICITY's assistance.

In order to evaluate potential projects, FELICITY has developed a set of criteria that form the basis for project selection. These include the following:

❶ **Relevance towards the fulfilment of Nationally Determined Contributions (NDCs)**,[5] gauging the extent to which the project can assist in contributing to national climate action plans.

❷ The **city's commitment**, with the inclusion of the project in a municipal development framework and the manifestation of political backing, and capacities, striking the right balance to identify cities that could benefit from FELICITY's assistance but also have the necessary capacities to follow through with the project.

5 The Paris Agreement requests each country to outline and communicate their post-2020 climate actions, known as their NDCs.

❸ **Climate Action Eligibility and GHG (greenhouse gases) Emission Potential** which, in line with Point 1, reveals the extent to which the project can reduce carbon emissions.

❹ **Additionality of Technical Assistance**, or the added value of FELICITY's assistance, and potential financing, that is, the options for funding the project.

❺ **Positive Socio-Economic and Environmental Impacts**, highlighting the holistic nature of the project and enhancing its bankability, as consideration of these impacts reduces risks to project development and operation (e.g. social unrest).

❻ **Financial and Technical Viability**, also taking into account the project's maturity and the timeframe needed for the project to achieve financial closure, as there is a limit on the resources that FELICITY can use for each project. Thus, the engagement phase must be as meaningful as possible in terms of its objectives.

❼ **Replication Potential and Scalability,** ensuring that the experience with FELICITY can be organically replicated in similar opportunities within the country.

Additional eligibility criteria included a minimum investment amount (€ 5 million) to ensure the project was sufficiently large to justify the transaction costs involved in the disbursement of credit.

Information for project evaluation based on the abovementioned criteria was gathered via a questionnaire that was filled in by interested parties and through direct contact with potential applicants, third-party sources (e.g. ministries and development banks) and external sources of information (e.g. credit ratings). Each target country had a FELICITY national focal point in the GIZ country office who was responsible for disseminating information regarding FELICITY amongst relevant stakeholders and consolidating the first pipeline of potential projects.

FELICITY decided against an open call for projects as a starting point for project identification. This was mainly to avoid a large number of applications that did not fit its requirements and save critical resources at the side of the project developers. The main channels through which FELICITY sought potential projects were GIZ and partner networks within each country, particularly those linked to the EIB (i.e. its financial intermediaries). These channels included stakeholders at the national level (e.g. ministries), national and international city networks (e.g. C40 and 100RC) and international organisations (e.g. WRI and UN-Habitat). In addition, FELICITY's national focal points reached out to their professional network, including cities, companies and professionals working in the field.

In spite of efforts to clarify FELICITY's approach and criteria amongst the different stakeholders and not having a public call for proposals, a considerable number of non-eligible applications were received, albeit fewer than might otherwise have been the case. An alternative to this strategy was piloted along with ICLEI in Mexico, with an attempt to identify projects via the Transformative Actions Program (TAP). Details of the approach taken in each of the countries are provided on the following pages.

Aerial view of Guaiba and Porto Alegre

Brazil

In Brazil, potential projects were mainly identified via the existing networks of both GIZ and the EIB. Its long term partnership with the Brazilian government means that GIZ has connections with several ministries (*Ministry of Energy, Ministry of Cities,* etc.) and with local and international city networks (e.g. FNP and C40), educational institutions (e.g. FGV), international organisations (e.g. WRI) and public enterprises (e.g. municipal transport companies and utilities in the energy sector). The EIB also has a number of local financial partners, namely regional development banks, such as the BRDE (*Regional Development Bank of the Far South*).

In addition to this, FELICITY worked with local consultants that have experience in the private sector relevant to infrastructure development in order to cover the entire range of stakeholders. In this case, most of the proposed projects were indeed private-led initiatives, but they were either too immature or had not yet been endorsed by the public authorities at the sub-national level and were therefore not eligible for FELICITY's technical assistance. Three projects proposed by the consultants were considered: two solid waste projects were not selected because the components designed to demonstrate the potential for net GHG emission reduction (anaerobic digestion or fermentation) were poorly developed; and one transport project (cycling lanes) with a limited need for FELICITY's technical assistance.

Against this background, FELICITY focused on cooperation with the BRDE and GIZ partner networks in the project identification and selection process. An important aspect in Brazil is the debt capacity of cities. This is greatly influenced

Downtown Florianopolis City – Florianopolis, Santa Catarina, Brazil

by the Law of Fiscal Responsibility (*Lei de Responsabilidade Fiscal, Lei Complementar nº 101, of 2000*), which enforces strict limitations on public spending throughout political cycles.[6] It can be observed that cities continue to use traditional means of financing (i.e. Brazilian development banks, such as Caixa and BNDES) and increasingly focus on the private sector for both project developers and potential borrowers for urban investments. The latter involves several challenges: the integration of private engagement into city planning, alignment with suitable public procurement procedures, the avoidance of different types of irregularities, community-based approaches and high-quality feasibility studies. Sound preparation of GHG mitigation projects related to urban infrastructure assets requires high levels of cooperation between entities, which are typically organised into sectors in Brazil. As a result, a considerable number of identified projects were not eligible because they were too immature in terms of project preparation quality, especially with regard to scenario analysis and the comparison of technical options, or concentrated on niche markets with limited transformative potential.

Additional efforts were necessary to improve stakeholders' understanding of the role FELICITY could play in assisting projects. Cities were asked to review the forms they had submitted based on FELICITY's comments, and a series of conversations were held with different stakeholders for further clarifications. In addition, an evaluation of the complex array of public procurement processes, the decentralised financial system, different standards for project preparation studies and incentive schemes established in regulations applicable to different urban sub-sectors was required for FELICITY's project selection process in Brazil.

6 To check cities' financial status and capabilities, a government-issued, city-specific bulletin (*Boletim de Finanças Públicas*) was utilised, in addition to internationally known rating agencies.

Residential building.
Bejing, China

China

In China, FELICITY was much more reliant on government institutions for disseminating and collecting information. Formal political approval for FELICITY by the *Ministry of Housing and Urban-Rural Development* (MoHURD) was only granted in March 2018, leaving a short period for the identification of projects before the discussion on the projects with BMU in July 2018. Nevertheless, the process continued afterwards with the identification of up to 40 projects. Two local consultants were commissioned in May 2018, although the projects identified via this channel were mostly ineligible for climate financing by the EIB in China (EIB has limitations in lending in China in several sectors such as solar PV and electro mobility).

Overall, there was a focus on state-owned enterprises due to current political trends (which result in fewer resources being allocated to public administrations) and interest from financiers. Finally, as the initiative was marketed at public events, interest from the private sector was also observed – namely from the solar panel, energy management system and electromobility industries.

A main limitation to project selection in China are international criteria for climate financing, which are stricter than the local stakeholders are familiar with.[7] This required additional efforts in clarifying provisions to 'project owners' (term used to denote the entity developing the project, be it the municipality or a state-owned enterprise). This constraint particularly affects the least developed areas in the central and western parts of the country, as they are less likely to have projects that fulfil the stricter criteria.

7 This was substantiated by the considerable number of applications from so-called 'clean coal projects'.

Residential building
in downtown Shanghai, China

There was a limited understanding of the PPF approach by project owners. Most of them expected FELICITY to provide project loans straight away and did not see much of a need for technical assistance, although it became clear that a significant number of projects identified were not mature enough for receiving support by FELICITY. Finally, there was a reluctance to allocate resources to the preparation of applications and technical development without a guarantee of receiving support from FELICITY.

Finally, it is worth noting that, although project owners might be open to improvements in their projects, as in the case of engagement with FELICITY, senior government officials, who have veto power, must approve any changes.

This negatively affects the value that FELICITY is potentially able to bring to the partnership, as it can significantly reduce the leeway that project owners have for project improvement.

Panoramatic view of Mexico City

Mexico

In Mexico, FELICITY also reached out to a series of stakeholders, including:

→ **GIZ's internal network:** FELICITY was presented to relevant GIZ projects in the country. Notably, several waste-to-energy projects (mostly from private companies operating in the waste-to-energy field) applied through the GIZ EnRes (*Converting Solid Urban Waste into Energy*) Project.

→ **National and regional partners:** engagement with representatives from several ministries (e.g. Environment, Energy, Agricultural Development and Urban Territory, and Finance) as well as state-level governments (e.g. Mexico City, Tabasco, Oaxaca, Nuevo León and Morelos). Via the *Ministry of Finance*, FELICITY reached *Mexico's Development Bank* (BANOBRAS), which provided a potential pipeline of projects in the sectors of waste management, water management and transportation and introduced *Proyectos Mexico*, an initiative aimed at bringing international investment for projects to the country.

→ **Extended network:** this includes local government networks at the international (e.g. ICLEI, C40 and 100RC) and national (e.g. AALMAC, ANAC, FENAMM and AMIMP) levels; international organisations (GGGI and WRI); and multi- lateral development banks (IDB, World Bank, AFD, CAF and KfW). A sense of competition among initiatives was noticed, with some reluctance from institutions to share project information.

Finally, the network of FELICITY's focal point in the country was also contacted – including city officials and officials from state – and national-level departments, who had worked in initial phases of cities' climate plans and could provide infor-

Solar Water Heaters installed on the rooftops of a public building in Mexico City

mation regarding project pipelines. In this case, the applications were for projects at the conceptual stage, highlighting the shortage of projects ready for finance and the need for capacity development for project preparation.

In Mexico, FELICITY also piloted cooperation with ICLEI's *Transformative Actions Program* (TAP). Developed by ICLEI and partners to unlock access to finance, TAP is a project pipeline and a project preparation facility that is active in Mexico. Taking advantage of ICLEI's network in the country, 18 cities were identified and briefed on FELICITY via webinars and then had the opportunity to apply to the initiative via TAP's application form with ICLEI's assistance. Eleven applications were submitted; however, most of the projects were found to be either at a stage considered too premature (i.e. pre-feasibility) for engagement or to be focused on adaptation, where FELICITY focuses on mitigation.

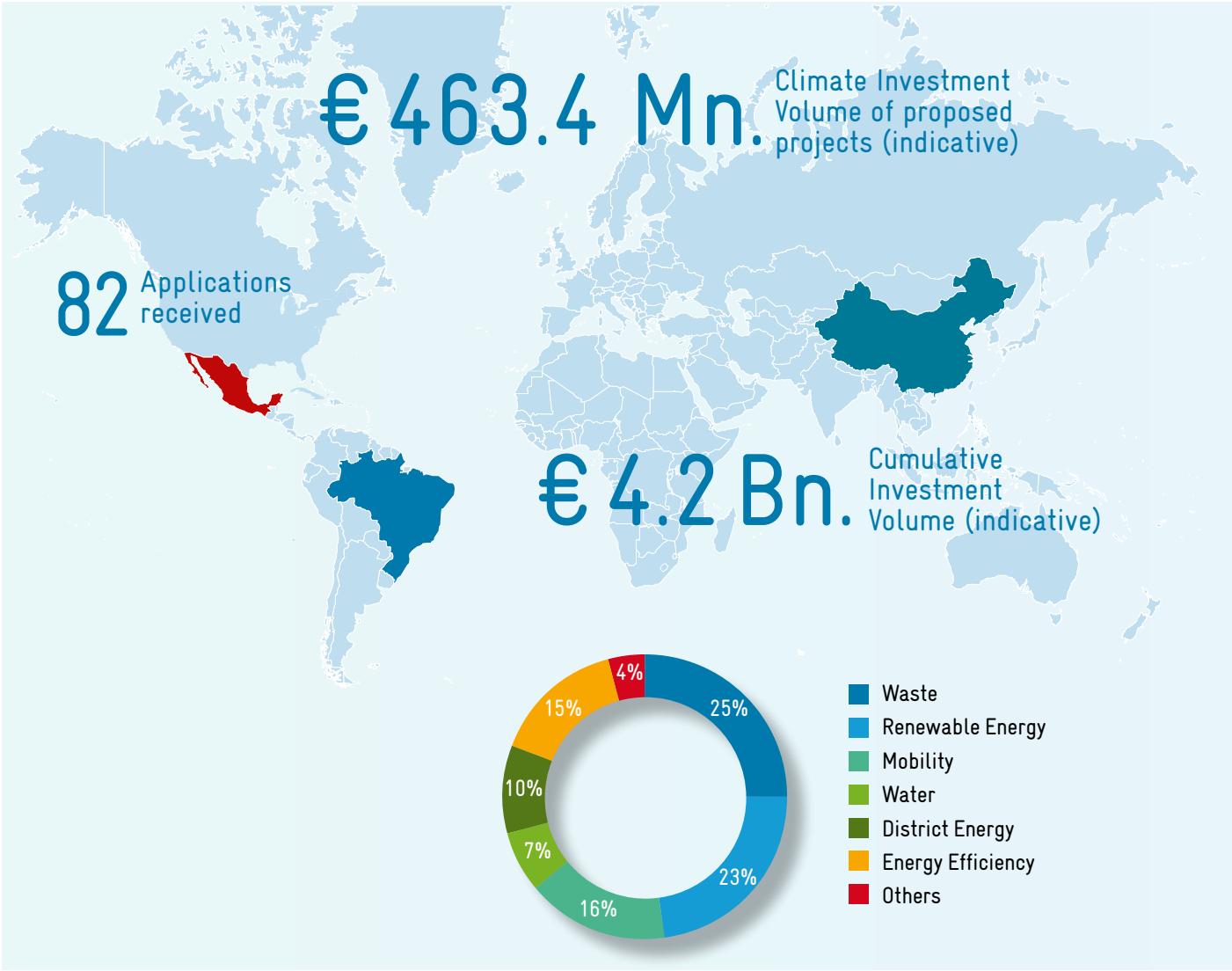
Additionally, FELICITY piloted the use of the *SmartScan* (developed by *Global Infrastructure Basel* (GIB)) for shortlisted projects to facilitate the selection process by obtaining a quick first assessment of the sustainability and resilience of the projects that were identified before they were proposed to BMU. Finally, information on the creditworthiness of cities was attained via ratings issued by *Fitch and HR* (local agency), although this did not play a major role in terms of determining eligibility.

Local elections were to be held in Mexico in July 2018, so particular attention needed to be paid to ensuring that potential projects would not be discontinued due to changes in government priorities.

5.0 PROJECT IDENTIFICATION RESULTS

Between October 2017 and June 2018, FELICITY received a total of 82 applications for project support: 22 in Brazil, 27 in China and 33 in Mexico. The indicative cumulative investment volume amounted to more than € 4 billion, of which more than € 450 million was climate-related. Waste and renewable energy projects accounted for almost 50% of the applications (roughly 25% each), followed by mobility, water and district energy. Project context

Figure 5 | Overview of identified projects (aggregated numbers)



Project Context[8]

More than a half (57%) of the projects were reported to be framed within a development or master plan at the local level, whilst more than a third (36%) also referred to a national framework (policy or programme). Consideration of this aspect is of relevance in gauging political viability and engagement (as seen above, one of the main criteria used by FELICITY) – although it can be significantly affected by political cycles.

Figure 6 | Geographical distribution of projects in Mexico

Except for Mexico,[9] where projects were identified all around the country, FELICITY's geographical coverage was limited to specific regions. In Brazil, it included the south-east (specifically the State of São Paulo) and the south. In China, most of the cities contacted fell within the eastern region of the country. In general, this limited coverage was due to the following reasons:

→ Significant imbalance in regional development in Brazil and China, with the less populous and less developed areas having fewer resources available and therefore fewer cities with development plans, projects and contacts, not to mention projects capable of complying with requirements.

→ Limited reach of GIZ and the EIB in these regions.

→ No conducive environment for municipalities to borrow from international financial institutions (IFIs) (e.g. north-east of Brazil).

Sectoral distribution was fairly representative in both Mexico and Brazil. The limited number of projects identified in China, as well as EIB's sectoral limitations in lending in China, naturally influenced this aspect, with all projects being related to district energy or building efficiency – topics that are not as relevant in the other countries due to differences in climatic conditions.

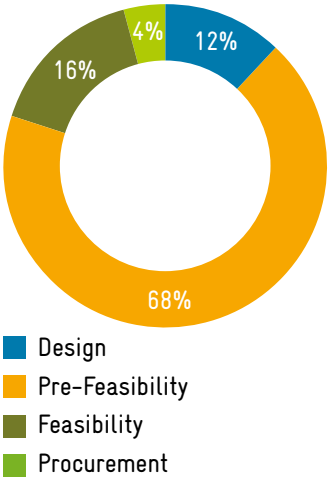
8 Please note that the analysis made for the following sections was based on the projects for which the application form was made available and had enough information for the evaluation (28 in total). No additional assumptions were made other than information provided by the applicants.

9 This has been attributed to the collaboration with ministries and national development banks, which have a country-wide perspective; however, there was engagement with ministries in both Brazil and China but with different outcomes.

One of the main issues identified in the preliminary screening was project maturity, with a significant number of projects found to be in very early stage (i.e. pre-feasibility or design).Cities face difficulties in putting together technical and financial resources to develop initial studies that would allow them to engage with FELICITY. The majority of the projects that made it onto the long-list were either initiating or had already finalised the full feasibility study, in accordance with the programme eligibility criteria described above.

In terms of the type of assistance required by applicants, support in finalising viability studies, developing a business model and accessing finance were all equally desired. A minority of cases also requested aid in identifying partners for project development (i.e. specialised agencies). Reportedly, in all countries, applicants associated FELICITY with the possibility of direct funding for their projects – and additional efforts were required to clarify how the initiative could assist.

Figure 7 | Applications by stage of development



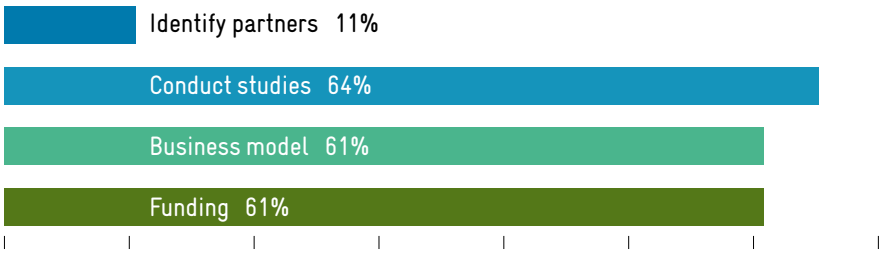


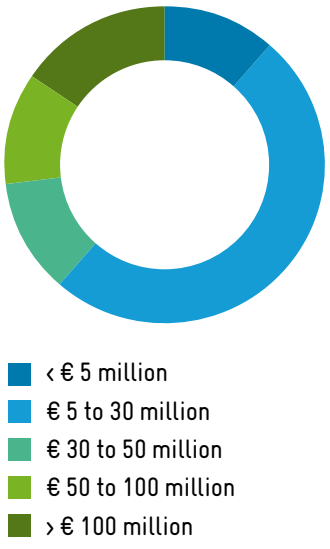
Figure 8 | Type of assistance requested

Finance Volume

Investment figures estimated for the applicant projects ranged dramatically from € 500 thousand to almost € 500 million. However, half of them were in the mid-range (i.e. between € 5 million and 30 million). No particular patterns regarding sector and project size were observed – waste-related projects were both amongst the smallest and largest investments, for example.

Overall, projects were planning to use traditional approaches to fund their initial investments as well as O&M costs. Initial investments (e.g. for studies) were funded either by own resources of the municipality or another lead entity (e.g. private operator) or by grants. In the case of the latter, five out of eleven projects stated that they had received financial support from national sources (e.g. national development banks, such as BNDES in Brazil, or specific funds, such as the FONADIN and FORTAMUN in Mexico for infrastructure development and municipal capacity strengthening, respectively); six others were assisted by international institutions, such as USAID (via the *Mexico Low Emissions Development Program*), US EPA or the *European Union*, through the *Low Carbon Business Action* in Mexico. No project reported making use of loans or any other sort of finance (e.g. partnerships with the private sector). For O&M costs, applicants mostly envision the use of user fees, either on their own or in combination with subsidies (as is the case for most large mobility projects). A specific tax was considered for public lighting projects in Brazil, where a fee is charged along with property tax.

Figure 9 | Applications by investment range



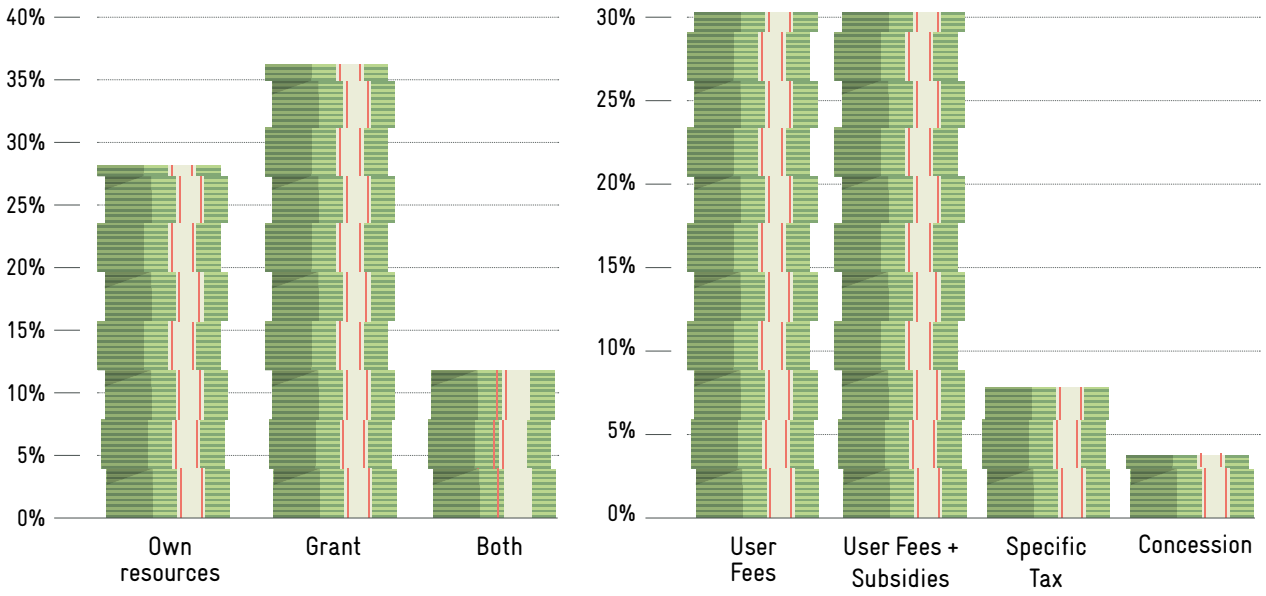


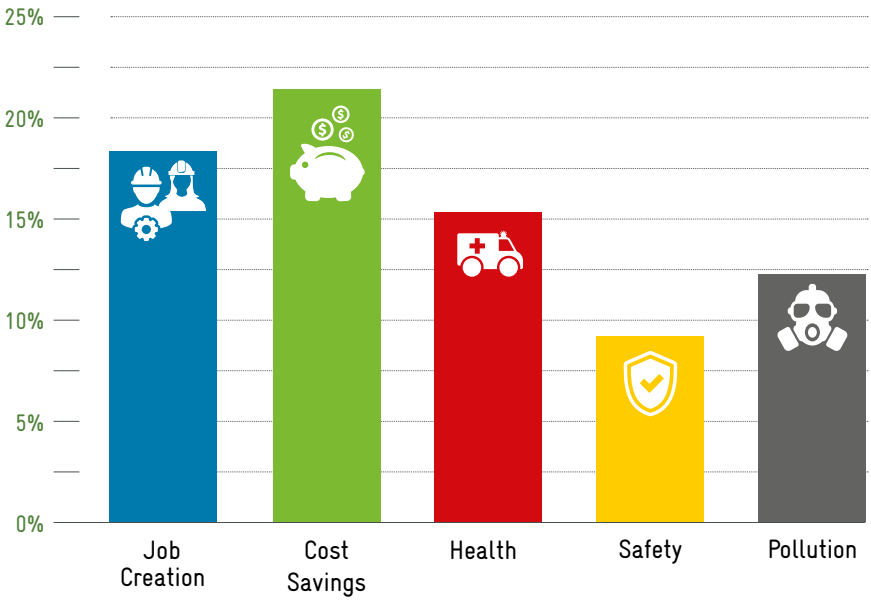
Figure 10 | Source of Funds for Initial Investment Costs and O&M

Project Impact

Most of the projects did not have full feasibility and impact studies completed at the time of assessment, which meant that information on their potential positive and negative impacts was rather limited, and no further verifications were made. In the majority of cases, the data most often highlighted was the number of people who would directly benefit from the project. None of them mentioned potential negative impacts, which is information that could be useful for FELICITY's assessment (both in terms of project risk and the possibility of improving the project's approach).

In addition to the more obvious project impacts (e.g. environmental impact of waste management projects), cost reduction potential for both end users and operators (particularly for energy and transport projects) was the main socio-economic impact mentioned by applicants, followed by the potential for job creation. Other important impacts related to reducing air pollution and improving public health (e.g. in transport and waste-related projects). Finally, public lighting projects cited increased public safety, an issue of particular relevance in Brazil and Mexico, which suffer from high crime rates.

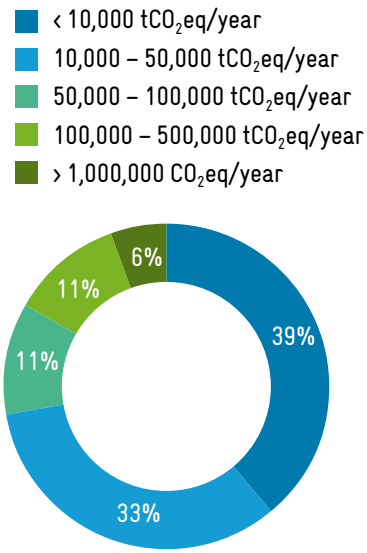
Figure 11 | Socio-Economic Impacts



Due to the wide range of project types, sizes and circumstances, mitigation potentials varied greatly. Whilst there were projects with mitigation potentials of up to 50,000 tonnes of CO_2e/year in all sectors, the ones exceeding this figure were mostly related to waste management and energy.

Analysis of the ratio of investment to mitigation potential also shows that figures for the applicant projects varied greatly. The average investment per tonne of CO_2e/year avoided was just over € 7,000, with amounts below € 100 for a waste project in Mexico and a district energy project in China; the highest value recorded was for a renewable energy project in Brazil (more than € 100,000).[10]

Figure 12 | Applications by mitigation potential



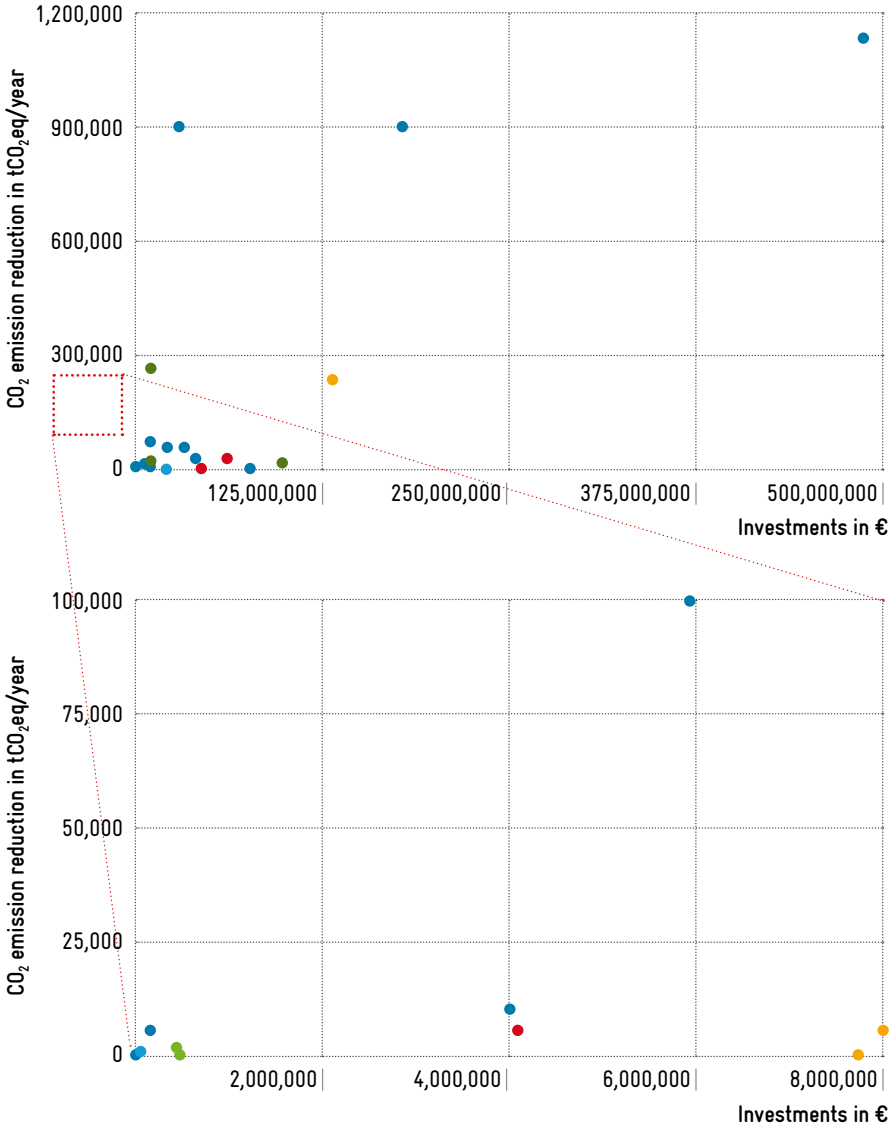


Figure 13 | Applications by Investment vs. Mitigation

- Waste
- Renewable Energy
- Mobility
- Water
- District Energy
- Energy Efficiency
- Public Lighting

10 Note that this is an estimation by the projects themselves without further assessment from FELICITY or any other partner. This data is therefore likely to be incomplete and/or of limited accuracy given the stage of development of most of the projects.

6.0 PROPOSED AND SELECTED PROJECTS

A total of eight projects were shortlisted in the first round of FELICITY's selection process – three in Brazil, one in China and four in Mexico. The selection was mostly based on project eligibility, that is, only a few projects were actually eligible according to all requirements. The leading criterion in project selection was maturity, as the majority of identified projects were at too early a stage for assistance (i.e. pre-feasibility or earlier). These eight projects were then proposed to the BMU and GIZ, who jointly decided to select five of them for collaboration with FELICITY.

The shortlisted projects are briefly described in *Tables 1* to *3*. The projects that were finally selected are highlighted in green.

Table 1 | Proposed projects in Brazil

Name	Sector	Short Description	Est. Climate Investment	Est. Mitigation Potential
Clean and integrated public transport system, Florianópolis	Mobility	The project will gradually renew the bus fleet (450 buses) with (partly) hybrid and electric buses and integrate the bus lines of eight municipalities into one public transport network, thereby achieving additional efficiency gains.	€ 114 million	20–50% in 2029 and 70–90% in 2039
Energy efficiency and solar energy at schools, Porto Alegre	Renewable energy	The project plans to upscale the installation of rooftop photovoltaic (PV) panels at 99 municipal public schools in Porto Alegre. The electricity produced by the PV installation would be consumed by public buildings, and the surplus production exported to the electric grid.	€ 23.3 million	At least 215 tCO_2e/year
Modernisation and energy efficiency for public lighting, Curitiba	Energy efficiency	The project envisages the modernisation and increased energy efficiency of Curitiba municipality's public lighting system, including the replacement of lamps by LEDs at some 160,000 lighting spots as well as the integration of smart technologies. The project would be implemented under a PPP model using performance-based contracts.	€ 59.5 million	3,230–6,460 tCO_2e/year

Table 2 | Proposed projects in China

Name	Sector	Short Description	Est. Climate Investment	Est. Mitigation Potential
Green electricity district heating, Beijing	District energy	The project will install a district heating system in the north-eastern part of Beijing, consisting of electrode boilers, hot water storage tanks and a distribution system. It provides for a high share of renewable energies for district heating, as 70% of the electricity will be purchased from a renewable energy provider.	€ 16.2 million	Not available

Table 3 | Proposed projects in Mexico

Name	Sector	Short Description	Est. Climate Investment	Est. Mitigation Potential
Urban waste management and conversion into energy, Naucalpan	Waste	Municipal solid waste separation and treatment in a mechanical and biological treatment (MBT) facility and anaerobic digestion facility in combination with a biogas combined heat and power (CHP) plant to generate 7.9 MW of electricity. All recyclable materials will be separated and sent through existing recycling channels.	€ 34 million	40,331 tCO_2e/year
Integrated management of solid waste, Monterrey	Waste	Implementation of proven technologies for material recovery, treatment of organic waste by means of anaerobic digestion and use of the calorific power of the inorganic fraction for energy generation.	€ 191 million	899,445 tCO_2e/year
Energy transition for public buildings, Mexico City	Energy efficiency	The project promotes energy efficiency in buildings as well as the use of alternative energies by implementing energy retrofit and solar water heating systems, initially in 50 public buildings, with high potential for expansion and replication.	€ 7.6 million	1,017 tCO_2e/year
Bus rapid transit Corridor 12, City of San Luis Potosi	Mobility	The project consists of the construction of a bus corridor connecting the central perimeter of the urban area with a set of established routes to the city's main industrial zone. It involves the replacement of 35 conventional diesel buses with 21 efficient, low-entry buses as well as roadworks and terminals.	€ 17.4 million	Not available

7.0 FINDINGS AND RECOMMENDATIONS

The evaluation of FELICITY's project identification and selection process reveals a series of findings.

❶ **It is clear there is a high demand for project preparation support**, particularly considering that cities and the private sector are looking for alternative ways of financing their viability studies and construction works, as traditional single-funder models are becoming less common.

❷ **FELICITY's strategy of not using open calls for project identification was proven correct**, as it avoided the submission of an even higher number of applications that would not have been eligible. It was clear that **numerous cities and other stakeholders did not fully understand FELICITY's approach**, despite efforts made in that regard, including webinars and presentations. Most notably, institutions expected FELICITY to provide some sort of loan as part of the collaboration and did not all accord as much value to technical assistance. Therefore, there is a need for a communication strategy that adequately clarifies PPF's role in the potential collaboration, particularly with a view to managing the expectations of potential applicants.

❸ **The use of the networks of GIZ and EIB provided a more adequate project pipeline.** Due to their knowledge in the fields of low-carbon infrastructure development, financing and project preparation, these partners could contribute with proposals that would be a better fit for support. The level of contribution from each stakeholder varied depending on the country and the type of actor. For example, whilst city networks (e.g. C40 and 100RC) provided information from cities that are part of their organisation, but with projects that would most likely fit the low-carbon investment criteria, ministries could share project pipelines at the national level, with a greater variety of project types (some of them not eligible) but also at different stages of development. In view of this, finding the right partners for project identification in each country is crucial.

Collaboration with ICLEI's TAP in Mexico contributed to a better understanding of the potential and challenges of consolidating different initiatives in terms of project pipelines. Despite some setbacks associated with the same communication issues mentioned above, one of the projects selected for assistance from FELICITY (energy efficiency in Mexico City) was identified by ICLEI through its first TAP call in 2015.

❹ The timing of project selection must be taken into account. The selection process was carried out in the first semester, when annual budgets had already been set; a second-semester round could potentially achieve more possibilities for engagement. Political cycles should also be considered, as the holding of elections at the time of the selection influenced the city`s availability to engage in the application process. In spite of the extensive project pipeline that was composed during the identification process, selecting eligible projects for support proved to be a challenge.

The main reason for non-eligibility was project maturity, with eligibility vis-à-vis financiers ranking second (particularly for China). As FELICITY directly supports to leverage finance, engagement should ideally happen towards the end of the pre-feasibility stage. However, most applicants struggle to find the resources required to reach that point, and the rather limited information available from existing pre-feasibility studies makes it difficult for them to move forward.

Finally, the reach of FELICITY in each country, except Mexico, was geographically imbalanced. The main reason for the limited geographical reach is associated with significant regional disparities, with cities in less developed regions not being able to absorb (international) debt. Due to the higher associated risks and need for more comprehensive engagement in terms of technical assistance, improving in-country coverage will largely depend on the availability of resources for collaboration and the willingness of financiers to take such risks.

Based on the findings above, the following recommendations are made for the selection of projects by PPFs:

Improvement of communication

Due to the still limited knowledge of the assistance that can be provided by PPFs, particularly among local stakeholders (e.g. cities and private developers), it is of foremost importance for adequate communication strategies to be elaborated as part of efforts towards clarifying their approach, reach and eligibility.

For this purpose, the use of direct channels of communication (e.g. city visits and meetings with potential project developers) is preferred, followed by webinars and other types of presentations. Even if simple and clear, reading materials tend to be ignored but could be of use for follow-up after face-to-face interactions.

Partnering up with local institutions in order to adapt language and the approach to explaining *Technical Assistance* (TA) processes and the importance of climate-relevant infrastructure is also useful and minimises travel.

Standardisation of project application processes

There should be continued efforts to build trust and collaboration among initiatives in the field of project preparation via partnerships and networks (e.g. CCFLA), aimed at consolidating an approach to identify and consolidate project pipelines of e.g. FELICITY, GIB and ICLEI. The use of the platform SOURCE (implemented by the *Sustainable Infrastructure Foundation*) for this objective should be explored.

This will not only facilitate project identification on the part of initiatives, which work in different project phases with distinct objectives and approaches, but also greatly ease the burden on cities of having to apply with the same project on multiple occasions. Furthermore, it will provide a consolidated database for institutions to quickly identify new projects, reducing the number of 'leftover' applications. Lastly, a consolidated project selection approach can minimise the general sense of competition among initiatives in the field of project preparation. Although this is reported to affect project identification only to small extent, this issue could gain more significance in the future, as the number of similar programmes is likely to increase.

20 Results are available: *http://mneguidelines.oecd.org/industry-initiatives-alignment-assessment.htm*

21 *https://sustainablefoodlab.org/performance-measurement/share-engage/sustainability-impacts-learning-platform/*

22 *https://www.globalreporting.org/information/news-and-press-center/Pages/GRI-and-RMI-partnership-2018.aspx*

Outreach to projects with partners

A crucial step in reducing efforts in project identification is cooperation with local partners that can provide information on project pipelines as well as reach out to potential beneficiaries. There is a need for a concise communication strategy to ensure local partners understand what the requirements of each PPF are. Engaging more strategically with local and international initiatives that address earlier phases of preparation could be a source of future projects.

Consideration of selection timing

In the case of government-initiated projects in particular, proposals are elaborated in specific timeframes associated with annual municipal budgeting, political cycles, etc., which PPFs must take into account.

For example, it is not uncommon for a project backed by a newly-elected mayor to be more likely to move forward than one that was proposed during a previous term (e.g. by a different political party), even if the latter is already at the feasibility stage. Moreover, as feasibility studies often depend on government resources, consideration of which projects will be included in the next fiscal year (the dates of which can vary from one country to another, e.g. April to March) is also important.

Designing broader initiatives

A look at the overall framework of PPFs reveals that there is a need to broaden the scope of PPF-initiatives. This applies to aspects such as the phase of involvement (early, mid, or late pre-feasibility), the type of stakeholders considered (partners of the PPF such as city networks and banks), geographical coverage as well as sectors. This would increase efficiency of identification of eligible projects and ease communication on eligibility, as well as decrease competition among PPFs to assist projects in a specific stage of development.

The main reason for the non-eligibility of projects was their early stage of development, highlighting a significant gap in early (high risk) project support e.g. for conducting pre-feasibility studies. Early support could include assisting projects to increase their mitigation impact and maximising positive socio-economic impacts. Such involvement could include more comprehensive technical assistance for initial studies as well as advisory and capacity development.

Lastly, PPFs could further engage with private-sector-led infrastructure projects, which often have more resources to carry out initial studies. This is particularly relevant for areas where government institutions have low capacities. A thorough understanding of the context is essential in this case, not only to ensure that projects fit into local and national development plans and are fully endorsed by government institutions (selected through official processes), but also to minimise the potential for unfair competition in terms of access to credit.

23 IISD (*in press*)

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