Ministry of Environment , Climate Change and Technology

Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits in Maldives

Promoting Energy Efficient Buildings through
Strengthening Low Carbon Energy Island Strategies (LCEI) Project

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Strengthening Low Carbon Energy Island Strategies (LCEI) Project

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Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits in Maldives

Inception Report with findings of inception Workshop

Promoting Energy Efficient Buildings through
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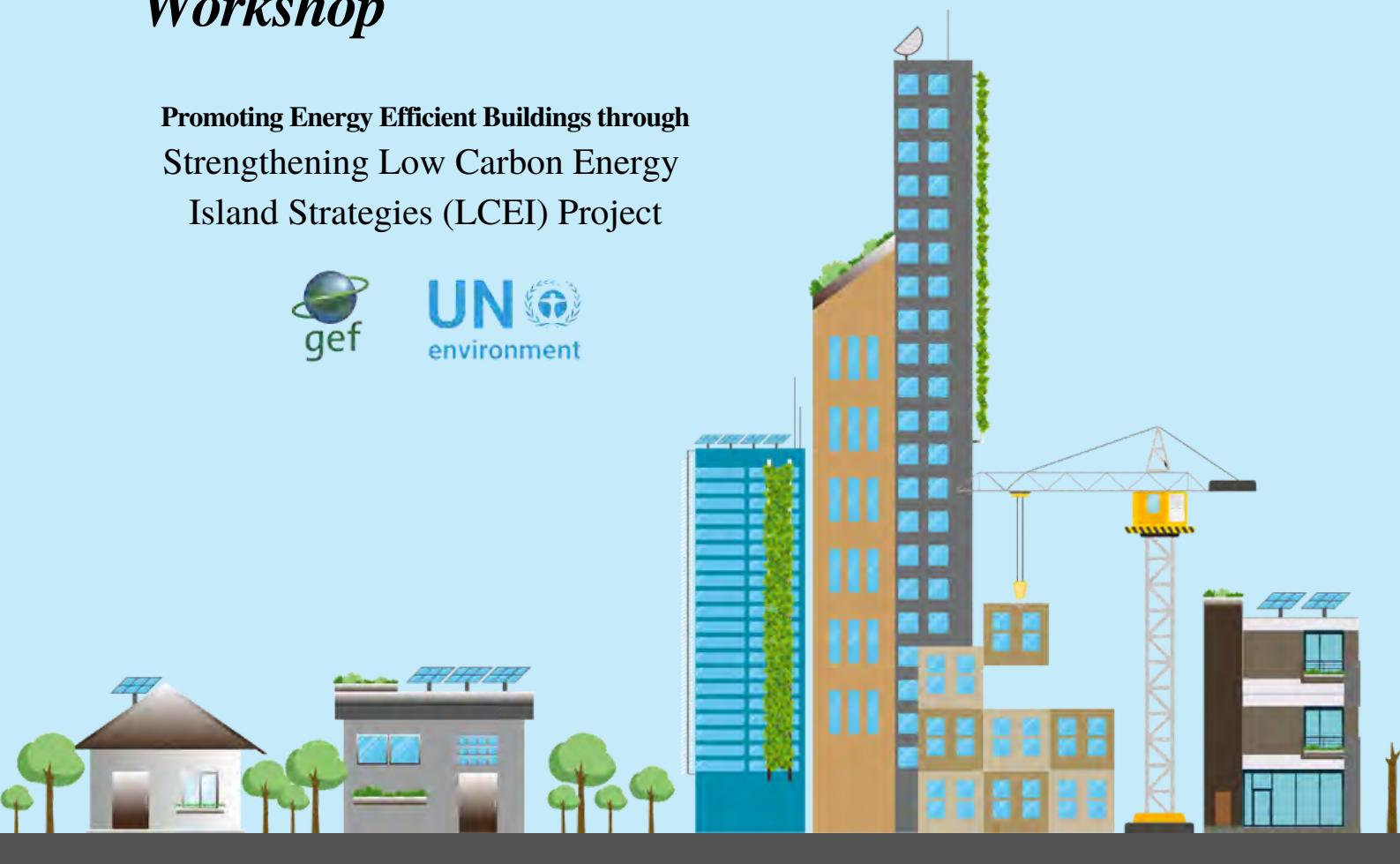

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1. Introduction to Project

1.1. Country Profile

1.1.1. Overview of the energy sector

The Republic of Maldives is a small island developing nation with tourism, fisheries, transport and construction being the key sectors driving economic growth. As per the Maldives statistical department, the country has emerged as the second fastest growing economy in South Asia with an average GDP growth rate of 6.2% since 2010). In the past three to four decades, there has been an exponential growth in the energy demand of the country. Further the entire energy demand is met by the import of fossil fuels due to unavailability of conventional sources of energy posing a significant burden on the country. In Maldives the most significant energy conversion is from diesel to electricity. The generation and distribution of the electrical systems are decentralized with each separate island operating a self-sustaining diesel power generation and distribution system.

The energy sector is regulated by Maldives Energy Authority, which regulates electricity tariffs, issues licenses for power generation and distribution and specifies industry standards. Most electricity in the Maldives is generated and distributed by two state-owned utilities – STELCO and FENAKA. The resorts and other industrial islands use their own power generation and distribution system for energy needs. The decentralized model of electricity generation and distribution contribute to the high electricity tariffs in the Maldives.

The World Bank estimates that the government subsidies on electricity amount to close to USD 58 million or 1.0 percent of GDP in 2019. Fuel accounts for 16% of total imports and 12% of total export revenue during 2019. Depending on the international oil prices, the Maldives could spend close to a half a billion USD on oil imports in a given year. According to World Bank estimates increasing the share of the renewables in the generation mix by 20 percentage points could reduce the oil import bill by 5 percent and energy sector subsidies by 14 percent based on 2019 levels, resulting in fiscal and external savings, provide environmental benefits and generate jobs.

- *The energy demand is expected to grow at more than 8.5% per annum with heavy dependence on fossil fuels, thereby increasing the CO_2 gas emissions.*
- *During 2010-2017, it has been observed that CO2 emissions have been increasing at an average rate of 9%. Hence, the Government of Maldives has set an ambitious national goal to reduce greenhouse gas (GHG) emissions by 10% before 2030 to mitigate the use of fossil fuels.*

Energy efficiency is a central component of the National Energy Policy and will help reduce GHG emissions and energy costs and contribute directly to energy security and affordable energy.

1.1.2. Overview of the building sector

The capital city Male is the hub of employment opportunities, healthcare facilities and educational services which has witnessed an increase of migration from outer islands. Due to this there has been a rapid increase in 10 to 25 storied high buildings. During 2010-2015, there was an increase in population, making it one of the most populated capital in the world. With the increase in population, it has been observed that the building sector in Maldives consumes 30% of the total energy consumption and is expected to grow by 8.5% annually (S0urce: Maldives Statistical Department). Building sector has been identified as a key sector to attain the objective of carbon neutrality by using renewable sources of energy and achieving energy efficiency in buildings. The key challenges faced by this sector includes high import cost of construction materials, dependency on conventional sources of energy and high population density.

Maldives has mixed infrastructure development as illustrated in Figure 1, which consists of residential sector with different income groups, commercial, hotels and luxury apartments, light industrial and government buildings. The real estate development in Maldives has about 86% of residential area and remaining 14% of commercial development. The tourism sector with hotels and guesthouses has highest

share of 37% of non-residential infrastructure development in Maldives followed by educational infrastructure comprising about 35%.

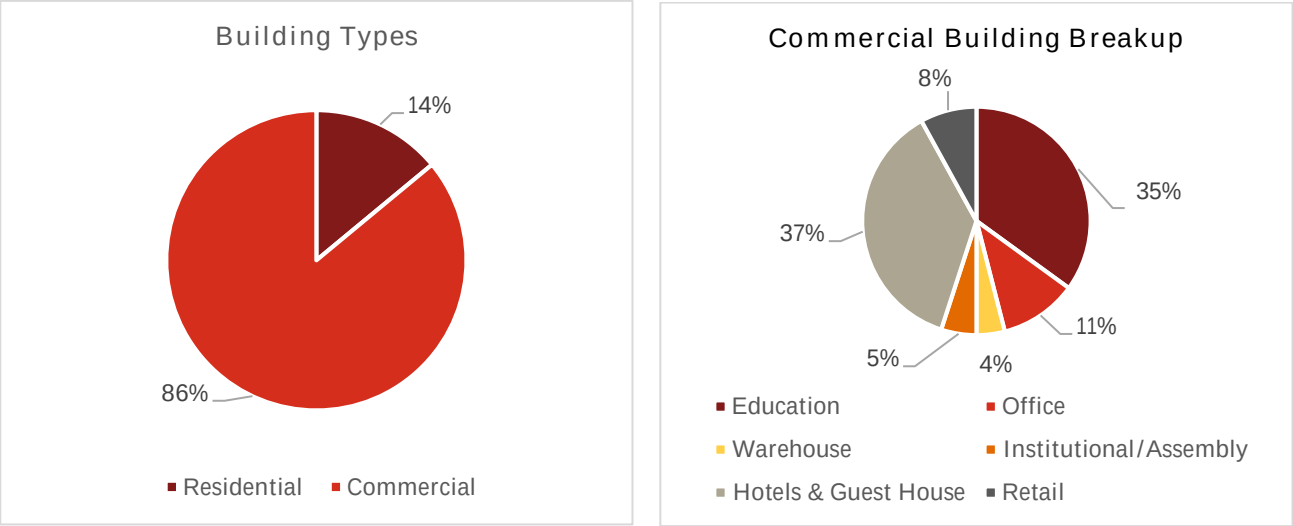


Figure 1: Buildings distribution in Maldives
(Source: Green buildings market intelligence-IFC World Bank Report)

The Energy consumption data analysis shows large variations in electricity consumption across various building typologies in Maldives. Energy use per unit area known as the Energy Performance Index is a useful and important measure of energy efficiency in buildings. The EPI of existing building stock in Male and Hulhumale is higher than that of modern buildings, thereby indicating huge potential for energy efficiency and energy savings. The average Energy Performance Index EPI (in kWh/sq.m/ year)* for buildings in Maldives calculated from annual energy bills collected during the assessment:

Table 1: Energy Consumption in Buildings

Total Average Annual Energy Consumption of Buildings in 2016 and 2017				
Parameters	Residential	Commercial	Government	Hotels and Guest Houses
Energy Performance Index EPI Range (in kWh/sq.m/ year)	100	120	180-200	300-350
International Benchmark EPI Values (in kWh/sq.m/year)**	30-64	250	100-180	200-250

**Source: ECBC India

1.1.3. Policy actions and key initiatives by Government of Maldives

With the objective to reduce the overall GHG emissions by 10% for the year 2030, Government of Maldives has taken several steps in the direction of energy efficiency and to make the nation a low carbon economy such as formulating progressive 'National Energy Policy & Strategy', strengthening the existing regulatory bodies, build capacities across the energy sector and conduct awareness on the benefits of energy conservation.

The current government's election manifesto also echoes the country's commitment to clean energy. The Strategic Action Plan (SAP) for 2019-2023, which is based on the key five priorities of the current

government's election manifesto, envisages an ambitious target of increasing the share of renewable energy in the national energy mix by 20 percentage points by 2023 compared to 2018 levels. The SAP also includes a 2023 target to decrease the fuel usage for electricity generation by 40 million litres and increase renewable energy storage capacity to 30 MWh. In September 2019, during UN Climate Action Summit, the Minister of Environment announced the Maldives would increase the share of renewable energy to 70 percent of the national energy mix by 2030, reinforcing the commitments made under the SAP.

The Minister of Environment has laid out the government's vision and commitment for clean energy and his conviction in surpassing the government's clean energy targets by 2023. Ministry has also emphasized the need for finance and technology to upgrade the country's grid system and several initiatives being perused such as harnessing wind energy, ocean thermal energy conversion or OTEC and wave energy in addition to solar.

Some of the key initiatives and policy actions are as follows:

- *Energy Sector Investment Roadmap was developed for Maldives in 2011 which conducted preliminary estimate of investment required to be carbon neutral*
- *Development of Clean Energy Investment Plan in collaboration with Ministry of Housing and Ministry of Environment of Maldives*
- *Energy efficiency guidelines for buildings are being developed for Residential, Commercial, Government, Hotels and Guesthouses, that shall lay the minimum energy efficiency requirements for buildings in Maldives.*
- *Life cycle cost based public procurement guidelines thereby promoting energy efficient products and technologies*
- *Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits*
- *Development of Financial Programme for Energy Efficient Appliances*
- *Establishment of the 'Green Loan' under Bank of Maldives Green Fund for increasing investment in energy efficiency and renewable energy solutions*

All the above would help Government address various technical, regulatory, infrastructural, financial and human resource barriers to assist the country in improving its energy security, as discussed in the subsequent chapters of the report.

1.1.4. Current barrier to integrating energy efficiency in buildings of Maldives

Based on experience and assessment of the local factors that have dampened uptake of energy efficiency in buildings of Maldives, a major contributing factor is absence of regulations and laws around the energy efficiency for buildings which hampers disciplined energy saving in the region. Maldives currently does not have policy in place to mandate the conservation of energy by different segments of the economy, which makes it even more critical to regularise the energy consumption policies and increase awareness across different segments to adopt energy saving practices. Non availability of energy efficient products due to small economy poses another challenge to uptake of the EE measures, even though the customer is ready to pay a high price. However, the major challenge to the uptake of EE measures have been has been found to be the lack of appropriate loan instruments among the promoters for EE update in construction. Another major roadblock is the lack of energy subsidies that have led to absence of incentivized based financing mechanisms to push EE market in Buildings. In this assignment, project team will specifically address the component of financial constraint, that greatly hinders the adoption and large scale dissemination of energy savings parameters and technologies.

1.1.5. Existing Building Financing Schemes in Maldives

Based on the review of a documentation in consultation with various stakeholders during the inception workshop, the financial instruments and EE financing schemes such as Green Loan by Bank of Maldives, FRESA (Fund for Renewable Energy System Applications) and SREP (Scaling up Renewable Energy Program) are available in Maldives. Although the interests rate offered under these schemes are comparatively low, the demand for EE loan schemes continues to be less as per the expectations of the Government and the efforts put to reduce GHG emissions.

Consumer financing is largely made available by Banks and NBFCs in Maldives in form of secured/ unsecured loans/ leases, few examples among the available products in Maldives are listed below:

Table 2: Summary of consumer finance options in Maldives

Bank/ NBFC	Product	Eligibility	Loan Amount (min – max), MVR	Assets covered
Bank of Maldives (Source: https://www.bankofmaldives.com.mv/)	BML Green Loan	Individuals and businesses	MVR 50,000 – 20 Million	Environmentally friendly projects focussed on renewable energy
	Home Construction Financing	Individuals with employment record	MVR 50,000 up to MVR 15 million	Home improvement purchases, household electrical appliances
	Real Estate Financing	Individuals and businesses	MVR 50,000 up to MVR 150 million	Construction of Residential housing, Row housing, Condominiums, Office premises and Purchase and build on land.
	Home Loan	Individuals with regular income	Interest Rate @11%, Equity 20% can be financed through pension fund	New Apartment or row-house
	Home Construction	Individuals with regular income	MVR 50,000 - 15 million	Revamp, renovate of build new home
Maldives Islamic Bank (Source: https://www.mib.com.mv/)	Housing Finance	Employment history with listed employers	Equity 20% can be financed through	New Apartment or row-house

Bank/ NBFC	Product	Eligibility	Loan Amount (min – max), MVR	Assets covered
			pension fund	
	Project Finance	Individuals with employment record and Businesses	MVR 50,000 up to MVR 15 million	Develop real estate for rent or sale
Maldives Finance Lease Company (Source: http://www.mflc.com.mv/)	Hiyaa Faseyha Lease	Employees with continuous employment for 02 years or more	MVR 10,000 – 100,000	Purchase construction materials for home improvement purpose
	Salhi Lease	Employees of registered organisation between age 23-50 with a continuous employment for 5 years in a supervisory level	MVR 60,000 – 200,000	Consumer Durables and construction materials
	Home improvement loan	Employees with continuous employment for 02 years or more and Businesses	MVR 200,000 – No Limit	Existing property owners for renovation, extension, additions and completion of existing housing units
	Home/Apartment purchase loan	Employees with continuous employment for 02 years or more and Businesses	MVR 300,000 – No Limit	Individuals for purchase of apartment or a house for own housing needs
	Home construction loan	Employees with continuous employment for 02 years or more and Businesses	MVR 500,000 – No Limit	Construction of apartment buildings in Male' Villimale' and Hulhumale
	Housing Loan	Individuals with steady source of income/ Govt employees. Proprietorship/partnership firms /Companies	MVR 300,000 – No Limit	Construct building for residential purposes and purchase of row houses/, apartment/flat, single unit or condominium apartments

Bank/ NBFC	Product	Eligibility	Loan Amount (min – max), MVR	Assets covered
Commercial Bank of Maldives (Source: https://www.cbmmv.com/)	Home Construction Loan	Employees with continuous employment or self-employed professional with an established practice and have assured monthly income.	MVR 250,000 – MVR 20 million	Construction Completion/ Renovation/ Extension to an existing house
	Home Loan	Employees with continuous employment or self-employed professional with an established practice and have assured monthly income.	No Minimum Amount – MVR 20 million	Purchase or construction of residential property or refinancing of other Bank Facilities
Housing Development Finance Corporation (Source: https://www.hdfcbank.com/)	Home Improvement Loan	Employees with continuous employment for 02 years or more	Up to MVR 50,000	Essential repairs, refurbishments, and improvement to the home
	Standard Home Loan		Up to MVR 1 million	Construction of Residential Housing where 2/3 or more shall be occupied by owners
	Million Plus		MVR 1million – 15 million	Construction of Residential Housing where 2/3 or more shall be occupied by owners
	Home Loan (Rent Option)		MVR 50,000 – 15 million	Construction of Housing where 1/3 or more are for rent
	Youth Loan		Up to MVR 1 million	Home Purchase Loan to youth for their residential purpose only
State Bank of India (Source: https://www.onlinesbi.com/)	Housing Loan	Individuals with steady source of income/ Govt employees. Proprietorship/partnership firms /Companies	MVR 300,000 – No Limit	Construct building for residential purposes and purchase of row houses/, apartment/flat, single unit or

Bank/ NBFC	Product	Eligibility	Loan Amount (min – max), MVR	Assets covered
				condominium apartments

1.1.6. Gaps and barriers to financing EE buildings and Building retrofits

Barriers are mainly centered around issues related to unavailability of incentivised financing whereas, non-financial barriers relate to the gaps in the technical know-how and availability of standards. Existence of barriers is evident from the following situations:

- Lack of EE based financing instruments, except for a few such as BML Green Loan. Much of the low-cost financing options are available for renewable energy related projects, whereas only a small portion of the fund is allocated for purchase of energy efficient appliances.
- Lack of uptake from existing EE based financing instruments.
- The reasons for low uptake of green loans need to be researched both from demand and supply side. One of the reasons for low uptake of green loans were found to be associated with less awareness amongst the end users of energy efficiency alternatives and absence of mechanisms that identify an energy efficient building from a conventional one.

Some of the barriers to energy efficiency financing in the context of Maldives are illustrated in below figure.

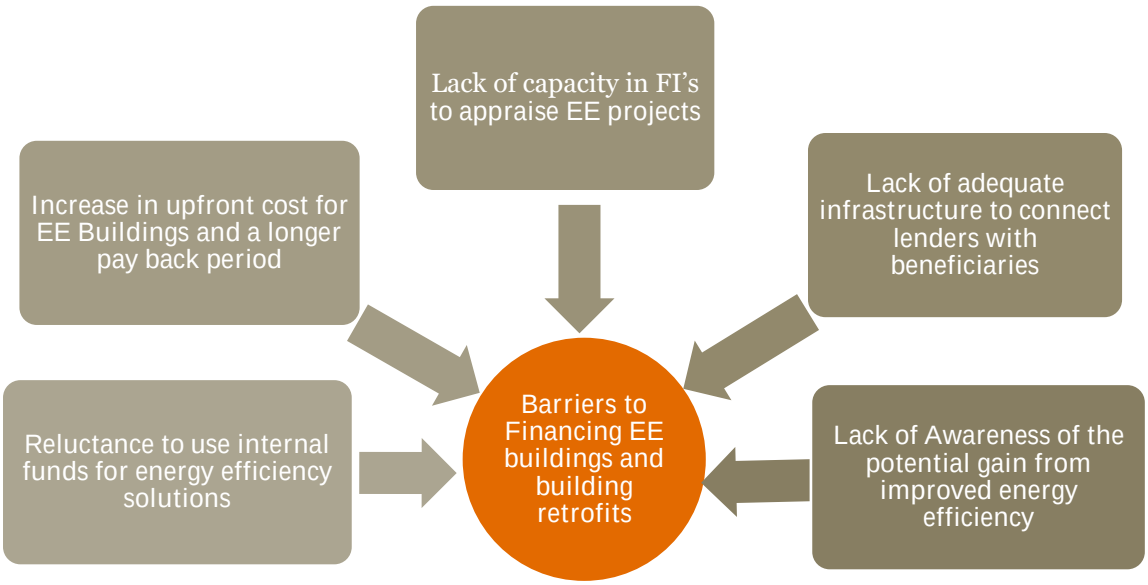


Figure 2: Barriers to Financing EE buildings and building retrofits

1.2. Expected benefits of the project

1.2.1. Need for Financial program

The building sector in the Maldives is generally under-investing in energy efficiency and other low carbon energy building technologies due to diffused responsibility for energy consumption over the lifetime of any given building. With an increase in population and energy demand, the dependence on imported goods have increased. In 2018, 5 billion USD worth goods were imported which almost doubled since last 10 years. With sustainability goals and objectives in mind, it is important that due consideration shall be given, on promoting demand for materials, buildings products and technologies which are energy efficient.

Energy efficiency measures require huge capital investment, and establishment of a building energy code or energy efficiency regulations for building retrofits in Maldives. Hence, an innovative financial programme is required to enhance uptake of EE buildings by generating cost savings from energy conservation measures by enabling users to safe payback options and by increasing the asset value and quality for financiers due to energy efficiency. This will lead to the transformation of EE buildings market in Maldives. Some of the user-specific benefits and overall benefits of a successful implementation of such a financial programme are depicted in figure 3 and figure 4, respectively.

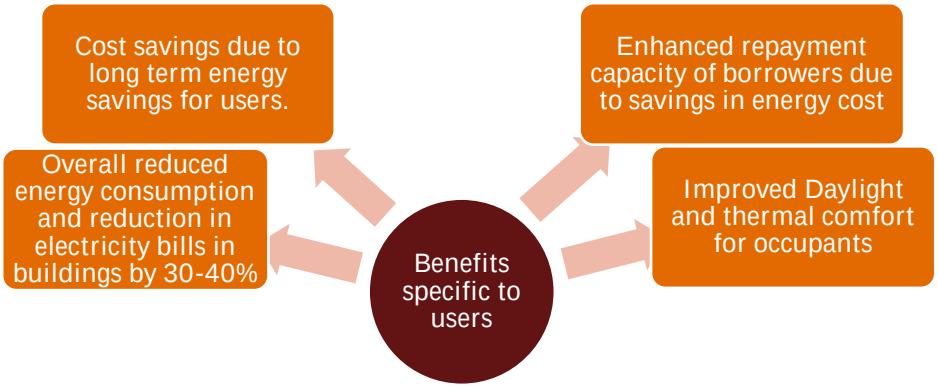


Figure 3: User Specific Benefits of financial program

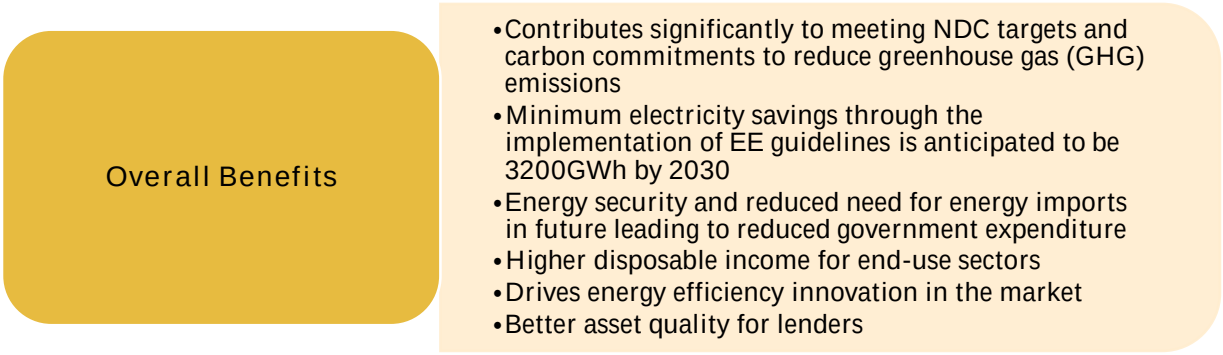


Figure 4: Overall Benefits of financial program

Going through the above benefits, development of robust financial strategy is very crucial to attain the objectives set by the Government of Maldives to reduce the GHG emissions by 10% before 2030. Further, the programme should support implementation of energy efficiency practices across buildings and at the same time lead to recovery of capital through operational energy cost savings, thereby enhancing the energy security of the nation.

2. Approach & Methodology for Project

Scope of work

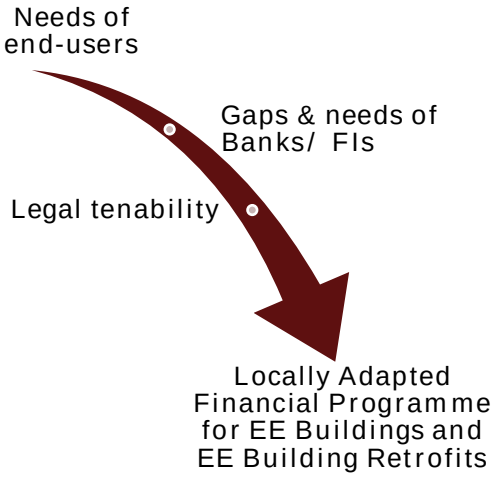
2.1. Approach for the assignment

The team will use an open, adaptative, flexible and consultative approach which has been very successful globally to execute many such assignments. At the same time, the approach is flexible and agile to adapt to local requirements in terms of assignment requirements and stakeholders' landscape.

Leveraging our experience of similar assignments

For successful implementation, we focus on three key areas as follows:

In our experience, development of financial programme for energy efficient Buildings and retrofits will require a three-pronged strategy to achieve the desired outcomes, as illustrated below:



Our approach involves identification of Building typologies and Energy Efficiency practices for new construction and building retrofits, that are suitable for the programme, identification of end users across sectors like residential, commercial, government, and hotels, understanding their financing needs, assessing the financial infrastructure, alignment with legal framework. This will enable us to identify areas that the financial programme shall address for each type of end user. Based on a consultative approach throughout the development phase, our team would then arrive at a possible strategy and the financial scheme which would be piloted to demonstrate the effectiveness and finetuning of procedures.

A six-step approach will be followed for attaining the objective of this project which has been illustrated in Figure 5. It will consist of identification of building typologies and their finance needs, review of banking and financial policy, identification of the issues faced by end-users, consulting multiple stakeholders, demonstration of developed financial programme and capacity building of stakeholders involved.

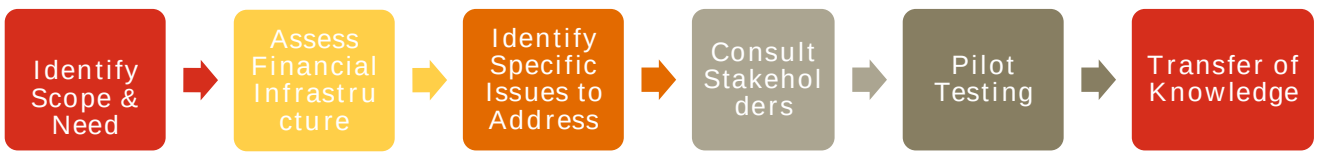


Figure 5: Approach for the assignment

Consultative

We will follow a consultative approach to achieve the intended goals by consulting a list of stakeholders to ensure appreciation of each other's objectives and interest, and consensus on decisions. This approach has an advantage that allows the assignment execution agency to understand and provide a wide multitude of perceptions and highlight barriers and opportunities. We have identified a list of stakeholders who will be consulted throughout the project duration as illustrated in figure no 6, as below:

Policy makers and regulators	• Ministry of Environment • Ministry of Finance • Ministry of Planning Housing and Infrastructure • Ministry of Economic Development • MMA, MEA
Other Relevant Govt. Agencies	• Male and other City Councils • Housing Development Corporation • State Electricity Company Limited and FENAKA • MWSC
International Development Agencies	• Asian Development Bank • World Bank • GIZ, JICA, other bi-laterals in Maldives
Banks/Lessors	• Bank of Maldives • Maldives Islamic Bank • Key banks and NBFCs in consumer financing • Commercial Bank of Maldives • HDFC Bank
Beneficiaries	• Residents • Building Owners • Importers, Producers, etc. • Private Developers
Technical Implementing Professionals	• Energy Auditors • Architects and Engineers

Figure 6: List of Stakeholders for consultations

Open, adaptive and flexible

Our experience shows that execution of such assignments cannot be narrowly restricted to declared deliverables but needs to be open, adaptive and flexible. These kinds of initiatives are often evolutionary and there is a need to respond with flexibility, speed and an open approach. We will conduct monthly review meetings (over Skype)with the client and conduct virtual and physical consultations with all the relevant stakeholders over the course of the project, to gather key insights at key stages/ events of the assignment, in order to continuously monitor the progress of the project.

2.2. Methodology and key steps for the assignment

The assignment is divided into three key phases: inception phase, financial strategy & development phase and implementation & capacity phase that will lead to development and implementation of financial programme. Across these phases, the project team will consult ME and other key stakeholders. The phases of project's

methodology are shown in figure no. 7, as illustrated below:

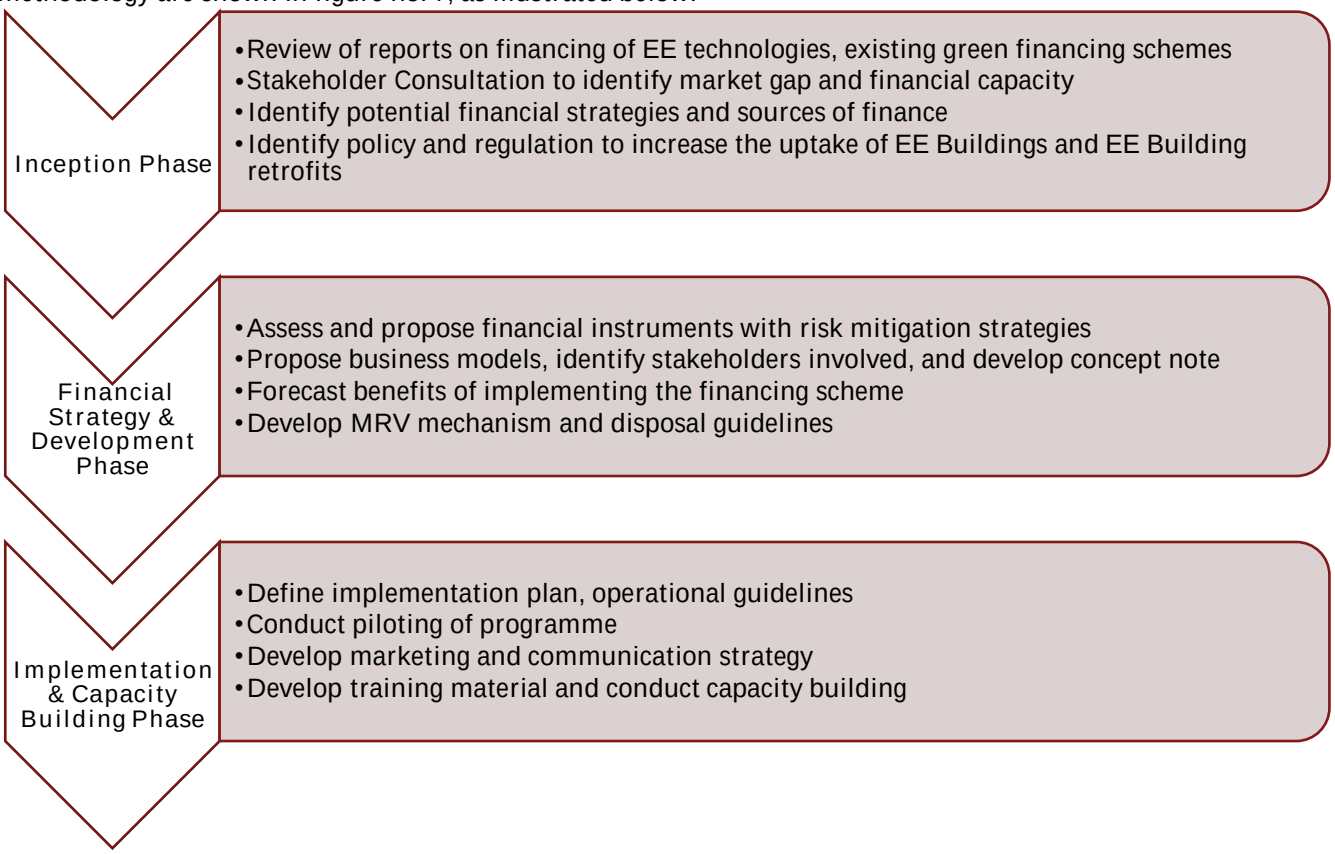


Figure 7: Project Methodology

Inception Phase – Setting the Blueprint

Task 1 – Review of existing information

The team has reviewed existing and relevant information for the assignment under the following three headings:

- Reports developed by the project on financing of energy efficiency technologies or initiatives
- Existing green financing instruments and/or case studies in local context
- Existing financing mechanisms for Energy Efficiency in Buildings and Energy Efficiency Building retrofits

The review was not just limited to desk research, but rather focussed on preliminary stakeholder consultation which helped us in gaining initial insights on the existing financing mechanisms, infrastructure and organizational framework involved, etc. The list of stakeholders who were part of the initial discussions during the inception consultations are mentioned in the subsequent section of the report.

Task 2 - Inception Workshop for the Stakeholders

The aim of the inception workshop was to apprise the stakeholder on the assignment objectives, understanding of their roles, seeking inputs from their mandates, and understand local market in terms of preparedness and gaps leading to development of a robust financial strategy. A brief illustration of purpose of the inception workshop with the select stakeholders of Maldives are shown below in figure no. 8:

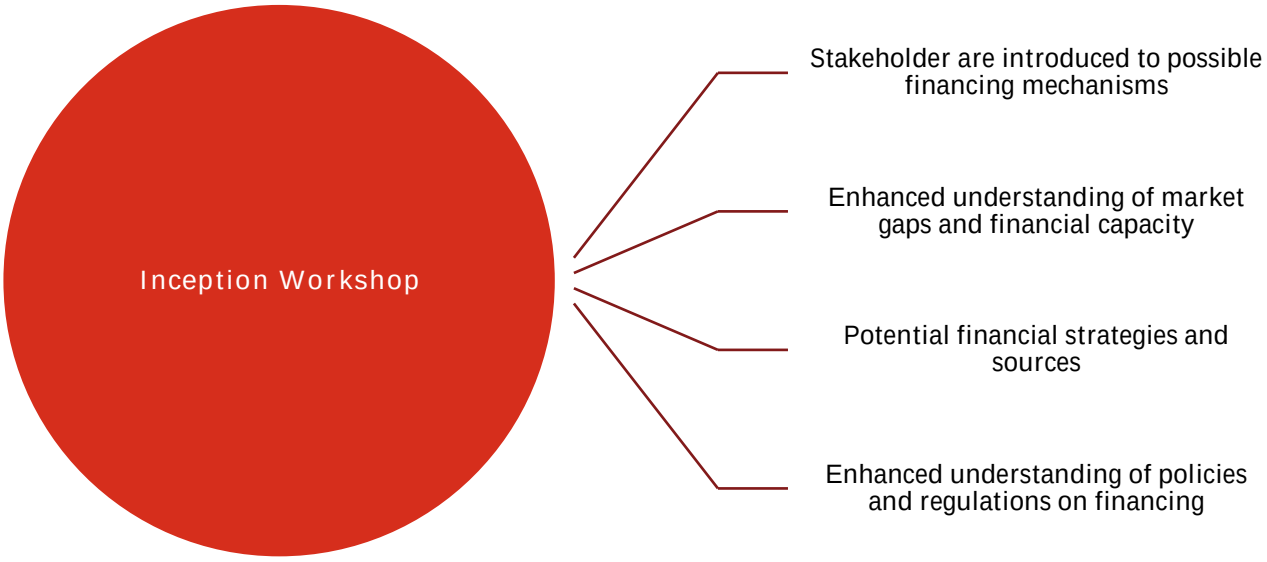


Figure 8: Activities performed during inception workshop

The inception workshop was conducted on 19 August 2020, and the below diagram provides a brief indication on the stakeholders who attended the Inception workshop and gave inputs to the project team regarding the project development activities. The detailed workshop findings are discussed in subsequent chapters of the report.

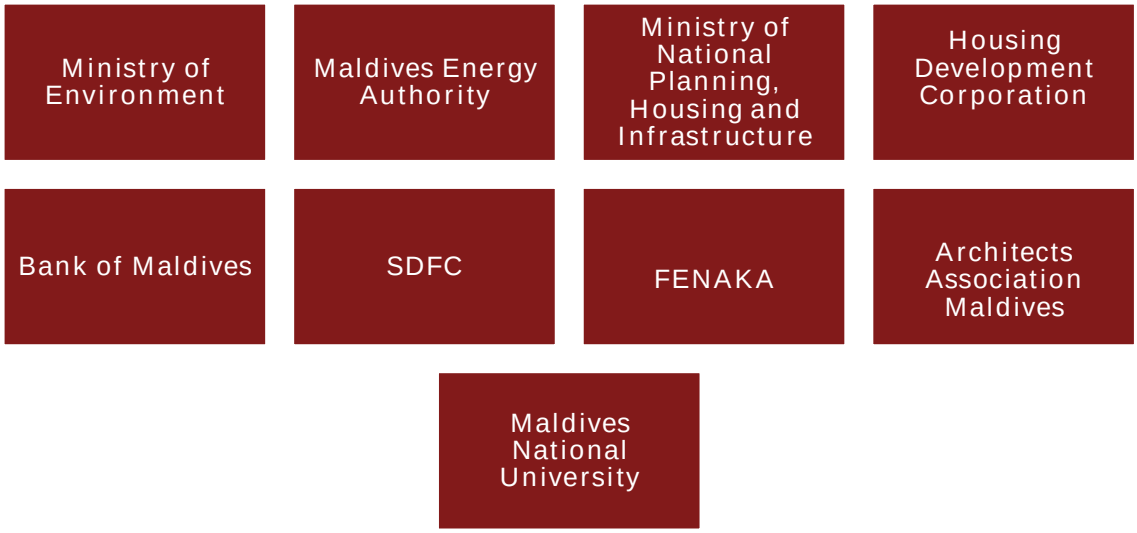


Figure 9: List of stakeholders consulted in inception workshop

Research and Development Phase – Extensive stakeholder consultation and programme development

Task 3 - Development Phase of Financial Strategy & Financial Programme

Development of financial strategy and programme is the crux of the assignment wherein the maximum resources will be utilized to span out extensive stakeholder consultation and development of a financing programme that is ready for pilot implementation. Therefore, the activities under the Task 3 have been divided into three sub-tasks as illustrated next in figure no 10 as below

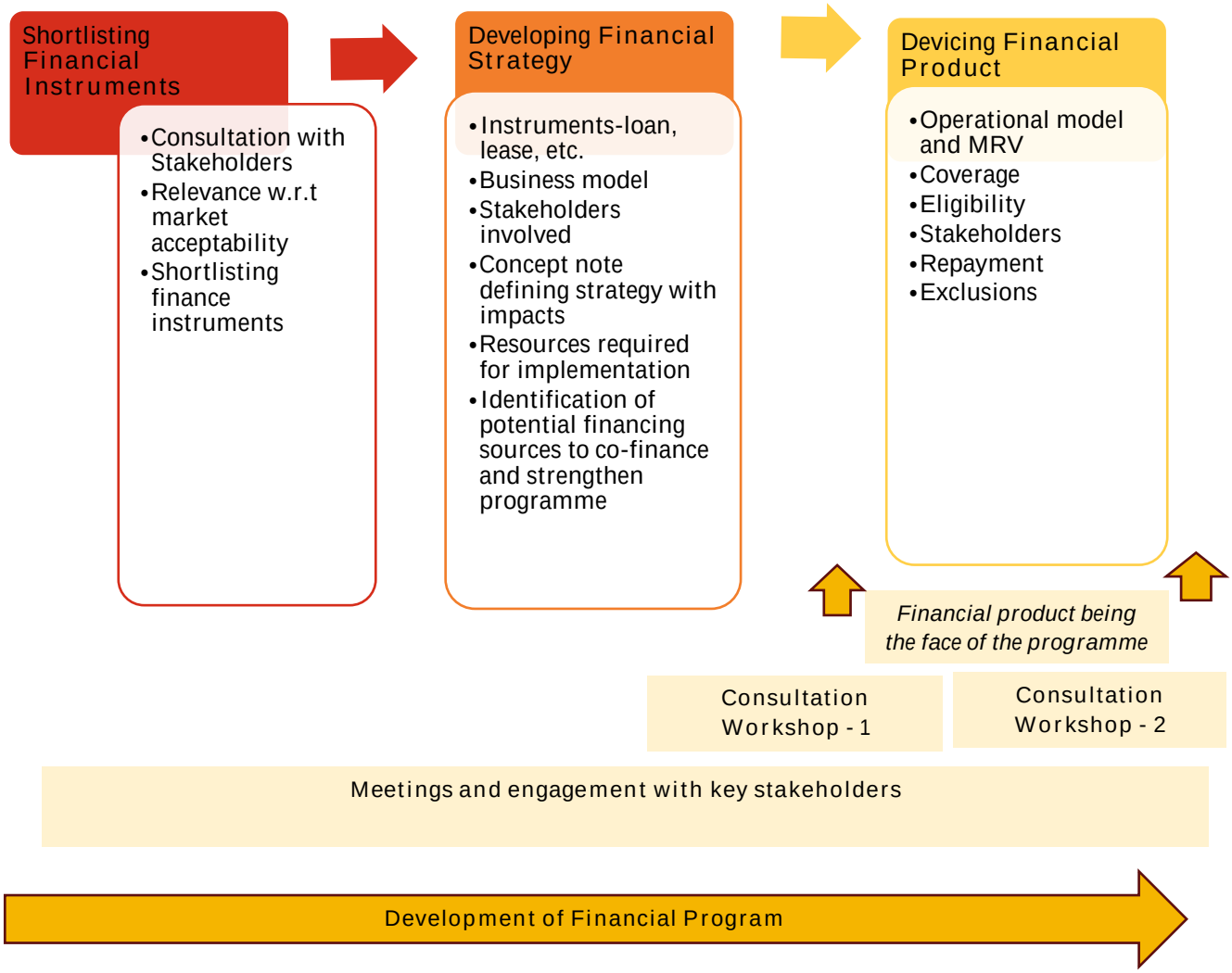


Figure 10: Activities for developing the financial strategy & financial programme

It is important to mention here that the activities of Task 4 (Consultation Workshops and Meetings with the key stakeholders) will be implemented in parallel with Task 3, so that necessary inputs from important stakeholders are brought-in at the development stage itself. We will continuously engage with stakeholders (identified earlier) as part of primary research for financial programme development.

Sub-task 3.1: Proposing Financial & Risk Mitigation Instruments

Financial Instruments

Outcomes from Task 1 and Task 2 will enable the team to propose suitable financial schemes taking reference of several international case studies and comparing their suitability/adaptability to local context. A long list of financial instruments, and their suitability to local situation will be prepared after in-depth analysis as part of the assignment. Inputs from the policy assessment and institutional infrastructure assessment while preparing the long list of financial instruments will also be considered. A framework approach will be adopted to shortlist the financial instrument(s) best suited for development of financial strategy. The framework for proposing a financial scheme to stakeholders will involve discussions on key aspects concerning selection of potential financial strategy, as illustrated below:

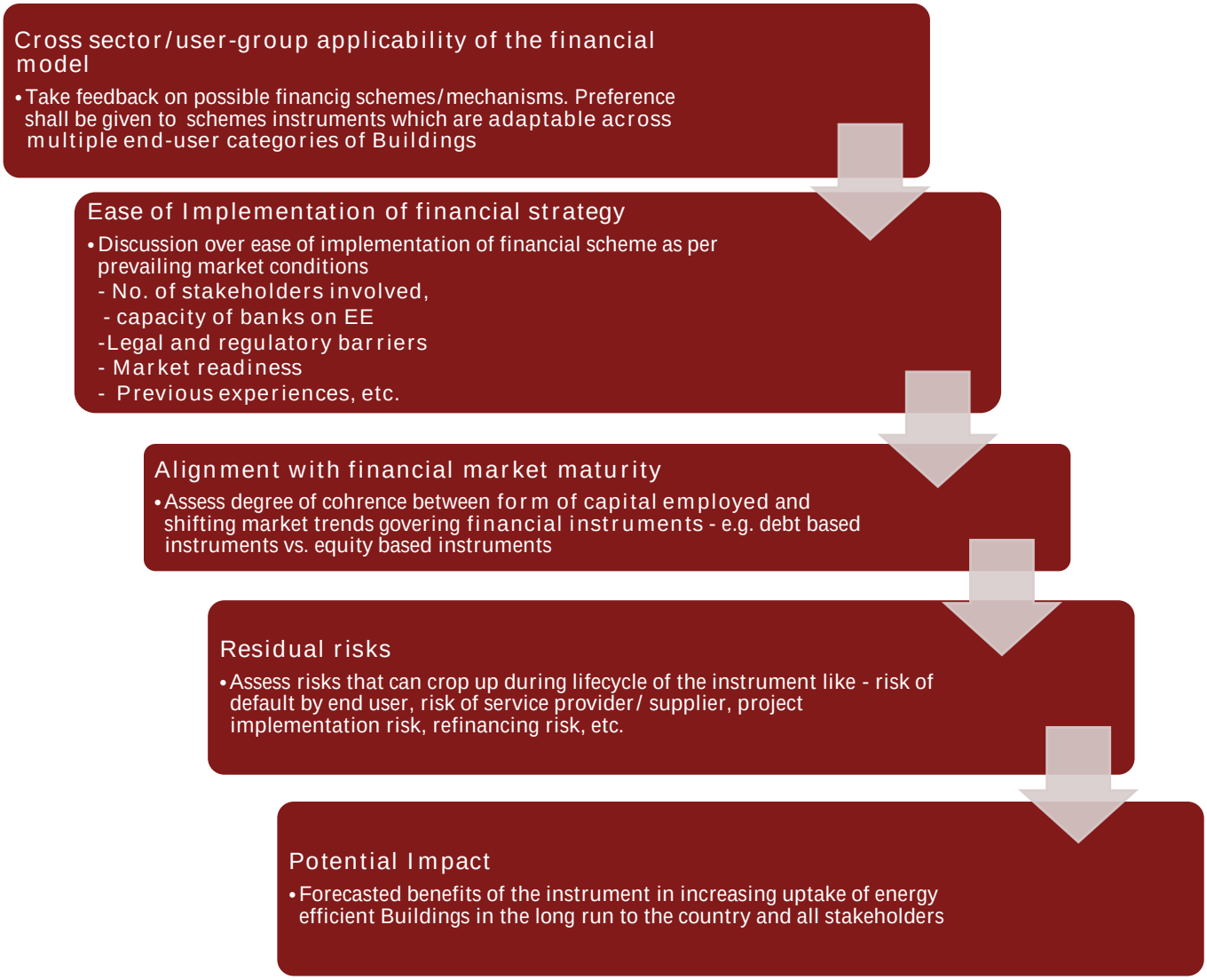


Figure 11: Framework for proposing a financial scheme

Illustrative list of possible financial instruments

Various financing model options (instruments) will be suitably explored for Buildings in consultation with stakeholders. A sample list of some of them is provided next:

Table 3: List of possible financial instruments

Parameters	ESCO Financing	List based finance	Demand aggregation	On-bill financing	Others like: Leasing
EE Technical competence required by Banks	High	Low to Medium	Low to Medium	High	High
Understanding among stakeholder institutions	TBD	TBD	TBD	TBD	TBD
Understanding among end-users	TBD	TBD	TBD	TBD	TBD

Availability of regulations	TBD	TBD	TBD	TBD	TBD
Alignment of policies and legal framework	TBD	TBD	TBD	TBD	TBD
Repayment risk	TBD	TBD	TBD	TBD	TBD
Institutional capacity to implement	TBD	TBD	TBD	TBD	TBD

The finance models in the long list will be suitably explored and assessed by our team. Most appropriate financing instruments (up to two) will be shortlisted for development of risk mitigation instruments and development of financial strategy and programme during the subsequent phases with inputs from ME, financial institutions, and other key stakeholders. Below in table 4, are the list of globally implemented energy efficiency financing instruments that will also be reviewed to assess the applicability for the Maldives programme:

Table 4: Description of potential financial instruments

Finance Instruments	Definition	Applicable Sector
Concessional loans (Green Credit Lines - Grant Financing or Soft Loans)	These are loans that are extended on terms substantially more generous than market loans. The concessionality is achieved either through interest rates below those available on the market or by longer repayment periods, or a combination of these. Concessional loans typically have long repayment periods.	Residential, Commercial, Industry
List based financing	Several markets in Europe and in India, use a list-based approach for financing, wherein covered appliances and minimum eligibility requirements are pre-listed for use by banks. Examples of such lists are Energy Technology List (EU), JICA SIDBI EE List (India), etc.	Residential, Commercial, Industry
On-bill financing	It refers to a loan made to a utility customer, the proceeds of which would pay for energy efficiency improvements. Regular monthly payments are collected by the utility on the utility bill until the loan is repaid. On-Bill financing programs are a promising way for utilities to help their customers invest in energy efficiency improvements, such as upgrading to a high-efficiency air conditioner, refrigerator, etc.	Residential, Commercial
Demand Aggregation with bulk procurement	In this model the similar consumer demands are combined to seek finance through a third party/SPV funding by reducing individual risk. Promoters/developers join up in energy cooperatives to aggregate their energy demand and access finance. This can overcome some of the challenges, reducing both risk and cost of finance, and tackling market barriers.	Residential, Commercial, Industry, Municipal
Performance Contracting (ESCO model)	In this model an Energy Savings Company (ESCO) provides financing options on capex and/or an operating lease to achieve energy savings at buildings/ facilities, by charging a fee to deliver energy savings on the owner's utility payments. The ESCO may also take on the performance risk of these projects.	Commercial, Industry, Municipal

Revolving Funds	A revolving fund is a fund or account that remains available to finance an organization's continuing operations without any fiscal year limitation, because the organization replenishes the fund by repaying money used from the account. Revolving funds have been used to support both government and non-profit operations	Commercial
Leasing	A lease is a contractual arrangement calling for the lessee (user) to pay the lessor (owner) for use of an asset. Property, buildings and vehicles are common assets that are leased. Industrial or business equipment is also leased. The lessee also agrees to abide by various conditions regarding their use of the property or equipment.	Commercial, Industry
Dealer Financing	Dealer financing is a type of loan that is originated by a retailer to its customers and then sold to a bank or other third-party financial institution. The bank purchases these loans at a discount and then collects principle and interest payments from the borrower. This is also called an indirect loan	Residential, Commercial
Micro-finance	Microfinance, also called microcredit, is a type of banking service provided to unemployed or low-income individuals or groups who otherwise would have no other access to financial services.	Residential, Industry
Savings group	Savings Groups are composed of 15 to 25 self-selected individuals who meet regularly and frequently to save, amounts are based on each member's ability. Groups then pool the savings to make loans on which they charge a relatively high service fee or interest rate which in turn increases the loan fund.	Residential (low-income households)
Pay-per-service model (Equipment as a service and district service models)	Pay-per-service unit is a type of service compensation model with payment tied to the quantity or quality of service the customer receives. In this model, the product manufacturer or retailer is typically responsible for installation, maintenance and take-back of the product. By tying the service price to performance, it encourages the provider to give the best service to its customers. Examples include lighting (pay-per-lux), tires (pay-per-kilometre) etc.	Residential, Commercial, Industry
Mortgage Financing	A mortgage is a debt instrument, secured by the collateral of specified real estate property, that the borrower is obliged to pay back with a predetermined set of payments.	Residential
On-tax financing model – Property Assessed Clean Energy (PACE)	A Property Assessed Clean Energy (PACE) loan is a type of financing that's available for energy-efficient upgrades or the installation of renewable energy sources for commercial, industrial, and private residential properties. Launched in 2010, the PACE Program, which is overseen by the U.S. Department of Energy (DOE), allows local and state governments, as well as inter-jurisdictional authorities authorized by state law, to provide funding for the cost of energy improvements on qualifying properties. This money is then repaid over time by the property owner.	Residential, Commercial

Remittance based payment models	A remittance refers to money that is sent or transferred to another party. Remittances can be sent via a wire transfer, electronic payment system, mail, draft, or check.	Residential
Financial incentives (e.g. rebate or subsidy)	Financial incentives refer to those incentives which are in direct monetary form i.e. money or can be measured in monetary terms. It can be provided on an individual or group basis and satisfy the monetary and future security needs of individuals.	Residential, Commercial
Guarantees	A financial guarantee is a contract by a third party (guarantor) to back the debt of a second party (the creditor) for its payments to the ultimate debtholder (investor). For example, a large corporation (the creditor) borrowing a significant amount of money from the market, backed by a guarantee from a large insurance company (guarantor).	Residential, Commercial
Energy Savings Insurance	Generally, in the SME sector, SMEs and local banks often lack both the technical capacity to assess the potential of more capital-intensive energy efficiency investments and the confidence that they will pay back, starving the sector of investment. Energy Savings Insurance aims to address these investment barriers by paying out if the projected value of energy savings is not met.	Commercial, Industry (SME)

In tandem with the selection of financial instruments, it is advisable to identify and shortlist the sectors for buildings and typologies that will be covered as part of the financial programme. We propose to adopt a similar framework-based approach for selection of Building typologies for which the financial strategy and programme will be developed, as illustrated next in figure no 12 below:

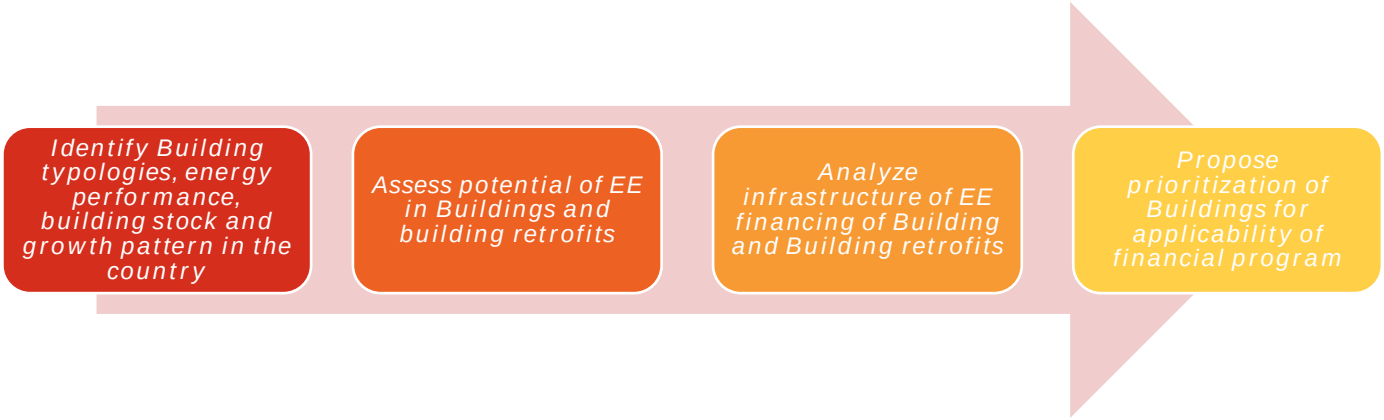


Figure 12: Approach for selection of building typologies

Risk Mitigation Strategy

Based on experience, the project team would enlist the parameters, which lead to conflict in roles and responsibilities of the performance contract abiding parties. Once the risks and corresponding conflict related issues have been identified and evaluated, the project team would draw up a list of measures. This will show specific areas of weakness of any business interruption in a systematic way, shown below in table 5, is an example of a risk mitigation matrix.

Table 5: Illustrative example of a risk mitigation matrix

Risk Identification			Risk Evaluation		Risk Reduction			Risk Control	
No	Risk Category	Cause	Amount of Loss	Probability of Occurrence	Measure	Effectiveness	Priority	Cost	Responsibility
1									
2									

Illustrative

Each identified risk will be assessed to determine the root cause behind its occurrence. The project team will also assess the performance of similar projects (in Maldives/other countries-contingent information available in public domain) to evaluate if and to what extent these and other risks have affected their performance. The project team will also document any mitigation measures that were employed. These mitigation steps will be developed in consultation with partner banks.

Sub-task 3.2: Financial Strategy

The financial strategy will revolve around the financial instruments and Building typologies shortlisted based on a framework approach. The strategy will provide insights into overall structuring of the financial programmes and its key functional domains. The key elements of the financial strategy are illustrated below in figure no 13.

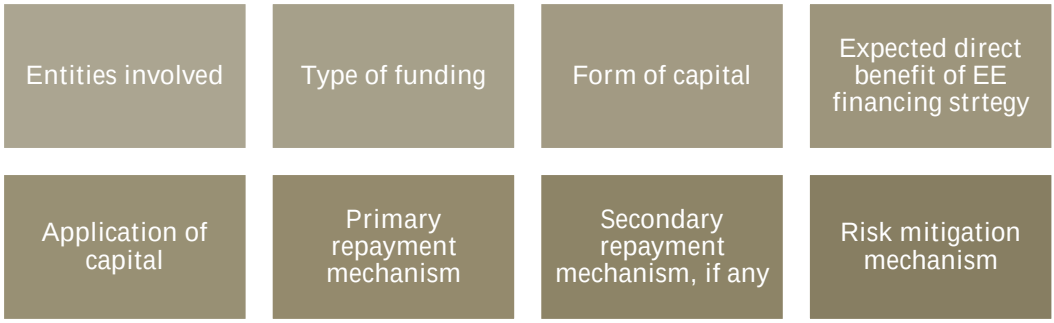


Figure 13: Elements of the financial strategy

The detailed explanation of these attributes in the context of energy efficient Buildings has been provided below in table 6:

Table 6: Attributes of components included in the financial strategy

Strategy element	Description
Stakeholders/ entities involved	This attribute describes the primary stakeholders involved in the various stages of the programme implementation. These entities can be sub categorised into four: a. The Financier: The financier in any instrument would be the entity, which directly provides the fund required for the successful implementation of the instrument. The instrument might be self-financed, or require no external source of financing, or the instrument might also require government support. b. The Programme Manager / Service Provider: A programme manager would be an entity, which performs all the operations required for the successful implementation of the programme. Involvement of a programme manager would be imperative in case the implementation phase requires a complex operation procedure. c. The Beneficiary: The beneficiary would be an entity, which receives the direct benefits of the EE financing instrument. This would be an entity, the benefit of whom the instrument focusses on. The beneficiary can be the end user or the customer, and the ESCO or the service provider in certain cases.

	d. Policy makers and regulators: to ascertain the financial programme is within the existing financial and legal framework, and to review the framework for accommodation of new and upcoming business models, if required.
Type of funding	This attribute would consider whether the capital required for the instrument is provided in the form of debt, or equity or a mixture of both. In case the government provides the capital and/or seed funding, it may be in the form of grant/ subsidy/ loan/ co-financing, etc.
Form of capital	This attribute would represent the financial stake in the instrument held by the financier for the capital provided by them. This can be in the form of common shares, preference shares, long-term loans, mezzanine debt, etc.
Instrument Objective / Expected Direct Benefits in EE investment	This attribute would entail the direct or the first benefit due to the investment made by the programme manager. This may be defined as the first objective the instrument seeks to achieve by the application of funds. A top-down approach is usually adopted for forecasting such impact and setting targets.
Application of Capital in Implementation Phase	This attribute would define the way in which the capital is expected to be applied by the programme manager. The implementation phase of the project would start after this investment.
Primary Repayment Mechanism (between end user and service provider)	After investment made for the EE improvement measure, the beneficiary is expected to repay the financier for the benefits enjoyed by them. Primary payment mechanism defines the financial agreement for repayment between the beneficiary and the service provider (or programme manager). This attribute has been further sub-divided into two components: a. Whether transferable: This refers to the clause when the repayment liability of the end user or the beneficiary is transferable to another entity, without any change in the payment terms. b. Modes of Repayment: This defines the mode of repayment by the end user to the service provider for the EE investment.
Secondary Repayment Mechanism (between service provider and financer	This is defined as payment terms for the cash flow from service provider to the financier. This attribute would define the return on investment for the financier
Risk Mitigation	This attribute describes if any risk mitigation strategy is present in the working model of the instrument.

It is to be noted here some of these elements may at times be clubbed together, or dropped, or new specific elements added to the strategy, based on local context, legal framework and stakeholders' inputs.

Disposal Strategy

In the context of sustainability, it is important for the financial strategy to have a mechanism for disposal or recycling of conventional Building materials and its components. A mechanism will be developed that incentivizes/encourages users and other stakeholders involved in the life cycle of buildings to reuse or recycle building materials, which contributes to a considerable amount of energy saving and preservation of raw materials. This will be the focus of 'Disposal Strategy'.

Our approach to propose recommendations on disposal strategy will involve the below workflow:

- Analyze existing building waste disposal guidelines and 'Waste Management Regulation' during subsequent stakeholder consultations during project duration
- Formulate safe disposal recommendations for select building typologies based on primary and secondary findings, in line with guidelines from other financing sources as well.
- Link disposal strategy with financial mechanism for ease of waste disposal through reduce, reuse and recycle principle

Our team will conduct meetings with key stakeholders to present and discuss various options for each of these elements, and how they will be brought together under the strategy. The parameters governing the financial strategy will be formulated in consultation with all the stakeholders and Banks/ FIs. Development and fine-tuning of these are largely dependent on the business case and stakeholders' inputs, wherein our consultative and flexible approach will come into play.

Our experience suggests that this is an important juncture in the overall assignment implementation and will provide direction to all downstream activities. Hence, it may be required to revisit and review the developments for several times at this stage in order to come up with the best possible solution. We are agreeable for this and our team members will patiently and flexibly engage with key stakeholders in order to achieve the desired outcomes of this task.

Development of a concept note for the financial strategy

A concept note will be prepared for initiating consultation with the stakeholders on the proposed financial strategy. The illustration below in figure no 14 describes the aspects of the key components of our Financial Strategy.

Figure 14: Key Components of the financial strategy

The concept note may be shared by ME with all stakeholder prior to the first stakeholder consultation workshop, for informed consultation process during the workshop. Project team will apply a consultative approach to conclude on the same, post consultation with ME and other stakeholders. The draft financial strategy will be finalized after incorporating stakeholders' comments and follow-up action, if any, for the same. The final strategy document will be submitted to ME within two weeks from the first stakeholder consultation workshop.

Sub-task 3.3: Financial Programme

Development of financial programme will ensure receiving comments and inputs from ME and stakeholders on the draft financial strategy. The key elements of the financial programme design are illustrated in Figure 11 for reference. Once again, it is to be noted that some of these elements may at times be clubbed together, or dropped, or new specific elements added to the programme, based on choice of instruments, local context, legal framework and stakeholders' inputs. Further, operational guidelines of financial programme will be developed to assist participating financing institutions to institutionalize/internalize the programme and keep track of the workflow as illustrated below in figure no 15,

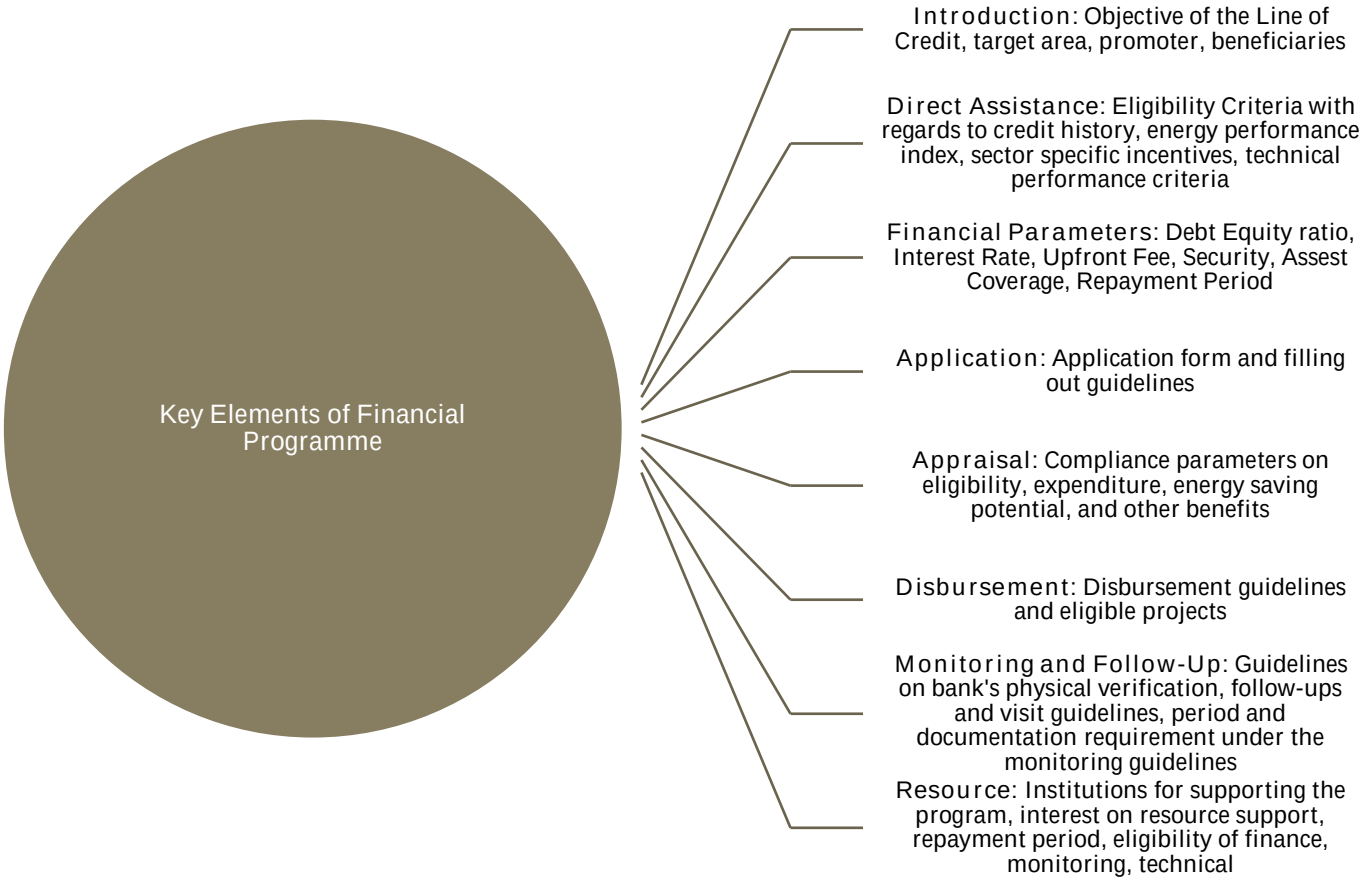


Figure 15: Key elements of the financial programme

Proposing the business model

Post evaluation of the various aspects of financial instruments with risk mitigation, and various consultations, Project Team will propose the most suited business model(s) to ME, financial institutions and other relevant stakeholders for further consultation. Components of the Business model will be as follows:

Value Proposition	Target end-users	Distribution Channels	Stakeholder responsibility	Capital Structure	Program Costs

Consultations to identify risk profile or possible beneficiaries

As per our understanding of the assignment, we have identified possible beneficiaries with their risk profile in the context of development of a financial programme. The illustration below, as per table 7, maps the respective sectoral beneficiaries and our assessment of their possible risk profiles:

Table 7: Mapping of beneficiaries and the risk profile

Sector	Beneficiary/ Customer	Risk Profile	Remarks
Commercial	Large Organizations	Better Creditworthiness, Good technical know-how and high retained earnings	Large organizations usually possess the capital and technical knowledge to undertake energy efficiency projects and their dependence on external factors is minimum. These organization can be made to comply with energy efficiency standards by imposing obligations to maintain a minimum level of energy efficiency.
	Small firms	Low Creditworthiness, Poor technical know-how and low retained earnings	Smaller firms generally have little/ no retained earnings to support investments in energy efficiency. Moreover, they do not have additional collateral to pledge against loans provided by banks for undertaking energy efficiency projects – for buildings, etc.
Residential	Home/ Apartment Owners	Low to medium to high credit worthiness, technical know-how and retained earnings.	Homeowners typically represent a pool of beneficiaries having varied levels of credit worthiness and per capita income. Policies/ instruments targeting this segment also suffers from high transaction costs, if the number of beneficiaries is less.
	Builders/Developers (Residential Complex)	Low to medium to high credit worthiness, low technical know-how	Builders can generally not be motivated to build energy efficient homes with energy efficient appliances (air-conditioning, lighting etc.) as this would increase the cost for the home buyers. However, incentivizing home buyers and builders and putting obligation may provide the much needed thrust.
Government	Government Departments, Local Government Entities	Generally low to medium credit worthiness, low technical know-how and low/no capital	Municipal corporations/ other local bodies are generally perceived as high-risk borrowers due to their poor credit worthiness. Government entities generally do not have their own source of earning and are largely dependent on aid from central government to implement energy efficiency in Buildings.

A good understanding of the creditworthiness, credit systems and risks associated with different end-user categories will be developed by meeting Maldives Monetary Authority, while understanding on technical know-how will be assessed by engaging with different end-user groups.

Activities for development of MRV

Effective setup of MRV for the financial programme will build confidence and trust among its partners/donors on how committed their funds are put to use and whether they are achieving their intended purpose. It will also enhance reporting of energy efficiency finance by key institutions.

Project team will develop the MRV guidelines based on below fundamental principles:

Accurate *M&V* reports should be as accurate as the *M&V* budget will allow. *M&V* costs should normally be small relative to the monetary value of the *savings* being evaluated. *M&V* expenditures should also be consistent with the financial implications of over- or under-reporting of a project's performance. Accuracy tradeoffs should be accompanied by increased conservativeness in any estimates and judgements.

Complete The reporting of *energy savings* should consider all effects of a project. *M&V* activities should use measurements to quantify the significant effects, while estimating all others.

Conservative Where judgements are made about uncertain quantities, *M&V* procedures should be designed to under-estimate *savings*.

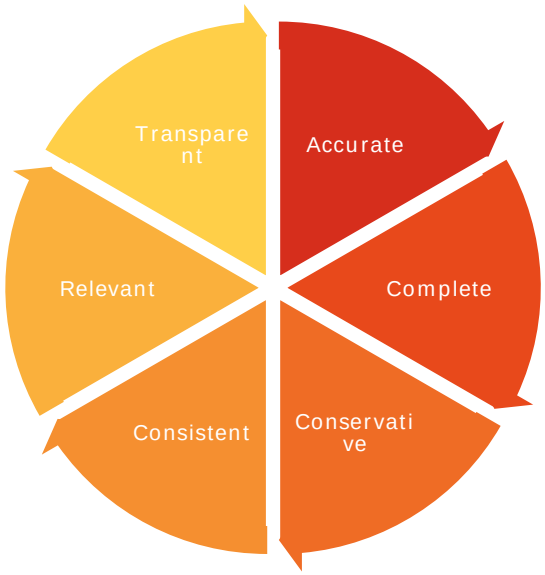
Consistent The reporting of a project's *energy* effectiveness should be consistent between:

- Different types of *energy* efficiency projects;
- Different *energy* management professionals for any one project;
- Different periods of time for the same project; and
- *Energy* efficiency projects and new *energy* supply projects.

'Consistent' does not mean 'identical,' since it is recognized that any empirically derived report involves judgements which may not be made identically by all reporters. By identifying key areas of judgement, MRV helps to avoid inconsistencies arising from lack of consideration of important dimensions.

Relevant The determination of impacts should measure the performance parameters of concern, or least well known, while other less critical or predictable parameters may be estimated.

Transparent All M&V activities should be clearly and fully disclosed. Full disclosure should include presentation of all the elements defined in financial programme. The balance of this document presents a flexible framework of basic procedures and four options for achieving *M&V* processes which follow these fundamental principles. Where the framework is silent or inconsistent for any specific application, these *M&V* principles will be used for guidance.



MRV preparation will involve

- Designing a light-version of Maldives' MRV of finance architecture covering full spectrum of MRV functions (track, process, verify and report).
- Making practical recommendations on road map for implementation.
- Prepare templates and list of instructions on how to put the MRV system from functions to practice.
- Develop guidance note on how to improve on the functionality, suggest possible modification and the ways to integrate MRV into normal operations of various actors.
- Make proposals on the capacity and resource needs necessary for the effective implementation of the MRV of finance.
- Recommend ways and measures to create awareness on user utility of the MRV of finance system.

Several indicators used for tracking by agencies involved in MRV will be identified. As per the structure of the financial programme, the MRV development will take place. The project team will also develop reporting formats, tools, and illustrations to describe the MRV mechanism of the financial programme.

PwC has many qualified M&V professionals (from EVO, US) and Certified energy auditors with relevant experience in framing the M&V documents for different areas in previous engagements. This experience will be strongly leveraged to create a robust MRV for this specific assignment. As per our experience and understanding of this project, we have defined the objectives for the MRV, that shall be fine-tuned in course of the project, after due consultation with ME and participating Financial Institutions.

Implementation work plan

At this stage, the assignment has made significant progress with respect to the stakeholder engagement and setting-up basic structure of the financial programme. We will seek inputs from ME on the prospective Banks/ FIs which will be considered by ME for the implementation phase. A detailed implementation work-plan will be

developed in consultation with the ME and identified financing institution, aligning with the assignment timelines. It is important to mention here that any lead time taken for onboarding the financial institution by ME has not been considered in the assignment timelines proposed by us as per the ToR. The implementation workplan will consist of two-fold activities, i.e. project documentation and action plan for demonstrating one implementation cycle, as illustrated next in figure no. 16,

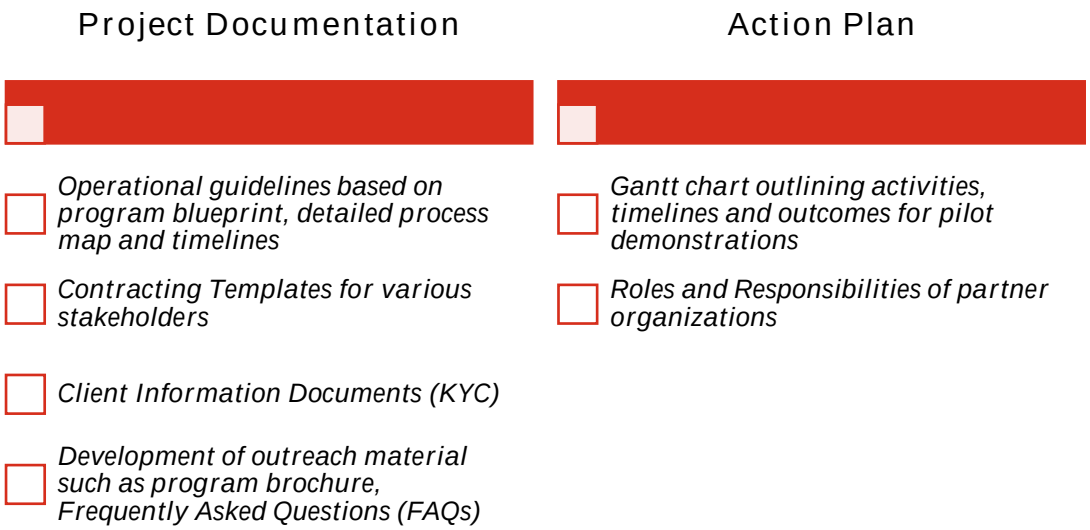


Figure 16: Key activities under implementation work plan

The action plan will be developed in consultation with ME, partner FI and other stakeholders to bring in clarity on starting point of the program, target setting, etc. These details will also be sought through various meetings as part of the stakeholder consultation activity in order to have their buy-in during the implementation phase. Development and fine-tuning of implementation action plan are largely dependent on the business case and stakeholders' inputs. Hence, The project team will adopt a consultative and flexible approach while proposing the same.

Task 4 – Stakeholder consultation workshops and meetings with the stakeholders

This task will be carried out in parallel with Task 3 as per our methodology and the scheduling of workshops and objectives thereof have already been discussed as part of methodology for Task 3. For summarizing, two stakeholder consultation workshops will be carried out in presence of key team members, ME officials and identified stakeholders, as per the following schedule:

- Stakeholder Consultation Workshop 1: to be organized after submission of draft financial strategy. The objective of the workshop is to gather inputs from stakeholders on the draft financial strategy and to finalize the same.
- Stakeholder Consultation Workshop 2: to be organized after submission of draft financial programme. The objective of the workshop is to gather inputs from stakeholders on the draft financial programme, ascertain their roles, seek additional feedback and to finalise the same.

In line with the ToR requirements, the logistical arrangements for the workshop will be made by the ME and the cost towards the same has been excluded from our proposal. We also seek ME's support in inviting and coordinating with the government and institutional stakeholders, in terms of sending out invitation letters to appropriate personnel, on ME's letter head.
This brings us to the conclusion of research and development phase for financing strategy and programme. The key outcomes, tasks covered, timelines and deliverables submitted during this phase are presented next.

Implementation Phase – documentation, piloting and capacity building

Task 5 – Implementation of Financial Strategy and Financial Programme

Implementation of financial strategy and programme is an important phase of the assignment wherein the maximum resources will be utilized to document, pilot, fine-tune the programme and enhance the capacity of stakeholders through a dedicated training programme. Our methodology looks at this task by dividing it into three sub-tasks, as illustrated next in figure no. 17,

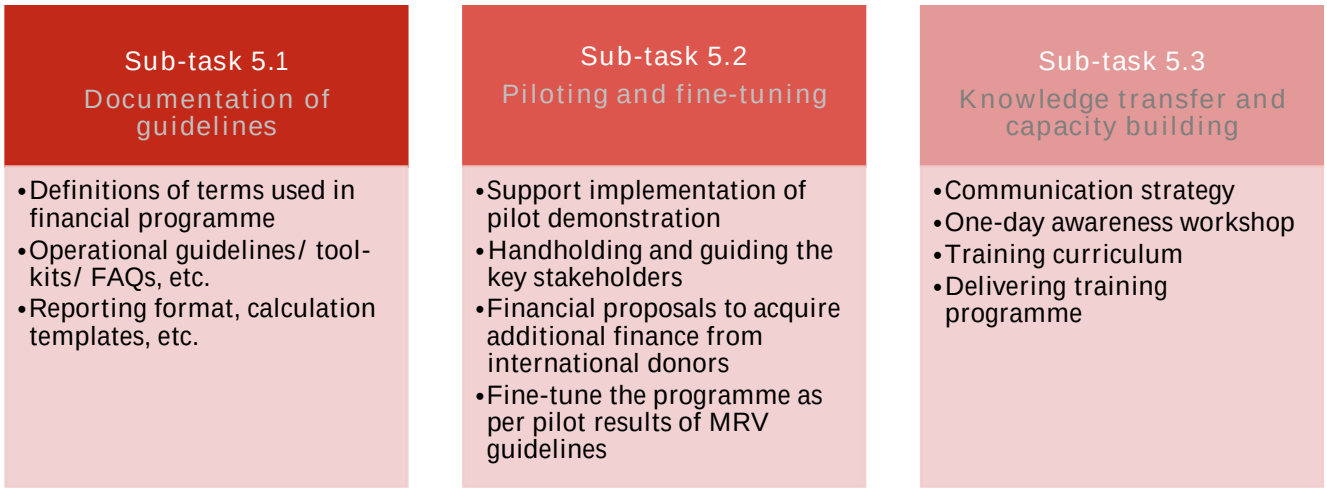


Figure 17: Methodology for implementation of financial strategy and financial programme

These sub-tasks are discussed in detail in upcoming sub-sections.

Sub-task 5.1: Documentation of Financial Programme guidelines

The operational guidelines of financial programme will be developed in detail so as to assist the participating financing institutions to institutionalize/internalize the programme and keep track of the workflow. The guides, tools and calculators would serve the purpose of detailing the various aspects and structure of the programme. This will be important for the stakeholders and anyone who wants to extract reports as per MRV criteria and other operational aspects of the financial programme. The guidelines would empower the involved financial institutions or other entities to know their responsibilities and the structure for the flow of information when a financial programme is operated.

Some of the guidelines/ tools/ formats to be developed for the financial programme are provided as an example as per The figure no. 18 below. This list will be reviewed and compared with the existing documents/ SOPs of the participating financial institution.

Figure 18: Examples of guidelines/ tools/ formats to be developed for the financial programme

The draft guidelines will be shared with ME and participating FI for feedback and review. The guidelines and documents will be finalized after incorporating the feedback from ME and FI.

Sub-task 5.2: Piloting and Fine-Tuning

The pilot testing of financial programme will be undertaken in a controlled environment by operationalizing the guidelines developed so far. Piloting becomes the litmus test for the planned financial programme and the assignment. Specific roles will be assigned to the participating entities (borrower, programme manager/ financier, etc.) and the guidelines/ templates/ calculators will be pilot tested. It is expected that up to three iterations will be required for pilot testing and results sharing as per the MRV guidelines. The results of pilot testing will be feed into the operational guidelines/ format and calculators as a finetuning mechanism. It is important to note here that pilot testing of financial programme and associated guidelines/ calculators, etc. will be carried out in a dummy environment with real stakeholders, i.e., without any financial transactions taking place into effect. The end-to-end pilot testing shall also cover implementing the overall MRV guidelines for the programme. We would make use of the below principles as indicated in figure no. 19, for a successful time-bound piloting of the project:

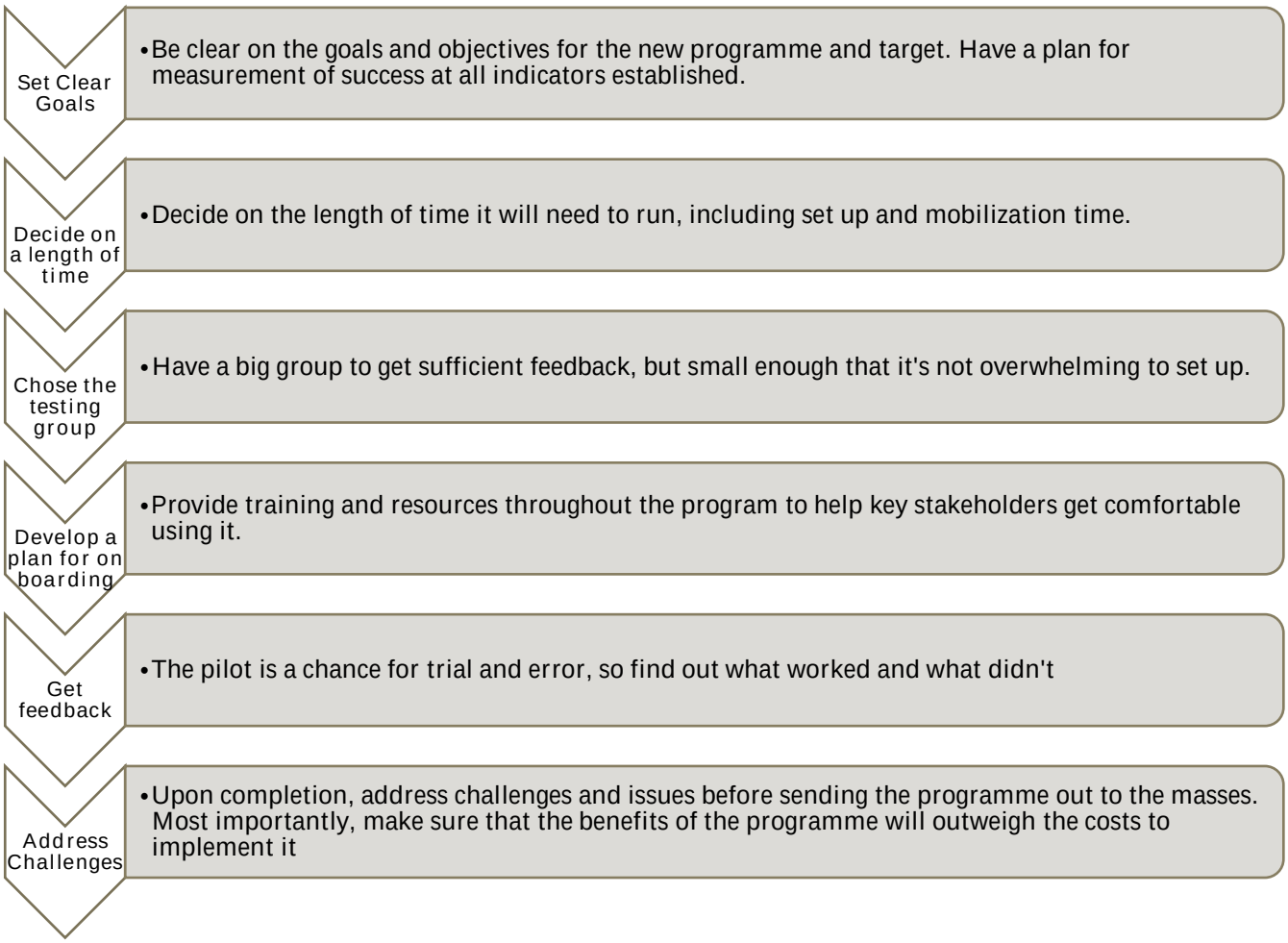


Figure 19: key principles to establish a robust MRV system for pilot testing financial programme

Our team will regularly engage with international donors in Maldives as well as the participating FIs to explore possibilities of additional financing. The funding resources of international donors are usually guided by the year-on-year layout as well their respective priorities for the energy efficiency related interventions with Building financing focus. We will undertake a matchmaking of FIs needs vis-à-vis available funding from international donors and submit a report to ME on the same. In case of a positive response from both the parties, we will assist

the FI to develop a proposal as per donor agencies' format. The necessary information from financing programme side will be provided by the project team.

Sub-task 5.3: Knowledge transfer and Capacity Building

The objective of knowledge transfer and capacity building is to develop guidance material and train the representatives of financial institutions involved in the operationalization of the financial programme. This will ensure that once the piloting and finetuning is complete, the responsible entities can operate the program to the best of their capabilities. PwC and Riyan consortium has carried out a number of capacity building workshops and trainings on financial programs and the experience would certainly help us engage with the stakeholders in a fruitful manner.

Marketing and Communication Strategy

Once the business model is finalized, it is imperative to conduct dissemination program for promoting the same. For promoting any activity, an integrated and a dynamic com/mar plan is an essential element. In the pursuit of developing com/mar plan, the project team would adopt the following approach as illustrated in figure no. 20 as below:

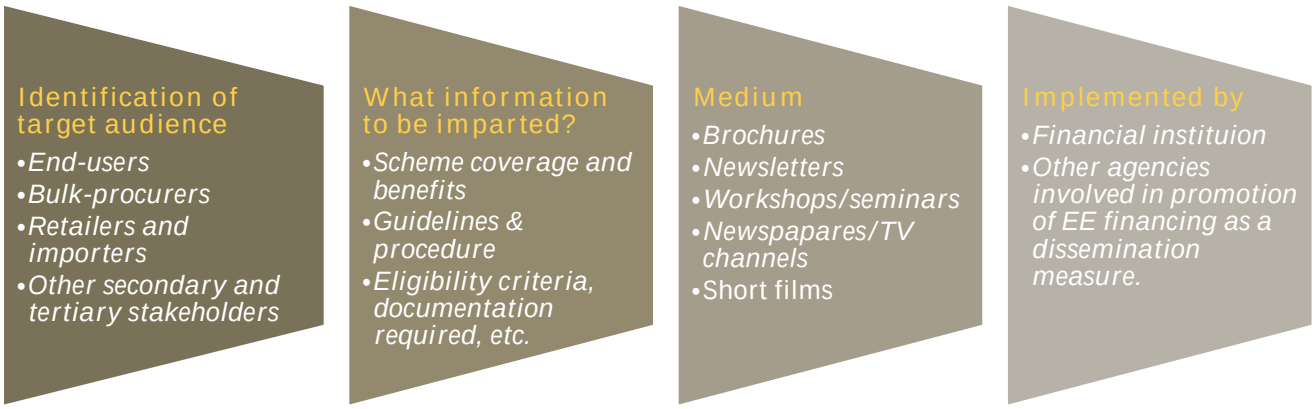


Figure 20: Approach for marketing and communication of financial programme

As part of the communication strategy, the project team will assist the financing institution to identify and profile the target audience and prepare presentations for various promotional and marketing avenues to disseminate the financial programme. The comprehensive communication/marketing plan would include details of each step as shown in the approach to promote the business model in the country. It would be noteworthy to mention that *PwC* has good experience in preparing and executing of media plan under the assignment titled ***"Marketing and General Outreach on EE Schemes"*** awarded by Bureau of Energy Efficiency, India.

Awareness workshop for stakeholders

A one-day awareness workshop will be conducted for the key stakeholders of the assignment. Similar to the methodology for conducting workshops in the assignment, our team will assist ME in identification of stakeholders, developing workshop agenda, inviting external speakers and moderating the open-house sessions. We shall seek support from ME in finalising the invitees list and sending out invitations to government and institutional stakeholders on ME letterhead.

Training and capacity building of finance professionals and stakeholders

Development of guidance and training material

The training materials would be developed with the aim of imparting basic knowledge and know-how of the financial programme and its operation. We will design the training material in a way that it captures the step by step aspects of the financial strategy and programme. The guidance material will comprise of illustrations related

to operation of the financial programme, flow of work, from generation of a query to assessment of requirements, implementation of the programme protocol and tracking savings and impacts.

List of training topics would materialise as per the development of financial programme in consultation with key stakeholders. Training materials will have a modular structure as per topics. They shall be designed in a way that the trainer will be able to disseminate information in the given timeframe. Also, the length of the timeframe for each module shall be planned to ensure optimum level of attention from the participants. The material would be designed to cover the course material for subsequent reference (copies of slides used, exercises, solutions, manuals, etc.). For easy understanding, the manual would include an index where important key words can be looked up training brochures, reference materials, slides and other auxiliary training materials.

The Training Modules shall be developed with inputs from subject matter experts on banking and project finance, credit and risk assessment.

Auxiliary training material

PwC and Riyan consortium would develop exemplary case studies and hands-on exercises on financing energy efficient Building and Energy efficient retrofits in the context of the programme, including the following (but not limited to):

- Calculating cash flows generating out of energy savings
- Financing models based on energy savings per unit investment, etc.
- Significant changes in project viability arising out of energy savings and associated incentives with financing energy efficient buildings construction or energy efficient retrofits.
- Specific cases where application has been rejected for failing to comply with environmental, legal, social obligations.

In addition to case-studies, PwC and Riyan consortium will develop calculation-based tools with illustrations in guidance material on their use calculation procedures. Other supporting and marketing materials will be designed involving – training brochures, reference materials, presentation slides, etc.

The training module shall serve as a ready reckoner for bankers to assess/vet energy savings vis-a-vis incremental cost of the project and assess EE benefits.

Designing programme format

The programme format shall be designed in a way that it addresses specific needs of the target participants and achieve the desired objective of the programme.

- Conference, roundtable, seminar or webinar
- Timeframe for the programme (one/half day, first/second half of the day, etc.)
- Scheduling of event while considering local cultural factors, etc.

An expert shall ideally lead each session. We shall adopt a consultative approach with local groups, associations and opinion leaders to finalize the programme format and schedule for individual events.

Training delivery

Training delivery has a big role to play in influencing the level of interest of the audience and their learnings. One of the most popular and proven adult learning approaches used for a variety of training and capacity building for adult professionals is the 70:20:10 model.

Based on the model, the entire training curriculum and learners' time will be divided in the ratio 70:20:10 as illustrated next - 70% focused on experiences, group-activities, problem-solving, concept-application, relevance

to core business; 20% focused on developmental relationships and feedback from the trainers on evaluation of group activities/exercises, etc.; and 10% focused on formal training through learning of theoretical concepts. The overall approach to conducting training programs are illustrated below in table no. 8,

Table 8 Approach for delivering of trainings

Method	Useful for	Advantages
Case study	• Solving problems • Changing Attitudes • Building analytical skills	• Involves learners actively • Allows sharing of leaners' experiences with others • Stimulates ideas and discussions of concrete subject
Role playing	• Developing interactive knowledge and modifying attitudes • Introducing humour and liveliness into training	• Stimulates interest • Keeps participants active • Uses participants' experiences
Group Exercise	• Team building • Developing interactive skills • Studying group dynamics	• Facilitates high participation of motivated learners
Brainstorming	• Stimulating creative thinking • Generating positive solutions • Consolidating past learning • Providing diversion	• Promotes active participation of learners • Uses learners' experiences and ideas
Demonstration	• Showing correct procedures and required standards	• Stimulates lot of interest • Can be used for large groups

Proposed training session format

The project team proposes a training programme schedule covering about 12 hours duration. We propose the programme schedule to cover three-day training sessions of 4 hours each with breaks in between for refreshments and Q&A discussions. The tentative schedule of the sessions would be as follows:

Session 1 (Day 1)

The first session will be aimed at interest and awareness creation for a larger audience (diverse stakeholders including general public), and will cover:

- Introduction to financial programme for energy efficient Buildings and energy efficient building retrofits
- Scope, need, benefits and objective of financial programme
- Energy Efficient best practices in new building construction and retrofitting, Existing building codes, Energy performance standards, EE index– local and global perspective
- Impact of EE Buildings on energy demand in Maldives

Elements of group activities will be initiated in the first session itself by organizing a small quiz at the conclusion of the session.

Session 2 (Day 2)

Session 2 will be aimed at specific finance professionals and sector experts (reviewers) from financial institutes including but not limited to banks, Ministry of Finance, Ministry of Environment, Climate Change and Technology. Session will introduce the participants to the structural, legal, and operational nuances of financial programme in the context of financial programme implementation:

- Brief review of session 1
- Structuring of financial programme and its overview – including financial instruments involved, their operational procedure from generation of a query to assessment of requirements,
- Risk mitigation application procedures
- Regulatory and policy framework for selection of a project

Session 3 (Day 3)

Session 3 will focus on operational aspect of the programme, institutional structure and measurement aspects of key indicators at various stages, their verification, validation and reporting across different stages of financial programme and at institutional level. These will include:

- Measurement of indicators for appraisal of requests, from identified stakeholders in the value chain
- Reporting of key indicators in the designed formats with knowledge on tools involved
- Verification of the reported indicators,
- Responsibility of individual institutions and their operations and responsibility in MRV process
- Calculations of energy savings, their impacts, in realising operational cost savings will be a key part of the operational structure of the financial programme.

This session would familiarize the participants with the nitty gritty of operational chain for financial programme and measurement, reporting and verification of operations at different stages. *Training programme feedback shall be collected at the end of each day and session to improve the content and make it relevant as per the understanding level of local stakeholders.*

2.3. Support required from ME, Banks and other FIs

While there is significant policy backing for energy reform, finance for such projects are hard to come by locally. Although benefits from energy efficiency is significant at national level in terms of reducing carbon footprint, foreign currency retention, energy independence and job creation among others, these benefits not necessarily underpin the lending decisions on the financial sector entities which rely on risk and reward model of investing.

Global initiatives such as UN Principles of Responsible Investing (PRI) and ESG reporting have not yet been embraced by the local financial institutions and other corporate entities in the Maldives. As the link between Maldives economy and its environment is undeniable, legally enforced adoption of frameworks such PRI, GRI Standards (global standards for sustainability reporting) and adoption of Carbon Disclosure Project (CDP) and Sustainability Accounting Standards Board (SASB) disclosure requirements among the government and corporate entities, especially those in the tourism sector, would be a great initiative for future.

In addition to enhanced disclosure requirements corporate entities, government guarantees could be very effective during the early stage, to address present apprehension and risk aversion by the financial sector for energy projects.

For the successful implementation of any financial program in a country, it is crucial to run parallel with the key expectations of all the major stakeholders involved in the assignment. For this project, banks and financial institutions play a role of utmost importance, followed by ministries and other development authorities of Maldives. As the next step, stakeholder consultations will be conducted with various banks and financial institutions. The team has jotted down the key discussion points for obtaining the required information from the banks and FIs' for successful implementation of this financial program:

1. Current financing practices and capital intensive EE products in new and existing buildings
2. Share information on any new and innovative products for EE Buildings financing.
3. Information on existing regulations related to financing of energy efficiency buildings and energy efficiency building retrofits
4. Share information on financial risk management guidelines

3. International Case Studies of similar financing programs

As a first step, a high-level review of globally practiced energy efficiency financing schemes and instruments were conducted. Different types of financing exist to provide access to end-users for investing in energy efficiency. The various categories of financing type are listed in the table no. 9, as illustrated below:

Table 9: Categories of financing type

Finance type	Description
Debt	Borrowers lay out commitment to pay principal and interest to lenders on an agreed schedule. To secure finance, borrowers use collateral as a means of reassurance to the lender. Conventional debt instruments include credit, mortgages, leasing.
Equity	Conventionally implies selling a stake in company receiving the funding from investors, who expect to share the profits of the company and the investment stake appreciation.
Grants	Non-repayable fund contributions (in cash or kind) provided by a grantor (e.g. government institution, multilateral / bilateral agencies, foundations, trusts) for a specified intervention. Grants are typically provided on a conditional basis against meeting certain objectives and might also call for proportional contributions by the recipient / other grant providing institutions.
Risk mitigation instruments	Instruments available in the market to mitigate risks of investing in energy efficiency. Beneficiaries of this instruments could be lenders, consumers, project developers and government. Common instruments include insurance, risk sharing and credit guarantee instruments.

The above-mentioned financing types are made available to end-users through various types of mechanisms / schemes. Some of these include – blended loans, green/climate bonds, convertible debt, securitization, crowd financing, demand aggregation, performance-linked financing, on-bill financing and owner equity. In addition, the funding through these instruments are provided by banks, institutional investors, development banks, multilateral/bilateral banks, non-banking financial companies, equity funds and ESCOs amongst others. A high-level overview of some of the applicable schemes/programs for energy efficient buildings are presented in the table no. 10, as illustrated below:

Table 10: Overview of applicable financing schemes/programs

Programme/Scheme	Country	Year	Features	Impact
De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits	Armenia	2016	• Collaboration between GCF, Municipality of Yerevan and Ministry of Nature Protection (MoNP) • Creating a favourable market environment and scalable business model for investment in EE building retrofits in Armenia • Provide grants amounting to USD 14 million for supporting poor and vulnerable households to secure grants for improving	• As of date, 1.4 million tCO_2 emission reductions avoided • Anticipated CO_2 emission reductions of up to 5.8 million tCO_2 over a period of 20 years • Directly benefit of 200,000 people and streamline private and public investment of around USD100 million • Around 6,463 buildings (single-family individual buildings, apartment

			thermal comfort and cost/energy savings	buildings, public buildings) to benefit
Energy Efficient Consumption Loan Programme	Mongolia	2018	• USD 21.5 million programme by XacBank with co-financing from GCF • Provide concessional loans for households undertaking insultation retrofits, EE household construction, EE heating appliances and EE housing solutions	• Anticipated CO_2 emission reductions of up to 0.5 million tCO_2 by 2029 • Around 15,278 direct beneficiaries
EESL – Building Energy Efficiency Programme	India	2015	• ESCO and PMC based model for undertaking energy efficiency retrofits (LED lights, EE fans and EE ACs) across public buildings in India • Entire upfront cost is taken up by EESL and repayment is recovered through energy savings	• As of 2020, 259 projects completed and 132 ongoing • As of 2020, 0.29 million tCO_2 emission reductions avoided and 75 MW of peak demand avoided
Energy Efficient Construction and Refurbishment	Germany	2009	• Soft loans and grants for energy efficient German residential sector • Reduction of CO2 emission levels in the German housing sector. • Available for all private investors in the residential building sector in Germany as well as housing companies at equal conditions	• The "KfW Efficiency House" standard became a market wide brand for energy efficiency in buildings • Reduction of carbon emissions by almost 9 million tonnes per year • Funding provided to over 4 million housing units • Triggering investment of over EUR 260 million in Building efficiency measures
DBS Green Bond	Singapore	2017	• The USD 500 million floating rate green bonds due 2022 were issued under DBS' USD 30 billion Global Medium Term Note Programme in July 2017. • DBS' Green Bond issuances (Proceeds) will be used to finance or refinance new or existing green assets/projects for Buildings • 100% of the net proceeds have been allocated to green assets comprising DBS' financing of a green building – Green Mark certified by Singapore BCA	• Energy Use Intensity reduced from 274 kWh/m^2 to 183 kWh/m^2 in 2019 • Estimated energy savings in 2019 is 13,843 MWh • 5,803 tonnes of CO_2 emissions avoided
Building Retrofit Energy Efficiency Financing (BREEF) Scheme		2011	• Facilitate financing for energy efficiency retrofits under an Energy Performance Contract (EPC) arrangement • Provides credit facilities for the purchase and installation of EE equipment	• N.A.

			• Facilitate loans to building owners with BCA sharing the risk of any loan default with the participating FIs issuing the loans	
Green Mark Incentive Scheme for New Buildings		2005	• Rewards private developers who achieve Gold Rating or higher with co-funding up to USD 2.4 million of the total cost.	• USD20 million fully disbursed
Thai Energy Efficiency Revolving Fund (EERF)	Thailand	2003	• Provides loan for EE/RE developers under ESCO mode for building applications that reduce heat gain, usage of energy-efficient construction materials and energy-efficient lighting solutions • Loans provided for a maximum duration of 7-years. Project developers pay an interest of 4% per year to the lending bank and the bank in-turn pays back the fund at an interest rate of 0.5% per year.	• 1,170 Mn kWh/year electricity savings • 0.98 Mn tons of CO_2 savings • 294 projects executed between (2003 – 2011)
Tonghua Country Program	China	2009	• Provided subsidies for retrofitting inefficient buildings in the urban area with energy upgrades and heating meters. • A combination of raising local funds and national incentives was designed to secure the budget of USD 26 million. Notably, 70% of this budget was secured through subsidies from central and local governments.	• Saved 20,000 tonnes of standard coal equivalent each year and raised the total energy savings rate to 40%

Conclusion

Following the initial review of the above-mentioned case examples, it is important to conduct a detailed assessment of the programs being implemented in India, Mongolia and Singapore as these have a fair mix of grants and concessional loans which might be beneficial for the end-user as well as create a niche market for an innovative financial programme. Further to this, the next step in this study would be to review the functionalities of these programmes in terms of business models, lending criteria etc. which can be taken as inputs for developing the Maldives specific programme. In addition, the team would also be assessing additional financing schemes and business models including – concessional loans, list-based financing, performance contracting (ESCO), leasing, dealer financing, microfinance, mortgage financing, on-tax financing, financial incentives, guarantees, and energy savings insurance to establish a strong business case for selecting the appropriate scheme applicable for Maldives.'

4. Work plan and Deliverables

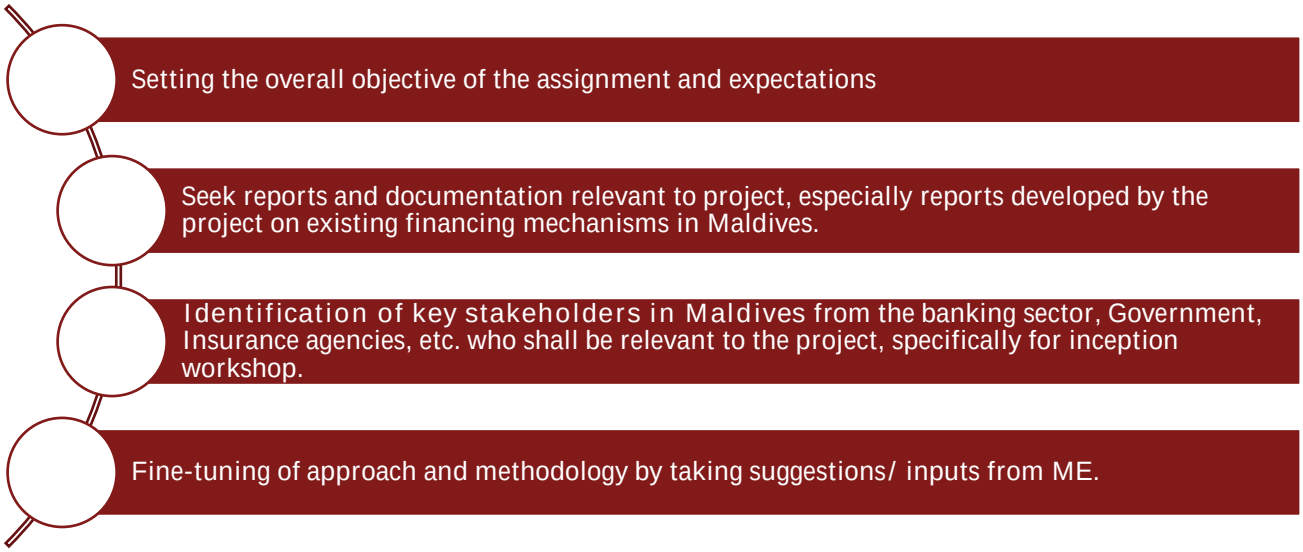
A detailed work plan for completion of all the activities has been finalized and the proposed submission of the deliverables is depicted in Table 11.

Table 11: Deliverables of the assignemnt

Deliverable Number	Name of the Deliverable	Timeline to submit the deliverable from contract award
Deliverable 1	Inception report with findings of workshop	1 month
Deliverable 2	Draft financial strategy for EE buildings and EE building retrofits	1 month
Deliverable 3	Stakeholder consultation	
Deliverable 4	Final report of financial strategy for EE buildings and EE building retrofits	1 month
Deliverable 5	Draft financial programme for EE buildings and EE building retrofits	2 months
Deliverable 6	Stakeholder consultation workshop	
Deliverable 7	Final report of financial programme for EE buildings and EE building retrofits	1 month
Deliverable 8	All draft documents/materials for implementation of financial strategy and financial programme	1 month
Deliverable 9	All draft documents/materials for capacity building of key stakeholders	
Deliverable 10	All final documents for implementation of financial strategy and financial programme	1 month
Deliverable 11	All final documents/materials for capacity building	
Deliverable 12	Report on 1-day awareness workshop on developed financial strategy and financial programme	1 month
Deliverable 13	Report on training for 10 professionals in finance sector to implement financial strategy and programme	
Deliverable 14	All final documents and reports	

5. Findings of the Inception Workshop

Inception workshop on Development of Financial Programme on Energy Efficient Building and Energy Efficient Building retrofits was conducted on August 19th, 2020 over a virtual online interface. The workshop was attended by various key stakeholders from policy makers, regulators, financing institutions, banks, non-banking finance companies (NBFCs) and other representatives from the private sector. The below points were covered during the kick-off meeting:



5.1. Agenda of the Inception workshop

The workshop was conducted with support from Ministry of Environment, Climate Change and Technology to achieve the following objectives:

- Introducing the project on financial programme for energy efficient buildings and energy efficient building retrofits and its need to the participants.
- Sharing global case studies and examples on financial programmes to promote uptake of energy efficient buildings and energy efficient building retrofits
- Existing Building Financing options in Maldives
- Development of Financial Programme for Energy Efficient Buildings in Maldives– Overview of proposed approach and methodology along with key tasks to be undertaken in this project
- Stakeholder consultation on existing financial capacity of FIs to run a financial programme, understanding the present gaps in access to financing schemes for energy efficient buildings, to identify potential financial strategies, and policy framework and ultimately the regulations to influence development of energy efficient buildings and energy efficient building retrofits.
- Summing up, next steps and Vote of Thanks

5.2. Minutes of the Inception meeting

Date: 19-August-2020
Venue: Virtual meeting over Google Meet

A. Opening

Ministry of Environment, Climate Change and Technology, Maldives expressed gratitude to all the participants for joining the Inception Workshop and introduced consultant team (PwC and Riyaan) to briefly introduce the project goal, objective and it's need in Maldives. Consultant team experts gave a brief presentation, highlighting 1) the major activities that will be undertaken in the project, 2) Various international case studies of similar financial programs being implemented in other parts of the world and 3) The stakeholder's whose support will be paramount for the successfully implementation of the program.

The presentation was followed by a Question and Answer session, where esteemed stakeholders from different banks and development agencies discussed the paraphernalia of the project with the consultant team and Ministry of Environment, Climate Change and Technology.

B. Summary of Discussions

1. On Existing Financing Options in Maldives

- There are few existing financial instruments within Maldives for Energy Efficient practices, for eg, Fresa fund, which was developed for Solar rooftop components. PwC team to review these existing financing instruments within Maldives to note the performance and challenges faced as an assessment of the lessons learnt.

- Currently BML – Green Loan faces the greatest challenge of less awareness among the Maldivian consumers, which leads to hindered uptake of the Green loan and uptake of the energy efficient technologies. It was therefore highlighted that capacity building and awareness generation will take utmost priority for successful implementation of the financial program that will be developed during the project.

- Maldives Islamic Bank has a financial product called Ujala, which allows all individuals (government or private sector) for a loan upto 250,000 MVR (no collateral) with a 5 years repayment period for installation of solar panels. PwC team to review the work done on Ujala and pick up lessons learnt and findings on the product.

2. Discussion on financial strategy and program

- The project aims to develop a suitable financial program, as per the Building Guidelines developed in Maldives for Energy efficient practices in Buildings. It shall also focus on integration of renewable energy components for new buildings and energy efficient retrofits of the existing buildings, wherever applicable.

- The financial product developed during this project will be designed in the form of soft loan or concessional loans, to help cater to a wider group of people with different paying capacities and from different locations within Maldives.

- All the associated costs for energy efficient technologies in new buildings and for existing buildings, including civil costs, will be duly assessed over the course of project duration and shall be incorporated in the financial program, post consultations with all the relevant stakeholders.

- The financial product developed under this project will cater to both energy efficient building material imports as well as for ones which are locally available.

- For building developers, the program creates scope of developing both new energy efficient buildings and retrofitting existing buildings to make it energy efficient. For the new energy efficient buildings developers will have direct financial benefits from availing the loan/financial product. For retrofitted properties, the developer will be benefited from increased value of asset and faster and higher selling rates as compared to conventional buildings, owing to reduced electricity bills and the additional daylight and thermal comfort of the residents.

- The project will require certified professionals or energy auditors to quantify savings and the payback period through different energy efficient measures in buildings as a pre-requisite for availing the loan/financial product, that will be developed during the project. However, the different ticket sizes for the loan and the components (building materials, Lighting, etc.) to be included, will be thoroughly assessed during the project duration and finalized post consultation with different stakeholders.

- Duty exemptions for materials and appliances that are Energy efficient may be taken up by the government under this program.

- As the Residential sector in Maldives has the highest share of energy consumption of up to 84% percent, the financial program is to be developed keeping in mind the challenges faced by design consultants of the residential sector to create energy efficient buildings.

- Project team to include service providers like FENAKA, STELCO and similar utility companies in greater capacities during the development of financial program, for eg. Through on-bill financing, where utility companies are enabled to give concessions to the consumers for different energy efficient practices like gray water recycling, rainwater harvesting, etc.

5.3. Next Steps

As per discussions conducted during the inception workshop on financial programme for energy efficient buildings and based on subsequent assessment of the project goals, the team identifies the below next actions to accomplish the assignment targets:

- Conduct Stakeholder consultants with banks and other stakeholders in Maldives to develop the financial program in line with the requirement of the country.
- Gather necessary documents on the existing financial schemes for energy efficient practices and equipment's in buildings.
- Propose financial strategy and finalize as per inputs from all key stakeholders.
- Financial programme development.
- Conduct stakeholder consultations (at least 2 workshops) with the concerned department of public offices to take feedback and inputs throughout the development of financial programme
- Implementation Phase – documentation, piloting and capacity building to start post September 2020.

Annexure 1 - List of participants in the Inception Workshop

Stakeholders Consulted during Inception Workshop	
Ministry of Environment, Climate Change and Technology	1. Ahmed Waheed (Director, Ministry of Environment, Climate Change and Technology) 2. Mohamed Inaz (Project Manager, Ministry of Environment, Climate Change and Technology) 3. Fathimath Raufa Moosa (M & E Officer, Ministry of Environment, Climate Change and Technology) 4. Moosa Rilwan (Management Administrator, Ministry of Environment) 5. Aishath Azleena (Project assistant, Ministry of Environment, Climate Change and Technology) 6. Hameed Ali (Assistant Engineer, Ministry of Environment, Climate Change and Technology)
Maldives Energy Authority	7. Shara Mauroof (Standards and Labelling Officer, MEA) 8. Fathimath Haifa Aslam (Accounts Officer, MEA)
Housing Development Corporation	9. Mohamed Saif (Assistant Director, HDC) 10. Ahmed Fathhee (Assistant Director – Utilities and Building, HDC)
Bank of Maldives	11. Imran Solih (Cluster Manager, Bank of Maldives) 12. Hassan Aqleem (North Cluster, BML - Bank of Maldives) 13. Ahmed Raushan (Cluster Manager, Bank of Maldives) 14. Aminath Leela (Customer Service Manager, Bank of Maldives)
Architects Association Maldives	15. Mauroof Jameel (President, Architects Association of Maldives)
Ministry of National Planning, Housing and Infrastructure	16. Mariyam Irasha Najeeb (Assistant Architect, Ministry of National Planning, Housing and Infrastructure)
FENAKA	17. Ahmed Azleem (Director Business Development, FENAKA)

Maldives National University	18. Mohamed Haikal (Lecturer, Department of Engineering, MNU)
SDFC	19. Ibrahim Afsah (Assistant Credit Analyst, SDFC)

Annexure 2 - Agenda of the Workshop

Development of Financial Programme on Energy Efficient Buildings and Energy Efficient Building retrofits

Strengthening Low Carbon Energy Island Strategies (LCEI) Project

Date: August 19, 2020 Venue: Virtual Interface

Inaugural Session	
10:00 – 10:20	Opening Statement by the Ministry of Environment , Climate Change and Technology
	Opening Address by Permanent Secretary or Minister (TBC)
	Introduction of Participants

Session 1: Introduction to Financial Programme		
10:20 – 10:40	Overview of Energy Efficiency in Building sector and its importance	PwC/ Riyan
	Introduction to Financial Programme and global examples	PwC/ Riyan
10:30 – 11:15	Existing Building Financing options in Maldives	PwC/ Riyan
	Development of Financial Programme for Energy Efficient Buildings in Maldives– Overview of proposed approach and methodology along with key tasks to be undertaken in this project	PwC
11:15 – 12:00	Stakeholder Discussion: • What are your new and innovative products for EE Buildings financing? • What are the challenges in developing and implementing EE Building financing programmes? • What kind of incentives may work for influencing consumer decisions towards investing in Energy efficient Buildings and EE Building retrofitting?	Moderated Discussion
	Summing up, next steps and Vote of Thanks	ME

Ministry of Environment, Climate Change and Technology

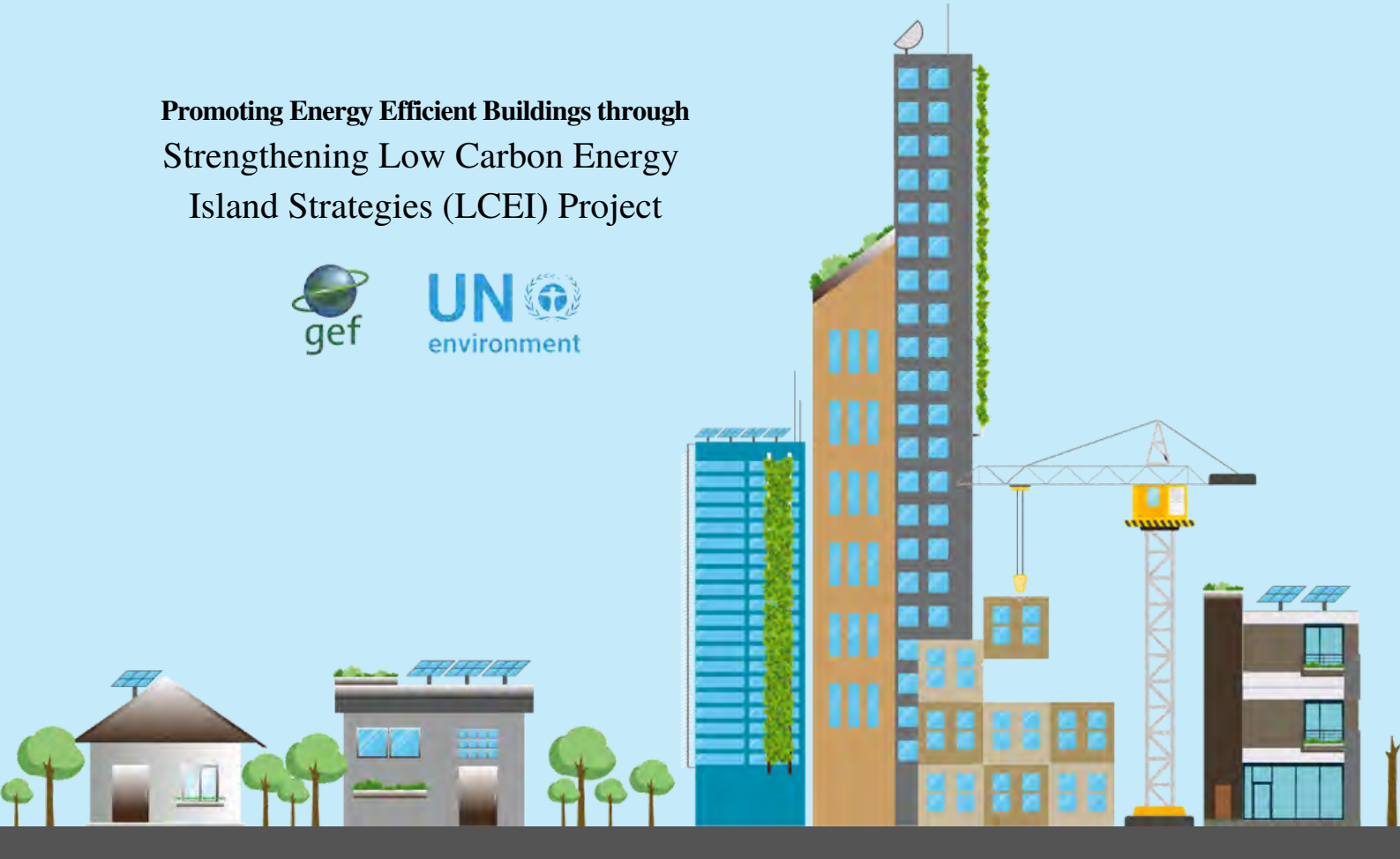
Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits in Maldives

Financial Strategy Report

Promoting Energy Efficient Buildings through
Strengthening Low Carbon Energy Island Strategies (LCEI) Project

gef

UN environment



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1. Project Background

The Republic of Maldives is a small island developing nation with tourism, fisheries, transport and construction being the key sectors driving economic growth. As per the Maldives statistical department, the country has emerged as the second fastest growing economy in South Asia with an average GDP growth rate of 6.2% since 2010. In the past three to four decades, there has been an exponential growth in the energy demand of the country. Further the entire energy demand is met by the import of fossil fuels due to unavailability of conventional sources of energy posing a significant burden on the country. In Maldives the most significant energy conversion is from diesel to electricity. The generation and distribution of the electrical systems are decentralized with each separate island operating a self-sustaining diesel power generation and distribution system.

The World Bank estimates that the government subsidies on electricity amount close to USD 58 million or 1.0 percent of GDP in 2019. Fuel accounts for 16% of total imports and 12% of total export revenue during 2019. Depending on the international oil prices, the Maldives could spend close to a half a billion USD on oil imports each year. According to World Bank estimates, increasing the share of the renewables in the generation mix by 20 percentage points could reduce the oil import bill by 5 percent and energy sector subsidies by 14 percent based on 2019 levels, resulting in fiscal and external savings, provide environmental benefits and generate jobs.

The capital city Male is the hub of employment opportunities, healthcare facilities and educational services which has witnessed an increase of migration from outer islands. Due to this there has been a rapid increase in 10 to 25 storied high buildings leading to rapid increase in population during 2010-2015, making it one of the most populated capital in the world. With the increase in population, it has been observed that the building sector in Maldives consumes 30% of the total energy consumption and is expected to grow by 8.5% annually (S0urce: Maldives Statistical Department). Building sector has been identified as a key sector to attain the objective of carbon neutrality by using renewable sources of energy and achieving energy efficiency in buildings. The key challenges faced by this sector includes high import cost of construction materials, dependency on conventional sources of energy and high population density.

With the objective to reduce the overall GHG emissions by 10% for the year 2030, Government of Maldives has taken several steps in the direction of energy efficiency and to make the nation a low carbon economy such as formulating progressive 'National Energy Policy & Strategy', strengthening the existing regulatory bodies, build capacities across the energy sector and conduct awareness on the benefits of energy conservation. Some of the key initiatives and policy actions are as follows:

- *Energy Sector Investment Roadmap was developed for Maldives in 2011 which conducted preliminary estimate of investment required to be carbon neutral*
- *Development of Clean Energy Investment Plan in collaboration with Ministry of Housing and Ministry of Environment of Maldives*
- *Energy efficiency guidelines for buildings are being developed for Residential, Commercial, Government, Hotels and Guesthouses, that shall lay the minimum energy efficiency requirements for buildings in Maldives.*
- *Life cycle cost based public procurement guidelines thereby promoting energy efficient products and technologies*
- *Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits*
- *Establishment of the 'Green Loan' under Bank of Maldives Green Fund for increasing investment in energy efficiency and renewable energy solutions*

Based on experience and assessment of the local conditions that have dampened uptake of energy efficiency in buildings of Maldives, a major contributing factor is absence of regulations and laws around the energy efficiency for buildings which hampers disciplined energy saving in the region. However, the major challenge to the uptake

of EE measures has been found to be the lack of appropriate loan instruments among the promoters for EE update in construction. Another major roadblock is the lack of energy subsidies that have led to absence of incentivized based financing mechanisms to push EE market in buildings. In this assignment, project team will specifically address the component of financial constraint, that greatly hinders the adoption and large-scale dissemination of energy savings parameters and technologies.

1.1. Need of financial programme for energy efficient buildings and energy efficient building retrofits in Maldives

The building sector in the Maldives is generally under-investing in energy efficiency and other low carbon energy building technologies due to diffused responsibility for energy consumption over the lifetime of any given building. With an increase in population and energy demand, the dependence on imported goods have increased. In 2018, 5 billion USD worth goods were imported which almost doubled since last 10 years. With sustainability goals and objectives in mind, it is important that due consideration shall be given, on promoting demand for materials, buildings products and technologies which are energy efficient.

Maldives government has initiated various actions to tackle the energy scarce situation in the country. As the construction sector continues to expand in Male and Hulhumale region, Ministry of Environment, Climate Change and Technology, Maldives (under LCEI project) are in process of development and implementation of Energy Efficiency guidelines along with Ministry of National Planning, Housing and Infrastructure (MNHPI) for new buildings and retrofitting of existing buildings under the typologies of Government Buildings, Commercial Buildings, Residential buildings and Hotels & Guesthouses in Maldives. One of the major barrier that was identified during the development of EE guidelines was the lack of financial instruments which led to low uptake of energy efficient technologies in buildings of Maldives.

When it comes to the adoption of the Energy efficiency measures, the requirement of additional capital investment becomes critical, along with establishment of a building energy code or energy efficiency regulations for building retrofits in Maldives. Furthermore, ones the code gets mandated by the government of Maldives, there will be a significant rise in the demand for such financial mechanisms to enable adoption of the measures by the end users. This creates an urgent need to undertake the current assignment of development of financial programme for energy efficiency buildings and energy efficiency retrofits in Maldives.

The financial programme will enhance the uptake of EE buildings by generating cost savings from energy conservation measures by enabling users to safe payback options and by increasing the asset value and quality for financiers due to enhanced comfort and performance of the building. This will lead to the transformation of EE buildings market in Maldives. Some of the user-specific benefits and overall benefits of successful implementation of such a financial programme are depicted in figure 3 and figure 4, respectively.

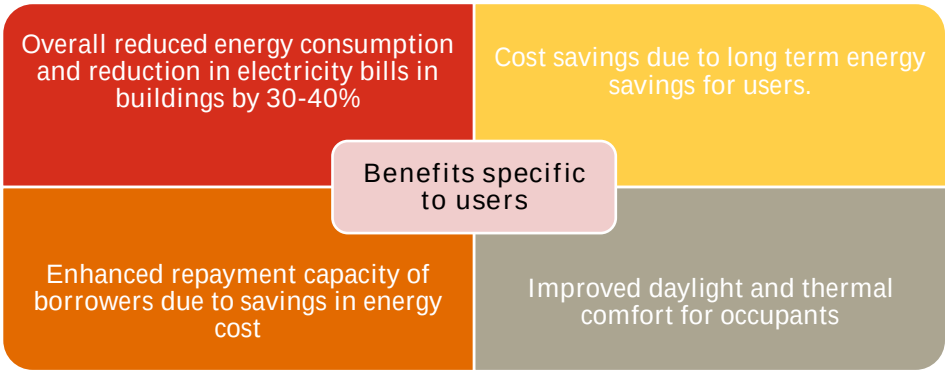


Figure 1 User Specific Benefits of financial program

Overall Benefits
•Contributes significantly to meeting NDC targets and carbon commitments to reduce greenhouse gas (GHG) emissions •Minimum electricity savings through the implementation of EE guidelines is anticipated to be 3200GWh by 2030 •Energy security and reduced need for energy imports in future leading to reduced government expenditure •Higher disposable income for end-use sectors •Drives energy efficiency innovation in the market •Better asset quality for lenders

Figure 2 Overall Benefits of financial program

Going through the above benefits, development of robust financial strategy is very crucial to attain the objectives set by the Government of Maldives to reduce the GHG emissions by 10% before 2030. Further, the programme should support implementation of energy efficiency practices across new and existing buildings and at the same time lead to recovery of capital through operational energy cost savings, thereby enhancing the energy security of the nation.

1.2. Scope of work and work status

Project team has divided the entire scope of work mentioned in the terms of reference (ToR) as per three implementation phases, tasks and sub-tasks, as tabulated below, for better understanding of assignment and structuring our Approach and Methodology. The inception phase has been completed successfully and this report details out the draft financial strategy for the development of financial programme. The scope of work and activities with their status highlighted in color code is provided below:

Table 1 Scope of Work & Activities

Tasks and Sub-tasks	Scope of Work and Activities
Inception Phase – Setting the Blueprint	
Task 1.0	Review reports on existing financing mechanisms and other reports – desk research and preliminary consultations with stakeholders,
Task 2.0	Conduct 1-day inception workshop to understand present relevant findings of Task 1, identify existing policy, gaps, understanding EE building practices in Maldives, discuss possible financial strategies, case studies
Research and Development Phase – Extensive stakeholder consultation and programme development	
Task 3.0	Develop financial strategy and financial programme
Sub-task 3.1	Propose financial and risk mitigation instruments and propose business model and interaction between stakeholders (providers – financial entity – government- others)
Sub-task 3.2	Financial Strategy – Identify stakeholders involved, develop concept note defining financial strategy, identify forecasted benefits by implementation of financing schemes in terms of investments and impacts (GHG emissions avoided as a result of EE potential)
Sub-task 3.3	Programme Development – Define activities for the financial model like MRV, disposal, resources needed, implementation work plan, and identify international financing sources to strengthen and co-finance the financial programme

Task 4.0	Conduct consultation workshops and meetings with key stakeholders in order to establish the financial programme and strategy as covered in Task 3.0. Consultation workshops will be performed in parallel with Task 3
Implementation Phase – Demonstrating the programme and capacity building of stakeholders	
Task 5.0	Implementation of the financial strategy and financial programme
Sub-task 5.1	Development of toolkit, guide and documents to support implementation of financial schemes by any financial institute (templates for calculation, formats, etc.). This shall include operational process, operational guidelines, financial strategy, entities involved in scheme, eligibility criteria, and other aspects. Also, develop marketing and communication strategy with supporting presentations.
Sub-task 5.2	Implementation of MRV, piloting demonstration of developed financial strategy and programme, facilitate overall implementation of financial programme.
Sub-task 5.3	Build Capacity of stakeholders – Conduct training programs and develop relevant training material. Conduct 1-day awareness workshop on developed financial strategy and programme, and at least 2-day training workshop on implementation of financial strategy and programme.
Color Code	Task Status
	Tasks Completed
	Tasks Covered in this report
	To be covered in subsequent stages of the project

Brief on Activities Completed Thus Far & Findings from Inception Phase

On road to develop a robust financial strategy and a financial programme for Energy Efficient Buildings and in Maldives, a number of activities were initiated in the inception phase and subsequently in the 'Research & Development Phase'. The following activities have been completed:

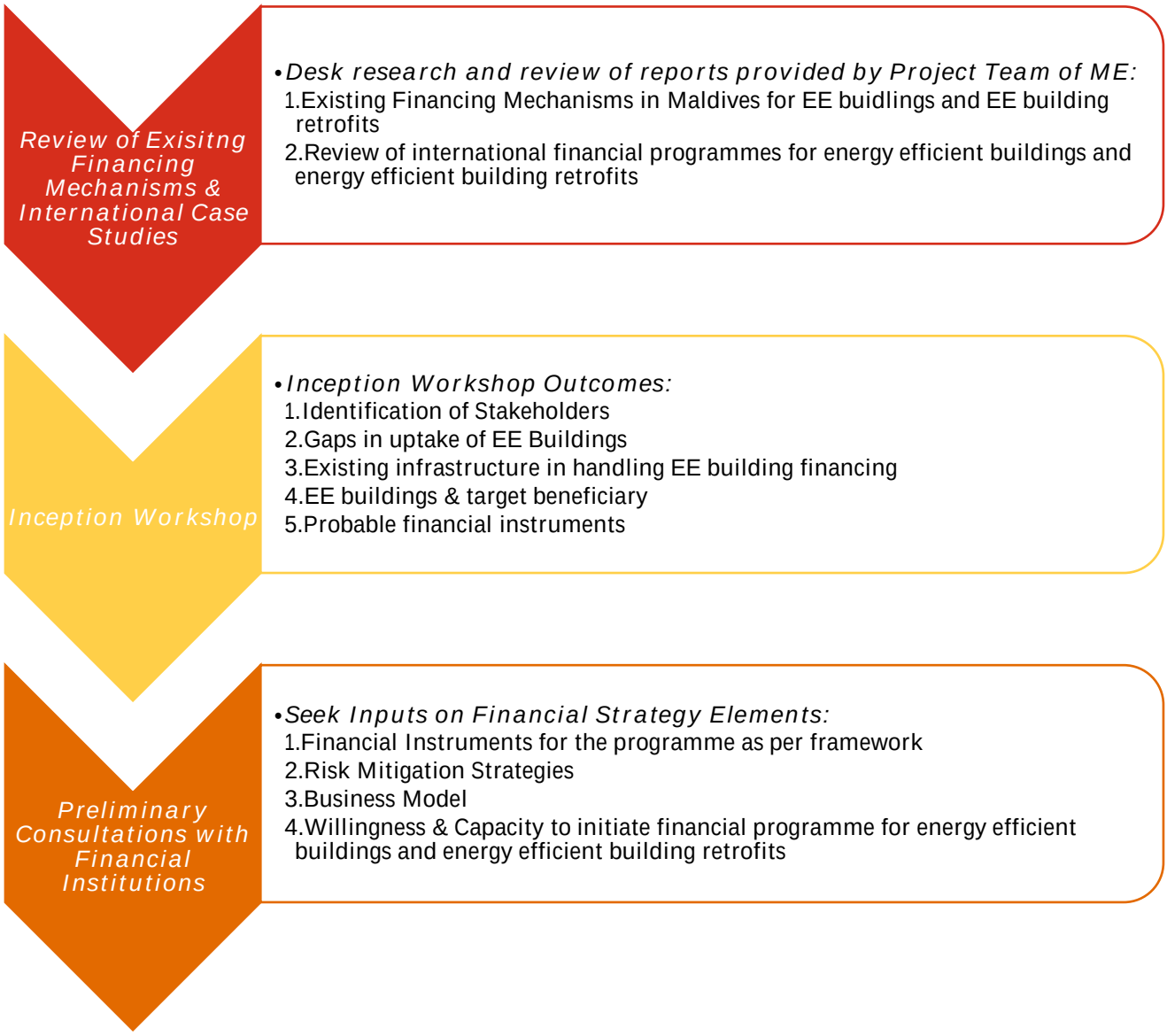


Figure 3 Activities Completed Thus Far

The findings up to the inception phase were presented in detail in the "Inception Report" that precedes this report. This report presents an in-depth analysis of the development of draft financial strategy which is one of the major activities of 'Research and Development Phase' of Financial Programme development. 'Financial Strategy' is a plan of action to develop a financial programme. The strategy shall enable one to assess financial need, resources, and supporting structure that includes key actors and flow of information to fulfill the needs of the financial programme. Project team's approach and methodology to develop a financial strategy are elaborated next in subsequent section.

2. Introduction to report on Financial Strategy

The outcome from inception phase resulted in deriving the key financial elements that are required for further study, such as, concessional loans, list based financing, demand aggregation, mortgage financing, performance contracting (ESCO model) etc. and the possibility of enforcing a mandatory regulation to promote energy efficient buildings. Draft financial strategy report thus enunciates the findings for drafting a robust financial strategy.

This phase comprises of secondary review of existing financial schemes (Maldives and globally practiced), shortlisting of instruments applicable to Maldives & building sector, proposing the relevant strategy and the business model and forecasting of benefits associated with implementation of the strategy. It is also important to note that consultations with stakeholders were conducted to identify the relevant financing instrument and the underlying risk mitigation measures that need to be deployed for safeguarding the stakeholders from any failure. To develop the financial strategy, a stepwise approach was adopted and the illustration of the same is shown below:

Table 2 Approach and methodology for developing the financial strategy and programme

Step	Description
Desk research	• Review of existing buildings and consumer financing schemes in Maldives • Review of globally endorsed energy efficiency financing schemes • Shortlisting of potential financing schemes applicable for a building programme (new and existing buildings)
Stakeholder consultations	• Consultations with stakeholders to validate the findings from desk research and also identify the most relevant instrument based on a scoring framework • Consultations with banks and NBFCs to understand the existing financing schemes, procedures for assessing the consumers and other risk mitigation processes adopted for consumer financing
Propose financing instrument and business model	• Based on findings from the consultation, propose the appropriate financing strategy and business model for new and existing buildings • For the identified model, propose key elements that could form the strategy and develop the outline of the model including flow of funds and lending process • Identify the supporting mechanisms, stakeholders to be involved in the strategy and the underlying benefits & challenges of this strategy
Propose risk mitigation measures	• Conduct review of existing risk mitigation measures prevalent in Maldives financial sector • Propose risk mitigation instruments for the proposed financing instrument
Forecasting benefits	• Conduct scenario testing of the financing instrument • Assess investment requirement and forecast benefits • Quantify energy savings and associated GHG emission reductions from the financial programme

In line with above, this report presents the detailed outline of the draft financial strategy (comprising of the instrument and business model) and the underlying steps that were conducted for arriving at the strategy. The report also presents a detailed outline of the forecasted benefits, both from a financing perspective (increase of sales of energy efficient buildings vis a vis the budget requirements) as well as from the energy efficiency perspective (energy savings and emission reductions).

The proposed financial strategy would be validated through discussions with the Ministry of Environment (ME) and other key stakeholders including government and private banks before finalizing the same for implementation. The implementation stage would involve identifying participating bank / FI, developing the operational guidelines, pilot demonstration to study the effectiveness of the strategy and conducting capacity building for stakeholders to implement the strategy. These would be presented in the subsequent reports.

3. Development of financing strategy and programme

3.1. Review of secondary data

A comprehensive secondary research was undertaken to establish an understanding of current practices in energy efficiency financing for buildings within and outside Maldives. Reports published by international development agencies, think-tanks and research organisations were reviewed. This review was augmented through focused stakeholder consultations with government and banking sector in Maldives and thereby provided the required local insights on existing mechanisms, infrastructure and organizational framework involved, etc.

Globally practiced energy efficiency financing options

Different types of financing exist, and they provided access to end-users for investing in energy efficiency. The various categories of financing type are listed in the table below:

Table 3 Categories of financing type

Finance type	Description
Debt	Borrowers lay out commitment to pay principal and interest to lenders on an agreed schedule. To secure finance, borrowers use collateral as a means of reassurance to the lender. Conventional debt instruments include credit, mortgages, leasing.
Equity	Conventionally implies selling a stake in company receiving the funding from investors, who expect to share the profits of the company and the investment stake appreciation.
Grants	Non-repayable fund contributions (in cash or kind) provided by a grantor (e.g. government institution, multilateral / bilateral agencies, foundations, trusts) for a specified intervention. Grants are typically provided on a conditional basis against meeting certain objectives and might also call for proportional contributions by the recipient / other grant providing institutions.
Risk mitigation instruments	Instruments available in the market to mitigate risks of investing in energy efficiency. Beneficiaries of this instruments could be lenders, consumers, project developers and government. Common instruments include insurance, risk sharing and credit guarantee instruments.

The above-mentioned financing types are made available to end-users through various types of mechanisms / schemes. Some of these include – blended loans, green/climate bonds, convertible debt, securitization, crowd financing, demand aggregation, performance-linked financing, on-bill financing and owner equity. In addition, the funding through these instruments are provided by banks, institutional investors, development banks, multilateral/bilateral banks, non-banking financial companies, equity funds and ESCOs amongst others. An overview of globally accepted and endorsed financing schemes and business models is presented in the table below:

Table 4 Global EE financing schemes and business models

Instrument type	Key features	Applicable sector	Use cases from other countries
Popular Financing Schemes & Business Models for EE Buildings and Building Retrofits			
Concessional Loans (Green Credit Lines - Grant Financing or Soft Loans) *These are generally combined with other financing instruments and act as upstream funding for existing financing mechanisms*	• End-users can secure direct loans from local financial institutions (LFI) for energy efficiency upgrades or equipment. • Loan is repaid to the LFI with interest within an agreed payment schedule (loan tenor). • Loans are provided based on credit worthiness of the end-user and in some case based on the project cash flow. • To attract users, LFIs are establishing green credit lines, concessional finance from multilateral funds and offer loans at concessional conditions lower than market rates.	Residential Commercial Industries	1. Energy Efficient Consumption Loan Programme (Mongolia, 2018): Key Features: • USD 21.5 million programme by XacBank with co-financing from GCF[1]. • Provide concessional loans for households undertaking insultation retrofits, EE household construction, EE heating appliances and EE housing solutions Impact: • Anticipated CO2 emission reductions of up to 0.5 million tCO2 by 2029 • Around 15,278 direct beneficiaries 2. De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits (Armenia, 2016) Key Features: • As of date, 1.4 million tCO2 emission reductions avoided • Anticipated CO2 emission reductions of up to 5.8 million tCO2 over a period of 20 years • Directly benefit of 200,000 people and streamline private and public investment of around USD100 million • Around 6,463 buildings (single-family individual buildings, apartment buildings, public buildings) to benefit

[1]Basel Agency for Sustainable Energy (BASE) for UN Environment, *Manual of Financing Mechanisms and Business Models for Energy Efficiency (March 2018)*, p.16

Instrument type	Key features	Applicable sector	Use cases from other countries
			3. Lebanon Energy Efficiency & Renewable Energy Finance Facility (LEEREFF) - Non-Standard Investment Loans, LEEREFF[2] (Lebanon) Key Features: • Non-LET based investments starting from EUR 40,000 up to EUR 15 million and in exceptional cases, EUR 25 million • To be eligible, all commercial buildings must be LEED or equivalent certified • Finance Threshold: LEED Platinum assessment or equivalent: loans are limited to 36% of real building costs LEED Gold assessment or equivalent: loans are limited to 28% of the real building costs 4. Building Retrofit Energy Efficiency Financing (BREEF) Scheme (Singapore, 2011) Key Features: • Facilitate financing for energy efficiency retrofits under an Energy Performance Contract (EPC) arrangement • Provides credit facilities for the purchase and installation of EE equipment • Facilitate loans to building owners with BCA sharing the risk of any loan default with the participating FIs issuing the loans 5. DBS Green Bond (Singapore, 2017) Key Features: • The USD 500 million floating rate green bonds due 2022 were issued under DBS' USD 30 billion Global Medium-Term Note Programme in July 2017.

[2] https://leereff.com/non-standard-investment-loans%e2%80%8b/

Instrument type	Key features	Applicable sector	Use cases from other countries
			• DBS' Green Bond issuances (Proceeds) will be used to finance or refinance new or existing green assets/projects for Buildings • 100% of the net proceeds have been allocated to green assets comprising DBS' financing of a green building – Green Mark certified by Singapore BCA Impact: • Energy Use Intensity reduced from 274 kWh/m^2 to 183 kWh/m^2 in 2019 • Estimated energy savings in 2019 is 13,843 MWh • 5,803 tonnes of CO_2 emissions avoided
Mortgage financing	• Also known as Green Mortgages, financing is offered for purchasing or refinancing a house that is already energy efficient or that might become one after refurbishment. • Lender conducts an inspection and assessment of the house through a certified energy auditor. The auditor provides a report outlining the energy performance levels, energy efficiency features, energy use and recommendations for improvement along with cost details. • Lender evaluates the report and assesses the quantum of financing based on the cost estimate and potential energy savings. For energy efficient homes, the lender can relax the debt-to-income qualifying ratio for the borrower.	Residential	1. Energy Efficient Construction and Refurbishment[3] (Germany, 2009) Key Features: • Soft loans and grants for energy efficient German residential sector • Reduction of CO2 emission levels in the German housing sector. • Available for all private investors in the residential building sector in Germany as well as housing companies at equal conditions Impact: • The "KfW Efficiency House" standard became a market wide brand for energy efficiency in buildings • Reduction of carbon emissions by almost 9 million tonnes per year • Funding provided to over 4 million housing units • Triggering investment of over EUR 260 million in Building efficiency measures

[3] https://www.kfw.de/KfW-Group/Newsroom/Latest-News/Pressemitteilungen-Details_10591.html

Instrument type	Key features	Applicable sector	Use cases from other countries
List Based Financing	• Establishment of a list of sectors, sustainable technologies, or technology providers pre-approved for lending by financial institutions. • Financing institutions provide loans to end-users under the condition – funds to be used for projects / investments under the pre-approved list. • Standard credit check and due diligence processes are conducted before approving the credit line. • Positive lists also have the added benefit of being combined with revolving funds, microfinance or other schemes.	Residential, Commercial Industrial	1. Lebanon Energy Efficiency & Renewable Energy Finance Facility (LEEREFF) - Standard Investment Loans, LEEREFF[4] (Lebanon) Key Features: • For implementation of individual technologies and equipment, investments between EUR 40,000 – EUR 100,000 can be offered and up to EUR 250,000 for multiple technologies and equipment • Loan can cover 80% of investment amount • List of Eligible Technologies: Thermal Insulation, Motors, Renewable Energy, Lighting, Monitoring and Control Systems, HVAC, Compressed Air System 2. Russia Sustainable Energy Financing Facility[5] (Russia) Key Features: • Established through the assistance of EBRD who provided a credit line of USD 400 million to participating financial institutions in order to scale up EE and RE investments in the residential and commercial sector. • This concessional facility was complemented through a list of pre-approved technologies that was made available to the borrowers in order to assist in selecting best-in-class technologies.
Demand Aggregation with Bulk procurement	• No-subsidy demand-driven mechanism that provides economies of scale thereby enabling manufacturers reduce prices of products through successful bidding processes.	Residential Municipal Industrial Commercial	

[4] https://leereff.com/standard-investment-loans/
[5] https://ebrdgeff.com/russia_facilities/

Instrument type	Key features	Applicable sector	Use cases from other countries
	• Large tenders are rolled out by the government or private sector for procurement of large quantity of energy efficient products. Volume of the bid is then allocated to all manufacturers who agreed the match the lowest price. • In some cases, this model also comes with annual maintenance services. Repeated tenders have the advantage of reducing the price of product further and the benefits are passed to the end-users.		
Performance Contracting (ESCO Model)	• An instrument where an Energy Service Company (ESCO) signs an EPC with the customer and implements energy efficiency projects. The cost savings achieved from these projects are used to repay the project costs. ESCO receives full payment upon satisfying the estimated energy savings thereby placing the risk on the service provider. Two contracting models exist: o Shared savings model: ESCO invests in the project and cost savings from energy savings are quantified. ESCO receives a share of the savings resulting from project as remuneration. o Guaranteed savings model: ESCO guarantees a level of energy savings and receives remuneration based on actual cost related to the energy savings. Customer is directly financed by an institution and repays the loan.	Commercial Industrial Municipal	1. EESL – Building Energy Efficiency Programme[6] (India, 2015) Key Features: • ESCO and PMC based model for undertaking energy efficiency retrofits (LED lights, EE fans and EE ACs) across public buildings in India • Entire upfront cost is taken up by EESL and repayment is recovered through energy savings Impact: • As of 2020, 259 projects completed and 132 ongoing • As of 2020, 0.29 million tCO2 emission reductions avoided and 75 MW of peak demand avoided 2. Thai Efficiency Revolving Fund[7] (EERF) (Thailand, 2003) Key Features: • Reduce heat from sun glare into the buildings

[6] https://tsredco.telangana.gov.in/PDFs/EE GUIDELINES/5_Retrofitting_Mahindra_Towers.pdf
[7] https://www.unece.org/fileadmin/DAM/energy/se/pp/gee21/Worshop_Bangkok_April_14/Session_7d_Vejakit.pdf

Instrument type	Key features	Applicable sector	Use cases from other countries
			• Use of energy-efficient construction materials and demonstration of qualities of such materials; • Efficient use of light in the building Impact: • 1,170 Mn kWh/year electricity savings • 0.98 Mn tons of CO2 savings • 294 projects executed between (2003 – 2011)
Other Financing Schemes & Business Models			
Leasing	• An instrument where the lessor conveys the use of an asset (building, equipment) to the lessee for a specified period of time and for periodical payments. • Leases can be offered by technology supplier (vendor lease), financial institution or by a third-party leasing company. Two model of leasing exist as given below: o Operating lease is a model similar to equipment rental where the ownership and other risks remain with the lessor. The asset is returned by the lessee after the lease term. In this model, the lease payments are considered as an operating expense in the balance sheet of the lessee. o Financing lease is similar to a loan where the equipment serves as the collateral. Ownership remains with the lessor and the lessee is given the option to buy the asset at the end of the lease term. In this model, the lessee absorbs all risks associated with the asset.	Commercial Industrial	1. IFC and the Clean Technology Fund Roll-out Innovative **EE Financing Model for Turkey's SMES**[8] (Turkey, 2014) Key Features: • The facility was financed with around USD 21 million of CTF funds blended with almost USD 100 million of IFC's funds. The program was primarily targeted at the commercial sector. • IFC adopted a leasing model through three Turkish leasing companies to scale up investments in projects that reduced energy consumption by at least 15%. Predominantly the target group was SMEs and upon agreement, the leasing company would procure the equipment using CSEF funds and provide under a leasing agreement. Impact: • Over a period of 4 years, leasing companies invested around USD 100 million in 50 EE projects and is expected to mitigate over 0.2 million tCO_2 of emissions per year.

[8] https://www.climateinvestmentfunds.org/sites/cif_enc/files/knowledge-documents/1506738_ifc_csef_turkey_v1_1_0.pdf

Instrument type	Key features	Applicable sector	Use cases from other countries
On-bill financing	• Innovative model where utility consumers can procure efficient equipment and pay for the equipment over time through monthly utility bills. • Three approaches are practised under this model: o Utility absorbs the capital investment of the energy efficiency upgrade and repays the capital thereby playing the additional role of a financing entity. o On-bill repayment model where capital is provided by public / private financial institutions. Utility thereafter acts as a facilitator for collecting payments through utility bills for the lender. • Tariff-based on-bill models where the cost recovery is tied to the energy meter rather than the property owner. Customers who occupy the property can continue to repay for the equipment in full or through monthly on-bill payments.	Residential Commercial	1. Cambia tu Viejo por uno Nuevo[9] (Replace old appliance for a new one) (Mexico): • An initiative coordinated by the Ministry of Energy and implemented by Trust for Saving Electricity (FIDE) in partnership with the National Development Bank (Nacional Financiera (NAFIN)). • Concessional finance was secured from World Bank and Inter-American Development Bank to fund energy efficient refrigerators and air-conditioners for residential customers and payment was collected through electricity bills. Impact: • By 2011, programme resulted in reducing 0.55 million tCO_2 emissions.
Dealer financing	• A credit-based model where energy efficiency technology suppliers provided finance to end-users. • End-users can procure products by paying low or more often, zero down payment and pay later based on an agreed schedule. • Two models exist: o Direct model – Technology supplier use their capital for purchase and secure repayment by offering a tenor period of 30-180 days. o Indirect model – Technology supplier facilitates a loan application by acquiring information from the end-user and submits it	Residential Commercial	1. Promotion of Energy-Efficient Products to the Benefit of the People[10] (China) Key Features: • Government provided subsidy for Tier 1 and Tier 2 EE level household appliances, fiscal subsidies were passed on to manufacturers and they further transferred the benefits to consumers. Strict screening of EE appliances ensuring selected appliances meet national standard for EE.

[9] Basel Agency for Sustainable Energy (BASE) for UN Environment, *Manual of Financing Mechanisms and Business Models for Energy Efficiency (March 2018)*, p.25
[10] https://c2e2.unepdtu.org/wp-content/uploads/sites/3/2017/06/good-practice-and-success-stories-on-ee-in-china.pdf

Instrument type	Key features	Applicable sector	Use cases from other countries
	to the lender. Lender assesses the credit profile of end-user and offers finance (e.g. credit card mode).		
Financial incentives (e.g. rebate or subsidy programme)	• An incentive-based scheme for promoting usage of energy efficient products thereby resulting in lowering the capital cost of technologies. Conventional incentive schemes prevalent include: o Rebates: Buyer purchases equipment or system that complies with specific energy use requirements and receives a rebate (utility cash rebate, instant rebate, mail-in rebate, etc.) upon submission of application. o Tax credits: Taxpayers can subtract tax amount upon purchase of pre-approved energy efficient product / system. These credits are granted to both individuals and businesses. o Subsidies: Measures that are put in place to keep prices of product below market level or reduced cost for purchase of energy efficient product. o Value-added tax (VAT): Lowering of VAT rates for efficient products in order to stimulate import of such products and subsequently lower the price of such products.	Residential Commercial	1. Green Mark Incentive Scheme for New Buildings (Singapore, 2005) Key Features: • Rewards private developers who achieve Gold Rating or higher with co-funding up to USD 2.4 million of the total cost. Impact: • USD 20 million fully disbursed 2. Rebate, Turn-in and Replacement Programme[11] (Ghana, 2013) Key Features: • The scheme allowed customers to replace the old appliance with a new energy efficient appliance that was made available through a rebate • USD 32 per appliance was the average rebate amount offered. Impact: • Increased the market share of imported efficient refrigerators to more than 80% • Resulted in reducing the energy demand of refrigerators from 1,140 kWh/year to 740 kWh/year (approx.)
Guarantees	• Instruments that can expand loan financing for commercially viable energy efficiency investments (e.g. partial risk loan guarantees).	Residential Commercial Industrial	1. Partial Risk Sharing Facility[12] (PRSF) (India) Key Features:

[11] Basel Agency for Sustainable Energy (BASE) for UN Environment, *Manual of Financing Mechanisms and Business Models for Energy Efficiency (March 2018)*, p.36
[12] https://sidbi.in/en/prsf-project

Instrument type	Key features	Applicable sector	Use cases from other countries
	• Guarantees are designed to reduce risk in short and long-run and improve technical and financial confidence amongst financial institutions on energy efficiency projects. • Guarantees are generally provided by international financial institutions (IFIs), governments or utilities to financial institutions through public energy efficiency investment programmes that are backed by IFIs or government. • Guarantee issuers enter into agreement with participating financial institutions who would release funds to borrowers (project developers) seeking loans. Agreement specify certain eligibility criteria and sets the guarantee support (e.g. % of loan amount, first loss coverage etc.). Borrowers are requested to submit project document to the lender and the loans are released. Repayment comes from either households or commercial entity owners where the projects are being implemented. • Although guarantees are in place, borrowers are required to submit collateral as a loan condition. • If claims are made due to any failure, guarantee issuers are required to pay the claim amount.		• Through the support of World Bank, SIDBI developed a Partial Risk Sharing Facility (PRSF) guarantee programme • The programme has the objective to fast track EE implementation through ESCOs under performance contracting model. Under this model, coverage of the guarantee extends to 75% of the loan and loan range varies from USD 13,000 to USD 1.9 million with a guarantee tenure of 5 years. • The overall outlay available under this scheme is USD 43 million of which USD 37 million is available for the risk sharing facility.

3.2. Stakeholder consultations

An important component of this programme was to conduct consultations with key stakeholders from Maldives and more specifically from the financing sector. The consultations were conducted to achieve the following objectives and gather primary information on certain elements relevant to buildings financing. The table below presents the objective and data points captured from the discussions.

Table 5 Objective and information gathered from stakeholder consultations

Objective	Information gathered
Establishing the current state of EE financing in Maldives	• Experience of funding EE building / other projects in the past • Lessons learnt • EE loans appraisal process
Gather insights and key facts on the elements of financing considered by the Banks in Maldives	• Elements of financing – debt to equity ratio, loan repayment period, debt service coverage ratio, eligibility criteria, etc. for the following customer group targeted
Selection of the feasible financing instrument for the Financing Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits	• Scoring of shortlisted instruments[13] on a scale of 'low-medium-high' to assess their suitability for this programme

In addition, to assess the preferred financing instrument, a list of parameters was developed to analyze the responses of the stakeholders with the aim to evaluate their relevance and suitability. This framework served as a tool for selecting the appropriate financial instrument for energy efficient buildings financial programme. The parameters are presented in the table below.

Table 6 Parameters for assessing the relevance of the preferred financing instrument

Parameters	Rationale for Selection
EE technical competence required by banks	Technical Competence on understanding of energy efficiency (especially in case of guaranteed savings EE financing etc.) can pose a challenge for financing institutions and banks. *A financing instrument that can be operated by banks with lower technical competence requirements will be preferred.*
Prior experience on these schemes / instruments	Past experience in operating a related financing instrument in consumer appliance financing can lead to better understanding and learning curve of institutions. The objective here will be to assess the prior experience and understanding among stakeholder institutions. *Higher understanding of the instrument by stakeholders will be preferred.*

[13] We conducted a review of 17 financing schemes/instruments that are typically applicable for EE financing. Based on our research we have shortlisted the following instruments to be applicable for buildings: Concessional Loans (Green Credit Lines, Grants or Soft Loans), List based financing, Demand aggregation with bulk procurement, Performance Contracting (ESCO model), Dealer Financing, Mortgage Financing, Others (Guarantees, Incentives, Leasing, On-bill financing). Stakeholders were asked to fill a scoring matrix, based on which a suitable financial instrument was selected for this assignment.

Parameters	Rationale for Selection
User-Friendly	To analyze user friendliness of the financial instrument related to its application process, contractual requirements. *Higher understanding is better.*
Availability of regulations	These can be related to national or international regulations to support the implementation of financial instrument for the country. *Availability of regulations to support establishment of financing instrument is must.*
Alignment of policies and legal framework	For a financial instrument policies and legal framework shall be conducive. In cases where the policies and the legal framework do not support the operation of financial scheme can pose a restriction to its adoption. *Higher alignment of policies and legal framework the better.*
Repayment risk	A risk is associated with the situation where the borrower may fail to repay the debt. There can be certain examples of financing instruments where the stakeholders may perceive a higher repayment risk especially when repayments are associated with energy savings. *Lower repayment risk perceived would be preferred.*
Institutional capacity to implement	Financial instruments depend on institutional structure and its capacity to operate for their implementation. Absence or presence of institutional capacity to implement can hinder the adoption of that financial instrument. E.g. the absence of micro finance institutions, and a demand aggregator can pose a restriction for adoption of micro finance and demand aggregation-based models, respectively. *Hence, higher institutional capacity and presence of institutional structures specific to financial instrument are preferred.*

To capture the stakeholder perspective, a scoring matrix was prepared and shared with them during the discussion. Stakeholders were requested to provide their scores on a scale of low-medium-high. The responses were gathered, and discussions were held to understand stakeholders' assessment of the preferred financial instruments and the related business model. The findings of the consultations are provided in the table below.

The responses in the above table are color coded with responses as 'Low', 'Medium' and 'High' and their meaning can be quickly assessed with '**Green'** representing '**Favorable'**, '**Red'** representing '**Unfavorable'** and 'Yellow representing 'Partially **Favorable'**.

Table 7 Responses from Financial Institutions on Relevance of Financial Instruments

Parameters	Concessional loans (green credit lines, grants or soft loans)	List based financing	Demand aggregation	Mortgage financing	Performance contracting (ESCO model)	Others: Dealer financing, on-bill financing, guarantees, incentives, leasing
EE technical competence required by banks	Low	Low	Low	Medium	Low	Low

Parameters	Concessional loans (green credit lines, grants or soft loans)	List based financing	Demand aggregation	Mortgage financing	Performance contracting (ESCO model)	Others: Dealer financing, on-bill financing, guarantees, incentives, leasing
Prior experience on similar instruments	Low	Low	Low	Low	Low	Low
Understanding among end-users	Medium	Medium to High	Medium to High	Medium to High	Medium	Medium to High
Availability of regulations	Low	Low	Low	Low to Medium	Low	Low to Medium
Alignment of policies and legal framework	Low	Low	Low	Medium	Low	Low to Medium
Repayment risk	Medium	Medium	Medium	Medium	Medium	Medium
Institutional capacity to implement	Low	Low	Low	Low to Medium	Low	Low to Medium

Based on review of secondary data, findings from inception workshop, and post analysis of inputs received from stakeholders, we see that mortgage based financing is widely adopted across the buildings sector. From an EE perspective, few green financing products catering to renewable energy and environmentally friendly solutions have been established by Bank of Maldives (BML) and Maldives Islamic Bank (MIB). However, it is also understood that conventional finance products applicable for residential and commercial buildings could also be eligible under the programme. A detailed overview of the various products currently available in Maldives and their eligibility are presented in the table below.

Table 8 Financing products in Maldives

Bank/ NBFC	Product	Eligibility	Loan Details	Assets covered	Eligible for the financial programme
Bank of Maldives (Source: https://www.bankofmaldives.com.mv/)	BML Green Loan	Individuals and businesses	Loan Amount: MVR 50,000 – 20 Million Interest rate: 10-12% Debt to equity: up to 85% for secured loan	Renewable energy solutions	Yes

Bank/ NBFC	Product	Eligibility	Loan Details	Assets covered	Eligible for the financial programme
			Repayment period: 5 – 20 years		
	Home Construction Financing	Individuals with employment record	Loan Amount: MVR 50,000 up to MVR 15 million Interest rate: 10.5% for 20% equity, 10.25% for 35% equity and 10% for 50% equity	Home improvement purchases, household electrical appliances	No
	Real Estate Financing	Individuals and businesses	Loan Amount: MVR 50,000 up to MVR 150 million Interest rate: 11% for 30% equity, 10.75% for 40% equity, 10.50% for 50% equity	Construction of Residential housing, Row housing, Condominiums, Office premises and Purchase and build on land.	Yes
	Home Loan	Individuals with regular income	Loan amount: Up to MVR 20 million Interest Rate: 10% Equity: 20% that can be financed through pension fund	New Apartment or row-house	Yes
Maldives Islamic Bank (Source: https://www.mib.com.mv/)	Ujaalaa Dhiriulhun	Salaried Individuals	Loan amount Up to MVR 250,000 Interest Rate: 10.5 - 15%	Consumer goods, construction materials (solar systems are also accepted)	Yes

Bank/ NBFC	Product	Eligibility	Loan Details	Assets covered	Eligible for the financial programme
	Housing Finance	Employment history with listed employers	Interest rate: 11% (first home-owners), 12% (second home-owners) Debt to equity: 80% (Equity 20% can be financed through pension fund)	New Apartment or row-house	Yes
	Project Finance	Individuals with employment record and Businesses	Loan amount: MVR 50,000 up to MVR 15 million	Develop real estate for rent or sale.	Yes
Maldives Finance Lease Company (Source: http://www.mflc.com.mv/)	Hiyaa Faseyha Lease	Employees with continuous employment for 02 years or more	Loan amount: MVR 10,000 – 100,000	Purchase construction materials for home improvement purpose	No
	Salhi Lease	Employees of registered organization between age 23-50 with a continuous employment for 5 years in a supervisory level	Loan amount: MVR 60,000 – 200,000	Consumer Durables and construction materials	No
	Home improvement loan	Employees with continuous employment for 02 years or more and Businesses	Loan amount: MVR 200,000 – No Limit Interest rate: 12%	Existing property owners for renovation, extension, additions and completion of existing housing units	No

Bank/ NBFC	Product	Eligibility	Loan Details	Assets covered	Eligible for the financial programme
	Home / Apartment purchase loan	Employees with continuous employment for 02 years or more and Businesses	Loan amount: MVR 300,000 – No Limit Interest rate: 12% Debt to equity: 80% max	Individuals for purchase of apartment or a house for own housing needs	Yes
	Home construction loan	Employees with continuous employment for 02 years or more and Businesses	Loan amount: MVR 500,000 – No Limit Interest rate: 12% Debt to equity: 80% max	Construction of apartment buildings in Male' Villimale' and Hulhumale	Yes
	Project Loans (Part finance the project cost or refinance the costs already incurred)	Individuals and Companies	Loan amount: MVR 300,000 – No Limit Interest rate: 12% Debt to Equity: 70% max	Residential housing units in Male' 'Hulhumale or in Vilimale	Yes
Commercial Bank of Maldives (Source: https://www.cbmmv.com/)	Home Construction Loan	Employees with continuous employment or self-employed professional with an established practice and have assured monthly income.	Loan amount: MVR 250,000 – MVR 20 million Interest rate: 10.05 – 11.5% Debt to equity: 70%	Construction Completion/ Renovation/ Extension to an existing house	Yes
	Home Loan	Employees with continuous employment or self-	Loan amount: No Minimum Amount – MVR 20 million	Purchase or construction of residential property or refinancing of	Yes

Bank/ NBFC	Product	Eligibility	Loan Details	Assets covered	Eligible for the financial programme
		employed professional with an established practice and have assured monthly income.	Interest rate: 10.5%	other Bank Facilities	
Housing Development Finance Corporation (Source: https://www.hdfc.com.mv/)	Home Improvement Loan	Individuals	Loan amount: Up to MVR 500,000 Interest rate: 11.25%	Essential repairs, refurbishments, and improvement to the home	No
	Standard Home Loan	Individuals	Loan amount: Up to MVR 1 million Interest rate: 11.25% Debt to Equity: 80%	Construction of Residential Housing where 2/3 or more shall be occupied by owners	Yes
	Million Plus	Individuals	Loan amount: MVR 1million – 15 million Interest rate: 11.5% Debt to equity: 20%	Construction of Residential Housing where 2/3 or more shall be occupied by owners	Yes
	Home Loan (Rent Option)	Individuals	Loan amount: MVR 50,000 – 15 million Interest rate: 12.5% Debt to equity: 80%	Construction of Housing where 1/3 or more are for rent	No
	Youth Loan	Individuals	Loan amount: Up to MVR 1 million	Home Purchase Loan to youth	No

Bank/ NBFC	Product	Eligibility	Loan Details	Assets covered	Eligible for the financial programme
			Interest rate: 10.5% Debt to equity: 85%	for their residential purpose only	
State Bank of India (Source: https://www.onlinesbi.com/)	Housing Loan	Individuals and Companies	Loan amount: MVR 300,000 – No Limit Interest rate: 10-12%	Construct building for residential purposes and purchase of row houses/, apartment/flat, single unit or condominium apartments	Yes
	Project Term Loans	Individuals and Companies	Loan amount: Need based Interest rate: Competitive	Acquisition of residential and commercial buildings, plant and machinery, etc.	Yes

In line with the above assessment, it is therefore imperative to enhance the existing products in consultation with interested banks rather than designing a new financing instrument. Since the proposed programme is targeted at EE buildings (new and retrofits), existing green financing options available with BML and MIB could be explored as a first step.

3.3. Proposed financing strategy

Given the presence of green products, the strategy would primarily build on the existing financing scheme and enhance the same by expanding the portfolio for including EE buildings and building retrofits projects. In order to create the necessary demand for this programme, the strategy would be to integrate the Maldives' EE Guidelines that is being developed by Ministry of Environment and MNHPI. The guidelines would serve as a mechanism for creating the need for the building sector to scale up EE solutions in the next 5-10 years. This would in turn act as an enabler for the banks to expand the coverage of the products from RE to EE.

In order to ascertain the existing product, it is important to understand the scope of the EE guidelines, interventions recommended, and the building typologies targeted.

Overview **of the Maldives' EE Guidelines**

The primary objective of the energy efficiency guideline is to facilitate building owners, builders/developers, energy consultants, engineers and architects in designing and operation of resources(energy and water) efficiently in buildings. This is achieved by providing minimum efficiency requirements for each of the following aspects as indicated below:

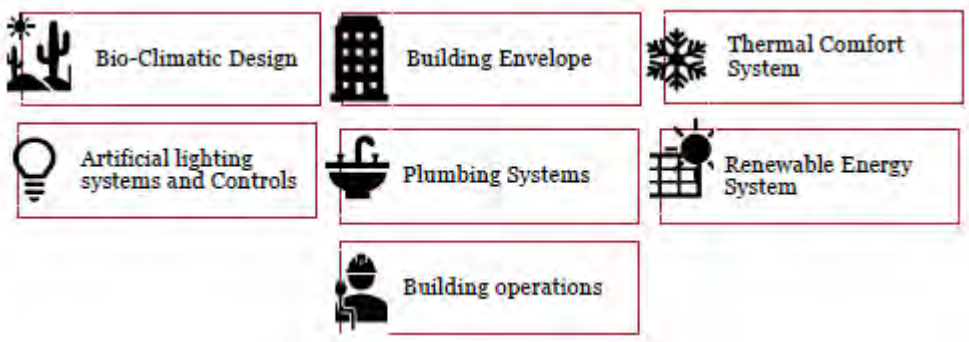


Figure 4 Aspects covered under building energy efficiency guidelines

The Guideline will provide minimum requirements for energy and water efficient design and operation of new and existing buildings in Maldives, that will largely benefit the end users by recognizing substantial cost savings during operations of the buildings, and the buildings sector of Maldives as a whole in achieving national energy efficiency targets and goals. The guideline will also provide additional sets of incremental requirements for buildings to achieve enhanced levels of resource (energy and water) efficiency that go beyond the minimum requirements. This is applicable to the following typologies of new and existing building in Male and Hulhumale:

- Government Buildings
- Commercial Buildings
- Residential Buildings
- Hotels & Guest Houses

The list of energy efficiency interventions as per the EE building guidelines, along with their probably solutions for application in buildings are mentioned below. After due consultations with ME and the banks, these will be well integrated in the checklist pertaining to the technical due diligence conducted by the banks for the loan approval process.

Table 9: List of energy efficiency interventions as per the draft Building Guidelines

S.no	Intervention	Probable Solutions
	Building Envelope	
1.	Energy Efficient Wall Material	AAC Blocks, XPS Wall Insulation etc.
2.	Roof Insulation	XPS Insulation, PUF Insulation, Rock Wool, Glass Wool etc.
3.	Cool Roof Finish	Green roof, Low SRI Paint etc.
3.	Efficient Glazing	Single glazing with low SHGC, Double Glazing etc.
	Thermal Comfort Systems	
4.	Efficient Air Conditioning system	Air/Water Cooled Chiller system, VRF/VRV
5.	Air Conditioning Controls	Building Energy Management Systems, Occupancy Control, Temperature Control
6.	Smart Building Technologies	Smart Meters, Smart Environmental sensors
7.	Not in-kind cooling solutions	Radiant Cooling, Under Floor Air Distribution system etc.
	Artificial Lighting Systems	
8.	Efficient Lighting systems	LED lighting, CFL
9	Lighting Controls	Occupancy and Daylight sensors, Exterior lighting controls

	Plumbing Systems	
10.	Water efficient plumbing fixtures	Low flow flush and flow fixtures- WC's, Urinals, Faucets/Taps, Showers etc
11.	Rainwater harvesting systems	Rainwater harvesting systems
12.	Efficient Pumps	Water Pumps and Booster Pumps
	Renewable Energy Systems	
13.	Rooftop Solar systems	Solar panels, Solar Water heating

For the ease of implementation of the financial programme and to align this with the guidelines, the existing products could be tailored separately for new and existing buildings. Target customer groups have been identified for both these categories as shown below:

Building Type	Building Typologies Covered	EE systems covered
New buildings	• Residential • Government • Commercial • Hotels / Guest Houses	• Shading systems • Wall systems • Roof • Glazing systems • Lighting systems • Heating, Ventilation, and Airconditioning (HVAC) • Smart Building technologies including BMS systems • Water efficient Products • Renewable Energy Systems
Existing buildings (for retrofits)	• Government • Commercial • Hotels/Guest houses	• Heating, Ventilation, and Airconditioning (HVAC), • Smart building technologies, BMS systems • Lighting systems • Renewable Energy

Based on consultations with stakeholders, it has emerged that banks could offer financing for construction and retrofitting of buildings with EE measures at a concessional rate provided the necessary demand is created through conducive supporting mechanisms. In addition, since the financing value for buildings would be on the higher side, stakeholders have suggested that this concessional financing should be offered with a security (mortgage) to safeguard from failure. Moreover, this model is a simple and proven one with the necessary institutional and supporting mechanism in place. Conversely, for EE retrofits in compliance with EE guidelines and meant for existing buildings, the product could have a predefined list of EE retrofit options against which lending can be provided. This model has been successful in Europe and other developing countries such as India, wherein EE technologies covered, and minimum eligibility criteria are pre-defined and listed for use by the banks. Moreover, a similar model is being developed under the EE appliance financing programme for the Ministry and banks and therefore implementation will be easier. The option of offering financing for new building and retrofits with / without mortgage needs to be deliberated further with the banks.

The above mentioned approach is relatively simple, and it will be easier for enhancing capacity and raising awareness amongst the stakeholder community. In line with this, the key elements that would entail this financial

strategy, business model, benefits and supporting mechanisms essential for rolling-out the strategy in the market are presented further in this section.

Elements of financial strategy

The following are proposed to be the elements of the financial strategy applicable for both new and existing buildings.

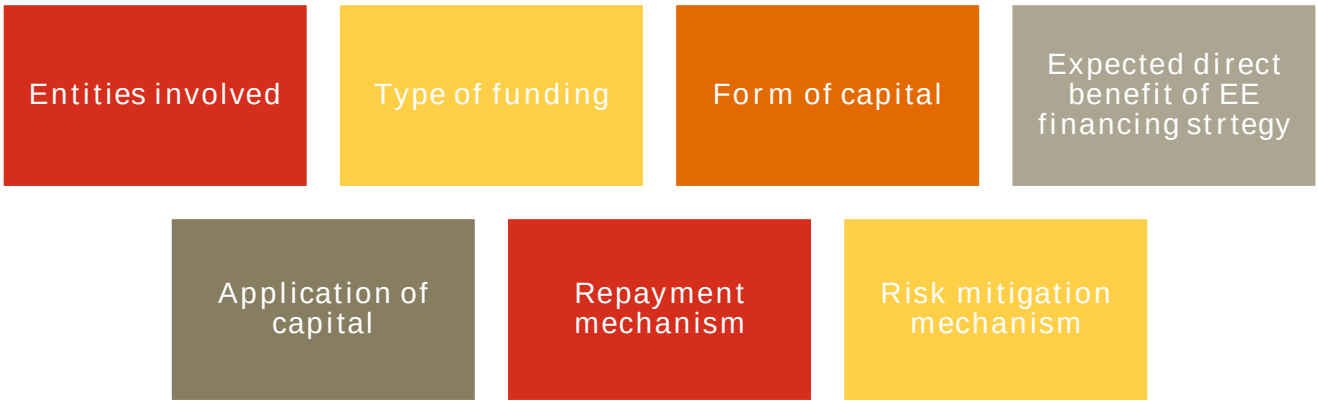


Figure 5 Elements of financial strategy

The detailed outline of these attributes in the context of energy efficient buildings and building retrofits has been provided in the table below.

Table 10: Applicability of financial strategy elements in Maldives

Strategy Element	Description	Remark
Stakeholders/ entities involved	This attribute describes the primary stakeholders involved in the various stages of the programme implementation. These entities can be sub categorised into four: a. The Financier: The financier in any instrument would be the entity, which directly provides the fund required for the successful implementation of the instrument. The instrument might be self-financed, or require no external source of financing, or the instrument might also require government support. b. The Programme Manager / Service Provider: A programme manager would be an entity, which performs all the operations required for the successful implementation of the programme. Involvement of a programme manager would be imperative in case the implementation phase requires a complex operation procedure. c. The Beneficiary: The beneficiary would be an entity, which receives the direct benefits of the EE financing instrument. This would be an	a. *Financial Institutions* to be the financiers as well as the service providers in case of both financing instruments. b. The programme can start with one FI to test the implementation and in due course other FIs can be included. c. *Residential, Government, Commercial building owners* complying with EE guidelines will be beneficiaries under the financing programme. d. *Government and Commercial building owners* complying with EE guidelines will be the beneficiaries under the list-based financing model. e. *Ministry of Environment (ME)* to be the policy maker and regulator for the financial programme for energy efficient

Strategy Element	Description	Remark
	entity, the benefit of whom the instrument focusses on. The beneficiary can be the end user or the customer, and the ESCO or the service provider in certain cases. d. Policy makers and regulators: To ascertain the financial programme is within the existing financial and legal framework, and to review the framework for accommodation of new and upcoming business models, if required. e. Facilitator: The one who will facilitate the finance (EMI/loan) processing between the consumer and the FI. In consumer financing, the one with whom the EE retrofit purchase request is made can be the facilitator for the same. f. Accredited / Approved Energy Experts: To ascertain whether the EE interventions are able to generate the desired energy savings and GHG reductions, the financier is provided with an option to appoint energy experts who are certified by the Ministry of Environment. For new buildings, the experts would be involved in the design and post-construction phase. In the design phase, their role would be checking the design features of EE interventions whereas post-construction they would undertake verification of the actual GHG reductions after commissioning. For existing buildings, their role would be checking the EE technology specification and undertake verification post commissioning.	buildings and building retrofits in compliance with the EE guidelines. f. Facilitator: For building retrofits, there may or may not have a pre-approved list of vendors for EE measures covered along with some basic minimum eligibility criteria. g. Assessors: ME to design a registration scheme for energy experts. A public database of registered assessors can be created and updated periodically.
Type of funding	This attribute would consider whether the capital required for the instrument is provided in the form of debt, or equity or a mixture of both. In case the government provides the capital and/or seed funding, it may be in the form of grant/ subsidy/ loan/ co-financing, etc.	Loan for upfront payment of the EE intervention with future co-financing opportunity
Form of capital	This attribute would represent the financial stake in the instrument held by the financier for the capital provided by them. This can be in the form of common shares, preference shares, long-term loans, mezzanine debt, etc.	Short loans for retrofits where the consumer will pay back the loan amount to bank subsequently over the loan period of 3 – 5 years at an agreed interest rate. Medium to long-term loans for new buildings where the consumer will pay back the loan amount to bank subsequently over the loan period

Strategy Element	Description	Remark
		of 8-10 years at an agreed interest rate.
Instrument Objective / Expected Direct Benefits in EE investment	This attribute would entail the direct or the first benefit due to the investment made by the programme manager. This may be defined as the first objective the instrument seeks to achieve by the application of funds. A top-down approach is usually adopted for forecasting such impact and setting targets.	The benefits will be in terms of GHG emission reduction and cost savings as a result of savings in electricity consumption. The forecasted benefits are elaborated in Section 3.5.
Application of Capital in Implementation Phase	This attribute would define the way in which the capital is expected to be applied by the programme manager. The implementation phase of the project would start after this investment.	The capital will be used to pay the upfront cost of EE intervention for the consumer. Financial Institutions will act as repayment conduit.
Primary Repayment Mechanism (between end user and service provider)	After investment made for the EE measure, the beneficiary is expected to repay the financier for the benefits enjoyed by them. Primary payment mechanism defines the financial agreement for repayment between the beneficiary and the service provider (or programme manager). This attribute has been further sub-divided into two components: a. Whether transferable: This refers to the clause when the repayment liability of the end user or the beneficiary is transferable to another entity, without any change in the payment terms. b. Modes of Repayment: This defines the mode of repayment by the end user to the service provider for the EE investment.	Equated monthly instalment (EMI) as per applicable interest rates over an agreed period and after consideration of concession.
Risk Mitigation	This attribute describes if any risk mitigation strategy is present in the working model of the instrument.	KYC process followed with Bank's Credit Evaluation check, Application of Risk Mitigation Instruments such as guarantees, appliance minimum warranty, post-dated cheque based payment, direct salary deduction based repayment mechanism. These are further described in Section 3.4

Proposed Business Model

Overview of the model

In this model an agreed list of EE interventions covering both building envelope and equipment and their energy efficiency levels as per the EE guidelines are pre-approved for lending by the financial institutions. The financial institutions provide lending to borrowers based on the evaluation of the project's design documents and bill of quantities (BOQ) which can clearly indicate the preferred choice of EE interventions to be purchased meeting the

pre-approved lending criteria. To ascertain the benefits associated with the EE interventions, the borrower or the banks/FI have the liberty to appoint an accredited/approved energy assessors by ME. The assessor is required to provide a report on the proposed EE interventions and the potential/achieved energy savings and GHG reductions in line with the EE guidelines. The banks/FIs can follow a standard lending procedure in assessing credit and conduct due diligence with the pre-approved EE interventions list in place. These will be concessional loan based instruments for promotion of energy efficient buildings in Maldives. There can exist a number of stakeholders in operating such a model depending on the financial strategy. Accordingly, the roles and responsibilities of each actor in the operational value chain of the instrument can be defined. The framework intends to standardize environmentally friendly lending by clarifying principles on the use of funds, the process of evaluation and selection of EE interventions, the management of funds, and reporting.

In addition, the model will aim to address the issue of higher cost of EE interventions by offsetting the cost through concessional loan as compared to conventional financing. The details of the business model showcasing the flow of funds, and the lending process is presented in this section.

Direct Financing to Borrower

In this model the borrower will approach the partner bank for issuance of borrowing request for EE building construction / retrofit. The Partner bank will process the request post due diligence and offer the concessional loan product to offset upfront cost of EE intervention in comparison to conventional financing. Post disbursement of loan at agreed terms, the borrower will repay the loan in equated monthly installments (EMI) during the agreed loan period with interest. The business model is illustrated in the figure below.

Financing Business Model

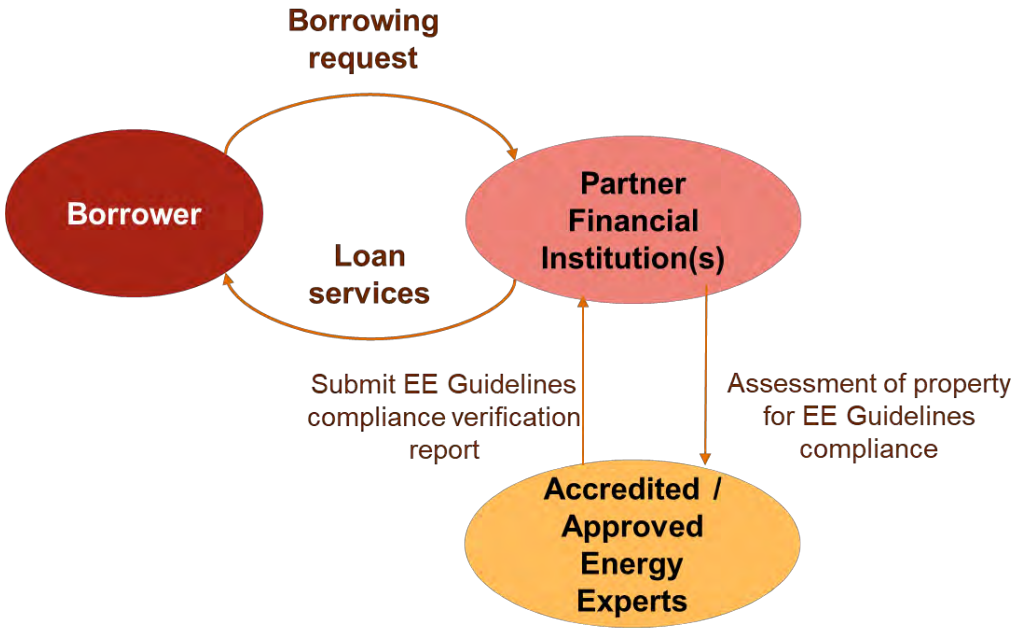


Figure 6: Business model for the financing programme

Fund Flow

The flow of funds is illustrated below:

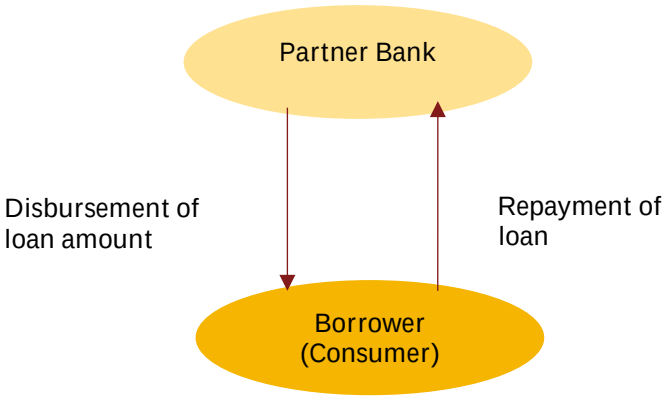


Figure 7: Flow of funds in the financial programme

Lending Process

The bank/FI will follow the minimum standards and best practices to ensure that the financing is offered and managed in a prudent manner. The product will follow similar characteristics to the existing product offered by the bank with an added element of concessionality. Subject to the above, the overall lending process is presented below:

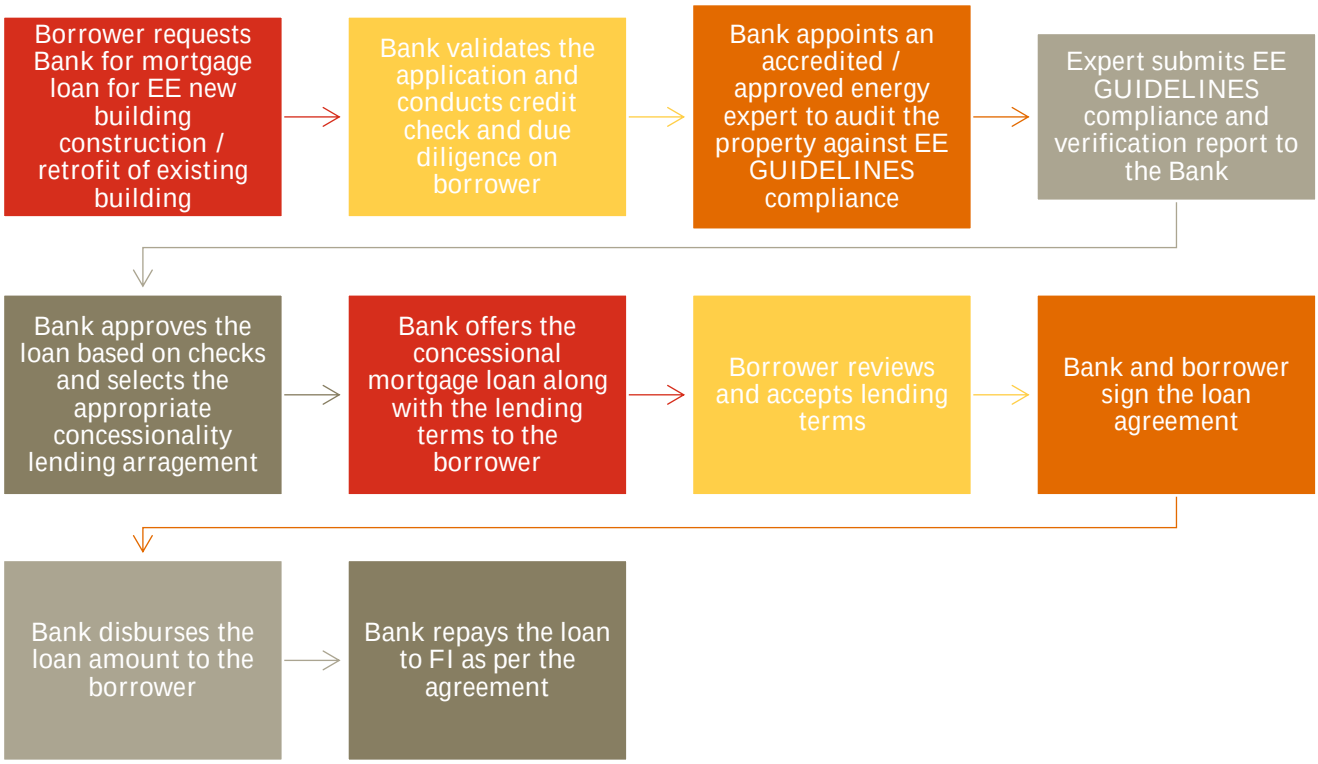


Figure 8: Lending process in the financial programme

Benefits & Challenges

The approach of adding a concessionality factor to a tested financing model would enable financial institutions leverage the growing demand in the building sector. With the EE guidelines to be notified sooner, the sector would require assistance (technical and financial) to invest in EE interventions. This model will also offer transparency on the measurement, reporting and verification of the environmental benefits of the loan instrument with concessionality. The foreseeable challenge is that as the EE technology for buildings undergoes innovation, the guidelines will require periodical updates with newer options and energy performance levels of various building typologies. Another possible challenge would be for the building owner to show a minimum operational lifetime guarantee for certain EE interventions such as envelope material, in order to realize the potential energy savings against a conventional intervention. Hence, some checks and balances have to be in place to ensure the quality of EE interventions are prudent apart from just meeting the minimum energy performance levels.

Supporting Mechanism

The initial funds to mobilize the financial strategy with banks for EE buildings needs to be further assessed. Since there is no government budget available for the programme, co-financing options from GCF, green credit lines from multilateral development agencies (MDAs) in form of grants or other mechanism need to be explored further.

Involved Stakeholders

The following are the stakeholders to be involved in deploying this financial strategy.

3.4. Risk mitigation measures

Overview of typical risks and control measures adopted

In most cases, Banks in Maldives rely on the below methods for risk mitigation purposes:

1. Debt Service Coverage Ratio (DSCR) - Banks generally require the Debt Service Coverage Ratio (DSCR) to be above 1.5 times. This requirement imposes restrictions early-stage projects as profitability improves progressively over time.
2. The equity requirements of typically 30% of the proposed funding is another risk control measure imposed by banks in Maldives.
3. Except in case of Government projects, the banks require perfection of collateral in the form of an immovable asset. Other properties like vessels and vehicles are not considered as primary collateral although ownership of these assets contribute to the credit approval process. The acceptable assets are restricted to property in Male City. The security cover ranges from 150%-133% of the loan taken, unless there is a government guarantee.
4. Another risk mitigation measure taken by Banks is the mandatory insurance cover requirement for the collateral during the tenure of the loan.

There are several other risk mitigation measures which are undertaken by the banks, which include:

- building construction permit
- Title registration certificate
- Mortgage registration with City Council
- Mortgage registration with Court
- Tax clearance statement from the Maldives Inland Revenue Authority (MIRA)

- Third party valuation of the collateral

Typical risk mitigation steps followed by banks

Banks require at least three years of business history, submission of audited financial statements and business plans for the project. Apart from documentary verifications and DSCR and SC and equity requirements, banks imposed the following to mitigate risks.

- Personal guarantees from the shareholders
- All proceeds on the project to deposited to the bank
- Progress payments and verification of work done
- Restrictions on further borrowing
- Restrictions on dividend distributions
- Restrictions on sale of assets
- Restrictions on related-party transactions
- Disclosure of information that may impact the future earning of the business and finances
- Single party exposure limits in addition to regulatory requirements
- Additional rights for the bank if there is a default in any other bank or any other facility held by the borrower or any party related to the borrower.
- Rights over all bank accounts of the borrower and other related parties.

3.5. Forecasting of Benefits

Approach to Forecasting Benefits by Implementation of Financing Scheme

The proposed financing scheme is expected to drive the EE buildings and building retrofit market towards uptake of energy efficient technology interventions in line with the upcoming EE guidelines. This will be achieved through the provision of concessional mortgage financing for new buildings and list based financing for existing buildings by banks/FIs. A detailed analysis of financing/investment requirements over the years to enable market transformation for various EE interventions covering building envelope and thermal comfort systems has been conducted. In this context the section provides an outline of the investment requirements, potential energy savings and GHG emissions reduction potential from 2021-2030 possible through this scheme. The figure below indicates the approach undertaken to forecast these benefits.

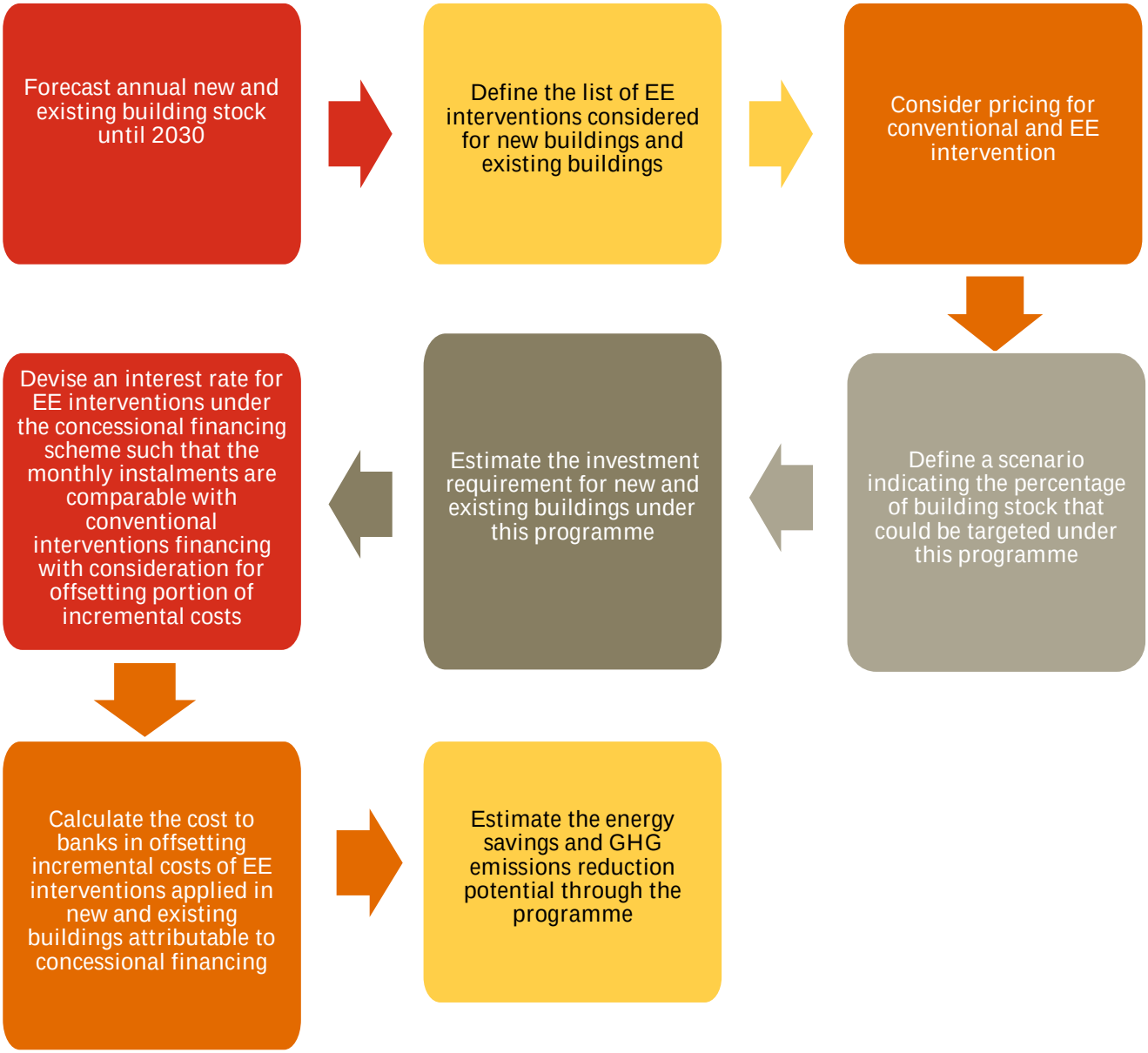


Figure 9: Approach to analyze forecasted benefits of financing scheme implementation

Investment requirement for the financial programme (FP)

In line with the approach described above, the section further delineates the findings from the assessment.

Annual building stock for new and existing buildings in Maldives from 2021 - 2030

To estimate the building stock for the 10-year period, the team collected current and future stock data from secondary sources published by Maldives Statistical Department and Housing Development Corporation. For new buildings to be covered under this programme, Hulhumale Phase 2 development was explicitly considered since the project was due for completion by 2030. This provides the necessary gambit to target new developments that are starting in this large development project. For existing buildings to be covered for the retrofit part of the programme, historical stock (2001 – 2017) information and data on Hulhumale Phase 1 development was used. Hulhumale Phase 1 was considered due to the fact that 80% of the construction was completed.

Since the programme is being designed for various building typologies, the data had to be segregated by building types. To arrive at this, the category wise split published by the World Bank was used[14]. The assumptions are as follows:

Table 11: Share % of building typologies in Maldives

Building typology	Share %
Residential	86%
Hotels & Restaurants	4.9%
Education	4.62%
Office	1.4%
Retail	1.12%
Government	0.70%
Warehouse	0.56%
Healthcare	0.42%
Transport	0.28%

Using the aforesaid datasets, the building stock for new and existing buildings are estimated to be 1.17 million sq.m and 1.44 million sq.m respectively. A key assumption that has been considered for existing buildings is that the overall existing stock of 2020 is assumed to remain through the years until 2030. Developments from Hulhumale phase 2 have been excluded from existing buildings. The detailed breakdown of the stock by building typologies are shown in the figures below:

[14] Green Building Market Intelligence, Maldives Country Profile, https://edgebuildings.com/wp-content/uploads/2018/05/Maldives-Green-Building-Market-Intelligence.pdf

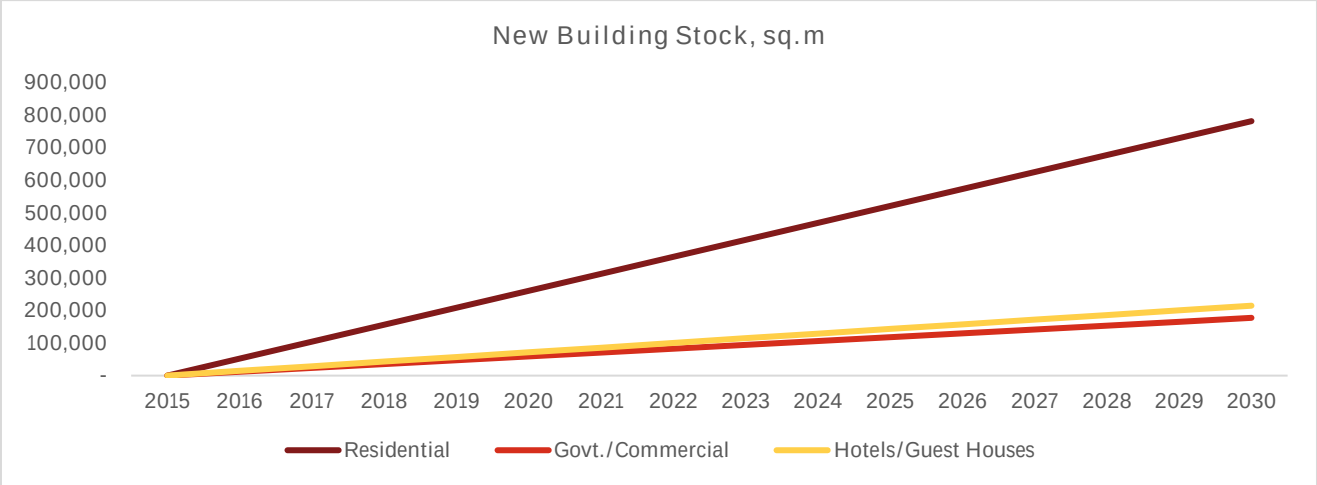


Figure 10: Forecasted new building stock in Maldives from 2021 – 2030

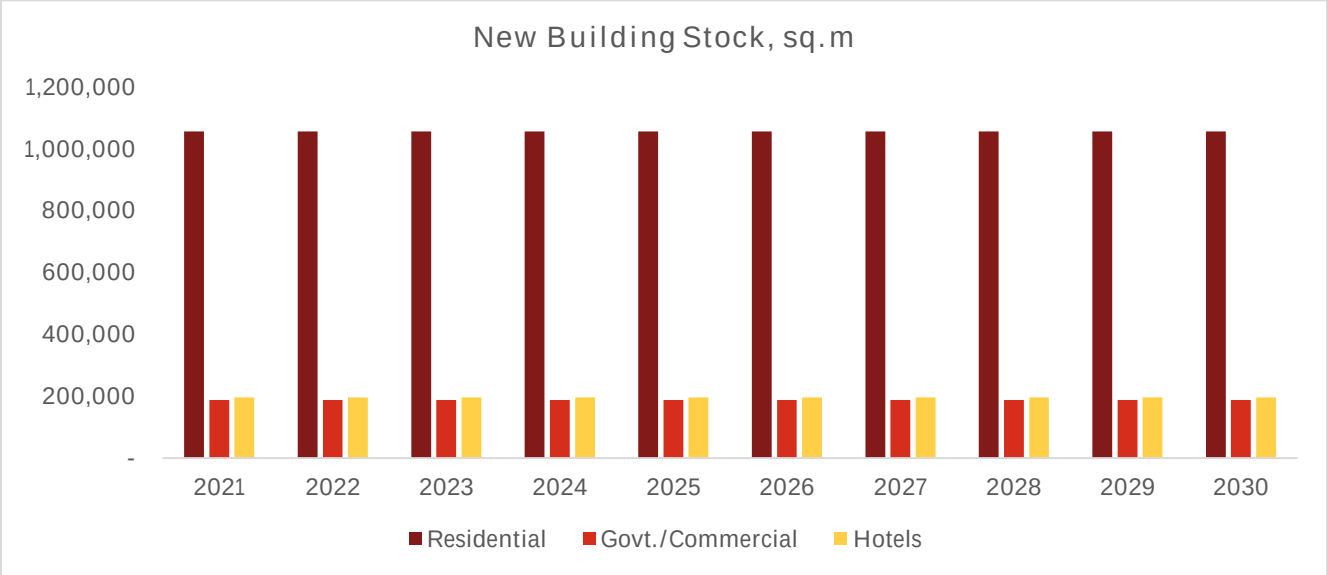


Figure 11: Forecasted existing building stock in Maldives from 2021 – 2030

Annual building stock to be covered under the financial programme from 2021 - 2030

To estimate the building stock covered under this programme, it was imperative to assess the number of buildings that typically approach banks/FIs for financing. Due to the absence of concrete primary and secondary information, the following assumptions formed the basis to estimate the building stock coverage under the programme.

Table 12: Assumptions for estimating the building stock coverage in the financial programme

Assumptions	New Buildings	Existing Buildings (For retrofits)
Percentage of buildings approach banks for financing	20%	5%
Percentage of buildings to be targeted under the FP	10%	3%

Using the above assumptions, the building stock for new and existing buildings to be covered under the programme are estimated to be 25,502 sq.m and 2,510 sq.m respectively. The detailed breakdown of the stock by building typologies are shown in the figures below:

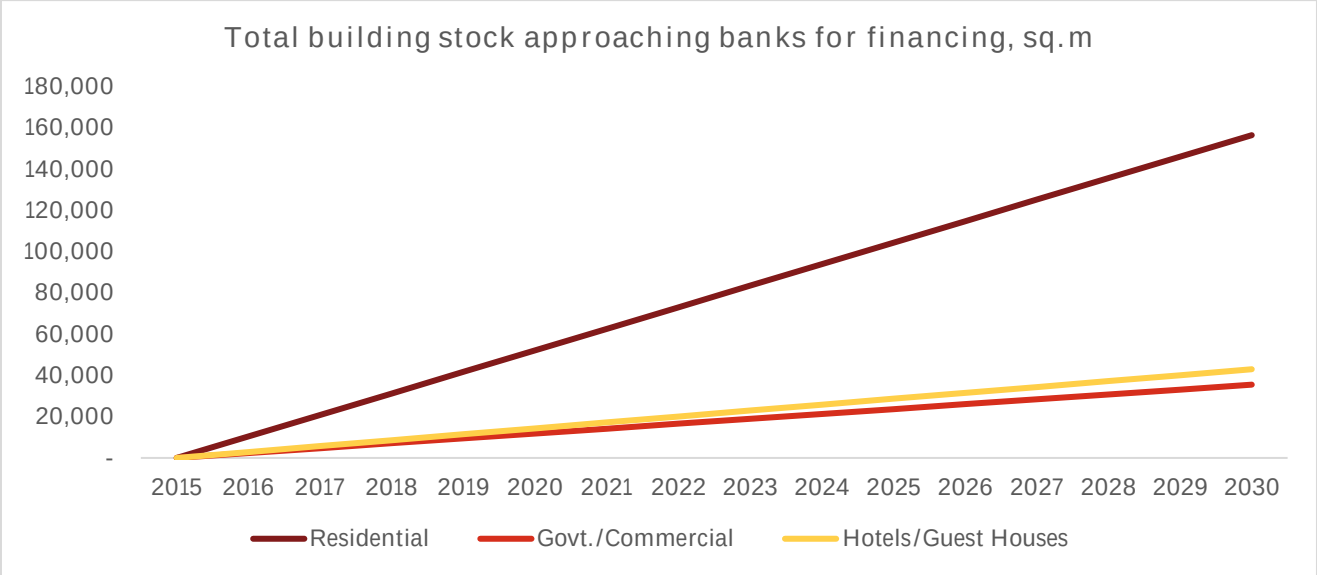


Figure 12: New building stock approaching banks for financing

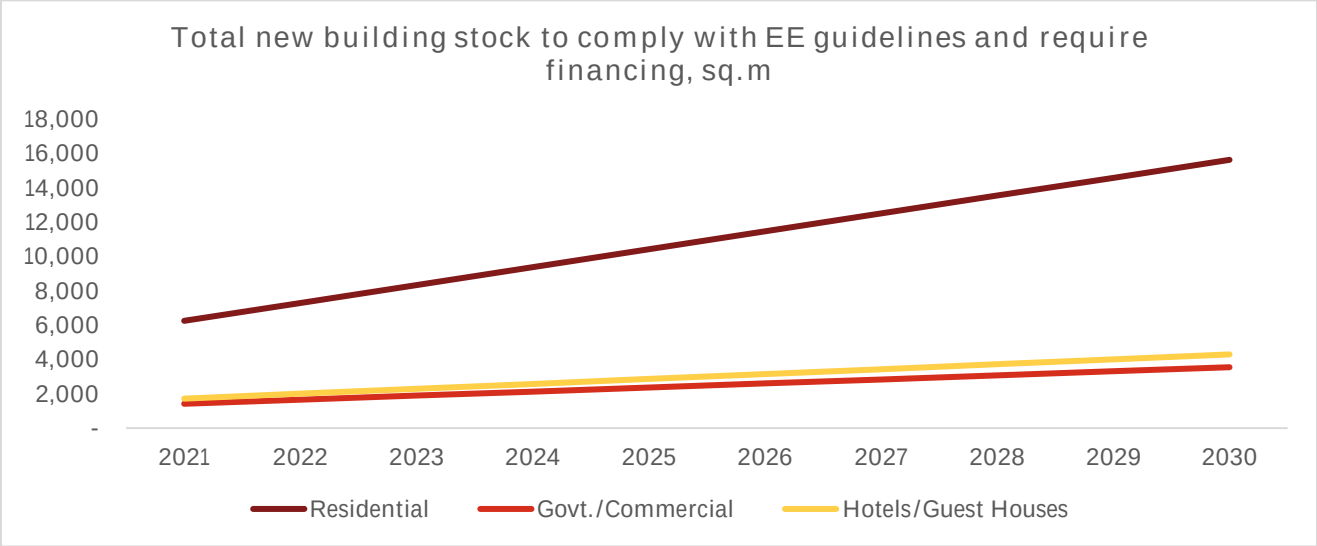


Figure 13: New building stock to comply with EE guidelines and require financing under the financial programme

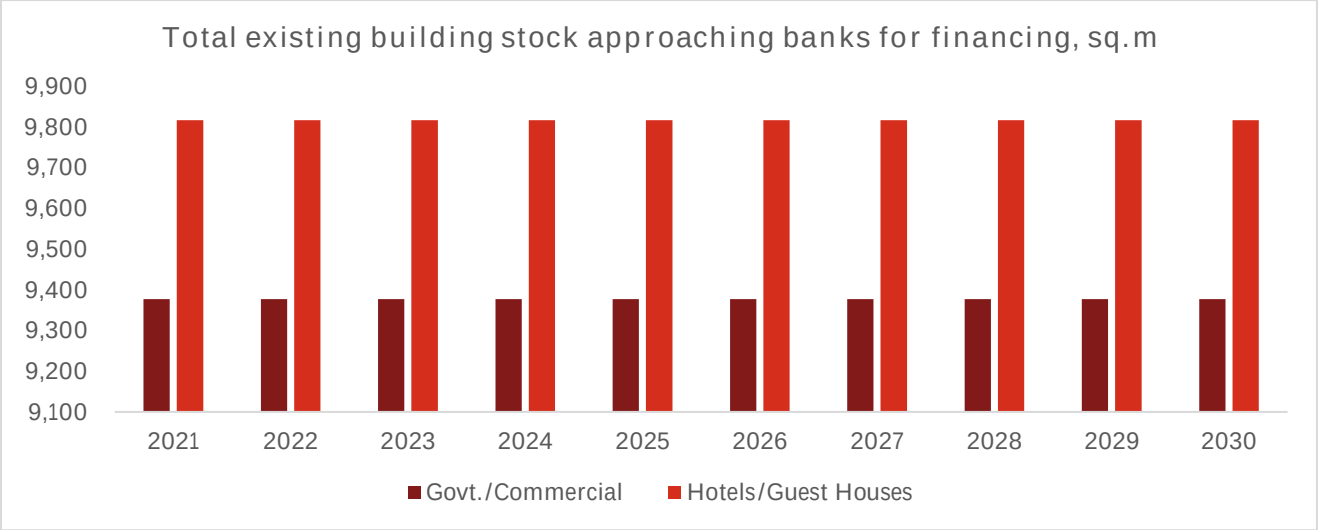


Figure 14: Existing building stock approaching banks for financing

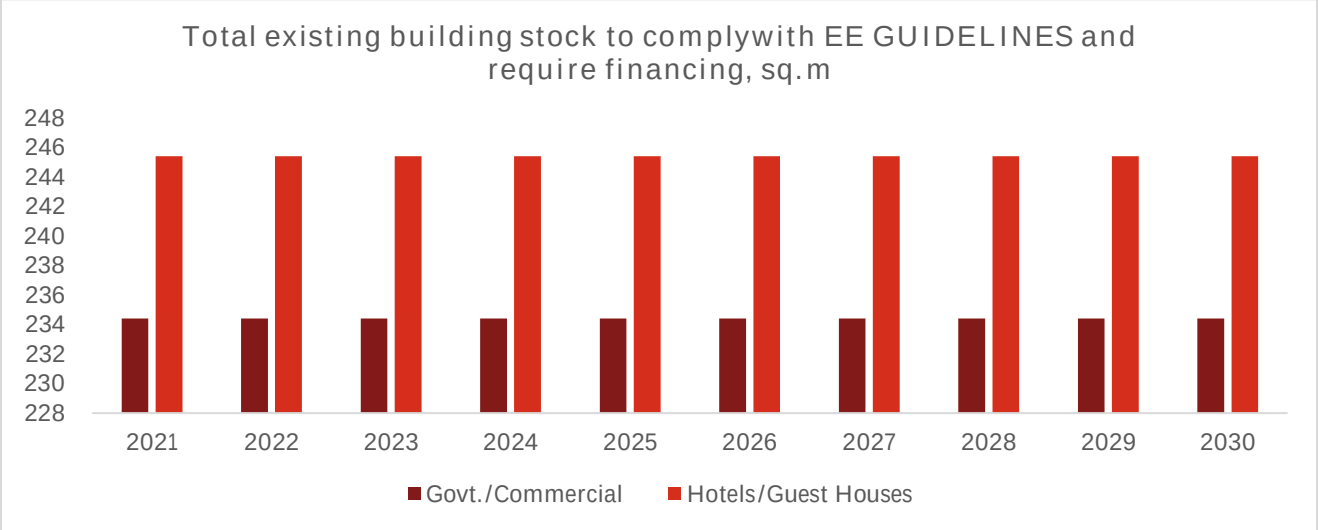


Figure 15: Existing building stock to comply with EE guidelines and require financing under the financial programme

Investment required for new and existing buildings under the financial programme from 2021 - 2030

To estimate the investment required for new and existing buildings it was important to calculate the cost of applying EE interventions against conventional practices followed in Maldives. Typical building elements such as wall, shading, roof, glass, lighting and HVAC costs were estimated. To align this with the EE guidelines, the costs were estimated for three options – base case, optimal case and best case. The guidelines for each of these cases are presented in Error! Reference source not found.. The table below indicates the cost of each intervention for the three options.

Table 13: Cost estimate for various building interventions

Typology	Govt./Commercial			Hotel			Residence		
	Base	Optimal	Best	Base case	Optimal	Best	Base case	Optimal	Best
Shading	-	116,664	345,327	-	232,997	714,193	-	52,566	104,956
Wall	38,401	48,001	191,975	138,398	153,776	348,560	73,279	91,598	207,629

Typology	Govt./Commercial			Hotel			Residence		
	Base	Optimal	Best	Base case	Optimal	Best	Base case	Optimal	Best
Roof	27,680	34,600	81,416	66,520	73,911	173,921	19,546	24,432	57,481
Glass	688,991	861,239	1,053,214	4,963,656	5,515,174	5,997,788	315,388	394,235	503,623
Lighting	135,064	168,830	527,880	206,933	229,925	2,875,468	26,720	33,400	139,219
HVAC	1,319,053	1,648,816	2,473,275	1,643,610	1,826,234	3,557,650	212,884	266,105	426,918
Total	2,209,189	2,878,150	4,673,085	7,019,117	8,032,016	13,667,580	647,816	862,336	1,439,826
Total Incremental cost (Optimal)	668,961			1,012,899			214,520		
Total Incremental cost (Best)	2,463,897			6,648,463			792,010		

Using the above cost estimates, the overall investment requirement for the three building typologies covered in the programme is as follows:

Table 14: Total investment required for new buildings under the Financial Programme (FP)

Building typology	Total investment size (million MVR)		Total investment required under the FP (million MVR)	
	Optimal	Best	Optimal	Best
Residential	234,695	866,497	23,469	86,650
Govt./Commercial	166,166	612,016	16,617	61,202
Hotels/Guest Houses	304,486	1,998,581	30,449	199,858

Table 15: Total investment required for existing buildings under the Financial Programme (FP)

Building typology	Total investment size (million MVR)		Total investment required under the FP (million MVR)	
	Optimal	Best	Optimal	Best
Govt./Commercial	30,922	108,230	773	2,706
Hotels/Guest Houses	17,927	34,313	448	4,697

The breakdown of investment required for new and existing buildings for various typologies is provided in the tables to be followed.

New Buildings - Residential

Table 16: Investment required for new residential buildings

Total investment size	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Building Stock (sq.m)	52,098	62,517	72,937	83,356	93,776	104,195	114,615	125,034	135,454	145,873	156,293
Incremental cost in million MVR (Optimal)	11,176	13,411	15,646	17,882	20,117	22,352	24,587	26,822	29,057	31,293	33,528
Incremental cost in million MVR (Best)	41,262	49,514	57,766	66,019	74,271	82,524	90,776	99,028	107,281	115,533	123,785

Investment required under the Financial Programme (FP)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Building Stock (sq.m)	5,210	6,252	7,294	8,336	9,378	10,420	11,461	12,503	13,545	14,587	15,629
Incremental cost in million MVR (Optimal)	1,118	1,341	1,565	1,788	2,012	2,235	2,459	2,682	2,906	3,129	3,353
Incremental cost in million MVR (Best)	4,126	4,951	5,777	6,602	7,427	8,252	9,078	9,903	10,728	11,553	12,379

New Buildings – Govt./Commercial

Table 17: Investment required for new govt./commercial buildings

Total investment size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Building Stock (sq.m)	14,194	16,560	18,925	21,291	23,657	26,022	28,388	30,753	33,119	35,485
Incremental cost in million MVR (Optimal)	9,495	11,078	12,660	14,243	15,825	17,408	18,990	20,573	22,155	23,738
Incremental cost in million MVR (Best)	34,972	40,801	46,630	52,459	58,287	64,116	69,945	75,773	81,602	87,431
Investment required under the FP	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030

Building Stock (sq.m)	1,419	1,656	1,893	2,129	2,366	2,602	2,839	3,075	3,312	3,548
Incremental cost in million MVR (Optimal)	950	1,108	1,266	1,424	1,583	1,741	1,899	2,057	2,216	2,374
Incremental cost in million MVR (Best)	3,497	4,080	4,663	5,246	5,829	6,412	6,994	7,577	8,160	8,743

New Buildings – Hotels/Guest Houses

Table 18: Investment required for new hotels/guest house buildings

Total Investment size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Building Stock (sq.m)	17,178	20,041	22,903	25,766	28,629	31,492	34,355	37,218	40,081	42,944
Incremental cost in million MVR (Optimal)	17,399	20,299	23,199	26,099	28,999	31,898	34,798	37,698	40,598	43,498
Incremental cost in million MVR (Best)	114,205	133,239	152,273	171,307	190,341	209,375	228,409	247,443	266,477	285,512
Investment required under the FP	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Building Stock (sq.m)	1,718	2,004	2,290	2,577	2,863	3,149	3,436	3,722	4,008	4,294
Incremental cost in million MVR (Optimal)	1,740	2,030	2,320	2,610	2,900	3,190	3,480	3,770	4,060	4,350
Incremental cost in million MVR (Best)	11,420	13,324	15,227	17,131	19,034	20,938	22,841	24,744	26,648	28,551

Existing Buildings – Govt./Commercial

Table 19: Investment required for existing govt./commercial buildings

Investment required for buildings	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Building Stock (sq.m)	9,377	9,377	9,377	9,377	9,377	9,377	9,377	9,377	9,377	9,377
Incremental cost in million MVR (Optimal)	3,092	3,092	3,092	3,092	3,092	3,092	3,092	3,092	3,092	3,092
Incremental cost in million MVR (Best)	10,823	2,007	2,007	2,007	2,007	2,007	2,007	2,007	2,007	2,007
Investment required for FP	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Building Stock (sq.m)	234	234	234	234	234	234	234	234	234	234
Incremental cost in million MVR (Optimal)	77	77	77	77	77	77	77	77	77	77
Incremental cost in million MVR (Best)	271	271	271	271	271	271	271	271	271	271

Existing Buildings – Hotels/Guest house

Table 20: Investment required for existing hotels/guest house buildings

Total investment size	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Building Stock (sq.m)	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816	9,816
Incremental cost in million MVR (Optimal)	1,793	1,793	1,793	1,793	1,793	1,793	1,793	1,793	1,793	1,793
Incremental cost in million MVR (Best)	3,431	3,431	3,431	3,431	3,431	3,431	3,431	3,431	3,431	3,431
Investment required under the FP	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**
Building Stock (sq.m)	245	245	245	245	245	245	245	245	245	245
Incremental cost in million MVR (Optimal)	45	45	45	45	45	45	45	45	45	45
Incremental cost in million MVR (Best)	470	470	470	470	470	470	470	470	470	470

Concessional financing requirement

To estimate the loan requirements for various building typologies and EE interventions, an initial assessment for consideration of interest rates and loan term was conducted for two scenarios – business as usual (BAU) and EE scenario. For BAU scenario, information was gathered from the stakeholder consultations with the banks. Based on the information gathered the following assumptions were used for the loan estimation.

Table 21: Assumptions on loan parameters for BAU and EE scenario

BAU Scenario	EE Scenario

	Debt to Equity Ratio	Loan Period (months)	Interest Rate	Debt to Equity Ratio	Loan Period	Interest Rate
New buildings	80%	96	15%	80%	120	10%
Existing buildings (retrofits)	80%	36	15%	80%	60	9%

Using these scenario parameters, a case has been built where the equated monthly installment (EMI) for the building owner in EE scenario through concessional financing is comparable to that in BAU scenario with conventional financing.

EMI estimation for new buildings

The EMI estimated in BAU and EE scenario for new buildings applying base, optimal and best case interventions are presented in the table below.

Residential

Table 22: EMI estimation for new residential buildings

Intervention	EMI in BAU scenario (MVR per sq.m)	EMI in EE scenario (MVR per sq.m)
Base case	9,300	-
Optimal case	12,380	9,117
Best case	20,671	15,222

Govt./Commercial

Table 23: EMI estimation for new govt./commercial buildings

Intervention	EMI in BAU scenario (MVR per sq.m)	EMI in EE scenario (MVR per sq.m)
Base case	31,716	-
Optimal case	41,320	30,428
Best case	67,088	49,404

Hotels/Guest house

Table 24: EMI estimation for new hotels/guest house buildings

Intervention	EMI in BAU scenario (MVR per sq.m)	EMI in EE scenario (MVR per sq.m)
Base case	100,769	-
Optimal case	115,310	84,915
Best case	196,216	144,494

Offset cost for new buildings

The banks/FIs may consider revisiting the interest rates and loan term with the aim to offset the differential cost in EMI for encouraging the application of optimal and best case EE interventions. Moreover, since the programme is aligned to the EE GUIDELINES this scheme could drive the demand for scaling up EE interventions in the building sector.

To offer concessional financing, banks/FIs will have to take up a cost in providing concessional finance to the borrower for application for EE interventions in building construction. This cost can be co-financed by funding on an annual basis depending on the availability. The offset cost foregone by financial institutions during the 10-year implementation period of the programme for various funding buildings applying optimal and best case interventions are presented below.

Residential

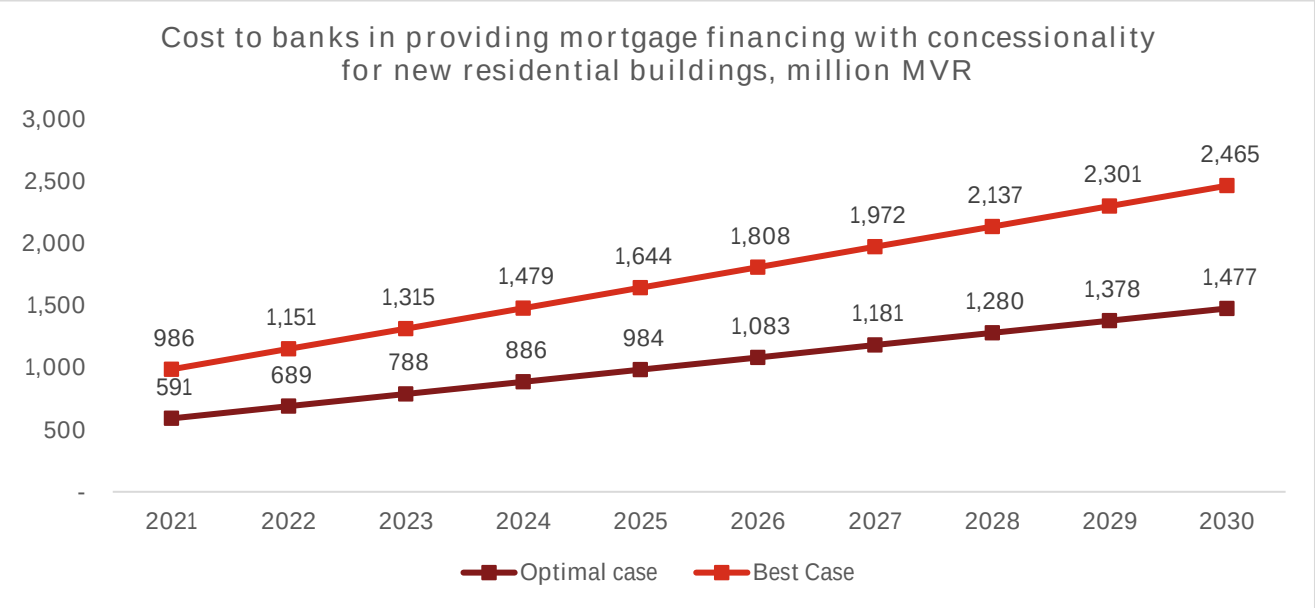


Figure 16: Offset Cost to Banks due to concessional financing for new residential buildings (2021 - 2030)

Govt./Commercial

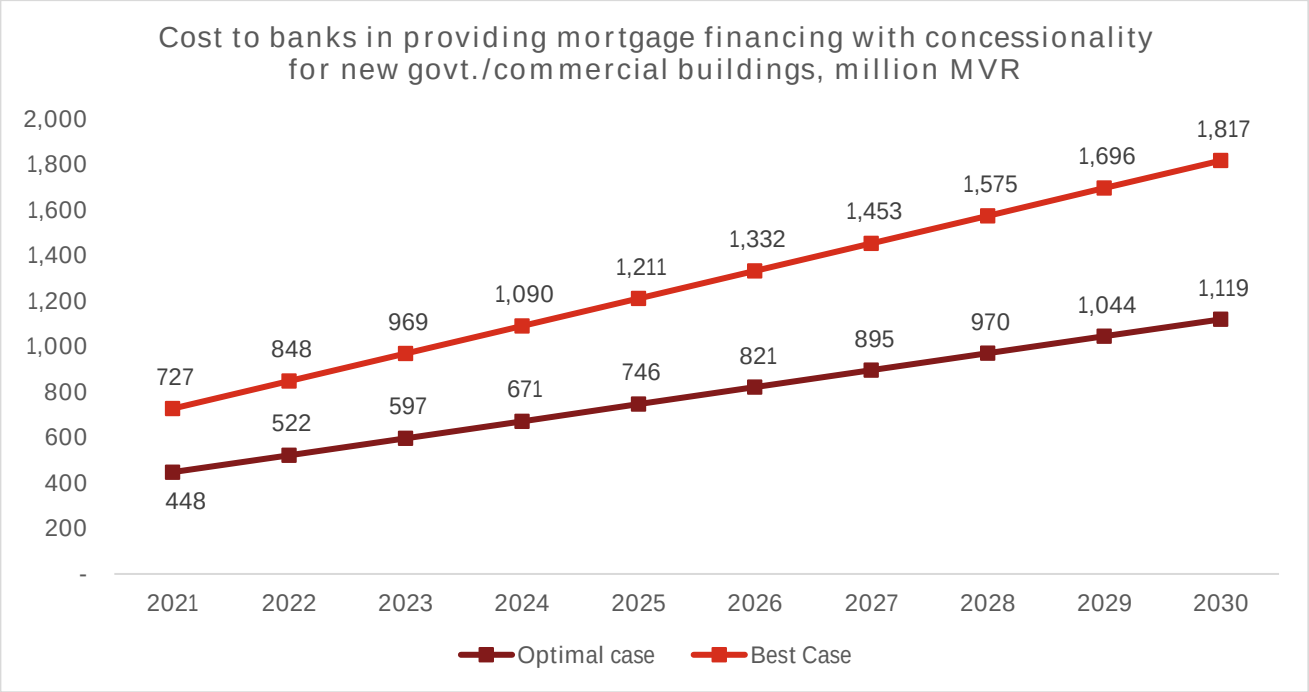


Figure 17: Offset Cost to Banks due to concessional financing for new govt./commercial buildings (2021 - 2030)

Hotels/Guest House

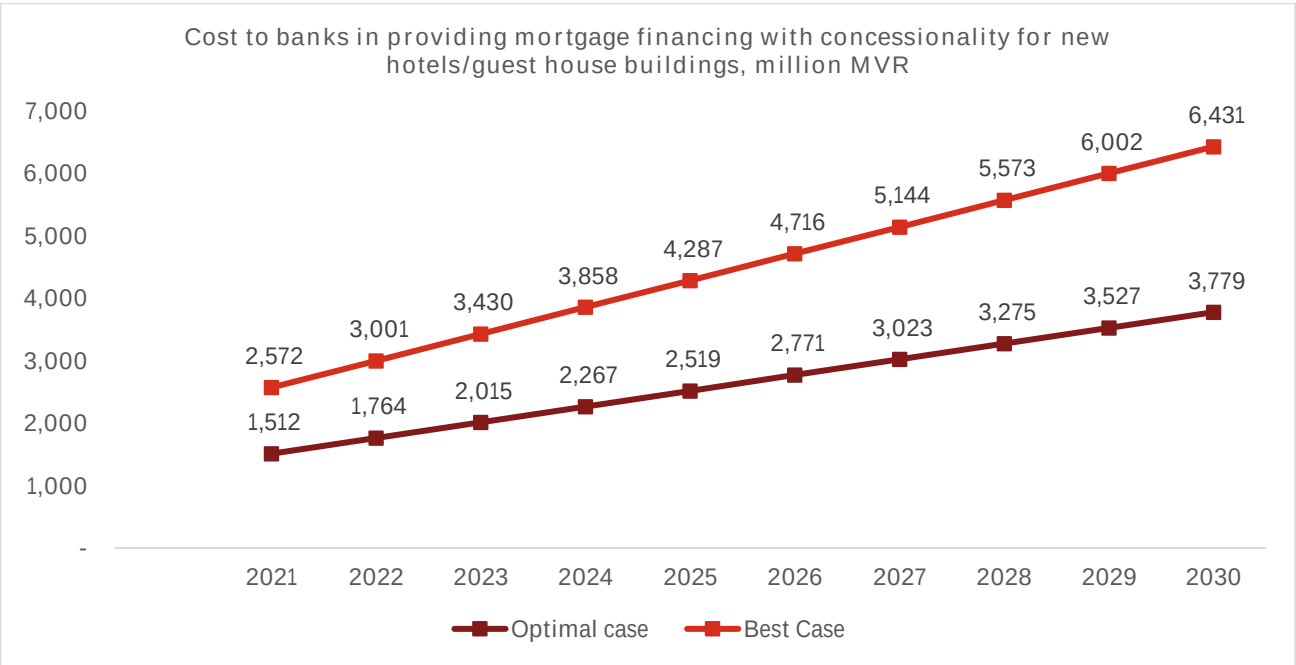


Figure 18: Offset Cost to Banks due to concessional financing for new hotels/guest house buildings (2021 - 2030)

EMI estimation for existing buildings (retrofits)

The EMI estimated in BAU and EE scenario for existing buildings applying optimal and best case HVAC interventions are presented in the table below.

Govt./Commercial

Table 25: EMI estimation for existing govt./commercial buildings

Intervention	EMI in BAU scenario (MVR per sq.m)	EMI in EE scenario (MVR per sq.m)
Base case	36,580	-
Optimal case	45,725	27,381
Best case	68,590	41,073

Hotels/Guest house

Table 26: EMI estimation for existing hotels/guest house buildings

Intervention	EMI in BAU scenario (MVR per sq.m)	EMI in EE scenario (MVR per sq.m)
Base case	45,581	-
Optimal case	50,646	30,328
Best case	98,662	59,081

Offset cost for existing buildings (retrofits)

The banks/FIs may consider revisiting the interest rates and loan term with the aim to offset the differential cost in EMI for encouraging the installation of optimal and best case EE interventions for existing buildings interested in replacing old HVAC with newer systems. Moreover, since the programme is aligned to the EE GUIDELINES this scheme could drive the demand for scaling up EE retrofits in the building sector.

To offer concessional financing, banks/FIs will have to take up a cost in providing concessional finance to the borrower for application for EE retrofit interventions in existing buildings. This cost can be co-financed by funding on an annual basis depending on the availability. The offset cost foregone by financial institutions during the 10-year implementation period of the programme for various funding buildings applying optimal and best case retrofit interventions are presented below.

Govt./Commercial

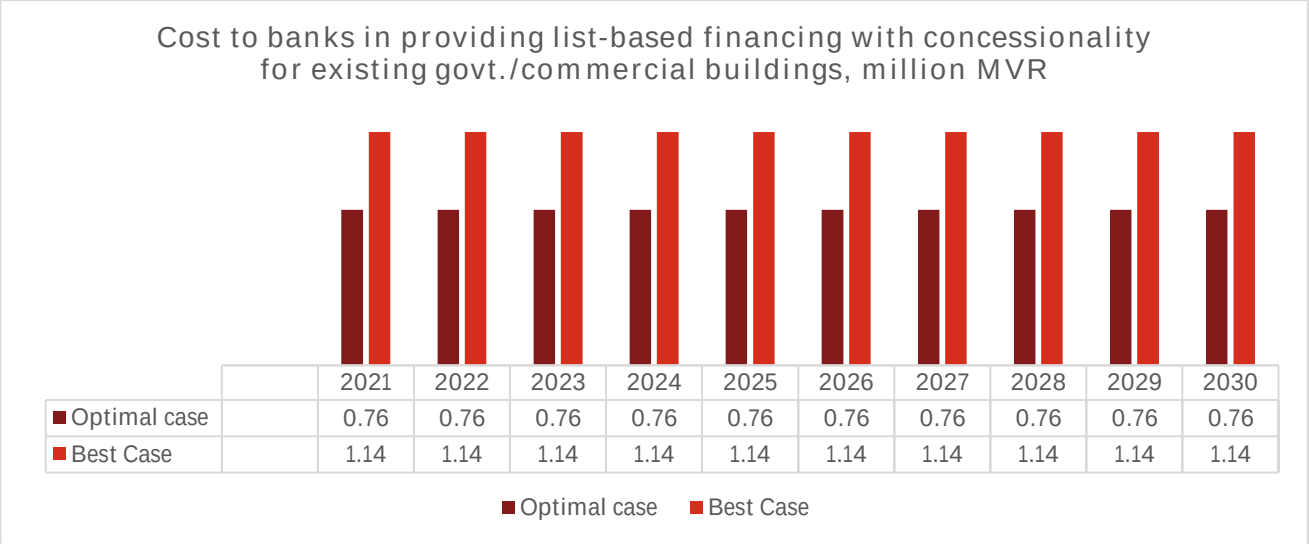


Figure 19: Offset Cost to Banks due to concessional financing for existing govt./commercial buildings (2021 - 2030)

Hotels/Guest House

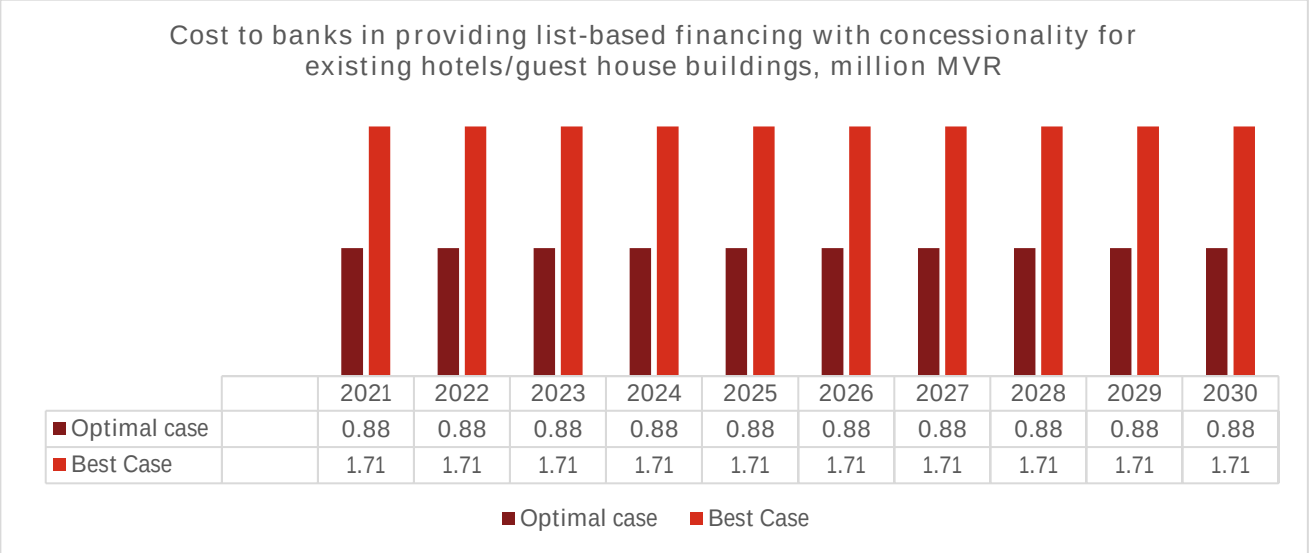


Figure 20: Offset Cost to Banks due to concessional financing for existing hotels/guest house buildings (2021 - 2030)

Potential GHG emissions reduction from the FP

In order to estimate the GHG emission reductions, the energy performance index (EPI) values was firstly estimated for new and existing buildings for the three options – base, optimal and best in line with the EE GUIDELINES. The table below presents the EPI values.

Table 27: EPI values for various building typologies

EPI- kWh/m2/year - New Buildings	Base case	Optimal Case	Best Case
Residential	100	50	25
Commercial/Government	150	110	70
Hotels and Guest Houses	300	175	115

EPI- kWh/m2/year - Existing Buildings	Base case	Optimal Case	Best Case
Residential	100	90	85
Commercial/Government	150	128	113
Hotels and Guest Houses	300	255	225

Using the above EPI, the energy savings for base, optimal and best case was estimated as follows:

- *Electricity consumption, kWh = Total building stock per year * EPI*
- *Energy savings, kWh = Electricity consumption (Baseline) – Electricity consumption (optimal/best case)*
- *GHG emissions reduction, tCO_2e = Energy savings (MWh) * Emission Factor (tCO_2e/MWh)*

The detailed breakdown of energy savings and GHG emissions reduction for new and existing buildings across various typologies are presented below.

Residential – New Buildings

Intervention	Energy savings by 2030, kWh	GHG emissions reduction by 2030, tCO_2e
Optimal case	25,788,279	19,058
Best case	38,682,419	28,586

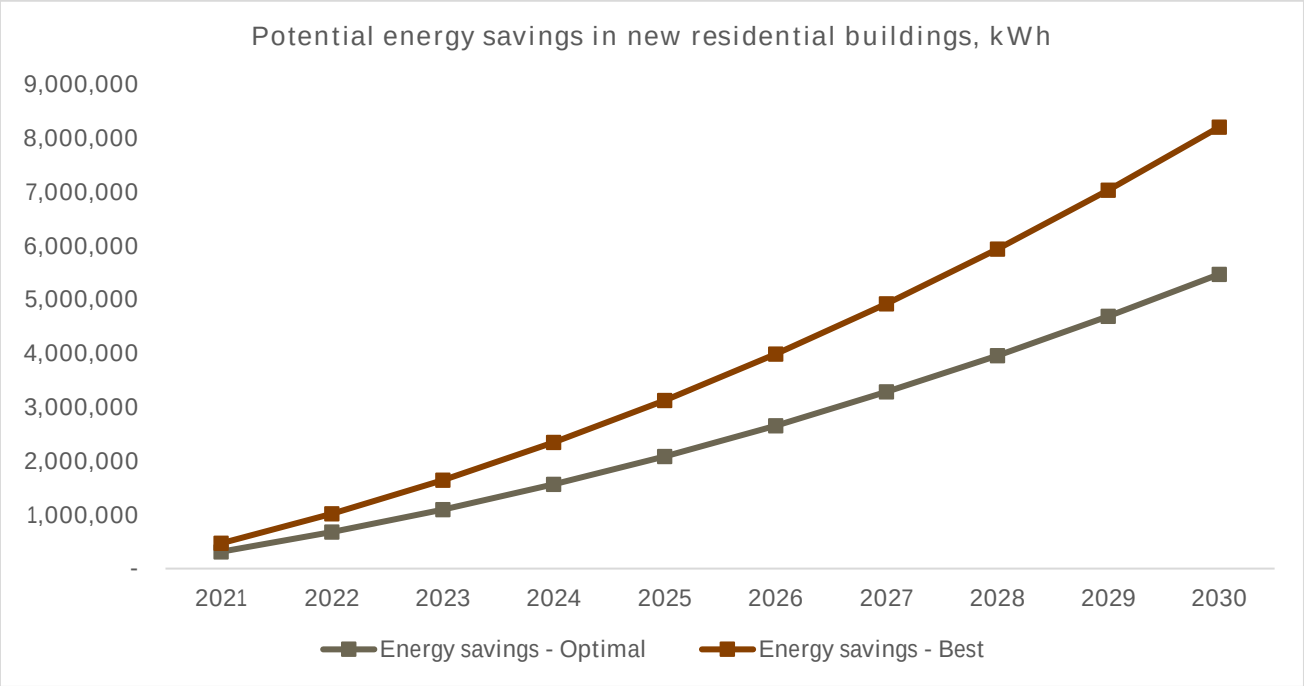
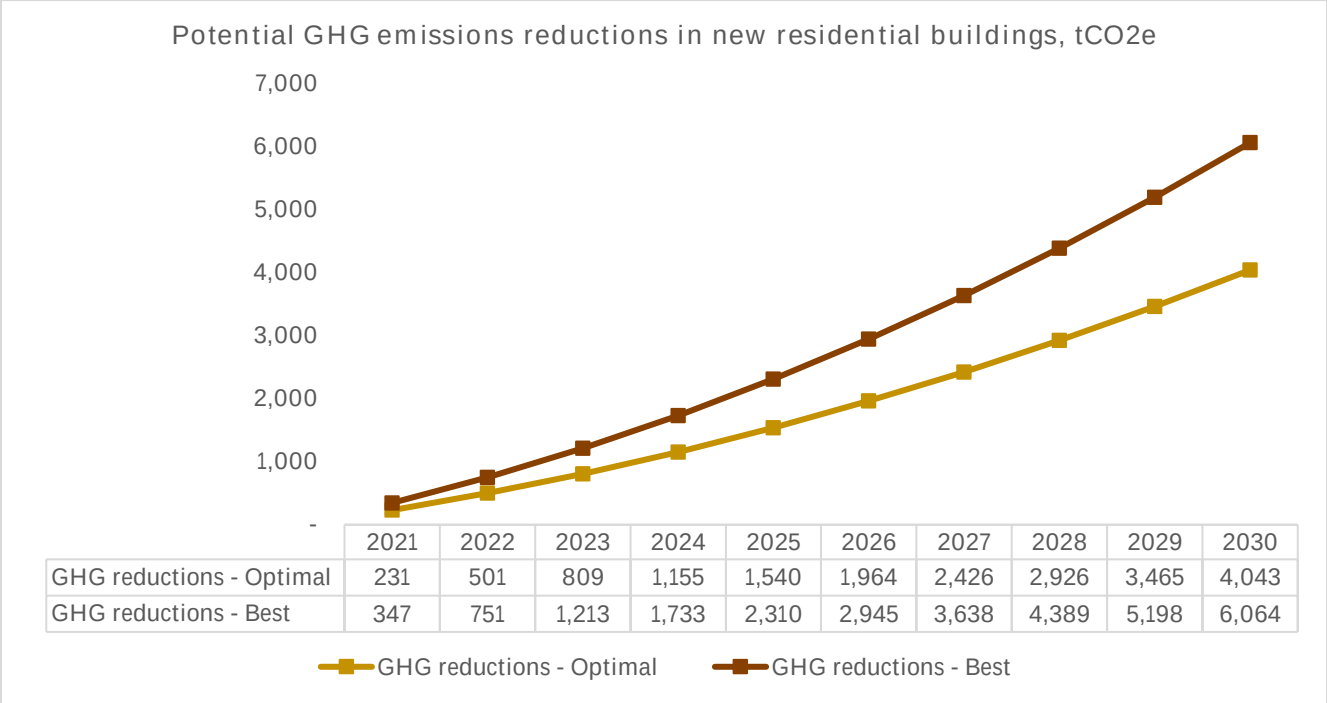


Figure 21: Energy savings in new residential buildings (2021-2030)



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
GHG reductions - Optimal	231	501	809	1,155	1,540	1,964	2,426	2,926	3,465	4,043
GHG reductions - Best	347	751	1,213	1,733	2,310	2,945	3,638	4,389	5,198	6,064

Figure 22: GHG emissions reduction in new residential buildings (2021-2030)

Govt./Commercial – New Buildings

Intervention	Energy savings by 2030, kWh	GHG emissions reduction by 2030, tCO_2e
Optimal case	4,683,994	3,461
Best case	9,367,987	6,923

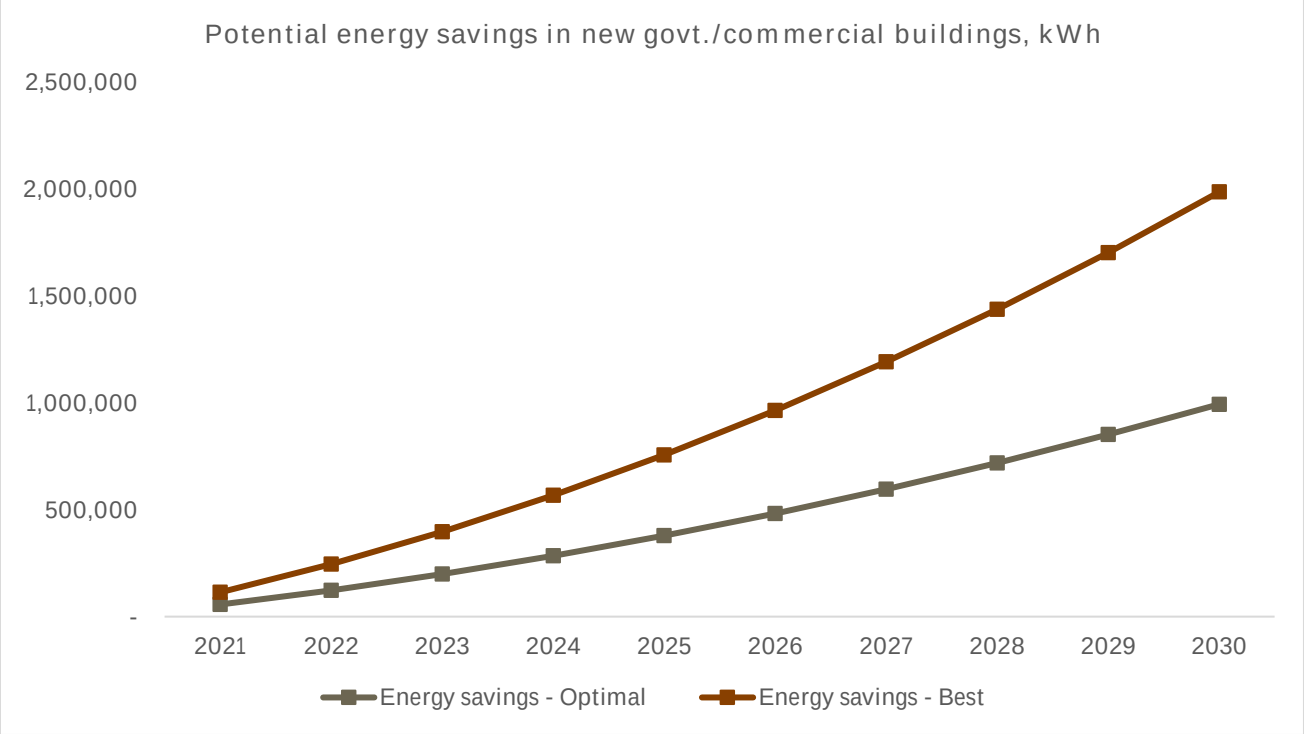
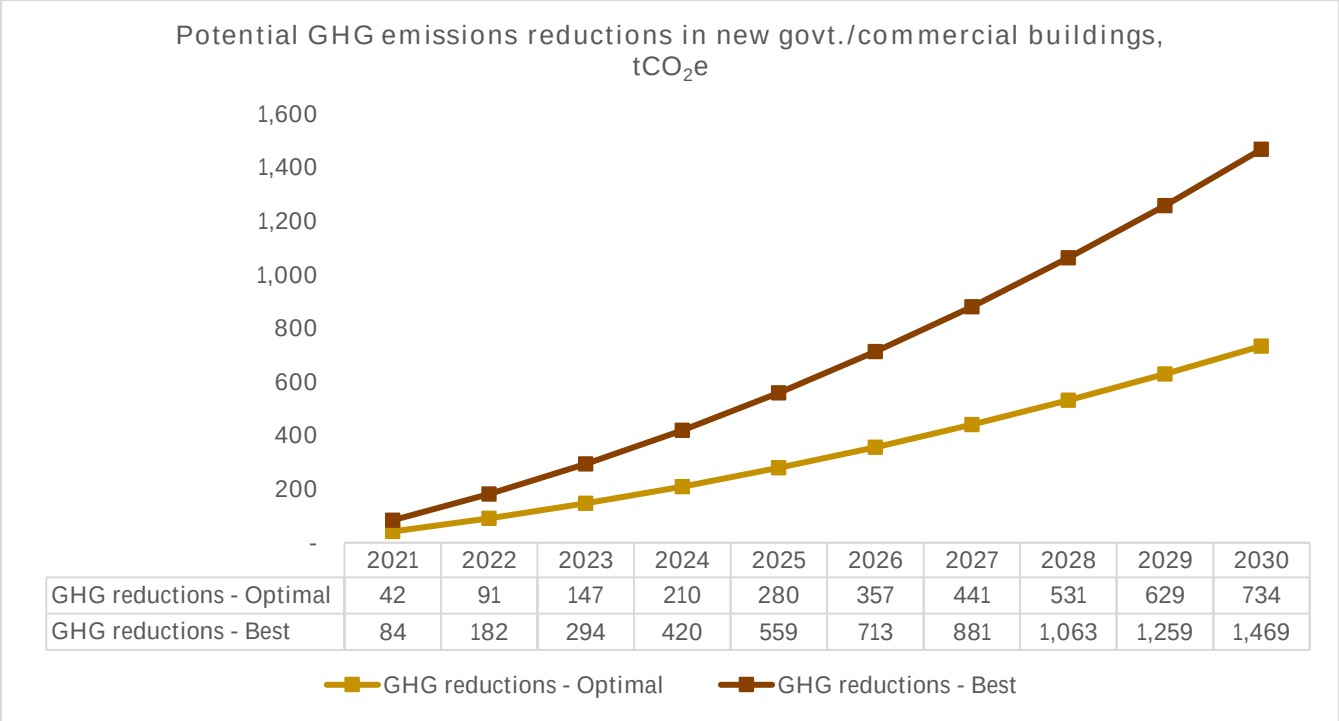


Figure 23: Energy savings in new govt./commercial buildings (2021-2030)



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
GHG reductions - Optimal	42	91	147	210	280	357	441	531	629	734
GHG reductions - Best	84	182	294	420	559	713	881	1,063	1,259	1,469

Figure 24: GHG emissions reduction in new govt./commercial buildings (2021-2030)

Hotels/Guest Houses – New Buildings

Intervention	Energy savings by 2030, kWh	GHG emissions reduction by 2030, tCO_2e
Optimal case	17,714,400	13,091
Best case	26,217,312	19,375

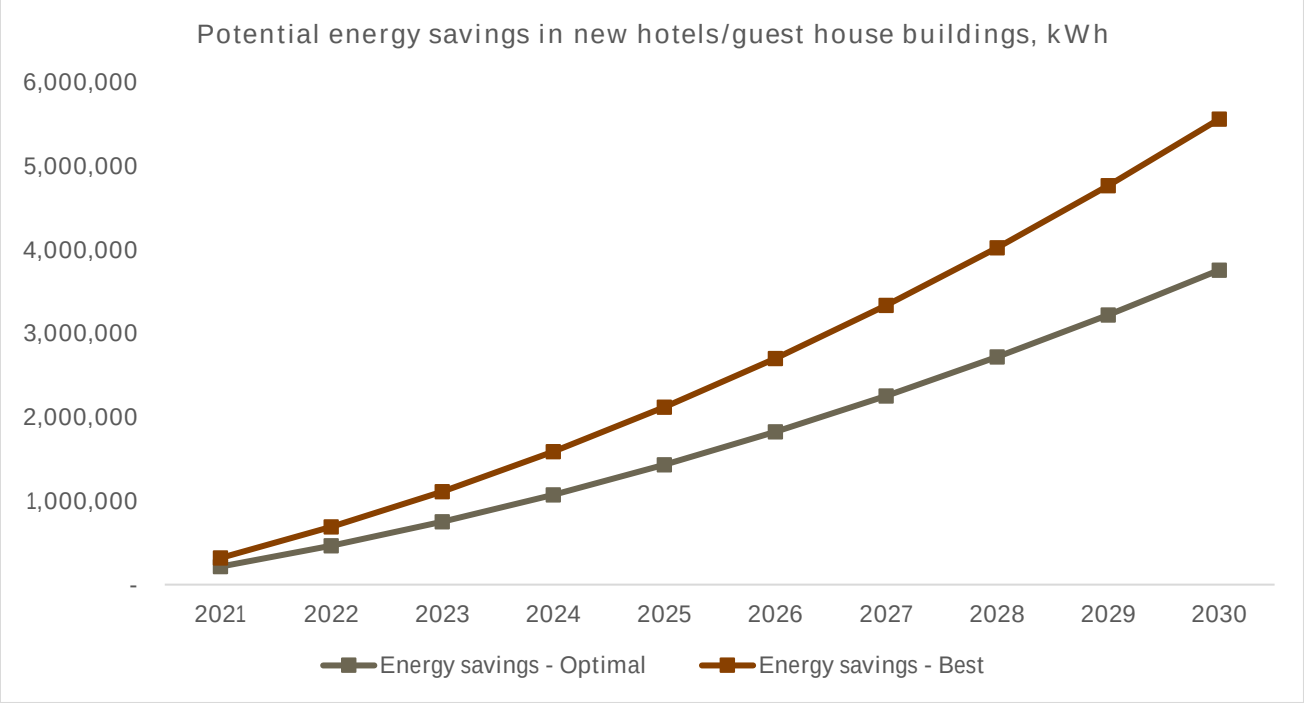
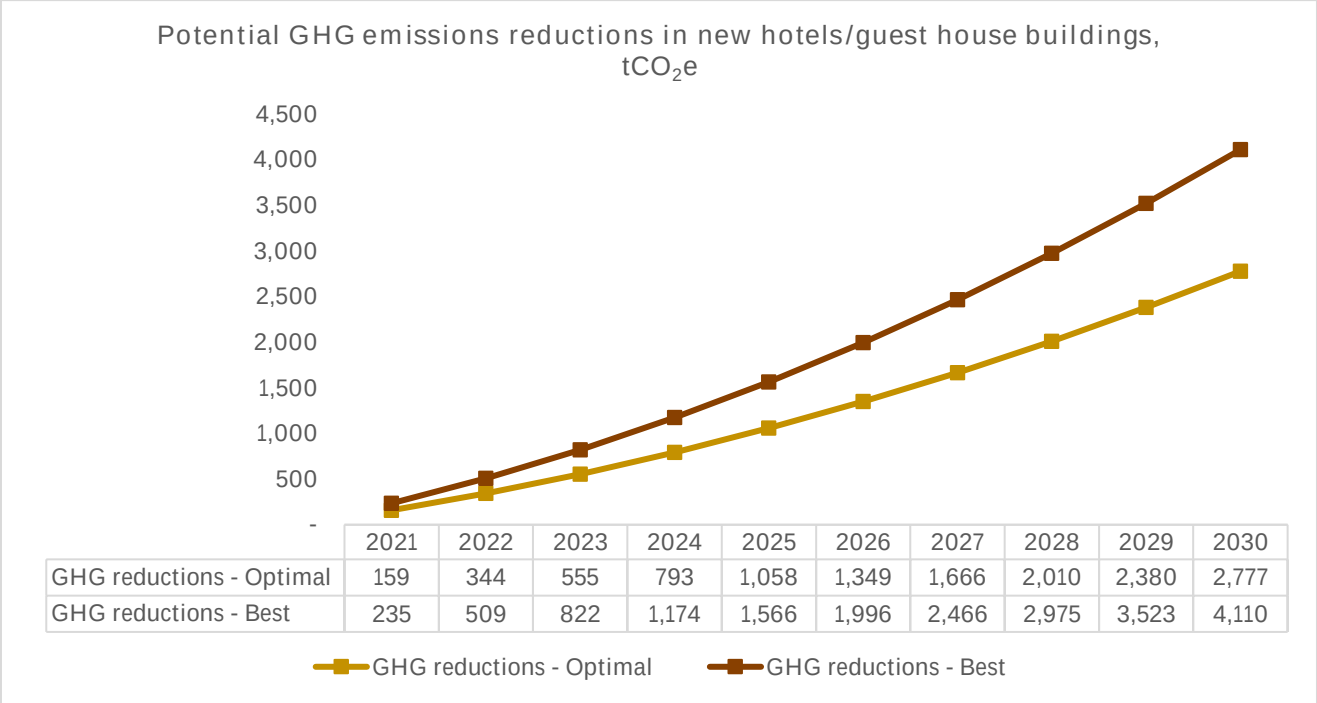


Figure 25: Energy savings in new hotels/guest house buildings (2021-2030)



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
GHG reductions - Optimal	159	344	555	793	1,058	1,349	1,666	2,010	2,380	2,777
GHG reductions - Best	235	509	822	1,174	1,566	1,996	2,466	2,975	3,523	4,110

Figure 26: GHG emissions reduction in new hotels/guest house buildings (2021-2030)

Govt./Commercial – Existing Buildings (retrofits)

Intervention	Energy savings by 2030, kWh	GHG emissions reduction by 2030, tCO_2e
Optimal case	290,097	214
Best case	483,496	357

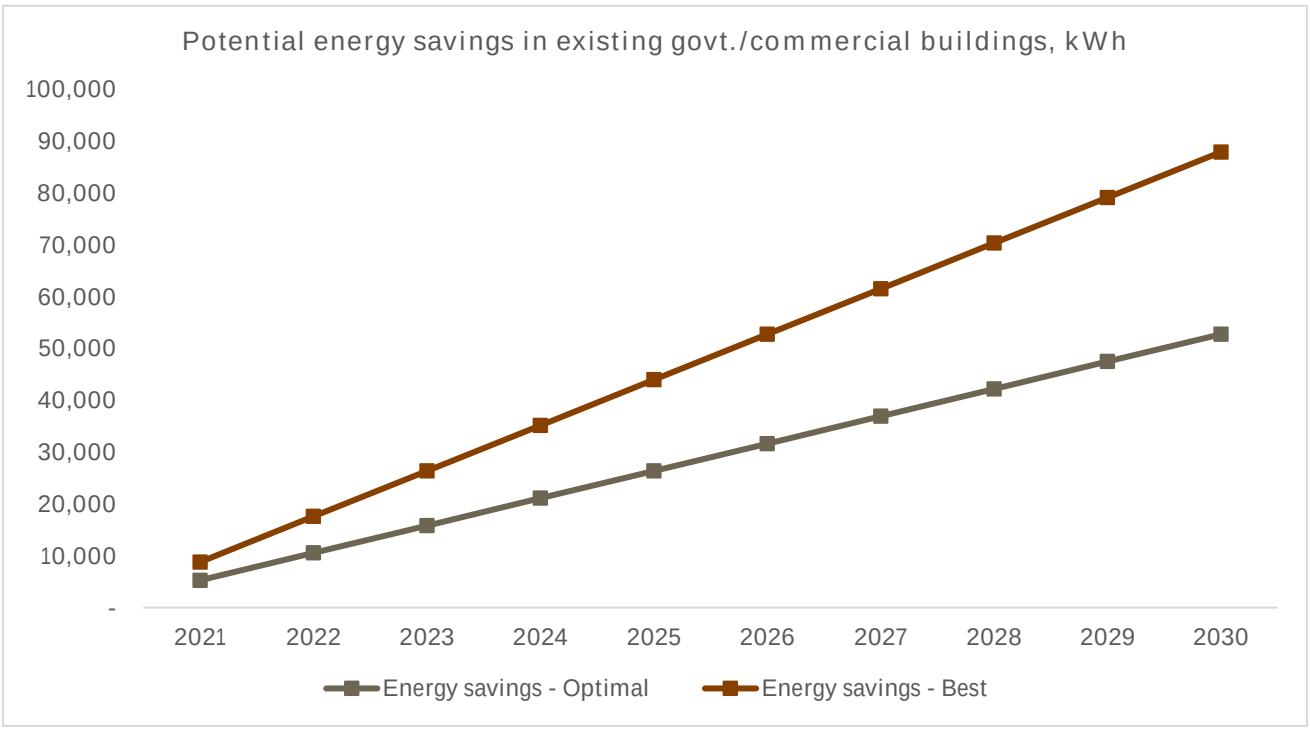


Figure 27: Energy savings in existing govt./commercial buildings (2021-2030)

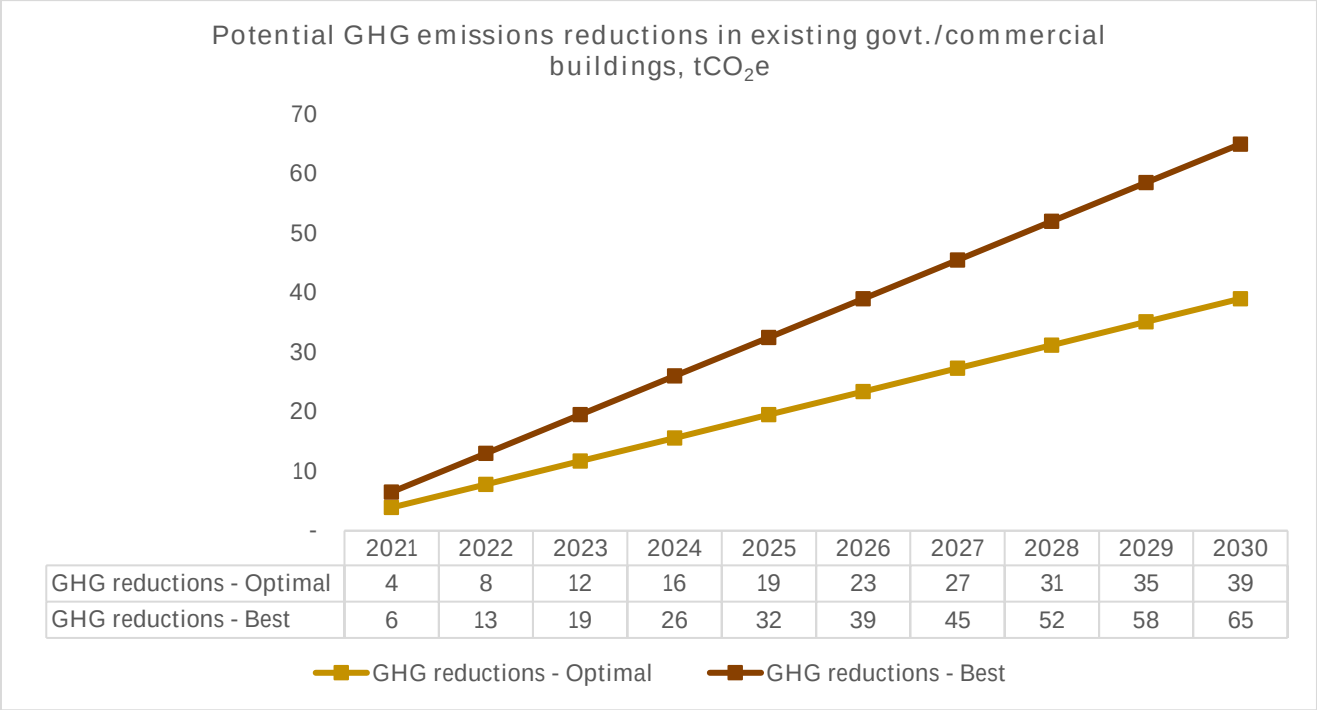


Figure 28: GHG emissions reduction in existing govt./commercial buildings (2021-2030)

Hotels/Guest Houses – Existing Buildings (retrofits)

Intervention	Energy savings by 2030, kWh	GHG emissions reduction by 2030, tCO_2e
Optimal case	607,393	449
Best case	1,012,321	748

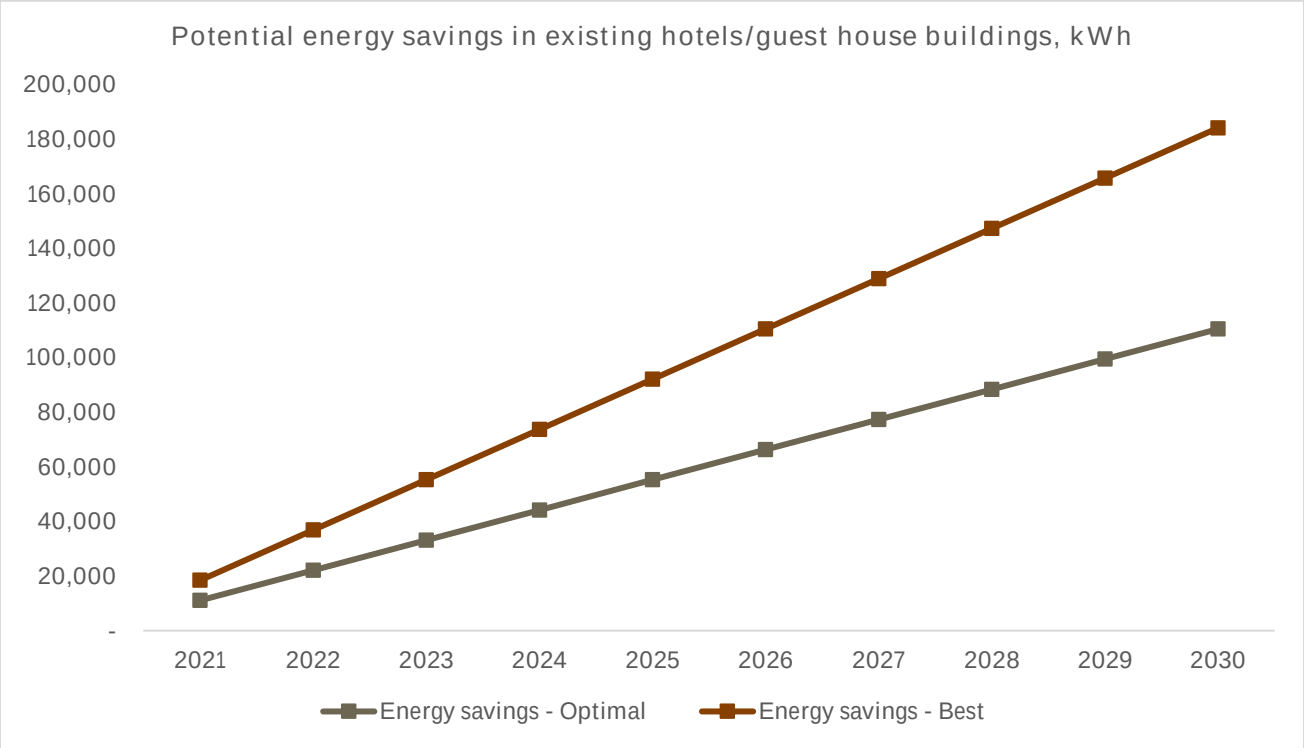
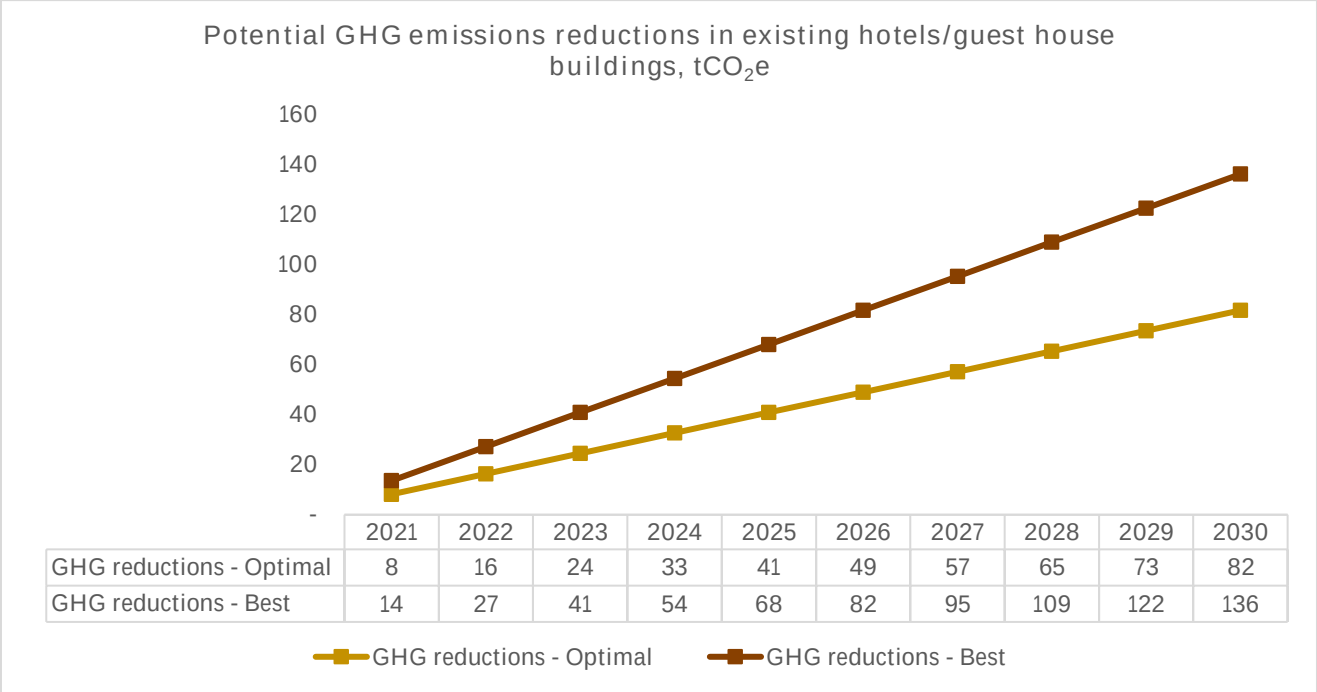


Figure 29: Energy savings in existing hotels/guest house buildings (2021-2030)



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
GHG reductions - Optimal	8	16	24	33	41	49	57	65	73	82
GHG reductions - Best	14	27	41	54	68	82	95	109	122	136

Figure 30: GHG emissions reduction in existing hotels/guest house buildings (2021-2030)

The overall energy savings estimated for new building applying optimal case EE interventions is around 48.19 GWh with an emissions reduction potential of 35,610 tCO_2e by 2030. Similarly, application of best case EE interventions could yield energy savings of around 74.27 GWh along with emissions reductions to the tune of 54,884 tCO_2e during the same period. In monetary terms, energy cost savings due to the application of optimal and best case interventions are estimated to be 145.68 million MVR and 227.81 million MVR respectively by 2030.

In the case of existing buildings, applying optimal HVAC retrofit could result in saving 0.90 GWh of energy and also reduce 663 tCO_2e emissions by 2030. Application of best case HVAC retrofit could result in energy savings of around 1.5 GWh and has the potential to reduce emissions of around 1,105 tCO_2e during the same time period. The energy cost savings to be accrued by 2030 is estimated to be 3.02 million MVR and 5.04 million MVR for optimal and best case HVAC systems respectively.

3.6. Recommendations on co-financing

Financial institutions operate on a risk and return basis. In the absence of reporting requirements for sustainability compliance, financial institutions will continue the lending practices as usual. In order to encourage financial institutions to mobilize funds for RE/EE, special funding sources or tax concessions would be necessary.

- The equity requirement of 30% of financing can be provided under a special government scheme. Similar schemes have been incorporated in the National Budget for 2021 towards housing under affordable housing scheme.
- The government has also planned to raise finance through issuance of Green/Blue bonds from the international market ($100 Million as per budget 2021). Part of the proceeds can be on-lend to the banks for lending to the private sector for EE projects that meets the government EE GUIDELINES guideline.
- Another funding source is the Green Tax Revenue. Government collected over $55 Million as green tax in 2019. Green tax is a tax payable by tourists who stay in tourist resorts, tourist hotels and tourist vessels. It is also payable by tourists who stay in tourist guesthouses from 1 October 2016 onwards. Green tax is payable at the rate of $6 per day of stay from tourist resorts, tourist hotels and tourist vessels, and $3 per day of stay from tourist guesthouses. Maldivians and resident permit holders are not required to pay Green Tax. Part of the proceeds Green Tax can be used to finance RE/EE projects.
- Another Alternative is tax concessions. Banks are subjected to highest tax brackets in Maldives, banks profit tax is 25% where is the ordinary profit tax in 15%. Government collected over $39 Million as bank profit tax in 2019. Government may consider giving tax deductions for banking participating in RE/EE financing.
- Another source of funding is the SWF. The SWF was created in 2017 and it is expected that the fund would have accumulated over $250 Million by the end of 2021 based on the budget transfers. One of the recommendations from the Parliament was to take measures for the strengthening the governance and management of the fund.
- Debt swaps are another alternative source of finance and this will help Maldives restructure its debt as well. Under these programs, green funds buy existing debt, provide term extensions and offer reduced interest rates on the conditions that part of the proceeds to be used for sustainability finance initiatives.
- The Maldives Green fund would have international appeal if properly structured with appropriate governance structure. The market for Sustainable finance is estimated at over $30 Trillion.
- There is an increasing demand for sustainability investments from Intuitional Investors such as national pension and SWF under ESG requirements. Maldives government with the private sector, especially the hotel industry can jointly work towards sustainability investment programs to attract financing from Institutional Investors.

4. Next steps

The following are the tasks that would be completed in the coming weeks:

- Discussion with ME on the integration of the financial program with existing products of banks, business model and forecasted benefits
- Finalizing the financial strategy and identification of participating bank
- Define the activities to develop the model, including MRV and disposal
- Conduct stakeholder consultations to validate the financial strategy and programme
- Develop implementation strategy and implementation workplan for the financial programme

Annexure 1 – Stakeholders Consulted on Relevance of Financial Instruments

Organization	Contact Details
Bank of Maldives	Mariyam Shaba Email: shaba664@bml.com.mv
Maldives Islamic Bank	Ismail Shafeeu Email: ismail.shafeeu@mib.com.mv
Commercial Bank of Maldives	Mohamed Giyas Deputy Chief Executive Officer Email: mohamed.giyas@cbmmv.com
SDFC Bank	Fathimath Muna Tel: +960 7919009 Email: fathimath.muna@sdfc.mv
Bank of Ceylon	Chamara Rajapaksha Senior Credit Manager Tel: +960 3020555 Email: credit@bocmale.com.mv
Mauritius Commercial Bank	Mohamed Anas Senior Relationship Manager T: (960) 330 5331 | M: (960) 793 2058 Email: mohamed.anas@mcbmaldives.com
HDFC Bank	Mohamed Rukhaam Senior Executive Tel: (960) 3338810 Email: rukhaam1087@hdfc.com.mv

Ministry of Environment, Climate Change and Technology

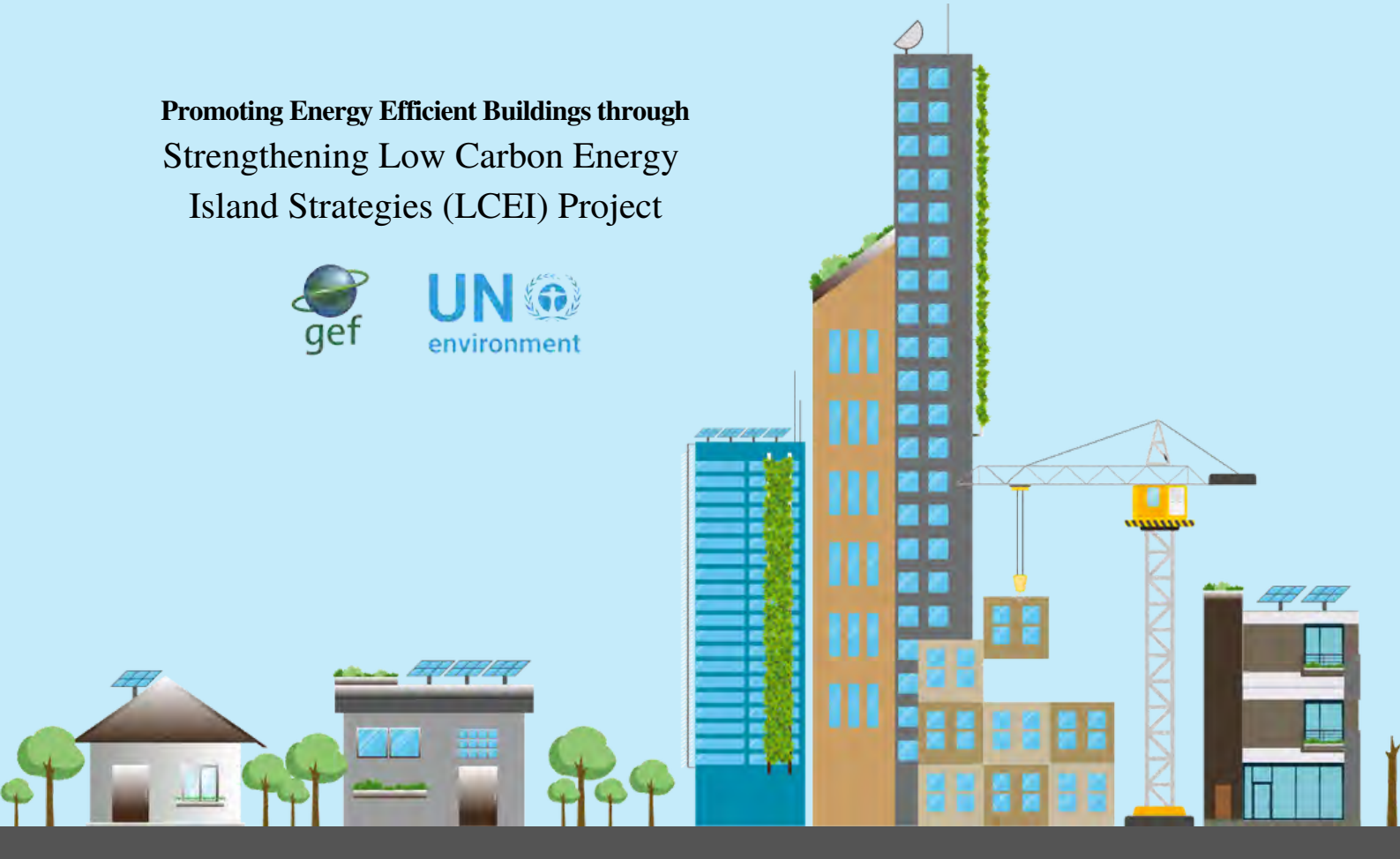
Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits in Maldives

Financial Program

Promoting Energy Efficient Buildings through
Strengthening Low Carbon Energy Island Strategies (LCEI) Project

gef

UN environment



Contents

A. Context

Background

The Republic of Maldives is a small island developing nation with tourism, fisheries, transport and construction being the key sectors driving economic growth. As per the Maldives statistical department, the country has emerged as the second fastest growing economy in South Asia with an average GDP growth rate of 6.2% since 2010. In the past three to four decades, there has been an exponential growth in the energy demand of the country. Further the entire energy demand is met by the import of fossil fuels due to unavailability of conventional sources of energy posing a significant burden on the country. In Maldives the most significant energy conversion is from diesel to electricity. The generation and distribution of the electrical systems are decentralized with each separate island operating a self-sustaining diesel power generation and distribution system.

The World Bank estimates that the government subsidies on electricity amount close to USD 58 million or 1.0 percent of GDP in 2019. Fuel accounts for 16% of total imports and 12% of total export revenue during 2019. Depending on the international oil prices, the Maldives could spend close to a half a billion USD on oil imports each year. According to World Bank estimates, increasing the share of the renewables in the generation mix by 20 percentage points could reduce the oil import bill by 5 percent and energy sector subsidies by 14 percent based on 2019 levels, resulting in fiscal and external savings, provide environmental benefits and generate jobs.

The capital city Male' is the hub of employment opportunities, healthcare facilities and educational services which has witnessed an increase of migration from outer islands. Due to this there has been a rapid increase in 10 to 25 storied high buildings leading to rapid increase in population during 2010-2015, making it one of the most populated capital in the world. With the increase in population, it has been observed that the building sector in Maldives consumes 30% of the total energy consumption and is expected to grow by 8.5% annually (Source: Maldives Statistical Department). Building sector has been identified as a key sector to attain the objective of carbon neutrality by using renewable sources of energy and achieving energy efficiency in buildings. The key challenges faced by this sector includes high import cost of construction materials, dependency on conventional sources of energy and high population density.

Presently, Maldives consumes approximately 627 GWh of energy per year[1]. As discussed in the previous paragraph, with the increase in the population, the energy demand of the building sector is continuously increasing. Hence, there is a need of introducing energy efficiency in the buildings. This will lead to long-term energy and cost savings, lower emissions and environmental impact, better thermal comfort and improved health due to continuous ventilation.

With the objective of reducing overall GHG emissions by 10% bv 2030, Government of Maldives has initiated several actions to transition to a low-carbon economy including formulating progressive 'National Energy Policy & Strategy', strengthening existing regulatory bodies, energy efficiency programme covering buildings and appliances, building capacities and create awareness across the energy sector on energy conservation. Some of the key initiatives and policy actions are as follows:

[1] https://www.climateinvestmentfunds.org/sites/default/files/maldives_energy_sector_srep_-_nigeria_.pdf

- *Energy Sector Investment Roadmap was developed for Maldives in 2011 which conducted preliminary estimate of investment required to be carbon neutral*
- *Development of Clean Energy Investment Plan in collaboration with Ministry of Housing and Ministry of Environment of Maldives*
- *Energy efficiency guidelines for buildings are being developed for Residential, Commercial, Government, Hotels and Guesthouses, that shall lay the minimum energy efficiency requirements for buildings in Maldives.*
- *Life cycle cost based public procurement guidelines thereby promoting energy efficient products and technologies*
- *Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits*
- *Establishment of the 'Green Loan' under Bank of Maldives Green Fund for increasing investment in energy efficiency and renewable energy solutions*

Based on experience and assessment of the local conditions that have dampened uptake of energy efficiency in buildings of Maldives, a major contributing factor is absence of regulations and laws around the energy efficiency for buildings which hampers disciplined energy saving in the region. However, the major challenge to the uptake of EE measures has been found to be the lack of appropriate loan instruments among the promoters for EE update in construction. Another major roadblock is the lack of energy subsidies that have led to absence of incentivized based financing mechanisms to push EE market in buildings. In this assignment, project team will specifically address the component of financial constraint, that greatly hinders the adoption and large scale dissemination of energy savings parameters and technologies.

Need for Financial Programme for Energy Efficient Buildings and Building Retrofits

The building sector in the Maldives is generally under-investing in energy efficiency and other low carbon energy building technologies due to diffused responsibility for energy consumption over the lifetime of any given building. With an increase in population and energy demand, the dependence on imported goods have increased. In 2018, 5 billion USD worth goods were imported which almost doubled since last 10 years. With sustainability goals and objectives in mind, it is important that due consideration shall be given, on promoting demand for materials, buildings products and technologies which are energy efficient.

Maldives government has initiated various actions to tackle the energy scarce situation in the country. As the construction sector continues to expand in Male and Hulhumale region, Ministry of Environment, Climate Change and Technology, Maldives (under LCEI project) is in process of development and implementation of Energy Efficiency guidelines along with Ministry of National Planning, Housing and Infrastructure (MNHPI) for new buildings and retrofitting of existing buildings under the typologies of Government Buildings, Commercial Buildings, Residential buildings and Hotels & Guesthouses in Maldives. One of the major barriers that was identified during the development of EE guidelines was the lack of financial instruments which led to low uptake of energy efficient technologies in buildings of Maldives.

When it comes to the adoption of the Energy efficiency measures, the requirement of additional capital investment becomes critical, along with establishment of a building energy code or energy efficiency regulations for building retrofits in Maldives. Furthermore, once the code gets mandated by the government of Maldives, there will be a significant rise in the demand for such financial mechanisms to enable adoption of the measures by the end users. This creates an urgent need to undertake the current assignment of development of financial programme for energy efficiency buildings and energy efficiency retrofits in Maldives.

The financial programme will enhance the uptake of EE buildings by generating cost savings from energy conservation measures by enabling users to safe payback options and by increasing the asset value and quality

for financiers due to enhanced comfort and performance of the building. This will lead to the transformation of EE buildings market in Maldives. Some of the user-specific benefits and overall benefits of successful implementation of such a financial programme are depicted in figure 1 and figure 2, respectively.

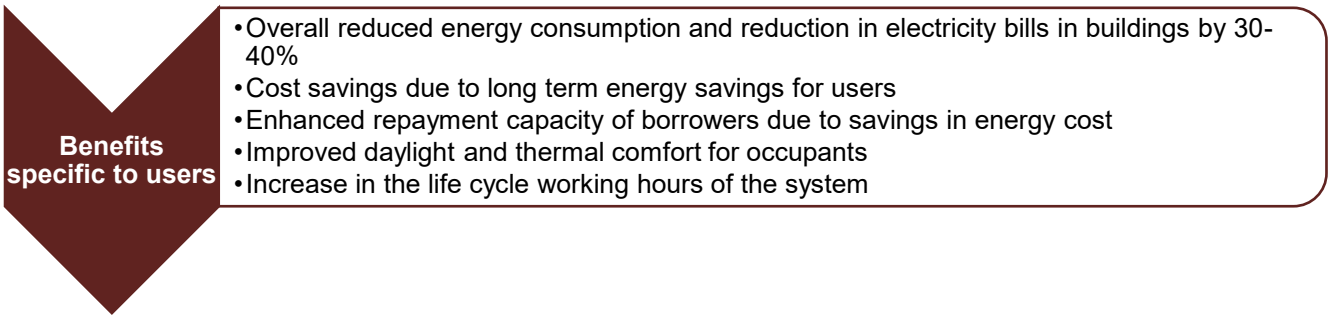


Figure 1: User Specific Benefits of financial program

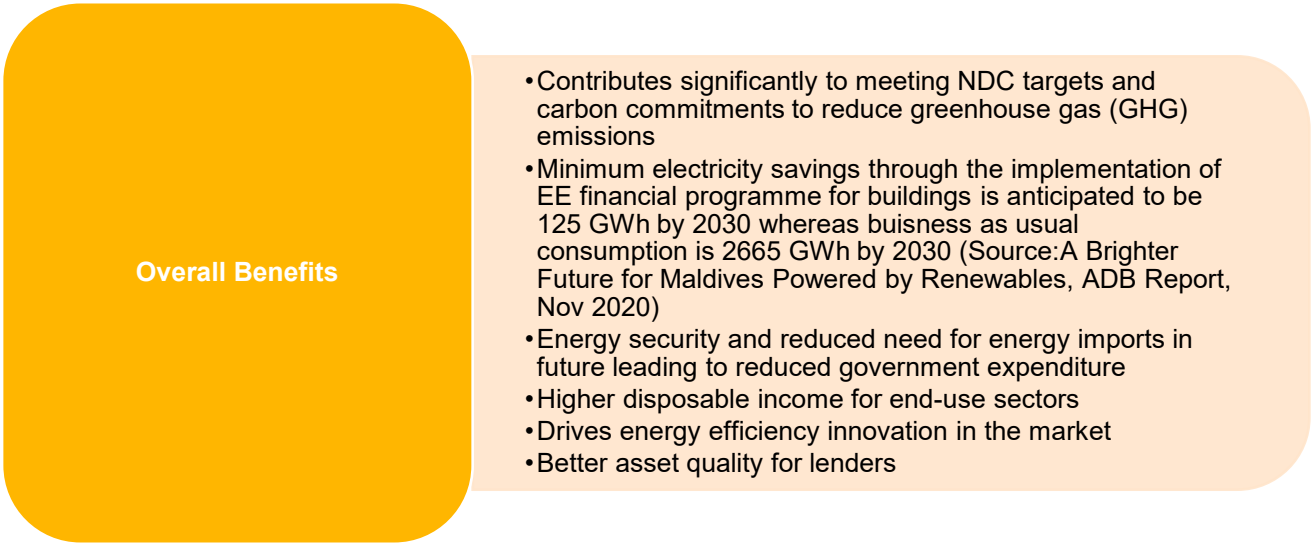


Figure 2: Overall Benefits of financial program

Going the above benefits, development of a robust financial strategy is very crucial to attain the objectives set by the Government of Maldives to reduce the GHG emissions by 10% before 2030. Further, the programme should support implementation of energy efficiency practices across new and existing buildings and also lead to recovery of capital through operational energy cost savings, thereby enhancing the energy security of the nation.

B. Programme Outline

A comprehensive secondary research was undertaken to establish an understanding of current practices in energy efficiency financing for buildings within and outside Maldives. Reports published by international development agencies, think-tanks and research organisations were reviewed. This review was augmented through focused stakeholder consultations with government and banking sector in Maldives and thereby provided the required local insights on existing mechanisms, infrastructure and organizational framework involved, etc. From the review of secondary data, findings from the inception workshop, draft financial strategy, and post analysis of inputs from stakeholders the following business models were found feasible for the programme:

- **Model 1: Energy Efficiency Revolving Fund with Concessional Loan**
- **Model 2: Energy Efficient Housing Loan**
- **Model 3: Sovereign Lending**
- **Model 4: Energy Efficient Equipment Leasing**

In order to create the necessary demand, the programme would be integrated with the Maldives' EE Guidelines that is being developed by Ministry of Environment, Climate Change and Technology and MNHPI. The guidelines would serve as a mechanism for creating the need for the building sector to scale up EE solutions in the next 5-10 years. The objective of the energy efficiency guideline is to facilitate building owners, builders/developers, energy consultants, engineers, and architects in designing and operation of resources(energy and water) efficiently in buildings. This is achieved by providing minimum efficiency requirements for each of the following aspects as indicated below:

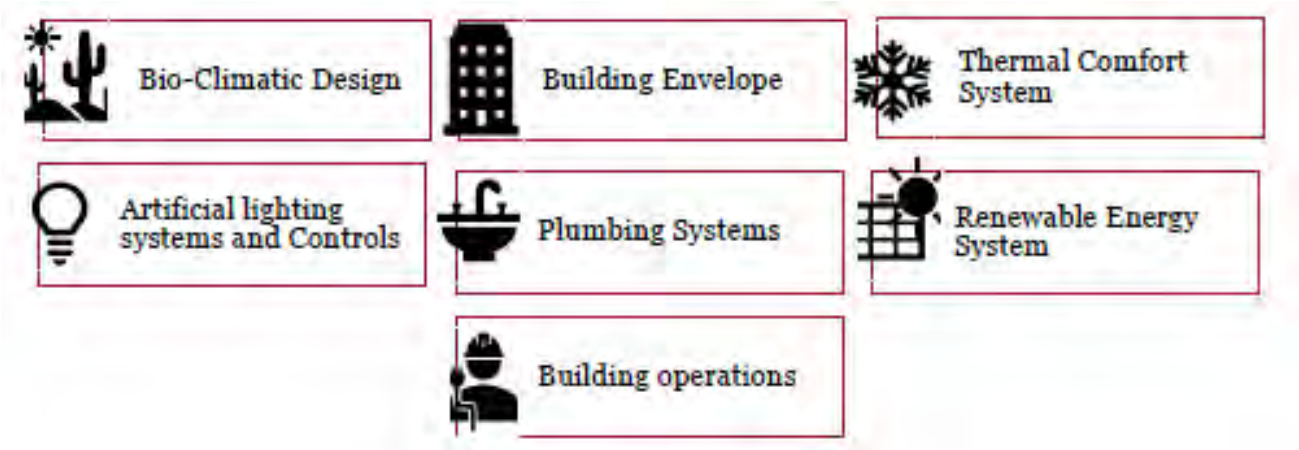


Figure 3: Aspects covered under the building energy efficiency guidelines

The guideline will provide minimum requirements for energy and water efficient design and operation of new and existing buildings in Maldives, that will largely benefit the end users by recognizing substantial cost savings during operations of the buildings, and the buildings sector of Maldives as a whole in achieving national energy efficiency targets and increasing the overall life of building and its systems. The guideline will also provide additional sets of incremental requirements for buildings to achieve enhanced levels of resource (energy and water) efficiency that go beyond the minimum requirements. This is applicable to the following typologies of new and existing building in Male and Hulhumale:

- Government Buildings
- Commercial Buildings

- Residential Buildings
- Hotels & Guest Houses

The list of energy efficiency interventions as per the EE building guidelines, along with their probably solutions for application in buildings are mentioned below. After due consultations with MECCT and the banks, these will be well integrated in the checklist pertaining to the technical due diligence conducted by the banks for the loan approval process.

Table 1: List of energy efficiency interventions as per the draft Building Guidelines

S.no	Intervention	Probable Solutions
Building Envelope		
1.	Energy Efficient Wall Material	AAC Blocks, XPS Wall Insulation etc.
2.	Roof Insulation	XPS Insulation, PUF Insulation, Rock Wool, Glass Wool etc.
3.	Cool Roof Finish	Green roof, High SRI Paint etc.
4.	Efficient Glazing	Single glazing with low SHGC, Double Glazing etc.
Thermal Comfort Systems		
5.	Efficient Air Conditioning system	Air/Water Cooled Chiller system with high COP, VRF/VRV
6.	Air Conditioning Controls	Building Energy Management Systems, Occupancy Control, Temperature Control
7.	Smart Building Technologies	Smart Meters, Smart Environmental sensors
8.	Not in-kind cooling solutions	Radiant Cooling, Under Floor Air Distribution system etc.
Artificial Lighting Systems		
9.	Efficient Lighting systems	LED lighting,
10.	Lighting Controls	Occupancy and Daylight sensors, Exterior lighting controls
Plumbing Systems		
11.	Water efficient plumbing fixtures	Low flow flush and flow fixtures- WC's, Urinals, Faucets/Taps, Showers etc
11.	Rainwater harvesting systems	Rainwater harvesting systems
12.	Efficient Pumps	Water Pumps and Booster Pumps
Renewable Energy Systems		
13.	Rooftop Solar systems	Solar panels, Solar Water heating

For ease of implementation of the programme and to align with the guideline, the models could be tailored for targeted customer groups withing new and existing buildings. The proposed target customer groups that can be catered through the programme are provided in the table below:

Table 2: Target customer groups and technologies to be covered

Building Type	Building Typologies Covered	EE systems covered
New buildings	• Residential • Government • Commercial • Hotels / Guest Houses	• Shading systems • Wall systems • Roof • Glazing systems • Lighting systems • Heating, Ventilation, and Airconditioning (HVAC) • Smart Building technologies including BMS systems • Plumbing systems • Rooftop solar PV
Existing buildings (for retrofits)	• Residential • Government • Commercial • Hotels/Guest houses	• Improvements in building envelope (Wall, Roof, Glazing) • Heating, Ventilation, and Airconditioning (HVAC), • Smart building technologies including BMS systems • Lighting systems • Plumbing systems • Rooftop solar PV

While consumers across typologies might be develop projects the share of beneficiaries approaching a bank for funding shall be minimal. For the purpose of this programme the following assumptions were considered to arrive at the overall market that can be captured in the next 10-years.

Targets for Financial Programme	New Buildings	Existing Buildings (For retrofits)
Percentage of buildings approaching banks for financing	20%	5%
Percentage of buildings to be targeted under the financing programme	10%	3%

Model 1: Energy Efficiency Revolving Fund with Concessional Loan for Residential and Commercial Buildings and Hotels/Guest House Buildings

Outline

In this model a revolving fund shall be established by the Ministry of Environment, Climate Change and Technology and Ministry of Finance through support from multilateral donor agencies that can provide an initial concessional loan. The Ministries shall thereafter empanel banks / financial institutions (FIs) for managing the programme. The FIs further empanel energy efficient (EE) technology providers by conducting due diligence whereas the nodal agency is required to maintain list of EE equipment with its specifications for programme eligibility. Post empanelment of all parties, the banks/FIs lend to EE projects proponents at concessional interest rates based on loan approval criteria and requirements designed for new and existing buildings. The loan can also be accessed by retail bank account holders to finance EE technology.

The revolving fund provides low interest loans to empanelled banks/FIs, who are expected to pass on the lower interest rates to the concerned borrowers while the risk sharing facility can be provided by multilateral donor agencies to FIs to make the EE lending attractive. Loan repayments and optional environmental tax are used to replenish the revolving fund without the necessity for requesting additional funds from donors. The figure below presents the outline of the model and flow of activities:

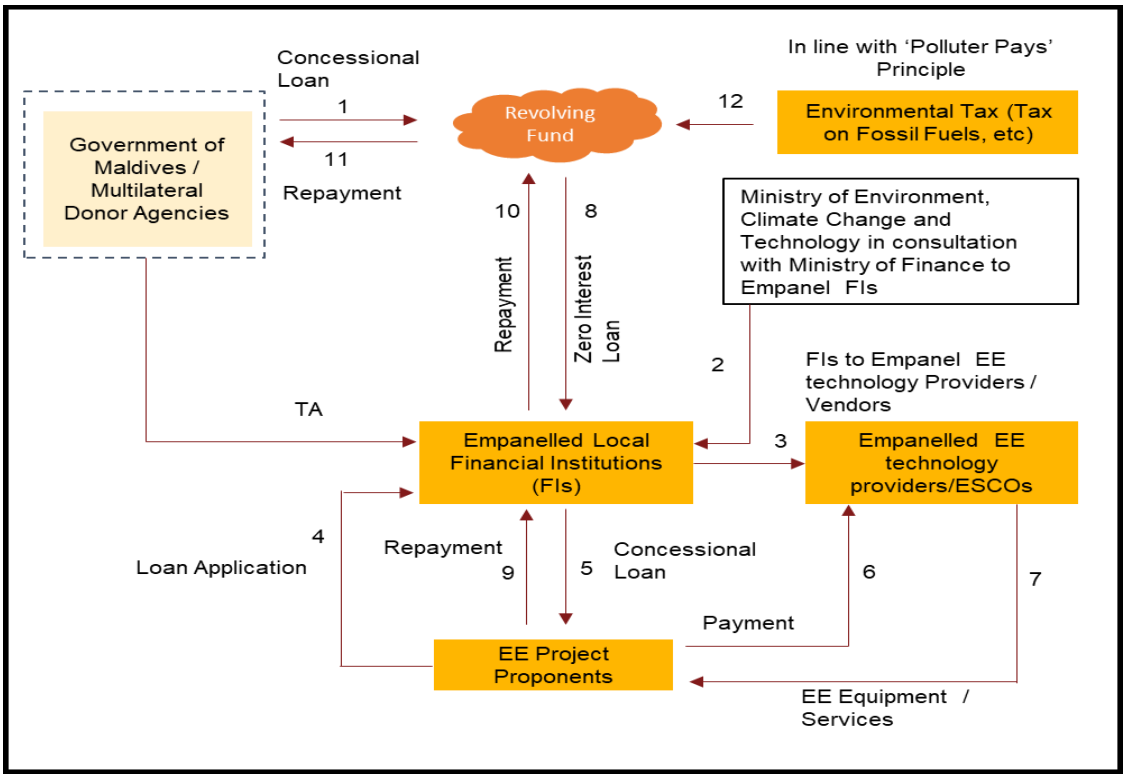
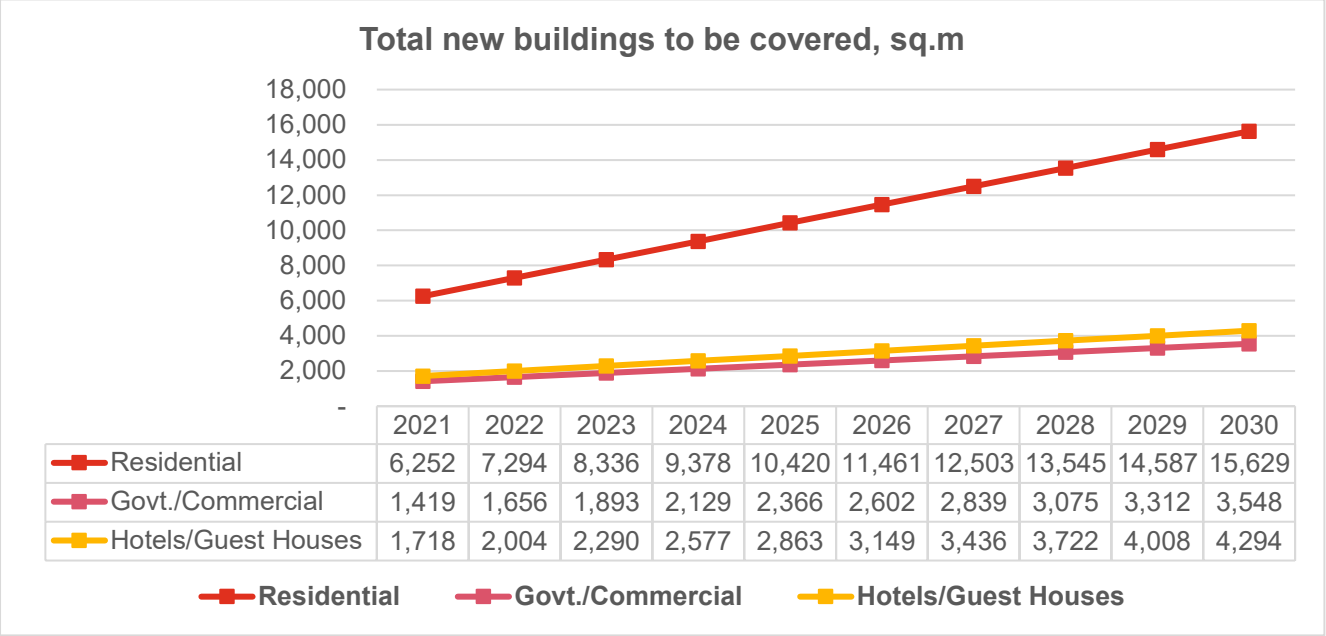


Figure 4: Overview of the business model for energy efficiency revolving fund

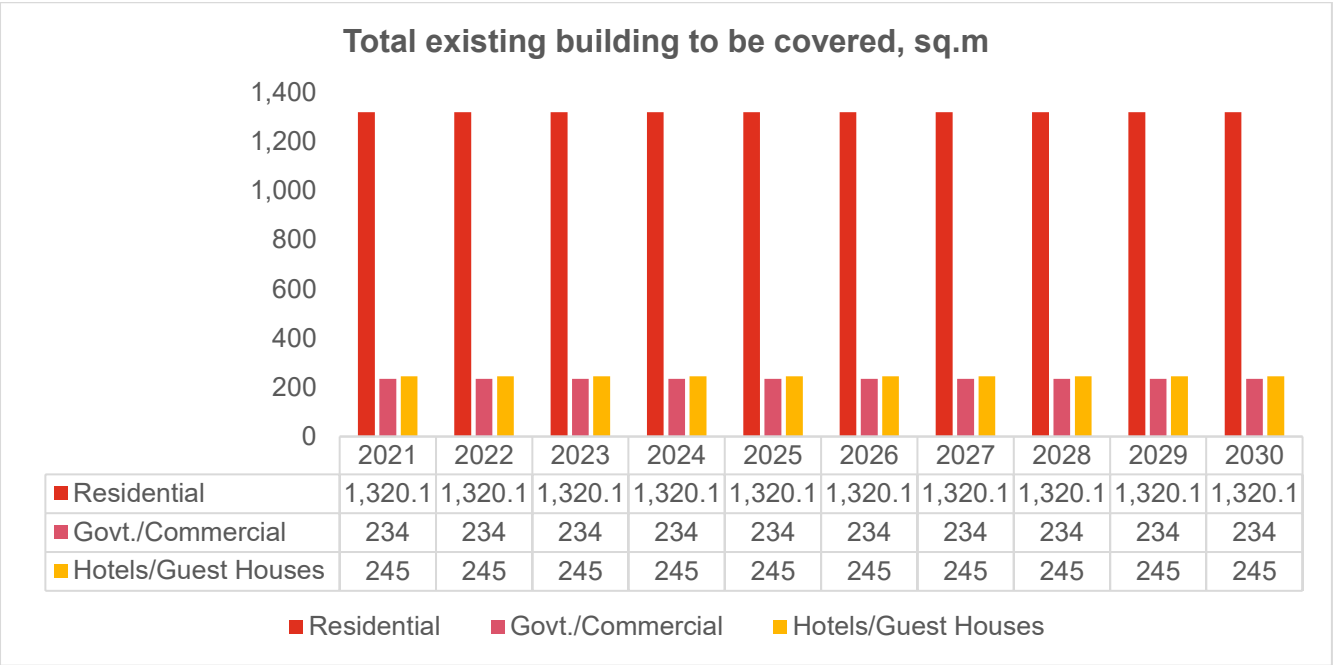
Costs

To realise the potential under this model, the total buildings to be targeted between 2021 to 2030 under new and existing buildings are provided below:



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential	6,252	7,294	8,336	9,378	10,420	11,461	12,503	13,545	14,587	15,629
Govt./Commercial	1,419	1,656	1,893	2,129	2,366	2,602	2,839	3,075	3,312	3,548
Hotels/Guest Houses	1,718	2,004	2,290	2,577	2,863	3,149	3,436	3,722	4,008	4,294

Figure 5: New building stock to be covered under the energy efficiency revolving fund model



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Residential	1,320.1	1,320.1	1,320.1	1,320.1	1,320.1	1,320.1	1,320.1	1,320.1	1,320.1	1,320.1
Govt./Commercial	234	234	234	234	234	234	234	234	234	234
Hotels/Guest Houses	245	245	245	245	245	245	245	245	245	245

Figure 6: Existing building stock to be covered under the energy efficiency revolving fund

To ensure energy efficient technology penetration across the above building typologies as a result of this model, the investments shall be required to offset the incremental price of EE technologies in Maldives which are comparable to costs to be incurred by the financial programme. The programme cost for new buildings is estimated to be 82,714 million MVR for optimal case and 362,949 million MVR for best case solutions. Similarly, the programme cost for existing buildings is estimated to be 5,982 million MVR for optimal case and 27,808

million MVR for best case solutions. The detailed breakup of annual investment requirement for new and existing buildings under revolving fund model are provided below[2]:

Table 3: Total investment required for new buildings under the energy efficiency revolving fund model

Year	Residential		Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	1,517	5,144	1,051	3,629	2,158	11,967
2022	1,770	6,001	1,227	4,234	2,518	13,961
2023	2,023	6,859	1,402	4,839	2,877	15,956
2024	2,275	7,716	1,577	5,443	3,237	17,950
2025	2,528	8,573	1,752	6,048	3,597	19,945
2026	2,781	9,431	1,928	6,653	3,957	21,939
2027	3,034	10,288	2,103	7,258	4,316	23,934
2028	3,287	11,145	2,278	7,863	4,676	25,928
2029	3,540	12,003	2,453	8,468	5,036	27,923
2030	3,792	12,860	2,629	9,072	5,395	29,917
Total investment (million MVR)	**26,547**	**90,020**	**18,400**	**63,506**	**37,767**	**209,422**

Table 4: Total investment required for existing buildings under the energy efficiency revolving fund model

Year	Residential		Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	116	472	174	599	308	1,710
2022	116	472	174	599	308	1,710
2023	116	472	174	599	308	1,710
2024	116	472	174	599	308	1,710
2025	116	472	174	599	308	1,710
2026	116	472	174	599	308	1,710
2027	116	472	174	599	308	1,710
2028	116	472	174	599	308	1,710
2029	116	472	174	599	308	1,710
2030	116	472	174	599	308	1,710
Total investment (million MVR)	**1,162**	**4,717**	**1736**	**5993**	**3,083**	**17,097**

[2] To estimate the investment cost for optimal and best case solutions across building typologies, technology specific costing per sq.m was estimated under the EE building guidelines study. The same cost was applied to the building stock to estimate the overall investment requirement. The details of the cost per technology under optimal and best cases are provided in the report on financial strategy.

Implementation Organisations – Roles and Responsibilities

The stakeholders involved in the programme implementation under this model would be the grant provider, financier, programme manager, facilitator, beneficiaries, policy makers and regulators. In addition, the financial institution would need to be empanelled by the nodal agency to operationalize the business model. The proposed role and responsibilities of the various stakeholders are detailed in the table below.

Table 5: Roles and responsibilities of key actors in the energy efficiency revolving fund model

Actors	Role	Responsibility
Multilateral donor agencies	Technical Assistance and Financing	• MOU with Ministry of Environment, Climate Change and Technology / Ministry of Finance and empaneled Banks / FIs • Disbursement of concessional credit towards EE Revolving Fund • Provide technical assistance to the Nodal Agency (NA) - Ministry of Environment, Climate Change and Technology and banks/FIs for design and operationalization of EE Revolving Fund and Concessional Loan Programme • Support banks/FIs through TA in assessing the technical eligibility of the loan application
Ministry of Environment, Climate Change and Technology / Ministry of Finance	Nodal Agencies for the implementation of revolving fund	• Facilitate selection of banks/FIs for creation of the financing facility • Empanelment of local FIs • Developing and maintaining list of EE technologies to be financed through the program • Develop reporting framework for revolving fund and concessional loan program • Create outreach platform to disseminate information on financial programme
FIs / Banks (Financing Institutions)	Intermediary Banks & Executing Agency (Empanelled by the NA)	• Responsible for design and operationalization of revolving fund, concessional loan program and any additional credit enhancement mechanisms • Availing co-finance for the revolving fund through collaboration with international development agencies • Empanelment of EE technology suppliers (vendors / ESCOs / Retail Chains / etc.) through market assessment and technical due diligence • Set up mechanisms for M&V of the EE sub-projects financed by the Revolving fund • Maintain records of funds disbursed and EE appliances purchased
EE Technology Supplier	Technology supplier	• Maintain approved list of EE technology by coordinating with Banks/FIs from time to time • Facilitate consumers for filing loan application with empaneled FIs/Banks • Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired

Actors	Role	Responsibility
		product quality and energy performance levels as laid out in the empanelment criteria

Model 2: Energy Efficient Housing Loan for Residential Buildings

Outline

In this model an agreed list of EE technologies and their energy efficiency levels as per the EE guidelines are pre-approved for lending by the banks/FIs. The financial institutions provide lending to borrowers based on the evaluation of the project's design documents and bill of quantities (BOQ) which can clearly indicate the preferred choice of EE interventions to be purchased meeting the pre-approved lending criteria. To ascertain the benefits associated with the EE interventions, the borrower or the banks/FIs have the liberty to appoint an accredited/approved energy assessor empanelled by the Ministry of Environment, Climate Change and Technology. The assessor is required to provide a report on the proposed EE interventions and the potential/achieved energy savings and GHG reductions in line with the EE guidelines. The banks/FIs can follow a standard lending procedure in assessing credit and conduct due diligence with the pre-approved EE technology list in place. These will be concessional loan based instruments for promotion of energy efficient buildings in Maldives. There can exist a number of stakeholders in operating such a model depending on the financial strategy. Accordingly, the roles and responsibilities of each actor in the operational value chain of the instrument can be defined. The framework intends to standardize environmentally friendly lending by clarifying principles on the use of funds, the process of evaluation and selection of EE interventions, the management of funds, and reporting.

In addition, the model will aim to address the issue of higher cost of EE interventions by offsetting the cost through concessional loan as compared to conventional financing. The details of the business model showcasing the flow of funds, and the lending process is presented in this section.

In this model the borrower will approach the partner bank for issuance of borrowing request for EE building construction / retrofit. The Partner bank will process the request post due diligence and offer the concessional loan product to offset upfront cost of EE intervention in comparison to conventional financing. Post disbursement of loan at agreed terms, the borrower will repay the loan in equated monthly installments (EMI) during the agreed loan period with interest. The business model and the flow of funds are illustrated in the figures below.

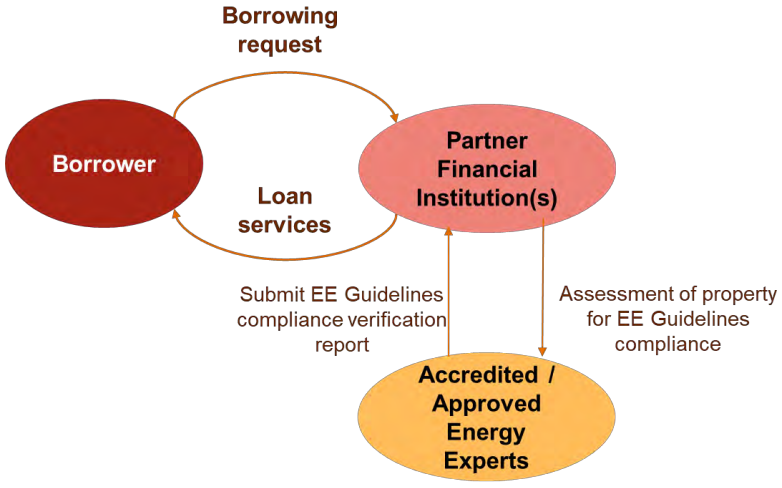


Figure 7: Overview of the business model for energy efficient housing loan

The flow of funds is illustrated below:

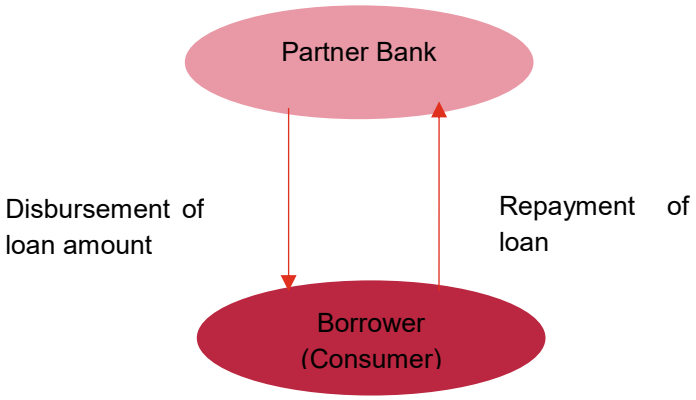
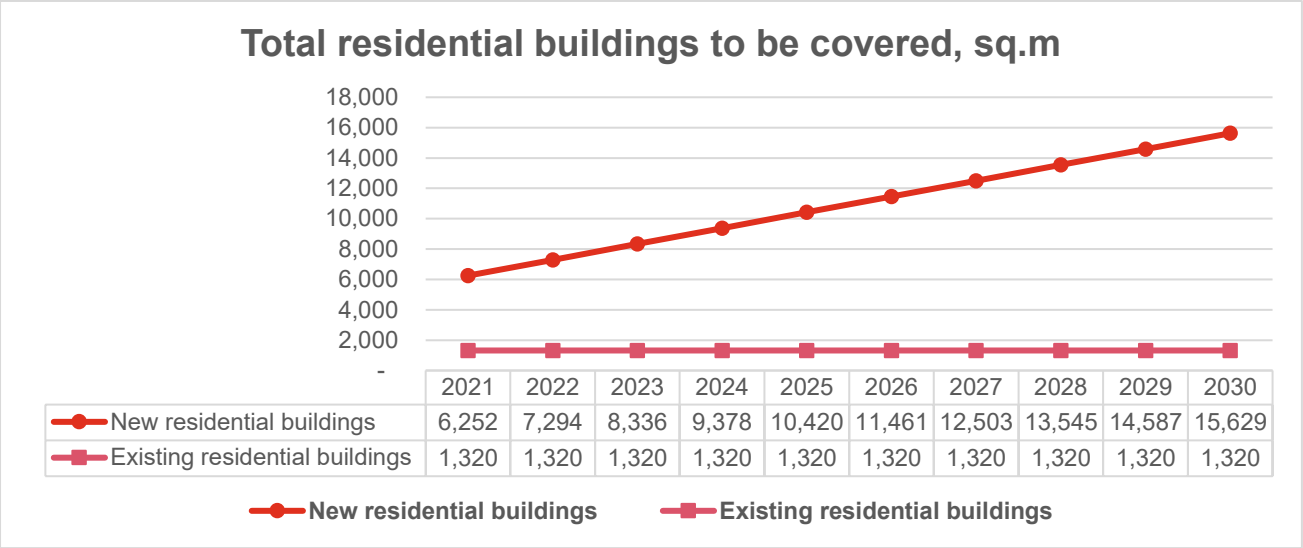


Figure 8: Flow of funds under the energy efficient housing loan model

Costs

To realise the potential under this model, the total new and existing residential buildings to be targeted between 2021 to 2030 are provided below:



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
New residential buildings	6,252	7,294	8,336	9,378	10,420	11,461	12,503	13,545	14,587	15,629
Existing residential buildings	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320	1,320

Figure 9: New and existing building stock to be covered under the energy efficient housing loan model

To ensure energy efficient technology penetration across the above building typologies as a result of this model, the investments shall be required to offset the incremental price of EE technologies in Maldives which are comparable to costs to be incurred by the financial programme. The programme cost for new residential buildings is estimated to be 26,547 million MVR for optimal case and 90,020 million MVR for best case solutions. Similarly, the programme cost for existing residential buildings is estimated to be 1,074 million MVR for optimal case and 3,232 million MVR for best case solutions. The detailed breakup of annual investment requirement for new and existing residential buildings under the housing loan model are provided below:

Table 6: Total investment required for new and existing residential buildings under the energy efficient housing loan model

Year	New Buildings		Existing buildings	
	Optimal	Best	Optimal	Best
2021	1,517	5,144	107	323
2022	1,770	6,001	107	323
2023	2,023	6,859	107	323
2024	2,275	7,716	107	323
2025	2,528	8,573	107	323
2026	2,781	9,431	107	323
2027	3,034	10,288	107	323
2028	3,287	11,145	107	323
2029	3,540	12,003	107	323
2030	3,792	12,860	107	323
Total investment (million MVR)	**26,547**	**90,020**	**1,074**	**3,232**

Implementation Organisations – Roles and Responsibilities

The stakeholders involved in the programme implementation under this model would be the ministry, financial institutions, technology supplier and energy assessor. In addition, the financial institution and energy assessor would need to be empanelled by the nodal agency to operationalize the business model. The proposed role and responsibilities of the various stakeholders are detailed in the table below.

Table 7: Roles and responsibilities of key actors in the energy efficient housing loan model

Actors	Role	Responsibility
Ministry of Environment, Climate Change and Technology and Ministry of Finance	Nodal Agency for the implementation of housing loan	• Facilitate selection of banks/FIs for creation of the loan facility • Empanelment of local FIs • Developing and maintaining list of EE technologies to be financed through the program • Develop reporting framework for the concessional loan program • Create outreach platform to disseminate information on financial programme
FIs / Banks (Financing Institutions)	Intermediary Banks & Executing Agency (Empanelled by the NA)	• Responsible for design and operationalization of the concessional loan program • Availing co-finance for the programme through collaboration with international development agencies • Empanelment of EE technology suppliers (vendors / ESCOs / Retail Chains / etc.) through market assessment and technical due diligence • Set up mechanisms for M&V of the EE loans financed

Actors	Role	Responsibility
		• Maintain records of funds disbursed and EE technologies purchased
EE Technology Supplier	Technology supplier	• Maintain approved list of EE technology by coordinating with Banks/FIs from time to time • Facilitate consumers for filing loan application with empaneled FIs/Banks • Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria
Energy Assessor	M&V body (individual / firm)	• Work with the bank/FIs and conduct verification of the energy savings prior to sanctioning of the loans • Provide verification reports as per international M&V guidelines

Model 3: Sovereign Lending for Govt./Commercial Buildings

Outline

In this model multilateral donor agencies together with co-financers offer sovereign lending to government to finance energy efficient building and building retrofit projects across govt./commercial sector. The lending could cover all energy efficient technologies identified under the EE guidelines thereby providing an attractive model for the public sector to scale up energy efficiency initiatives. The Ministry of Environment, Climate Change and Technology will serve as the nodal agency for appraising the EE building project(s) identified by the local government / districts in Maldives. Upon approval of the EE building project(s) funds are disbursed to the district administration for procurement of EE technologies through a robust and transparent procurement process (tendering for EE procurement, selection of vendors and supervision of EE installation and commissioning). The district administration together with the oversight of the nodal agency shall identify the EE service provider through competitive bidding process. Upon completion of services the district administration shall repay the loan based on energy cost savings which is further repaid to the multilateral donor agency and co-financers. The overview of the model and its functionalities are provided in the figure below:

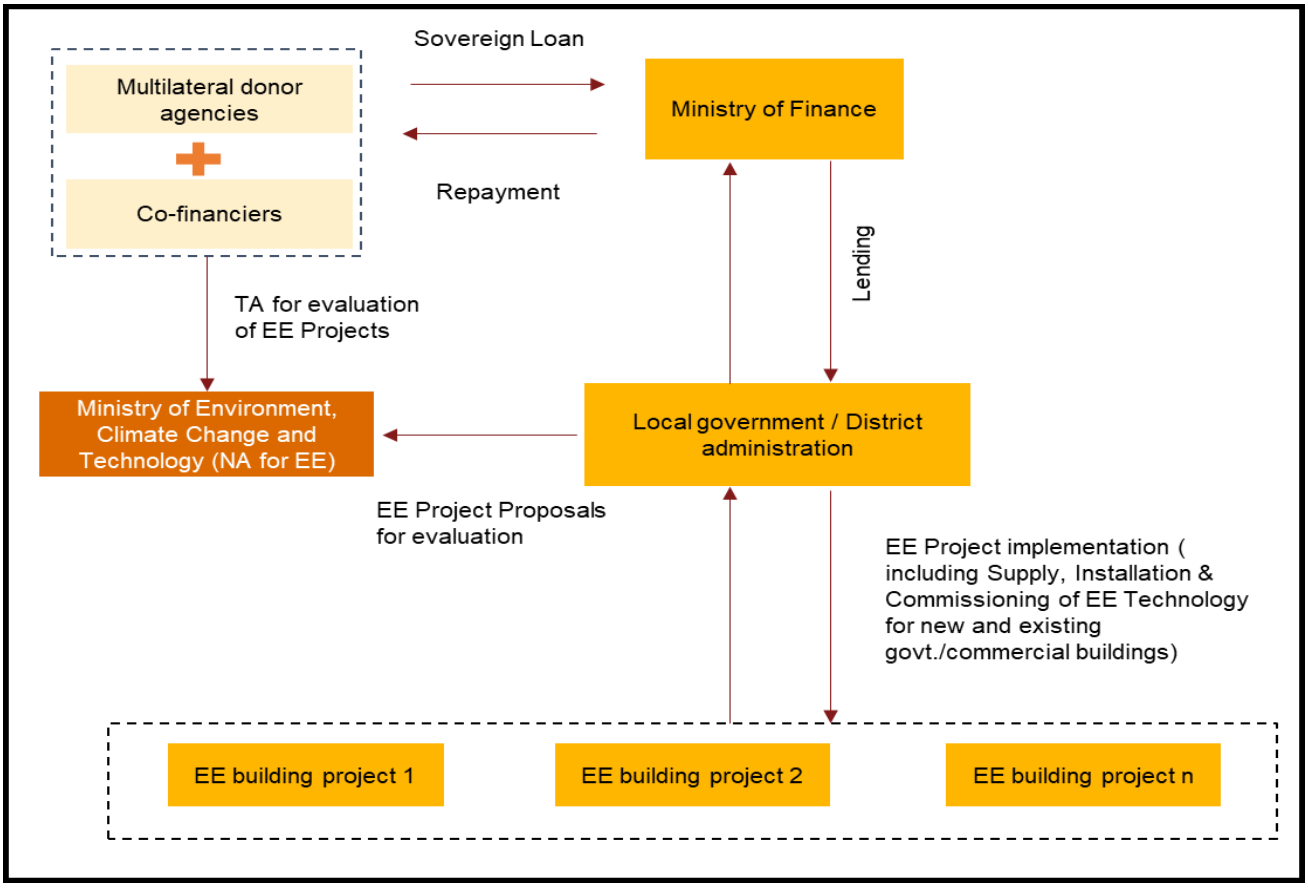
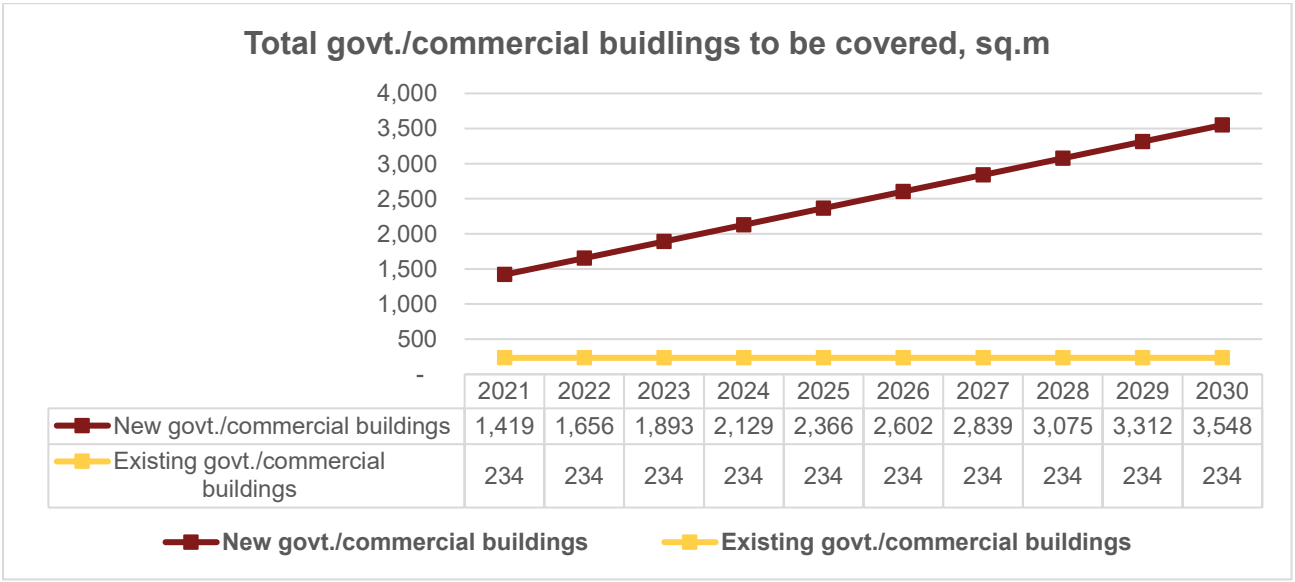


Figure 10: Overview of the business model for sovereign lending model

Costs

To realise the potential under this model, the total new and existing govt./commercial buildings to be targeted between 2021 to 2030 are provided below:



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
New govt./commercial buildings	1,419	1,656	1,893	2,129	2,366	2,602	2,839	3,075	3,312	3,548
Existing govt./commercial buildings	234	234	234	234	234	234	234	234	234	234

Figure 11: New and existing building stock to be covered under the sovereign lending model

To ensure energy efficient technology penetration across the above building typologies as a result of this model, the investments shall be required to offset the incremental price of EE technologies in Maldives which are comparable to costs to be incurred by the financial programme. The programme cost for new govt./commercial buildings is estimated to be 18,400 million MVR for optimal case and 63,506 million MVR for best case solutions. Similarly, the programme cost for existing govt./commercial buildings is estimated to be 1,736 million MVR for optimal case and 5,993 million MVR for best case solutions. The detailed breakup of annual investment requirement for new and existing govt./commercial buildings under the sovereign lending model are provided below:

Table 8: Total investment required for new and existing govt./commercial buildings under the sovereign lending model

Year	New Buildings		Existing buildings	
	Optimal	Best	Optimal	Best
2021	1,051	3,629	174	599
2022	1,227	4,234	174	599
2023	1,402	4,839	174	599
2024	1,577	5,443	174	599
2025	1,752	6,048	174	599
2026	1,928	6,653	174	599
2027	2,103	7,258	174	599
2028	2,278	7,863	174	599
2029	2,453	8,468	174	599
2030	2,629	9,072	174	599
Total investment (million MVR)	**18,400**	**63,506**	**1,736**	**5,993**

Implementation Organisations – Roles and Responsibilities

The stakeholders involved in the programme implementation under this model would be the donor agency and co-financer, nodal agency / ministry, and local government / district administration. The proposed role and responsibilities of the various stakeholders are detailed in the table below.

Table 9: Roles and responsibilities of key actors in the sovereign lending model

Actors	Role	Responsibility
Multilateral donor agencies / co-financer	Technical Assistance and Financing	• Disbursement of sovereign loan • Provide technical assistance to Ministry of Environment, Climate Change and Technology (NA) on 'Evaluation of EE Projects'
Ministry of Environment, Climate Change and Technology / Ministry of Finance	Nodal Agencies for implementation	• Developing and maintaining list of EE technologies to be financed through the programme • Evaluation of EE Project Proposals for Govt./Commercial buildings • Develop reporting framework for sovereign lending programme

Actors	Role	Responsibility
Local Government / District Administration	Executing agency for EE project implementation	• Develop EE project proposals for new and existing govt./commercial buildings • Provide information related to EE sub-project/project monitoring to NA as per the established procedures • Set up mechanisms for M&V of the EE projects financed by sovereign loan facility • Empanelment of EE technology suppliers (vendors / ESCOs / etc.) through market assessment and technical due diligence

Model 4: Energy Efficient Equipment Leasing for Commercial Buildings, Hotels and Guest Houses

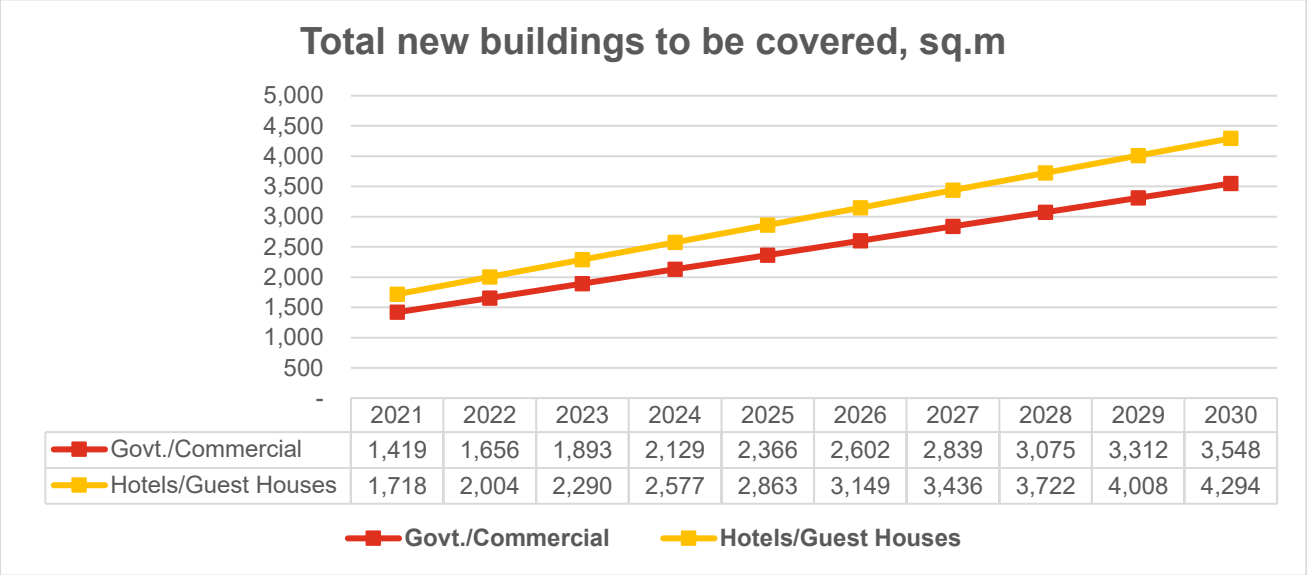
Outline

In this model two parties (lessor and lessee) enter into a lease agreement wherein the lessor requests for the use of an energy efficiency technology asset from the lessee for a specified period of time in exchange for periodical payments. Under this programme two leasing options are applicable – operating lease and financing lease. An operating lease is a rental option where the ownership and all risks associated with the technology remain with the lessor while the technology is returned back by the lessee after the lease term. Payments under this option are considered as operating expenses. Financing lease is similar to a loan facility wherein the technology supplied acts as the collateral for the lessor. The lessor continues to own the technology while the lessee uses the asset for the tenure of the lease agreement with an option to buy the asset towards the end of the contract.

Given this programme is to be implemented at the national level, the Ministry of Environment, Climate Change and Technology would function as the nodal agency overseeing the implementation of the model. The ministry would also conduct due diligence and empanel EE technology suppliers as well as energy assessors. The EE technology suppliers are required to maintain a list of available EE technologies and provide information to the nodal agency in a timely manner. The role of the energy assessor is to conduct measurement & verification of the technology installation at the building site and provide a report as per international guidelines.

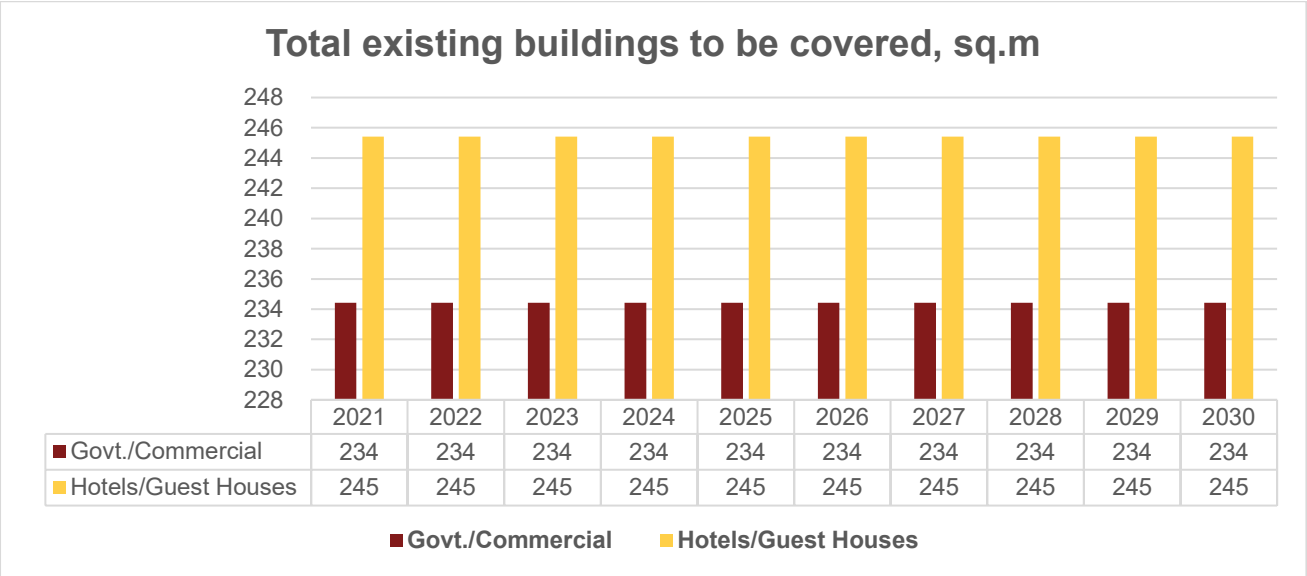
Costs

To realise the potential under this model, the total new and existing commercial buildings, hotels/guest houses to be targeted between 2021 to 2030 are provided in the figures below:



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Govt./Commercial	1,419	1,656	1,893	2,129	2,366	2,602	2,839	3,075	3,312	3,548
Hotels/Guest Houses	1,718	2,004	2,290	2,577	2,863	3,149	3,436	3,722	4,008	4,294

Figure 12: New building stock to be covered under the equipment lease model



	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Govt./Commercial	234	234	234	234	234	234	234	234	234	234
Hotels/Guest Houses	245	245	245	245	245	245	245	245	245	245

Figure 13: Existing building stock to be covered under the equipment lease model

To ensure energy efficient technology penetration across the above building typologies as a result of this model, the investments shall be required to offset the incremental price of EE technologies in Maldives which are comparable to costs to be incurred by the financial programme. The programme cost for new govt./commercial buildings and hotels/guest houses is estimated to be 56,167 million MVR for optimal case and 272,929 million MVR for best case solutions. Similarly, the programme cost for existing govt./commercial buildings and hotels/guest houses is estimated to be 4,820 million MVR for optimal case and 23,090 million MVR for best case solutions. The detailed breakup of annual investment requirement for new and existing govt./commercial buildings and hotels/guest houses buildings under the equipment leasing model are provided below:

Table 10: Total investment required for new govt./commercial buildings under the equipment leasing model

Year	Govt./Commercial	Hotels/Guest Houses

	Optimal	Best	Optimal	Best
2021	1,051	3,629	2,158	11,967
2022	1,227	4,234	2,518	13,961
2023	1,402	4,839	2,877	15,956
2024	1,577	5,443	3,237	17,950
2025	1,752	6,048	3,597	19,945
2026	1,928	6,653	3,957	21,939
2027	2,103	7,258	4,316	23,934
2028	2,278	7,863	4,676	25,928
2029	2,453	8,468	5,036	27,923
2030	2,629	9,072	5,395	29,917
Total investment (million MVR)	**18,400**	**63,506**	**37,767**	**209,422**

Table 11: Total investment required for existing govt./commercial buildings under the equipment leasing model

Year	Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best
2021	174	599	308	1,710
2022	174	599	308	1,710
2023	174	599	308	1,710
2024	174	599	308	1,710
2025	174	599	308	1,710
2026	174	599	308	1,710
2027	174	599	308	1,710
2028	174	599	308	1,710
2029	174	599	308	1,710
2030	174	599	308	1,710
Total investment (million MVR)	**1,736**	**5,993**	**3,083**	**17,097**

Implementation Organisations – Roles and Responsibilities

The stakeholders involved in the programme implementation under this model would be the donor agency and co-financer, nodal agency / ministry, and local government / district administration. The proposed role and responsibilities of the various stakeholders are detailed in the table below.

Table 12: Roles and responsibilities of key actors in the equipment leasing model

Actors	Role	Responsibility
Ministry of Environment,	Nodal Agency for implementation	• Developing and maintaining list of EE technologies to be financed through the programme

Actors	Role	Responsibility
Climate Change and Technology		• Empanelment of EE technology suppliers and energy assessors • Develop reporting framework for the programme
EE Technology Supplier	Technology supplier	• Maintain approved list of EE technology by coordinating with the nodal agency • Provide leasing of the technology as per the requirement of the lessee • Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria
Energy Assessor	M&V body (individual / firm)	• Work with the nodal agency and conduct verification of the energy savings at the lessee site • Provide verification reports as per international M&V guidelines

Elements of Financing Programme

The following are proposed to be the elements of the financial programme applicable for both new and existing buildings.

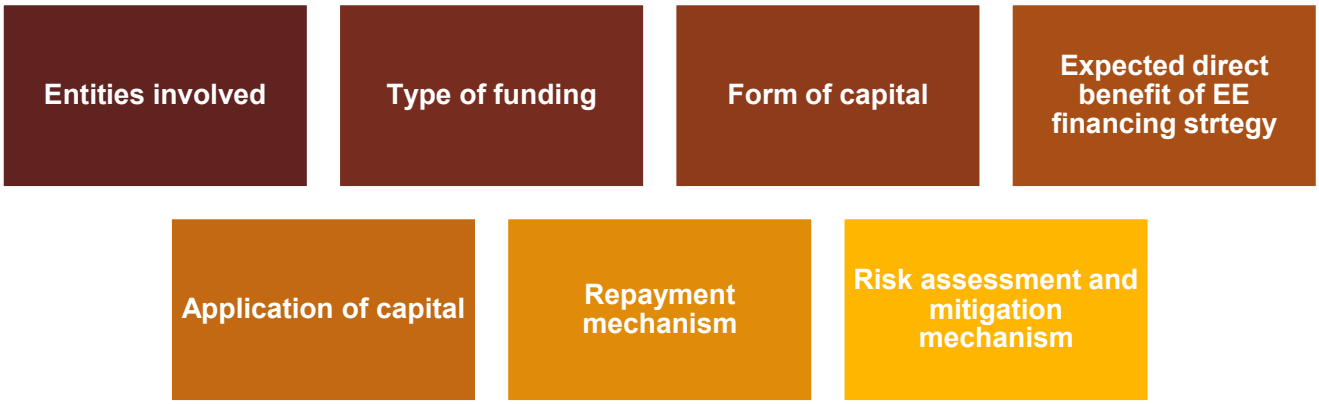


Figure 14: Elements of financial programme

The detailed outline of these attributes in the context of energy efficient buildings and building retrofits has been provided in the table below.

Table 13: Applicability of financial programme elements in Maldives

Strategy Element	Description	Remark
Stakeholders/ entities involved	This attribute describes the primary stakeholders involved in the various stages of the programme implementation. These entities can be sub categorised into four: a. **Grant Provider**: Initial Grant to support the mobilization of financial programme for	a. *Financial Institutions* to be the **financiers** as well as the **service providers.** b. The programme can start with one FI to test the implementation and in due

Strategy Element	Description	Remark
	specific business models and to support financiers in operating the same. b. **The Financier**: The financier in any instrument would be the entity, which directly provides the fund required for the successful implementation of the instrument. The instrument might be self-financed, or require no external source of financing, or the instrument might also require government support. c. **The Programme Manager / Service Provider:** A programme manager would be an entity, which performs all the operations required for the successful implementation of the programme. Involvement of a programme manager would be imperative in case the implementation phase requires a complex operation procedure. d. **The Beneficiary:** The beneficiary would be an entity, which receives the direct benefits of the EE financing instrument. This would be an entity, the benefit of whom the instrument focusses on. The beneficiary can be the end user or the customer, and the ESCO or the service provider in certain cases. e. **Policy makers and regulators**: To ascertain the financial programme is within the existing financial and legal framework, and to review the framework for accommodation of new and upcoming business models, if required. f. **Facilitator**: The one who will facilitate the finance (EMI/loan) processing between the consumer and the FI. g. **Technology Supplier**: To provide state-of-the-art energy efficient technologies as listed in the EE guidelines along with the performance levels required to achieve the desired energy savings h. **Accredited / Approved Energy Experts**: To ascertain whether the EE interventions are able to generate the desired energy savings and GHG reductions, the financier is provided with an option to appoint energy experts who are certified by the Ministry of Environment. For new buildings, the experts would be involved in the design and post-construction phase. In the design phase, their role would be checking the design features of EE	course other FIs can be included based on the model selected. c. *Residential, Government, Commercial building owners* complying with EE guidelines will be beneficiaries under the financing programme. d. *Government and Commercial building owners* complying with EE guidelines will be the beneficiaries under the financial programme. e. *Ministry of Environment, Climate Change and Technology* to be the policy maker and regulator for the financial programme for energy efficient buildings and building retrofits in compliance with the EE guidelines. f. *Facilitator*: For all kinds of buildings, there may or may not have a pre-approved list of vendors for EE technology measures covered along with some basic minimum eligibility criteria. g. *Technology Supplier*: Ministry of Environment, Climate Change and Technology to design a registration scheme for EE technology suppliers. A public database of registered suppliers can be created and updated periodically, and this can be utilised for any model recommended under this programme. h. *Assessors*: Ministry of Environment, Climate Change and Technology to design a registration scheme for energy experts. A public database of registered assessors can be created and updated periodically.

Strategy Element	Description	Remark
	interventions whereas post-construction they would undertake verification of the actual GHG reductions after commissioning. For existing buildings, their role would be checking the EE technology specification and undertake verification post commissioning.	
Type of funding	This attribute would consider whether the capital required for the instrument is provided in the form of debt, or equity or a mixture of both.	Concessional loan under model 1, 2 and 3 for procurement of EE technology
Form of capital	This attribute would represent the financial stake in the instrument held by the financier for the capital provided by them. This can be in the form of common shares, preference shares, long-term loans, mezzanine debt, etc.	Short loans for retrofits where the consumer will pay back the loan amount to bank subsequently over the loan period of 3 – 5 years at an agreed interest rate. Medium to long-term loans for new buildings where the consumer will pay back the loan amount to bank subsequently over the loan period of 8-10 years at an agreed interest rate.
Instrument Objective / Expected Direct Benefits in EE investment	This attribute would entail the direct or the first benefit due to the investment made by the programme manager. This may be defined as the first objective the instrument seeks to achieve by the application of funds. A top-down approach is usually adopted for forecasting such impact and setting targets.	The benefits will be in terms of GHG emission reduction and cost savings as a result of savings in electricity consumption. The forecasted benefits are elaborated in **Section D.**
Primary Repayment Mechanism (between end user and service provider)	After investment made for the EE measure, the beneficiary is expected to repay the financier for the benefits enjoyed by them. Primary payment mechanism defines the financial agreement for repayment between the beneficiary and the service provider (or programme manager). This attribute has been further sub-divided into two components: a. Whether transferable: This refers to the clause when the repayment liability of the end user or the beneficiary is transferable to another entity, without any change in the payment terms. b. Modes of Repayment: This defines the mode of repayment by the end user to the service provider for the EE investment.	Equated monthly instalment (EMI) as per applicable interest rates over an agreed period and after consideration of concession. In case of equipment lease model, repayment is in the form of the equipment that is leased by the lessor.
Risk Assessment and Mitigation	This attribute describes the step to identify any potential risks a customer is prone to while accepting this financing programme. If there are any risks identified, the strategy to mitigation the same	KYC process followed with Bank's Credit Evaluation check, Application of Risk Mitigation Instruments such as guarantees, appliance minimum warranty, post-

Strategy Element	Description	Remark
	is to be present in the working model of the instrument.	dated cheque based payment, direct salary deduction based repayment mechanism. These are further described in Section C.

C. Risk Management

Overview of typical risks and control measures adopted

In most cases, Banks in Maldives rely on the below methods for risk mitigation purposes:

1. Debt Service Coverage Ratio (DSCR) - Banks generally require the Debt Service Coverage Ratio (DSCR) to be above 1.5 times. This requirement imposes restrictions early-stage projects as profitability improves progressively over time.
2. The equity requirements of typically 30% of the proposed funding is another risk control measure imposed by banks in Maldives.
3. Except in case of Government projects, the banks require perfection of collateral in the form of an immovable asset. Other properties like vessels and vehicles are not considered as primary collateral although ownership of these assets contribute to the credit approval process. The acceptable assets are restricted to property in Male City. The security cover ranges from 150%-133% of the loan taken, unless there is a government guarantee.
4. Another risk mitigation measure taken by Banks is the mandatory insurance cover requirement for the collateral during the tenure of the loan.

There are several other risk mitigation measures which are undertaken by the banks, which include:

- Building construction permit
- Title registration certificate
- Mortgage registration with City Council
- Mortgage registration with Court
- Tax clearance statement from the Maldives Inland Revenue Authority (MIRA)
- Third party valuation of the collateral

Typical risk mitigation steps to be followed

Banks require at least three years of business history, submission of audited financial statements and business plans for the project. Apart from documentary verifications and DSCR and SC and equity requirements, banks imposed the following to mitigate risks.

- Personal guarantees from the shareholders
- All proceeds on the project to deposited to the bank
- Progress payments and verification of work done
- Restrictions on further borrowing
- Restrictions on dividend distributions
- Restrictions on sale of assets
- Restrictions on related-party transactions
- Disclosure of information that may impact the future earning of the business and finances
- Single party exposure limits in addition to regulatory requirements
- Additional rights for the bank if there is a default in any other bank or any other facility held by the borrower or any party related to the borrower.

- Rights over all bank accounts of the borrower and other related parties.

D. Programme Benefits

The proposed financing programme is expected to drive the buildings market towards uptake of energy efficient technologies. This can be achieved through the adoption of the recommended models detailed in section B. The project team has analysed the financing requirements/investments over the years across the four models covering selected energy efficient technology measures – shading, wall, roof, glass, lighting, HVAC, and rooftop solar PV. Given the integration of the programme with the EE guidelines, the energy performance index (EPI) was estimated for new and existing buildings for three cases – base, optimal and best. The EPI is a threshold that the building can attain post implementation of EE technology measures to a certain extent. The EPI values for new and existing buildings are provided below:

Table 14: EPI values for various building typologies

EPI- kWh/m^2/year - New Buildings	Base case	Optimal Case	Best Case
Residential	100	50	25
Commercial/Government	150	110	70
Hotels and Guest Houses	300	175	115
EPI- kWh/m^2/year - Existing Buildings	**Base case**	**Optimal Case**	**Best Case**
Residential	100	90	85
Commercial/Government	150	128	113
Hotels and Guest Houses	300	255	225

The project team used the EPI values and targeted building stock to estimate the potential energy savings and greenhouse gas (GHG) emissions reductions that can be achieved through the programme.

Projected energy savings and GHG emissions reductions

Model 1: Energy Efficiency Revolving Fund with Concessional Loan for Residential and Commercial Buildings and Hotels/Guest House Buildings

The financial programme through this model is expected to reduce energy consumption of new buildings between 48,187 MWh to 74,268 MWh and 1,624 MWh to 2,585 MWh in the case of existing buildings by 2030. Further, the potential GHG emissions reduction from new buildings is estimated to be around 35,610 tCO_2e to 54,884 tCO_2e and 1,200 tCO_2e to 1,910 tCO_2e in the case of existing buildings by 2030. In addition, the programme can also lead to energy cost savings amounting to 11.9 million USD to 18.4 million USD in new buildings and 0.4 million USD to 0.7 million USD across existing buildings. The annual breakdown of energy savings, GHG emissions reductions and energy cost savings are provided in the tables below.

Table 15: Annual benefits for new buildings in the energy efficiency revolving fund model

Year	Energy Savings (MWh)		GHG Emissions Reduction (tCO_2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	584	900	432	665	0.1	0.2
2022	1,266	1,950	935	1,441	0.3	0.5
2023	2,044	3,151	1,511	2,328	0.5	0.8
2024	2,920	4,501	2,158	3,326	0.7	1.1
2025	3,894	6,001	2,878	4,435	1.0	1.5
2026	4,965	7,652	3,669	5,655	1.2	1.9
2027	6,133	9,452	4,532	6,985	1.5	2.3
2028	7,398	11,403	5,467	8,427	1.8	2.8
2029	8,761	13,503	6,475	9,979	2.2	3.3
2030	10,221	15,754	7,554	11,642	2.5	3.9
Total benefits	**48,187**	**74,268**	**35,610**	**54,884**	**11.9**	**18.4**

Table 16: Annual benefits for existing buildings in the energy efficiency revolving fund model

Year	Energy Savings (MWh)		GHG Emissions Reduction (tCO_2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	30	47	22	35	0.01	0.01
2022	59	94	44	69	0.02	0.02
2023	89	141	65	104	0.02	0.04
2024	118	188	87	139	0.03	0.05
2025	148	235	109	174	0.04	0.06
2026	177	282	131	208	0.05	0.07
2027	207	329	153	243	0.05	0.09
2028	236	376	175	278	0.06	0.10
2029	266	423	196	313	0.07	0.11
2030	295	470	218	347	0.08	0.12
Total benefits	**1,624**	**2,585**	**1,200**	**1,910**	**0.4**	**0.7**

Model 2: Energy Efficient Housing Loan for Residential Buildings

The financial programme through this model is expected to reduce energy consumption of new buildings between 26 MWh to 39 MWh and 0.7 MWh to 1.1 MWh in the case of existing buildings by 2030. Further, the potential GHG emissions reduction from new buildings is estimated to be around 19,058 tCO_2e to 28,586 tCO_2e and 537 tCO_2e to 805 tCO_2e in the case of existing buildings by 2030. In addition, the programme can also lead to energy cost savings amounting to 4.8 million USD to 7.2 million USD in new buildings and 0.1 million USD to 0.2 million USD across existing buildings. The annual breakdown of energy savings, GHG emissions reductions and energy cost savings are provided in the tables below.

Table 17: Annual benefits for new buildings in the energy efficient housing loan model

Year	Energy Savings (MWh)		GHG Emissions Reduction (tCO_2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	0.31	0.47	231	347	0.06	0.09
2022	0.68	1.02	501	751	0.13	0.19
2023	1.09	1.64	809	1,213	0.20	0.31
2024	1.56	2.34	1,155	1,733	0.29	0.44
2025	2.08	3.13	1,540	2,310	0.39	0.58
2026	2.66	3.99	1,964	2,945	0.50	0.74
2027	3.28	4.92	2,426	3,638	0.61	0.92
2028	3.96	5.94	2,926	4,389	0.74	1.11
2029	4.69	7.03	3,465	5,198	0.88	1.31
2030	5.47	8.21	4,043	6,064	1.02	1.53
Total benefits	**26**	**39**	**19,058**	**28,586**	**4.8**	**7.2**

Table 18: Annual benefits for existing buildings in the energy efficient housing loan model

Year	Energy Savings (MWh)		GHG Emissions Reduction (tCO2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	0.01	0.02	10	15	0.00	0.00
2022	0.03	0.04	20	29	0.00	0.01
2023	0.04	0.06	29	44	0.01	0.01
2024	0.05	0.08	39	59	0.01	0.01
2025	0.07	0.10	49	73	0.01	0.02
2026	0.08	0.12	59	88	0.01	0.02
2027	0.09	0.14	68	102	0.02	0.03
2028	0.11	0.16	78	117	0.02	0.03
2029	0.12	0.18	88	132	0.02	0.03
2030	0	0	98	146	0.02	0.04
Total benefits	**0.7**	**1.1**	**537**	**805**	**0.1**	**0.2**

Model 3: Sovereign Lending for Govt./Commercial Buildings

The financial programme through this model is expected to reduce energy consumption of new buildings between 5 MWh to 9 MWh and 0.3 MWh to 0.5 MWh in the case of existing buildings by 2030. Further, the potential GHG emissions reduction from new buildings is estimated to be around 3,461 tCO_2e to 6,923 tCO_2e and 214 tCO_2e to 357 tCO_2e in the case of existing buildings by 2030. In addition, the programme can also lead to energy cost savings amounting to 1.3 million USD to 2.7 million USD in new buildings and 0.1 million USD across existing buildings. The annual breakdown of energy savings, GHG emissions reductions and energy cost savings are provided in the tables below.

Table 19: Annual benefits for new buildings in the sovereign lending model

Year	Energy savings (MWh)		GHG Emissions Reduction (tCO2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	0.06	0.11	42	84	0.02	0.03
2022	0.12	0.25	91	182	0.04	0.07
2023	0.20	0.40	147	294	0.06	0.11
2024	0.28	0.57	210	420	0.08	0.16
2025	0.38	0.76	280	559	0.11	0.22
2026	0.48	0.97	357	713	0.14	0.28
2027	0.60	1.19	441	881	0.17	0.34
2028	0.72	1.44	531	1,063	0.21	0.41
2029	0.85	1.70	629	1,259	0.24	0.49
2030	0.99	1.99	734	1,469	0.28	0.57
Total benefits	**5**	**9**	**3,461**	**6,923**	**1.3**	**2.7**

Table 20: Annual benefits for existing buildings in the sovereign lending model

Year	Energy savings (MWh)		GHG Emissions Reduction (tCO2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	0.01	0.01	4	6	0.00	0.00
2022	0.01	0.02	8	13	0.00	0.01
2023	0.02	0.03	12	19	0.00	0.01
2024	0.02	0.04	16	26	0.01	0.01
2025	0.03	0.04	19	32	0.01	0.01
2026	0.03	0.05	23	39	0.01	0.02
2027	0.04	0.06	27	45	0.01	0.02
2028	0.04	0.07	31	52	0.01	0.02
2029	0.05	0.08	35	58	0.01	0.02
2030	0.05	0.09	39	65	0.02	0.03
Total benefits	**0.3**	**0.5**	**214**	**357**	**0.1**	**0.1**

Model 4: Energy Efficient Equipment Leasing for Commercial Buildings, Hotels and Guest Houses

The financial programme through this model is expected to reduce energy consumption of new buildings between 22 MWh to 36 MWh and 0.9 MWh to 1.5 MWh in the case of existing buildings by 2030. Further, the potential GHG emissions reduction from new buildings is estimated to be around 16,552 tCO_2e to 26,298 tCO_2e and 663 tCO_2e to 1,105 tCO_2e in the case of existing buildings by 2030. In addition, the programme can also lead to energy cost savings amounting to 4.7 million USD to 7.6 million USD in new buildings and 0.1 million USD to 0.2 million USD across existing buildings. The annual breakdown of energy savings, GHG emissions reductions and energy cost savings are provided in the tables below.

Table 21: Annual benefits for new buildings in the energy efficient equipment leasing model

Year	Energy savings (MWh)		GHG Emissions Reduction (tCO2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	0.27	0.43	201	319	0.06	0.09
2022	0.59	0.93	435	691	0.12	0.20
2023	0.95	1.51	702	1,116	0.20	0.32
2024	1.36	2.16	1,003	1,594	0.28	0.46
2025	1.81	2.88	1,338	2,125	0.38	0.61
2026	2.31	3.67	1,705	2,709	0.48	0.78
2027	2.85	4.53	2,107	3,347	0.59	0.96
2028	3.44	5.46	2,541	4,038	0.71	1.16
2029	4.07	6.47	3,010	4,781	0.85	1.38
2030	4.75	7.55	3,511	5,578	0.99	1.61
Total benefits	**22**	**36**	**16,552**	**26,298**	**4.7**	**7.6**

Table 22: Annual benefits for existing buildings in the energy efficient equipment leasing model

Year	Energy savings (MWh)		GHG Emissions Reduction (tCO2e)		Energy Cost Savings (million USD)	
	Optimal	Best	Optimal	Best	Optimal	Best
2021	0.02	0.03	12	20	0.00	0.00
2022	0.03	0.05	24	40	0.01	0.01
2023	0.05	0.08	36	60	0.01	0.01
2024	0.07	0.11	48	80	0.01	0.01
2025	0.08	0.14	60	100	0.01	0.02
2026	0.10	0.16	72	121	0.02	0.02
2027	0.11	0.19	84	141	0.02	0.03
2028	0.13	0.22	96	161	0.02	0.03
2029	0.15	0.24	109	181	0.02	0.03
2030	0.16	0.27	121	201	0.03	0.04

Total benefits	**0.9**	**1.5**	**663**	**1,105**	**0.1**	**0.2**

E. Way Forward

The steps to be followed beyond the finalizing of this document are highlighted below:

- Discussion with the Ministry of Environment, Climate Change and Technology on the proposed financial programme
- Finalizing the financial programme
- Conduct stakeholder consultations to validate the draft financial programme, ascertain their roles and seek additional feedback
- Development of implementation workplan in consultation with the Ministry of Environment, Climate Change and Technology

Ministry of Environment, Climate Change and Technology

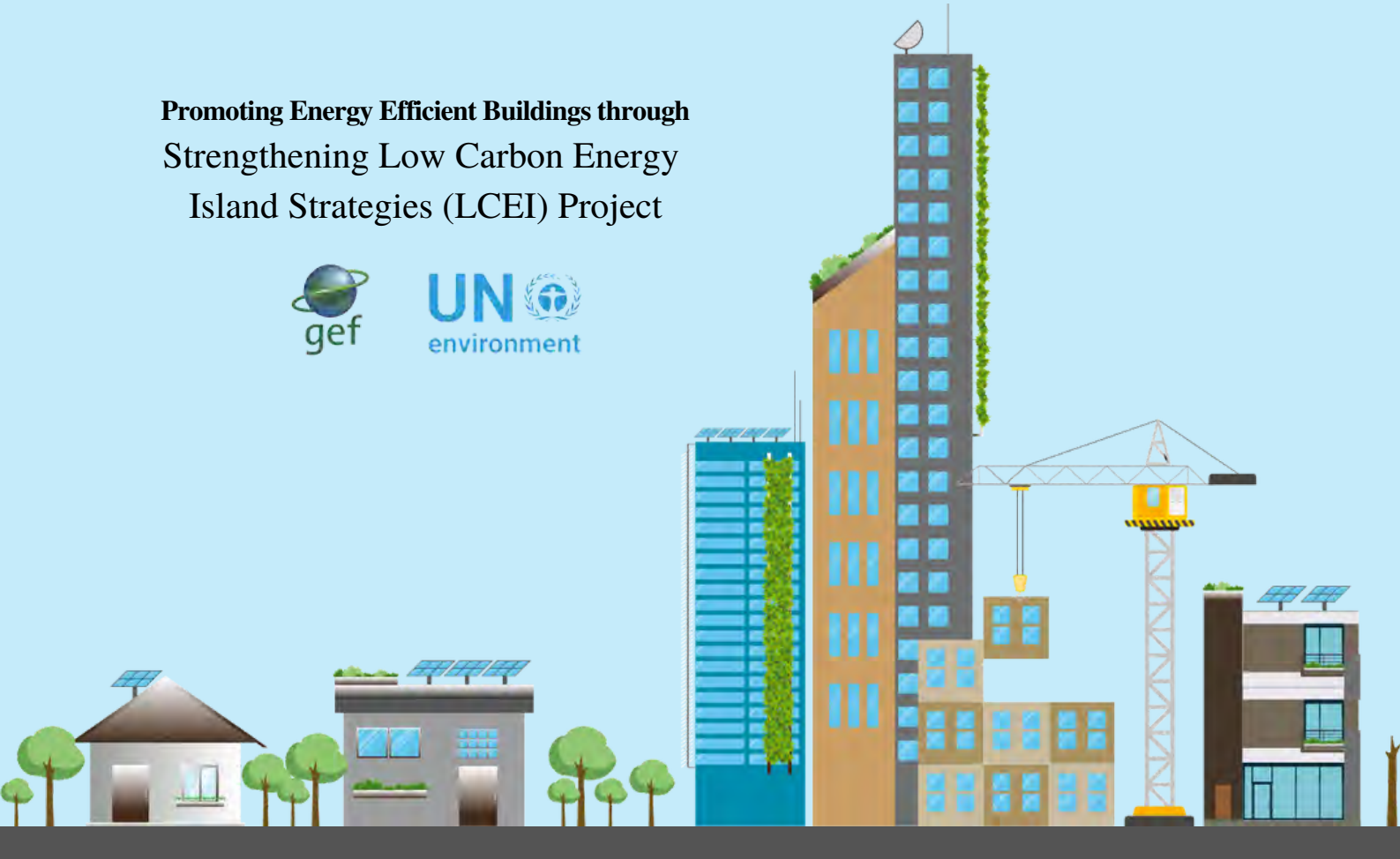
Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits in Maldives

Implementation Plan

Promoting Energy Efficient Buildings through
Strengthening Low Carbon Energy Island Strategies (LCEI) Project

gef

UN environment



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A. Project Description

The programme will finance new and existing government, commercial, residential, hotels and guest house buildings across Maldives to incorporate energy efficiency measures during building construction and retrofits in accordance with the Maldives EE Building guidelines. The programme will be implemented through the following business models: i) energy efficiency revolving fund with concessional loan for residential, commercial, hotels and guest house buildings, ii) energy efficient housing loan for residential buildings, iii) sovereign lending for govt./commercial buildings, and iv) energy efficient equipment leasing for commercial, hotels and guest house buildings. The programme through these models will enhance the uptake of energy efficient technology interventions in new construction and retrofits. This includes the following interventions:

Table 1: List of energy efficiency interventions as per the draft Building Guidelines

S.no	Intervention	Probable Solutions
Building Envelope		
1.	Energy Efficient Wall Material	AAC Blocks, XPS Wall Insulation etc.
2.	Roof Insulation	XPS Insulation, PUF Insulation, Rock Wool, Glass Wool etc.
3.	Cool Roof Finish	Green roof, High SRI Paint etc.
4.	Efficient Glazing	Single glazing with low SHGC, Double Glazing etc.
Thermal Comfort Systems		
5.	Efficient Air Conditioning system	Air/Water Cooled Chiller system with high COP, VRF/VRV
6.	Air Conditioning Controls	Building Energy Management Systems, Occupancy Control, Temperature Control
7.	Smart Building Technologies	Smart Meters, Smart Environmental sensors
8.	Not in-kind cooling solutions	Radiant Cooling, Under Floor Air Distribution system etc.
Artificial Lighting Systems		
9.	Efficient Lighting systems	LED lighting,
10.	Lighting Controls	Occupancy and Daylight sensors, Exterior lighting controls
Plumbing Systems		
11.	Water efficient plumbing fixtures	Low flow flush and flow fixtures- WC's, Urinals, Faucets/Taps, Showers etc
11.	Rainwater harvesting systems	Rainwater harvesting systems
12.	Efficient Pumps	Water Pumps and Booster Pumps
Renewable Energy Systems		
13.	Rooftop Solar systems	Solar panels, Solar Water heating

The impact of the programme will be an expanded market for energy efficient buildings and building retrofits and reduced greenhouse gas (GHG) emissions of the economy, aligned with the Nationally Determined Contributions (NDC) to the United Nations Framework Convention on Climate Change (UNFCCC). The programme's outcome will be increased end-use electricity efficiency in the buildings sector.

B. Implementation Plans

Programme Readiness Activities

Table 2: Programme Readiness Activities

Indicative Activities	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Responsibility
Consultation on the financial programme with stakeholders													Ministry of Environment, Climate Change and Technology
Shortlisting of Participating Entities[1]													Ministry of Environment, Climate Change and Technology and Ministry of Finance
Finalisation of the business model(s)													Ministry of Environment, Climate Change and Technology
Advance Memorandum of Understanding (MoU) actions with participating entities													Ministry of Environment, Climate Change and Technology and FI/Bank
Establish Programme Implementation Arrangements													Ministry of Environment, Climate Change and Technology
Maldives Ministry of Finance approval													Ministry of Finance
MoU signing with participating entities													Ministry of Environment, Climate Change and Technology
Implementation of pilot project													FI/Bank
Programme effectiveness assessment based on pilot project													Ministry of Environment, Climate Change and Technology
Roll-out of the full programme													Ministry of Environment, Climate Change and Technology and FI/Bank

[1] Participating entities refers to financial institutions (FIs)/banks, technology suppliers and energy assessor as required for the recommended business models. Details of the participating entities for different business models are provided in the report 'Draft Financial Programme for Energy Efficient Buildings and Building Retrofits'.

Selection criteria for business model and participating entities

Ministry of Environment, Climate Change and Technology shall ensure that business models and participating entities recommended for the programme are appraised, selected, and approved in accordance with the requirements given below. As applicable, the Ministry, without limiting to these requirements, will ensure that:

- Participating entities
    - will have appropriate mechanisms to request various entities to express interest to partner in the implementation of the programme;
    - will be selected based on evaluation against an appropriate qualification criteria;
    - will be provided an opportunity to provide inputs / recommendations on the business model selection;
- Business model selection
    - will not overlap with existing products of FIs/banks and bilateral / multilateral programmes of funding agencies;
    - seeks inputs of stakeholders from public and private sector in the selection, design and finalisation of the suitable model;
    - will have appropriate provisioning for integration of the Maldives EE building guidelines and proposed list of technology interventions that shall yield the desired energy savings and emissions reduction benefits;
    - will be selected on an economic least cost basis in consultation with the participating entities thereby reflecting robust economic returns expected of energy efficiency investments;

The Project Implementation Unit (PMU) set up within the Ministry of Environment, Climate Change and Technology will reconfirm that selection is based on the above criteria and submit it further to Ministry of Finance for final approval. Ministry of Environment, Climate Change and Technology should develop a system for retention of any documentation that formed the basis for selection of the business model(s) and participating entities for the entire project implementation period for any further review by Ministry of Finance.

C. Programme Management Arrangements

Programme Implementation Organisations – Roles and Responsibilities

Table 3: Roles and responsibilities of organisations in the sovereign lending model

Actors	Role	Responsibility
Multilateral donor agencies / co-financer	Technical Assistance and Financing	• Disbursement of sovereign loan • Provide technical assistance to Ministry of Environment, Climate Change and Technology (NA) on 'Evaluation of EE Projects'
Ministry of Environment, Climate Change and Technology / Ministry of Finance	Nodal Agencies for implementation	• Developing and maintaining list of EE technologies to be financed through the programme • Evaluation of EE Project Proposals for Govt./Commercial buildings • Develop reporting framework for sovereign lending programme
Local Government / District Administration	Executing agency for EE project implementation	• Develop EE project proposals for new and existing govt./commercial buildings • Provide information related to EE sub-project/project monitoring to NA as per the established procedures • Set up mechanisms for M&V of the EE projects financed by sovereign loan facility • Empanelment of EE technology suppliers (vendors / ESCOs / etc.) through market assessment and technical due diligence

Table 4: Roles and responsibilities of organisations in the energy efficiency revolving fund model

Actors	Role	Responsibility
Multilateral donor agencies	Technical Assistance and Financing	• MOU with Ministry of Environment, Climate Change and Technology / Ministry of Finance and empaneled Banks / FIs • Disbursement of concessional credit towards EE Revolving Fund • Provide technical assistance to the Nodal Agency (NA) - Ministry of Environment, Climate Change and Technology and banks/FIs for design and operationalization of EE Revolving Fund and Concessional Loan Programme • Support banks/FIs through TA in assessing the technical eligibility of the loan application
Ministry of Environment, Climate Change and Technology / Ministry of Finance	Nodal Agencies for the implementation of revolving fund	• Facilitate selection of banks/FIs for creation of the financing facility • Empanelment of local FIs • Developing and maintaining list of EE technologies to be financed through the program • Develop reporting framework for revolving fund and concessional loan program

Actors	Role	Responsibility
		• Create outreach platform to disseminate information on financial programme
FIs / Banks (Financing Institutions)	Intermediary Banks & Executing Agency (Empanelled by the NA)	• Responsible for design and operationalization of revolving fund, concessional loan program and any additional credit enhancement mechanisms • Availing co-finance for the revolving fund through collaboration with international development agencies • Empanelment of EE technology suppliers (vendors / ESCOs / Retail Chains / etc.) through market assessment and technical due diligence • Set up mechanisms for M&V of the EE sub-projects financed by the Revolving fund • Maintain records of funds disbursed and EE appliances purchased
EE Technology Supplier	Technology supplier	• Maintain approved list of EE technology by coordinating with Banks/FIs from time to time • Facilitate consumers for filing loan application with empaneled FIs/Banks • Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria

Table 5: Roles and responsibilities of organisations in the energy efficient housing loan model

Actors	Role	Responsibility
Ministry of Environment, Climate Change and Technology and Ministry of Finance	Nodal Agency for the implementation of housing loan	• Facilitate selection of banks/FIs for creation of the loan facility • Empanelment of local FIs • Developing and maintaining list of EE technologies to be financed through the program • Develop reporting framework for the concessional loan program • Create outreach platform to disseminate information on financial programme
FIs / Banks (Financing Institutions)	Intermediary Banks & Executing Agency (Empanelled by the NA)	• Responsible for design and operationalization of the concessional loan program • Availing co-finance for the programme through collaboration with international development agencies • Empanelment of EE technology suppliers (vendors / ESCOs / Retail Chains / etc.) through market assessment and technical due diligence • Set up mechanisms for M&V of the EE loans financed • Maintain records of funds disbursed and EE technologies purchased
EE Technology Supplier	Technology supplier	• Maintain approved list of EE technology by coordinating with Banks/FIs from time to time

Actors	Role	Responsibility
		• Facilitate consumers for filing loan application with empaneled FIs/Banks • Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria
Energy Assessor	M&V body (individual / firm)	• Work with the bank/FIs and conduct verification of the energy savings prior to sanctioning of the loans • Provide verification reports as per international M&V guidelines

Table 6: Roles and responsibilities of organisations in the energy efficient equipment leasing model

Actors	Role	Responsibility
Ministry of Environment, Climate Change and Technology	Nodal Agency for implementation	• Developing and maintaining list of EE technologies to be financed through the programme • Empanelment of EE technology suppliers and energy assessors • Develop reporting framework for the programme
EE Technology Supplier	Technology supplier	• Maintain approved list of EE technology by coordinating with the nodal agency • Provide leasing of the technology as per the requirement of the lessee • Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria
Energy Assessor	M&V body (individual / firm)	• Work with the nodal agency and conduct verification of the energy savings at the lessee site • Provide verification reports as per international M&V guidelines

Programme Organization Structure

Ministry of Environment, Climate Change and Technology will be the executing and implementing agency for the programme.

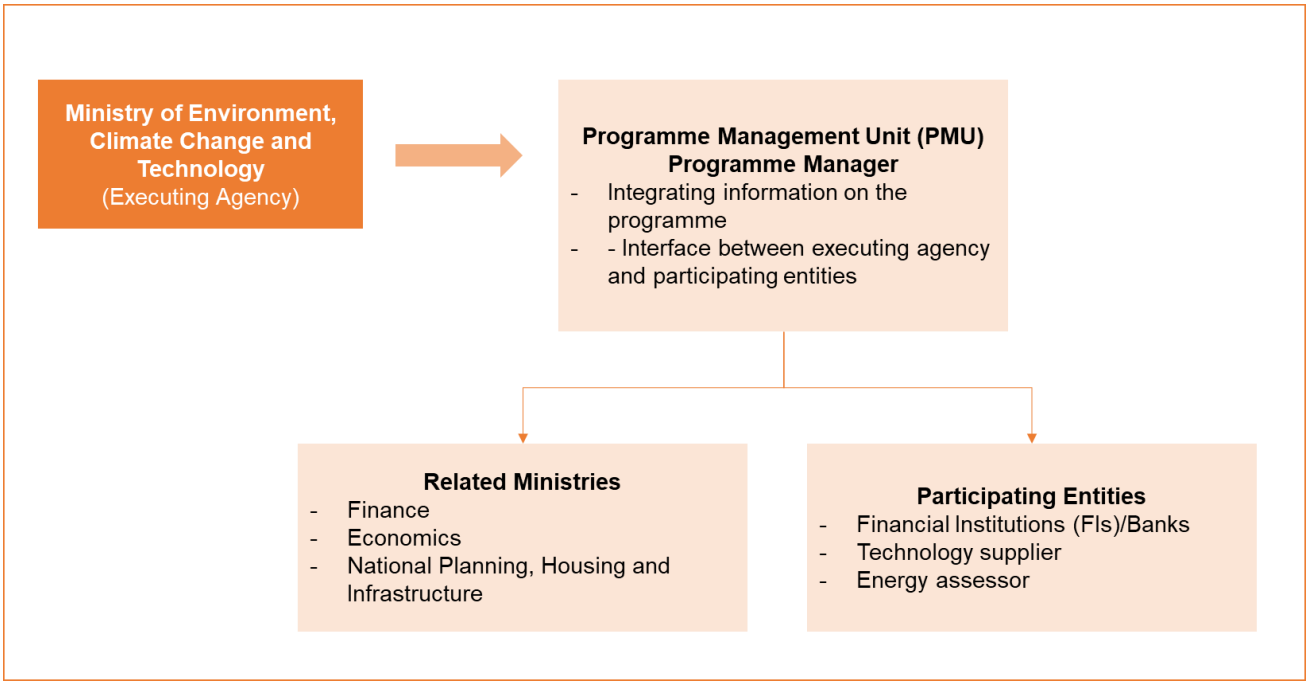

Figure 1: Programme Implementation Structure

D. Financing

The investment required for implementation of the programme through the recommended business models until 2030 are provided below:

1. **Model 1: Energy Efficiency Revolving Fund with Concessional Loan for Residential, Commercial, Hotels and Guest House Buildings**

Table 7: Total investment required for new buildings under the energy efficiency revolving fund model

Year	Residential		Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best	Optimal	Best
Total investment (million MVR)	26,547	90,020	18,400	63,506	37,767	209,422

Table 8: Total investment required for existing buildings under the energy efficiency revolving fund model

Year	Residential		Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best	Optimal	Best
Total investment (million MVR)	1,162	4,717	1736	5993	3,083	17,097

2. Model 2: Energy Efficient Housing Loan for Residential Buildings

Table 9: Total investment required for new and existing residential buildings under the energy efficient housing loan model

Year	New Buildings		Existing Buildings	
	Optimal	Best	Optimal	Best
Total investment (million MVR)	26,547	90,020	1,074	3,232

3. Sovereign Lending for Govt./Commercial Buildings

Table 10: Total investment required for new and existing govt./commercial buildings under the sovereign lending model

Year	New Buildings		Existing Buildings	
	Optimal	Best	Optimal	Best
Total investment (million MVR)	18,400	63,506	1,736	5,993

4. Energy Efficient Equipment Leasing for Commercial, Hotels and Guest House Buildings

Table 11: Total investment required for new buildings under the energy efficient equipment leasing model

Year	Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best
Total investment (million MVR)	18,400	63,506	37,767	209,422

Table 12: Total investment required for existing buildings under the energy efficient equipment leasing model

Year	Govt./Commercial		Hotels/Guest Houses	
	Optimal	Best	Optimal	Best
Total investment (million MVR)	1,736	5,993	3,083	17,097

E. Performance Monitoring, Reporting and Communication

A. Programme Design and Monitoring Framework

Ministry of Environment, Climate Change and Technology shall design an appropriate framework to assess the effectiveness of the programme. The framework shall be created based on the business model selected. The framework shall be outlined in the following template:

Impact(s) the Programme is aligned with		
Results chain	**Performance indicators with targets and baseline**	**Data sources and reporting**
Outcome		
Outputs		
Key activities and milestones		

B. Monitoring

Programme performance monitoring: Overall monitoring of the programme in terms and progress and performance will be undertaken in a timely manner by the Ministry of Environment, Climate Change and Technology. The PMU through the functional departments of the Ministry will be responsible for monitoring the implementation of the programme, including outcomes, outputs, and activities in relation to the targets and milestones set for the programme.

A designated officer within the PMU shall be responsible for the submission of the programme implementation reports. The senior authorities within the Ministry will receive bi-annual progress reports and review the performance in bi-annual review meetings.

The PMU will prepare monitoring reports in the format covering all essential aspects of the programme and submits them to the senior authorities at the agreed frequency. The information to be captured in the monitoring report shall be as follows:

- Name of the borrower
- Loan disbursement amount (MVR)
- Loan disbursement rate

- Loan tenure
- Interest rate
- Monthly EMI (MVR)
- Energy Efficiency Technology Intervention Details
- Technology Supplier
- Anticipated energy savings (kWh)
- Anticipated GHG emissions reductions (tCO2e)
- Proof of installation of the energy efficiency technology
- Verification report from the Energy Assessor

C. Reporting

Ministry of Environment, Climate Change and Technology will prepare i) bi-annual progress reports consistent with the information detailed above; ii) consolidated annual reports including a) progress achieved by output as measured through the indicator's performance targets, b) key implementation issues and solutions, c) programme completion report within 6-months of physical completion of the programme.

D. Stakeholder Communication Strategy

Ministry of Environment, Climate Change and Technology shall post all relevant information on its website. The website shall include at minimum information regarding the business model, participating entities, buildings covered, financing provided, energy savings and GHG emissions reduction achieved under the programme progress.

Ministry of Environment, Climate Change and Technology

Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits in Maldives

Report On One-Day Awareness and Training for Financial Professions

Promoting Energy Efficient Buildings through
Strengthening Low Carbon Energy Island Strategies (LCEI) Project

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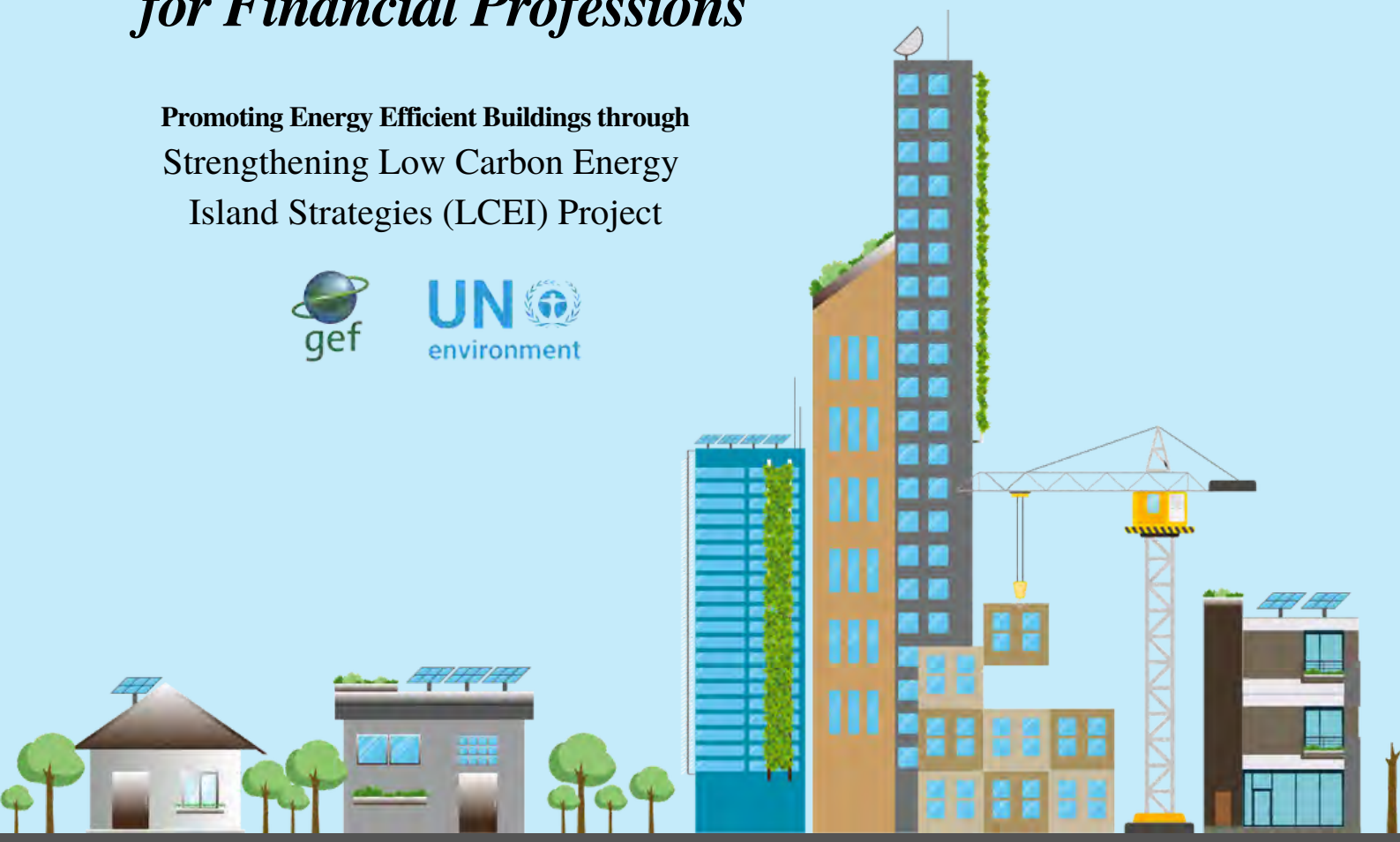

Contents

Introduction

Background

The building sector in the Maldives is generally under-investing in energy efficiency and other low carbon energy building technologies due to diffused responsibility for energy consumption over the lifetime of any given building. With an increase in population and energy demand, the dependence on imported goods have increased. In 2018, 5 billion USD worth goods were imported which almost doubled since last 10 years. With sustainability goals and objectives in mind, it is important that due consideration shall be given, on promoting demand for materials, buildings products and technologies which are energy efficient.

Maldives government has initiated various actions to tackle the energy scarce situation in the country. As the construction sector continues to expand in Male and Hulhumale region, Ministry of Environment, Climate Change and Technology, Maldives (under LCEI project) is in process of development and implementation of Energy Efficiency guidelines along with Ministry of National Planning, Housing and Infrastructure (MNHPI) for new buildings and retrofitting of existing buildings under the typologies of Government Buildings, Commercial Buildings, Residential buildings and Hotels & Guesthouses in Maldives. One of the major barriers that was identified during the development of EE guidelines was the lack of financial instruments which led to low uptake of energy efficient technologies in buildings of Maldives.

When it comes to the adoption of the Energy efficiency measures, the requirement of additional capital investment becomes critical, along with establishment of a building energy code or energy efficiency regulations for building retrofits in Maldives. Furthermore, once the code gets mandated by the government of Maldives, there will be a significant rise in the demand for such financial mechanisms to enable adoption of the measures by the end users. This creates an urgent need to undertake the current assignment of **development of financial programme for energy efficiency buildings and energy efficiency retrofits** in Maldives.

The financial programme will enhance the uptake of EE buildings by generating cost savings from energy conservation measures by enabling users to safe payback options and by increasing the asset value and quality for financiers due to enhanced comfort and performance of the building. This will lead to the transformation of EE buildings market in Maldives.

The overall benefits of this financial programme are as follows:

- Contributes significantly to meeting NDC targets and carbon commitments to reduce greenhouse gas (GHG) emissions
- Minimum electricity savings through the implementation of EE financial programme for buildings is anticipated to be 125 GWh by 2030 whereas business as usual consumption is 2665 GWh by 2030 (Source: A Brighter Future for Maldives Powered by Renewables, ADB Report, Nov 2020)
- Energy security and reduced need for energy imports in future leading to reduced government expenditure
- Higher disposable income for end-use sectors
- Drives energy efficiency innovation in the market
- Better asset quality for lenders

Purpose of this report

This report on “Report on one-day awareness workshop to all stakeholders on the developed the financial strategy and financial programme” introduces and highlights the financial program for Energy Efficient Buildings and Building Retrofits to the stakeholders involved.

The details of the consultations are provided next.

Training Workshop for Banks and Financial Institution

The COVID-19 pandemic situation in the Maldives presented several challenges in organizing stakeholder workshop due to restrictions on people gathering and lockdown. Despite the challenges, the workshop was conducted using virtual platform to introduce the financial program for energy efficient buildings and building retrofits to the finance and banking professionals.

The stakeholder workshop was organized on 17th November 2021 with larger stakeholder group comprising of representatives from Bank of Maldives, Bank of Ceylon, Maldives Islamic Bank, Housing Development Finance Corporation Ltd. (HDFC), SME Development Finance Corporation (SDFC), State Bank of India and MECCT. In the workshop, the purpose of Financial Programme for Energy Efficiency in Buildings was presented to the stakeholders followed by open discussion sessions to gather comments and feedback of the stakeholders.

Discussion Points in the stakeholder workshop

Introduction to Energy Efficiency

- The workshop started with an introduction covering the general understanding of energy efficiency, its importance, and benefits.

EE Buildings in Maldives

- As per the latest electricity consumption trend in Maldives, the focus was to implement energy efficiency measures in the building sector to meet the country's increasing energy demand and target set by Govt. of Maldives to achieve net zero by 2030.
- An overview of EE guidelines was presented which has been implemented in Maldives to make the building sector energy efficient.
- The primary reason for low uptake of EE measures in Maldives was lack of financial resources.

Green Building Financing for Energy Efficiency

- The concept of green finance was introduced to the stakeholders covering its aspects, projects that fall under it and the green finance instruments used.
- Based on the globally implemented financial programs for EE in buildings, globally accepted financial practices and stakeholder consultations with government and banking sector in Maldives, a structure for the financial programme suitable for Maldives was developed.

Outline of the Financial Program for EE Buildings and Building Retrofits

- The financial programme proposed 4 business models for all the building typologies in Maldives and for the new and existing buildings, wherever applicable:
    1. EE revolving fund with Concessional Loan for Residential, Commercial and Hotels/Guest House Buildings
    2. EE Housing Loan for Residential Buildings
    3. Sovereign Lending for Govt./Commercial Buildings
    4. EE Equipment Leasing for Commercial Buildings, Hotels and Guest Houses
- As per Maldives' commitment to reduce GHG emissions by 2030, the investment required, potential energy savings, potential GHG emissions reduction and the implementing organizations involved for each business model was explained in the presentation to help the participating bank in selecting the appropriate business model.

Risk Mitigation and MRV Process for Financial Institutions

- The workshop covered the important procedures to be followed by the financial institution participating in the programme such as risk mitigation measures and MRV process which can be found in the presentation of the workshop attached in Annex 2.

Annexure

Annex 1: Agenda of the Workshop

Ministry of Environment, Climate Change and Technology
GOVERNMENT OF MALDIVES

Training for Finance Professionals
Financing for Energy Efficiency in Buildings

Agenda

Date: 17th November 2021
Time: 1000 – 1200 hrs
Venue: Virtual Meeting over Teams

Opening and Introduction		
10:00 – 10:05	Opening Remarks by the Ministry of Environment, Climate Change and Technology	

Training Outline		
10:05 – 11:55	1. Overview of Energy Efficiency (EE) in Building sector and its importance 2. Current scenario of EE Building sector in Maldives - Energy Efficiency Guidelines for Buildings in Maldives 3. Green Financing for Energy Efficient Buildings 4. Financing program outline for EE Buildings and building retrofits 5. Risk Mitigation & Measurement, Reporting and Verification	PwC/ Riyan
11:55 – 12:00	Closing	MECCT

Supported by: Strengthening Low Carbon Energy Island Strategies (LCEI) Project

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Ministry of Environment, Climate Change and Technology
GOVERNMENT OF MALDIVES

List of Stakeholders Invited

1. Housing Development Finance Corporation
2. Bank of Maldives
3. Maldives Islamic Bank
4. Bank of Ceylon
5. State Bank of India
6. Maldives Finance Leasing Company (MFLC)
7. SME Development Finance Corporation

Annex 2: Presentation of the Workshop

Table of contents

Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits 2

Purpose of the Training

The objective of this training is to make you :

1. Understand Energy Efficiency
2. Familiarize with the Maldives' Energy Efficiency Building Initiatives and Guidelines
3. Introduce to the Financial Program for EE Buildings and Building Retrofits

1 Introduction to Energy Efficiency

What is Energy Efficiency

Energy efficiency simply means using less energy to perform the same task – that is, eliminating energy waste

Energy Efficiency is using less energy to provide the same service

It involves delivering equal or greater levels of energy output or service with less energy supply

Energy is consumed in cooling, heating, lighting, motor operation, operating equipment and appliances, etc.

Energy Efficiency is not Energy Conservation which is reducing or going without a service to save energy

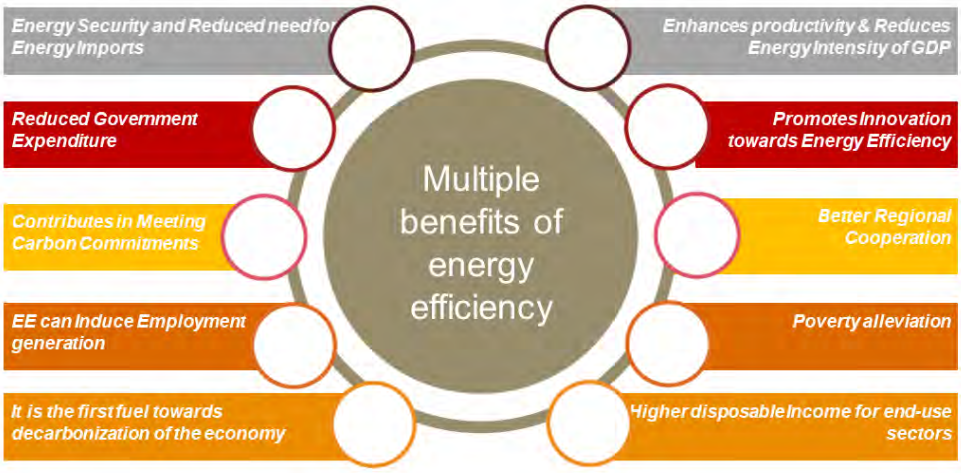
All devices, equipment, energy services that consume energy and waste energy, so no energy consuming process is perfectly efficient

The more efficient a device, building or ecosystem is, the less energy is wasted

- For Example: *Turing off a light is energy conservation. Replacing a 'Compact Fluorescent Lamp' with 'LED Lamp' which uses less energy to produce the same amount of light is energy efficiency.*

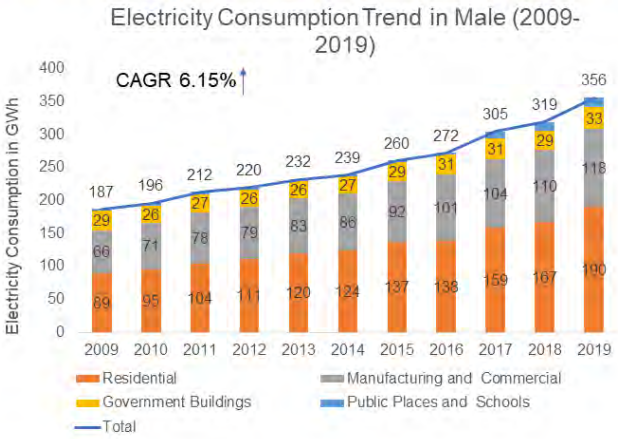
Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits 5

Benefits of Energy Efficiency



Maldives' Electricity Demand by Sector

More than 90% of electricity in Maldives is consumed by commercial and residential buildings hence energy efficiency is imperative for the building sector



- ✓ The total electricity consumption in Male grew at **CAGR of 6.15% in the years 2010-2019**.
- ✓ **Residential, Manufacturing & Commercial sector** accounted for **53%** and **33%** of the total electricity demand, respectively. in the total electricity demand. **Government buildings accounted for 10%**
- ✓ It is expected that Maldives' electricity demand will continue **to grow at more than 8.5% per annum**.

Source: National Bureau of Statistics, MNPHI, Maldives

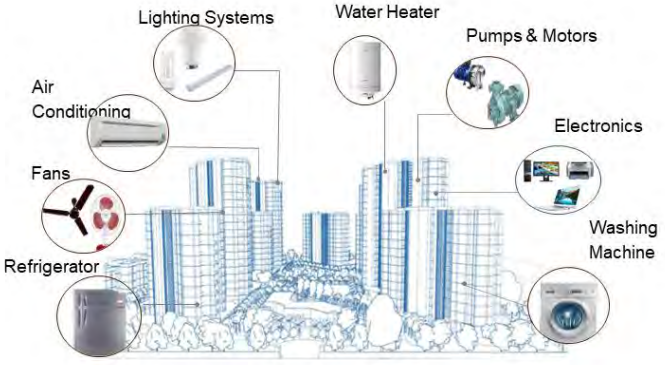
*Source: https://www.finance.gov.mv/public/attachments/s4VyBczH8ZHoM_teTsoCyiRSC5g_J8oV2kfCs73CHA.xlsx

How To Achieve Energy Efficiency in Building Sector

Energy Efficient Building Envelope (Following Green Building Guidelines)

Use of Energy Efficient Appliances & Equipment (S&L Program of Maldives Recognizes such appliances)

- ✓ **Energy/electricity is consumed by the various appliance/ equipment** used in the building irrespective of building use.
- ✓ Thus, **energy efficiency interventions targeting these appliances/ equipment** will enable reduction in energy consumption in buildings (both residential and commercial)
- ✓ Thereby, **helping Maldives in achieving its NDC commitments**



Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits 8

Maldives' commitment to reduce GHG emission

- ✓ Under the Paris Agreement, Maldives has committed (Nationally Determined Contribution referred as NDC) to **achieve net zero by 2030** (as compared to BAU), on condition that extensive support is received. If the required support is not received, **26% of emissions to be reduced from own resources by 2030.**
- ✓ **"Strengthening Low Carbon Energy Islands Strategies (LCEI)"** with support from Global Environment Facility (GEF) was initiated to realize the commitment .
- ✓ LCEI includes initiatives for mainstreaming **energy efficiency in appliances and building design practices to achieve substantial reduction of energy consumption from buildings.**

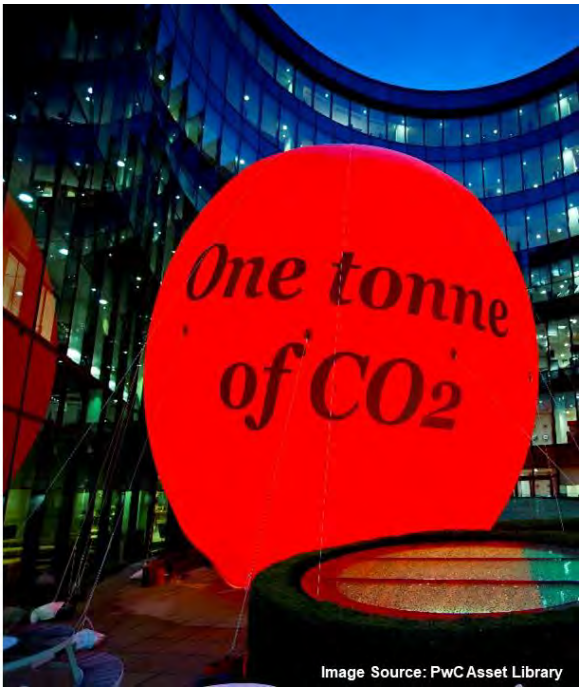
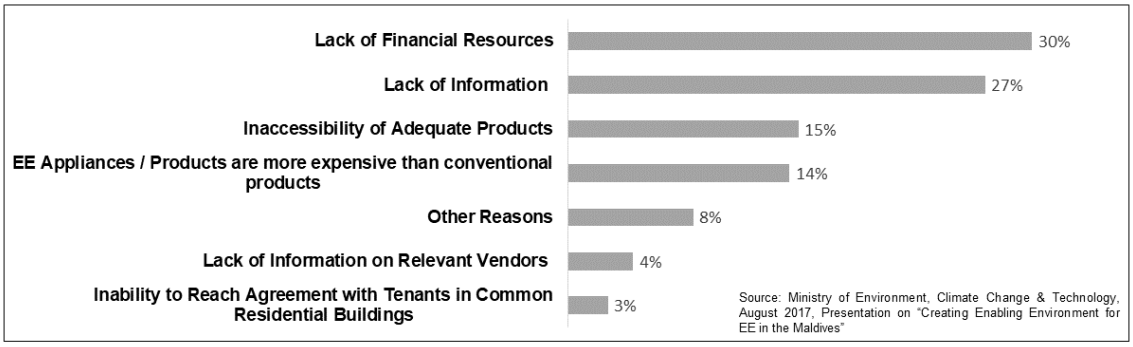


Image Source: PwC Asset Library

Responses on Factors Resulting in Low Uptake of EE Measures in Maldives



Source: Ministry of Environment, Climate Change & Technology, August 2017, Presentation on "Creating Enabling Environment for EE in the Maldives"

Lack of Financial Resources & Information were identified as two major factors resulting in low uptake of EE measures in Maldives. The **Financial Program for EE Buildings and Buildings Retrofits** aim to address these barriers

2 EE Buildings in Maldives

Some of the key initiatives by the Government of Maldives

Steps have been taken in formulating progressive 'National Energy Policy & Strategy', strengthening the existing regulatory bodies, build capacities across the energy sector and conduct awareness on the benefits of energy conservation

- *Energy Sector Investment Roadmap was required to be carbon neutral developed for Maldives in 2011 which conducted preliminary estimate of investment*
- *Development of Clean Energy Investment Plan in collaboration with Ministry of Housing and Environment of Maldives*
- *Energy efficiency guidelines for buildings are being developed for Residential, Commercial, Government, Hotels and Guesthouses, that shall lay the minimum energy efficiency requirements for buildings in Maldives.*
- *Life cycle cost based public procurement guidelines thereby promoting energy efficient products and technologies*
- *Development of Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits*
- *Development of Financial Programme for Energy Efficient Appliances*

Energy Efficiency Building Guidelines in Maldives

Overview of Energy Efficient Building Guidelines in Maldives

Objective of the Building guideline/code

- Provide minimum requirements for **energy efficient design** and **construction of buildings**
- Provide guidelines for **new and existing buildings** to achieve **minimum requirements for energy efficiency**
- Provide minimum requirements to achieve **water efficiency** in buildings.
- Provide additional sets of incremental requirements for buildings to achieve **enhanced levels of resource** (energy and water) **efficiency** that go beyond the minimum requirements.

Energy Savings Potential from Energy Efficient Building Guidelines in Maldives

Building Typologies	Govt./Office/Retail		Hotel		Residence	
	Optimal	**Best**	Optimal	**Best**	Optimal	**Best**
Energy Performance Index (kWh/m²/year)	106	**69**	176	**115**	42	**23**
Energy Savings	58%	**73%**	53%	**70%**	57%	**76%**
Incremental Cost per sqm (in MVR)	28,939	**47,068**	39,063	**67,122**	8,666	**15,406**
Payback Period	3.0	**3.8**	1.9	**2.5**	2.4	**3.1**

List of Energy Efficiency Interventions as per Building Guidelines in Maldives

Insulation to internal/external wall surface

Building Energy Management Systems

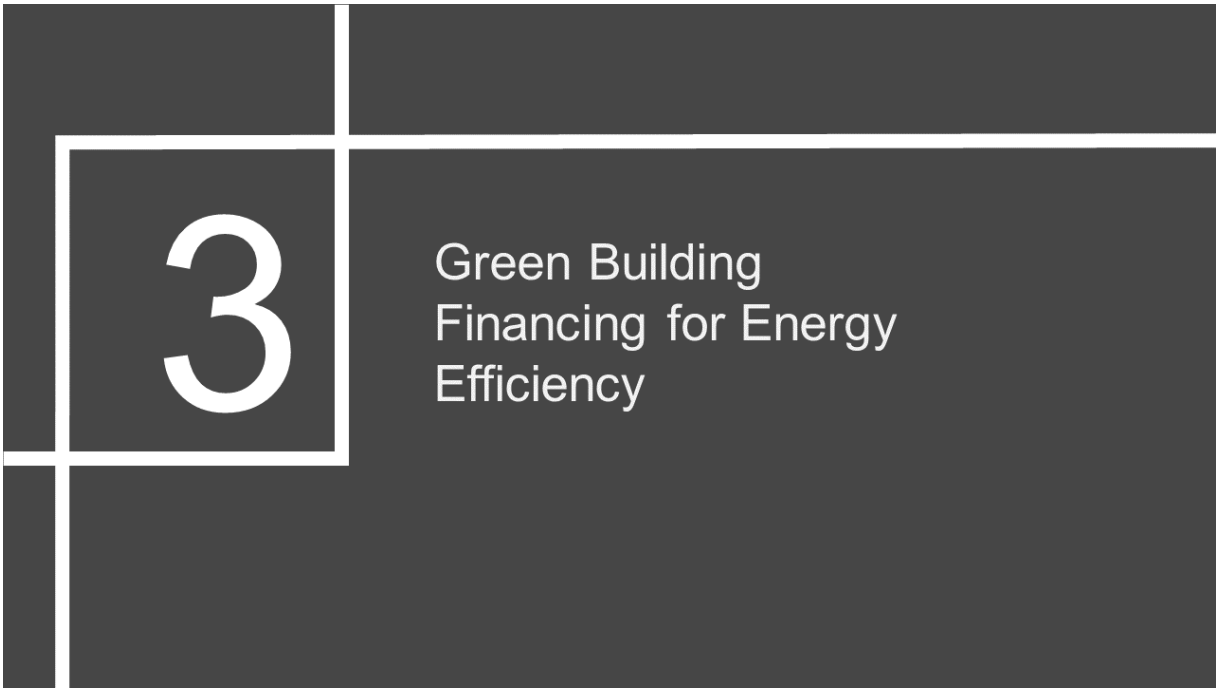
Water Cooled Chillers

Solar PVs on rooftop

Interventions	*Possible Solutions*
Building Envelope	• **Energy Efficient Wall Material:** AAC Blocks, XPS Wall Insulation etc. • **Roof Insulation:** XPS Insulation, PUF Insulation, Rock Wool, Glass Wool etc. • **Cool Roof Finish:** Green roof, Low SRI Paint etc. • **Efficient Glazing:** Single glazing with low SHGC, Double Glazing etc.
Thermal Comfort Systems	• **Efficient Air Conditioning system:** Air/Water Cooled Chiller system, VRF/VRV • **Air Conditioning Controls:** Building Energy Management Systems, Occupancy Control, Temperature Control • **Smart Building Technologies:** Smart Meters, Smart Environmental sensors • **Not in-kind cooling solutions:** Radiant Cooling, Under Floor Air Distribution system etc.
Artificial Lighting Systems	• **Efficient Lighting Systems:** LED lighting, CFL • **Lighting Controls:** Occupancy and Daylight sensors, Exterior lighting controls
Plumbing Systems	• **Water efficient plumbing fixtures:** Low flow flush and flow fixtures- WC's, Urinals, Faucets/Taps, Showers etc • **Rainwater harvesting systems:** Rainwater harvesting systems • **Efficient Pumps:** Water Pumps and Booster Pumps
Renewable Energy Systems	• **Rooftop Solar systems:** Solar panels, Solar Water heating

Scope of the Strategy

Building Type	Building Typologies Covered	EE / RE systems covered
New buildings	• **Residential** • **Government** • **Commercial** • **Hotels / Guest Houses**	• Shading systems • Wall systems • Roof • Glazing systems • Lighting systems • Heating, Ventilation, and Airconditioning (HVAC) • Smart Building technologies including BMS systems • Plumbing systems • Renewable Energy Systems (rooftop solar PV)
Existing buildings (for retrofits)	• **Government** • **Commercial** • **Hotels/Guest houses**	• Improvements in building envelope (Wall, Roof, Glazing) • Heating, Ventilation, and Airconditioning (HVAC), • Smart building technologies, BMS systems • Lighting systems • Plumbing systems • Renewable Energy (rooftop solar PV)



Green Finance

Defining aspects of Green Financing

- Financing **public and private green investments** in environmental goods and services and prevention of damage to the environment
- Financing of **public policies** that encourage the implementation of environmental and environmental damage mitigation or adaptation projects and initiatives
- Components of the **financial system that deal specifically with green investments**: financial instrument for green investments and structured green funds

Projects that fall under the umbrella of Green Financing

- Renewable Energy and Energy Efficiency
- Pollution Prevention and control
- Biodiversity Conservation
- Circular Economy Initiatives
- Sustainable use of Natural Resources and Land

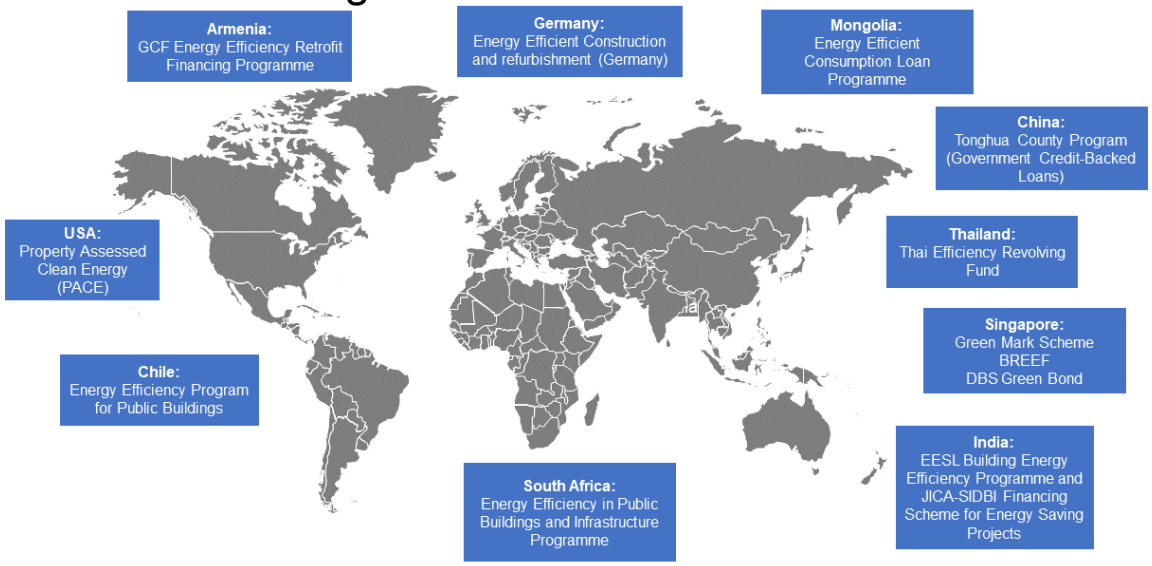
Why Energy Efficient Buildings: Green buildings represent a major global investment opportunity, with buildings making up the largest segment of the US$231 billion energy efficiency market.

*Source: https://www.ebrd.com/home

Green Finance Instruments

Concessional Loans | List Based Financing | On Bill Financing | Performance Contracting | Revolving Funds | Leasing | Dealer Financing | Micro-Finance | Pay-per-service

Overview of Globally implemented Financial Programs for EE in Buildings

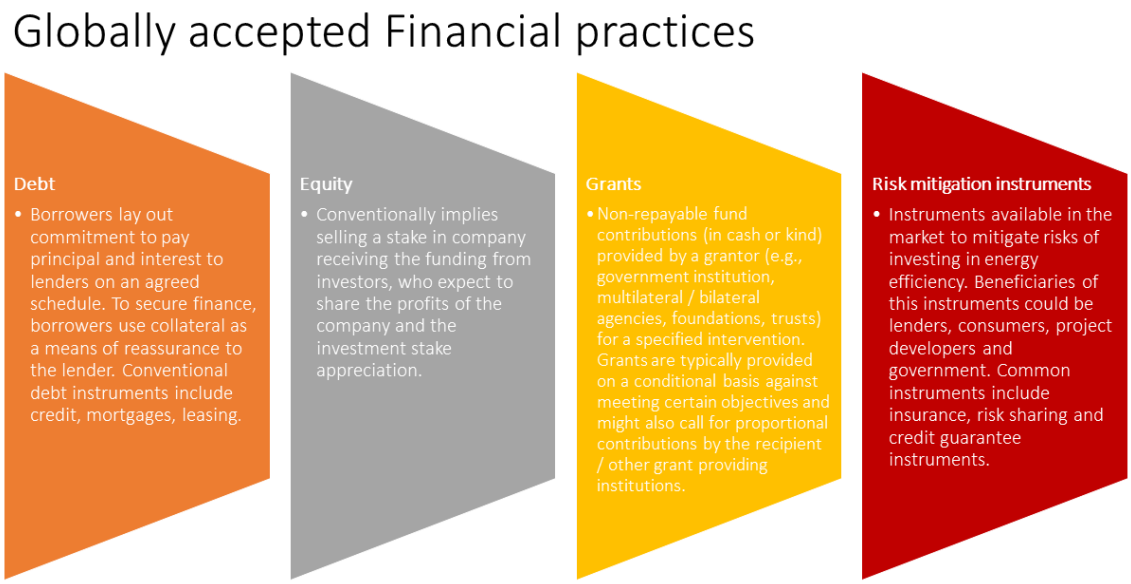


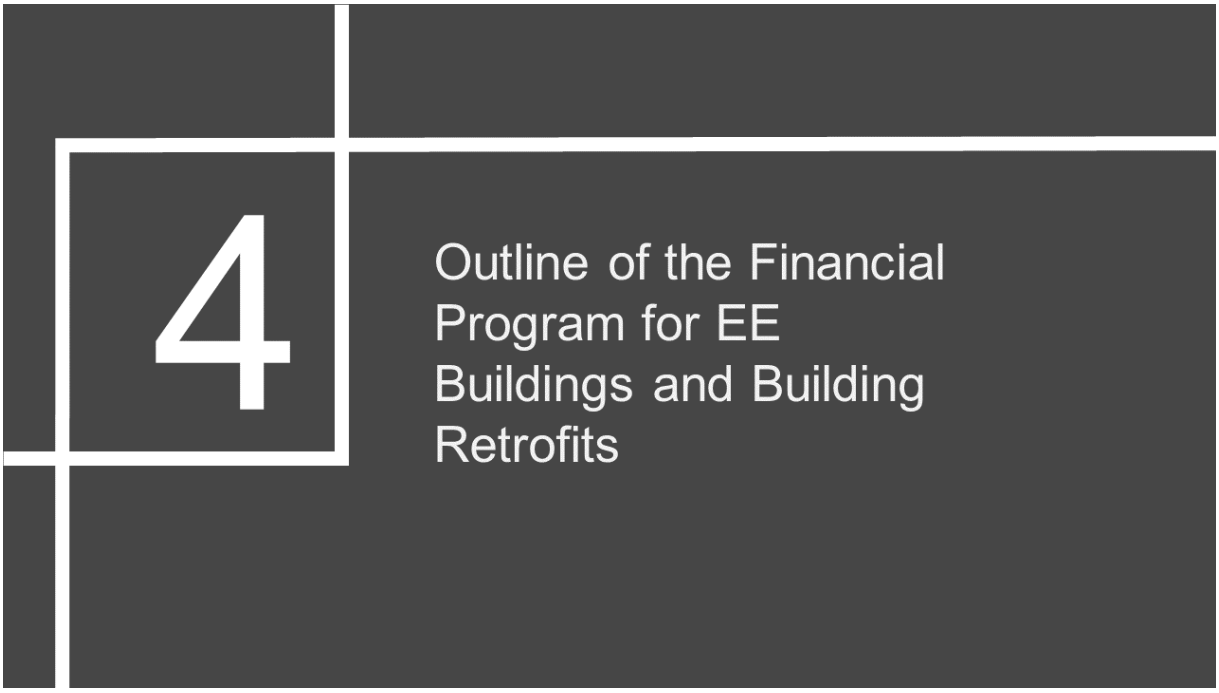
Global EE Financing Schemes and Business Models

Country	Programme	Year	Features	Impact	Instrument Type
Singapore	Green Mark Incentive Scheme for New Buildings	2005	• Rewards private developers who achieve Gold Rating or higher with co-funding up to USD 2.4 million of the total cost.	• USD 20 million fully disbursed	Financial Incentives (e.g. rebate or subsidy programme)
Armenia	De-Risking and Scaling-up Investment in Energy Efficient Building Retrofits	2016	• Collaboration between GCF, Municipality of Yerevan and Ministry of Nature Protection (MoNP) • Creating a favourable market environment and scalable business model for investment in EE building retrofits in Armenia • Provide grants amounting to USD 14 million for supporting poor and vulnerable households to secure grants for improving thermal comfort and cost/energy savings	• As of date, 1.4 million tCO2 emission reductions avoided • Anticipated CO2 emission reductions of up to 5.8 million tCO2 over a period of 20 years • Directly benefit of 200,000 people and streamline private and public investment of around USD100 million • Around 6,463 buildings (single-family individual buildings, apartment buildings, public buildings) to benefit	Concessional Loans
Mongolia	Energy Efficient Consumption Loan Programme	2018	• USD 21.5 million programme by XacBank with co-financing from GCF • Provide concessional loans for households undertaking insultation retrofits, EE household construction, EE heating appliances and EE housing solutions	• Anticipated CO2 emission reductions of up to 0.5 million tCO2 by 2029 • Around 15,278 direct beneficiaries	

Global EE Financing Schemes and Business Models

Country	Programme	Year	Features	Impact	Instrument Type
Singapore	DBS Green Bond	2017	• The USD 500 million floating rate green bonds due 2022 were issued under DBS' USD 30 billion Global Medium-Term Note Programme in July 2017. • DBS' Green Bond issuances (Proceeds) will be used to finance or refinance new or existing green assets/projects for Buildings • 100% of the net proceeds have been allocated to green assets comprising DBS' financing of a green building – Green Mark certified by Singapore BCA	• Energy Use Intensity reduced from 274 kWh/m2 to 183 kWh/m2 in 2019 • Estimated energy savings in 2019 is 13,843 MWh • 5,803 tonnes of CO2 emissions avoided	Concessional Loans
	Building Retrofit Energy Efficiency Financing (BREEF) Scheme	2011	• Facilitate financing for energy efficiency retrofits under an Energy Performance Contract (EPC) arrangement • Provides credit facilities for the purchase and installation of EE equipment • Facilitate loans to building owners with BCA sharing the risk of any loan default with the participating FIs issuing the loans	• N.A.	
India	EESL – Building Energy Efficiency Programme	2015	• ESCO and PMC based model for undertaking energy efficiency retrofits (LED lights, EE fans and EE ACs) across public buildings in India • Entire upfront cost is taken up by EESL and repayment is recovered through energy savings	• As of 2020, 259 projects completed and 132 ongoing • As of 2020, 0.29 million tCO2 emission reductions avoided and 75 MW of peak demand avoided	Performance Contracting (ESCO Model)


Globally accepted Financial practices
Debt
• Borrowers lay out commitment to pay principal and interest to lenders on an agreed schedule. To secure finance, borrowers use collateral as a means of reassurance to the lender. Conventional debt instruments include credit, mortgages, leasing.
Equity
• Conventionally implies selling a stake in company receiving the funding from investors, who expect to share the profits of the company and the investment stake appreciation.
Grants
• Non-repayable fund contributions (in cash or kind) provided by a grantor (e.g., government institution, multilateral / bilateral agencies, foundations, trusts) for a specified intervention. Grants are typically provided on a conditional basis against meeting certain objectives and might also call for proportional contributions by the recipient / other grant providing institutions.
Risk mitigation instruments
• Instruments available in the market to mitigate risks of investing in energy efficiency. Beneficiaries of this instruments could be lenders, consumers, project developers and government. Common instruments include insurance, risk sharing and credit guarantee instruments.


4
Outline of the Financial Program for EE Buildings and Building Retrofits

Approach for Development of Financial Programme for EE Buildings and Building Retrofits under this assignment

Carried out a secondary research to establish an understanding of current practices in EE financing in buildings within outside Maldives

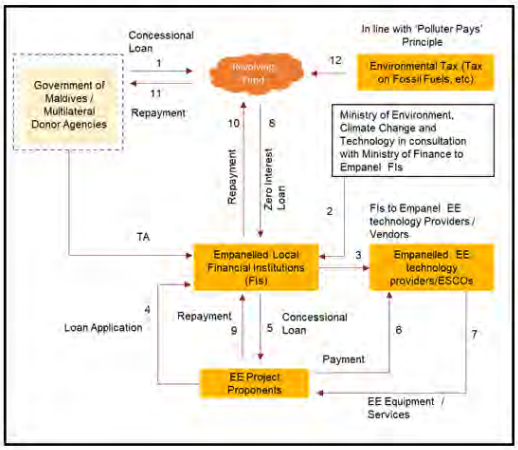
Reviewed reports published by international development agencies, think-tanks and research organizations

Conducted stakeholder consultations with government and banking sector in Maldives to gather local insights on existing mechanisms, infrastructure and organizational framework involved

Proposed business models feasible for this programme

1.EE Revolving Fund with Concessional Loan
2.EE Housing Loan
3.Sovereign Lending
4.EE Equipment Leasing

Model 1 - Energy Efficiency Revolving Fund with Concessional Loan for Residential and Commercial Buildings and Hotels/Guest House Buildings



Investment Required by 2030 (in mil. MVR)

	Residential		Govt./Commercial		Hotels/Guest House	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	26,547	90,020	18,400	63,506	37,767	209,422
Existing Buildings	1,162	4,717	1736	5993	3,083	17,097

Potential Energy Savings & GHG Emission Reduction by 2030

	Energy Savings (MWh)		GHG Emission Reduction (tCO_2e)		Energy Cost Savings (USD mil.)	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	48,187	74,268	35,610	54,884	11.9	18.4
Existing Buildings	1,624	2,585	1,200	1,910	0.4	0.7

Implementing Organizations in the EE Revolving Funding model

Multilateral donor agencies — ***Technical Assistance and Financing***

- MOU with Ministry of Environment, Climate Change and Technology / Ministry of Finance and empaneled Banks / FIs
- Disbursement of concessional credit towards EE Revolving Fund
- Provide technical assistance to the Nodal Agency (NA) - Ministry of Environment, Climate Change and Technology and banks/FIs for design and operationalization of EE Revolving Fund and Concessional Loan Programme
- Support banks/FIs through TA in assessing the technical eligibility of the loan application

Ministry of Environment, Climate Change and Technology / Ministry of Finance — ***Nodal Agencies for the implementation of revolving fund***

- Facilitate selection of banks/FIs for creation of the financing facility
- Empanelment of local FIs
- Developing and maintaining list of EE technologies to be financed through the program
- Develop reporting framework for revolving fund and concessional loan program
- Create outreach platform to disseminate information on financial programme

FIs / Banks (Financing Institutions) — ***Intermediary Banks & Executing Agency (Empanelled by the NA)***

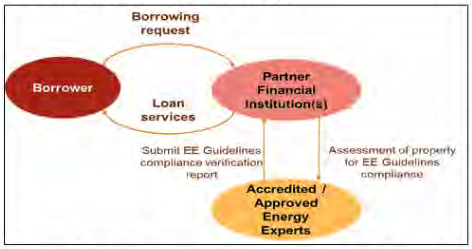
- Responsible for design and operationalization of revolving fund, concessional loan program and any additional credit enhancement mechanisms
- Availing co-finance for the revolving fund through collaboration with international development agencies
- Empanelment of EE technology suppliers (vendors / ESCOs / Retail Chains / etc.) through market assessment and technical due diligence
- Set up mechanisms for M&V of the EE sub-projects financed by the Revolving fund
- Maintain records of funds disbursed and EE appliances purchased

EE Technology Supplier — ***Technology supplier***

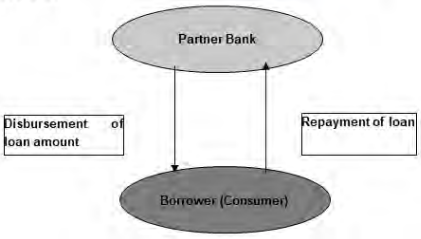
- Maintain approved list of EE technology by coordinating with Banks/FIs from time to time
- Facilitate consumers for filing loan application with empaneled FIs/Banks
- Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria

Model 2 - Energy Efficient Housing Loan for Residential Buildings

Overview of business model



Flow of funds under the EE housing loan model



Investment Required by 2030 (in mil. MVR)

	Residential		Govt./Commercial		Hotels/Guest House	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	26,547	90,020	NA	NA	NA	NA
Existing Buildings	1,074	3,232	NA	NA	NA	NA

Potential Energy Savings & GHG Emission Reduction by 2030

	Energy Savings (MWh)		GHG Emission Reduction (tCO_2e)		Energy Cost Savings (USD mil.)	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	26	39	19,058	28,586	4.8	7.2
Existing Buildings	0.7	1.1	537	805	0.1	0.2

Implementing Organizations in the EE Housing Loan model

Ministry of Environment, Climate Change and Technology / Ministry of Finance — ***Nodal Agencies for the implementation of housing loan***

- Facilitate selection of banks/FIs for creation of the financing facility
- Empanelment of local FIs
- Developing and maintaining list of EE technologies to be financed through the program
- Develop reporting framework for revolving fund and concessional loan program
- Create outreach platform to disseminate information on financial programme

FIs / Banks (Financing Institutions) — ***Intermediary Banks & Executing Agency (Empanelled by the NA)***

- Responsible for design and operationalization of the concessional loan program
  - Availing co-finance for the programme through collaboration with international development agencies
  - Empanelment of EE technology suppliers (vendors / ESCOs / Retail Chains / etc.) through market assessment and technical due diligence
  - Set up mechanisms for M&V of the EE loans financed
- Maintain records of funds disbursed and EE technologies purchased

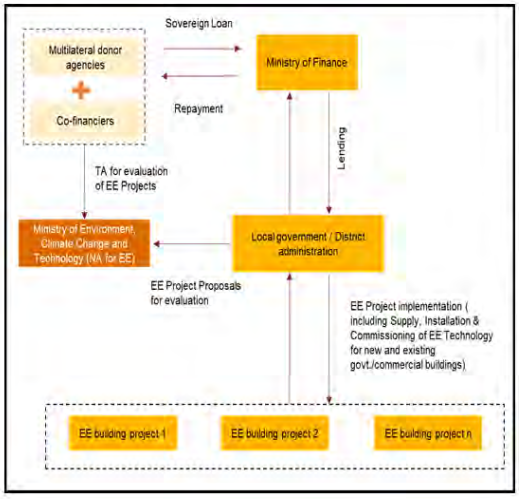
EE Technology Supplier — ***Technology supplier***

- Maintain approved list of EE technology by coordinating with Banks/FIs from time to time
- Facilitate consumers for filing loan application with empaneled FIs/Banks
- Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria

Energy Assessor — ***M&V body (individual / firm)***

- Work with the bank/FIs and conduct verification of the energy savings prior to sanctioning of the loans
- Provide verification reports as per international M&V guidelines

Model 3 – Sovereign Lending for Govt./Commercial Buildings



Investment Required by 2030 (in mil. MVR)

	Residential		Govt./Commercial		Hotels/Guest House	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	NA	NA	18,400	63,506	NA	NA
Existing Buildings	NA	NA	1,736	5,993	NA	NA

Potential Energy Savings & GHG Emission Reduction by 2030

	Energy Savings (MWh)		GHG Emission Reduction (tCO_2e)		Energy Cost Savings (USD mil.)	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	5	9	3,461	6,923	1.3	2.7
Existing Buildings	0.3	0.5	214	357	0.1	0.1

Implementing Organizations in the Sovereign Lending model

Multilateral donor agencies — ***Technical Assistance and Financing***

- Disbursement of sovereign loan
- Provide technical assistance to Ministry of Environment, Climate Change and Technology (NA) on 'Evaluation of EE Projects'

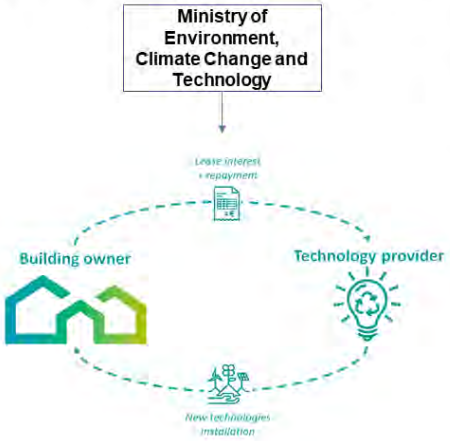
Ministry of Environment, Climate Change and Technology / Ministry of Finance — ***Nodal Agencies for the implementation***

- Developing and maintaining list of EE technologies to be financed through the programme
- Evaluation of EE Project Proposals for Govt./Commercial buildings
- Develop reporting framework for sovereign lending programme

Local Government / District Administration — ***Executing agency for EE project implementation***

- Develop EE project proposals for new and existing govt./commercial buildings
- Provide information related to EE sub-project/project monitoring to NA as per the established procedures
- Set up mechanisms for M&V of the EE projects financed by sovereign loan facility
- Empanelment of EE technology suppliers (vendors / ESCOs / etc.) through market assessment and technical due diligence

Model 4 – Energy Efficiency Equipment Leasing for Commercial Buildings, Hotels and Guest Houses



Investment Required by 2030 (in mil. MVR)

	Residential		Govt./Commercial		Hotels/Guest House	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	NA	NA	18,400	63,506	37,767	209,422
Existing Buildings	NA	NA	1,736	5,993	3,083	17,097

Potential Energy Savings & GHG Emission Reduction by 2030

	Energy Savings (MWh)		GHG Emission Reduction (tCO_2e)		Energy Cost Savings (USD mil.)	
	Optimal	Best	Optimal	Best	Optimal	Best
New Buildings	22	36	16,552	26,298	4.7	7.6
Existing Buildings	0.9	1.5	663	1,105	0.1	0.2

Implementing Organizations in the EE Equipment Leasing model

Multilateral donor agencies — ***Technical Assistance and Financing***

- Developing and maintaining list of EE technologies to be financed through the programme
- Empanelment of EE technology suppliers and energy assessors
- Develop reporting framework for the programme

Ministry of Environment, Climate Change and Technology / Ministry of Finance — ***Nodal Agencies for the implementation***

- Developing and maintaining list of EE technologies to be financed through the program
- Create outreach platform to disseminate information on financial programme

EE Technology Supplier — ***Technology supplier***

- Maintain approved list of EE technology by coordinating with the nodal agency
- Provide leasing of the technology as per the requirement of the lessee
- Responsible for the overall supply and installation and O&M of the EE technology and maintain the desired product quality and energy performance levels as laid out in the empanelment criteria

Energy Assessor — ***M&V body (individual / firm)***

- Work with the nodal agency and conduct verification of the energy savings at the lessee site
- Provide verification reports as per international M&V guidelines

Elements of Financial Programme

Entities involved	Type of funding	Form of capital	Expected direct benefit of EE financing strategy	Application of capital	Repayment mechanism	Risk mitigation mechanism
• Grant Provider • Financier • Programme Manager / Service Provider • Beneficiary • Policy makers and regulators • Facilitator • Technology Supplier • Accredited/Approved Energy Experts	• This attribute would consider whether the capital required for the instrument is provided in the form of debt, or equity or a mixture of both	• Represents the financial stake in the instrument held by the financier for the capital provided by them which can be in the form of common shares, preference shares, long-term loans, mezzanine debt, etc	• Would entail the direct or the first benefit due to the investment made by the programme manager • A top-down approach is usually adopted for forecasting such impact and setting targets	• Defines the way in which the capital is expected to be applied by the programme manager	• Primary payment mechanism defines the financial agreement for repayment between the beneficiary and the service provider	• This attribute describes if any risk mitigation strategy is present in the working model of the instrument to reduce the risks associated with the financing process

Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits

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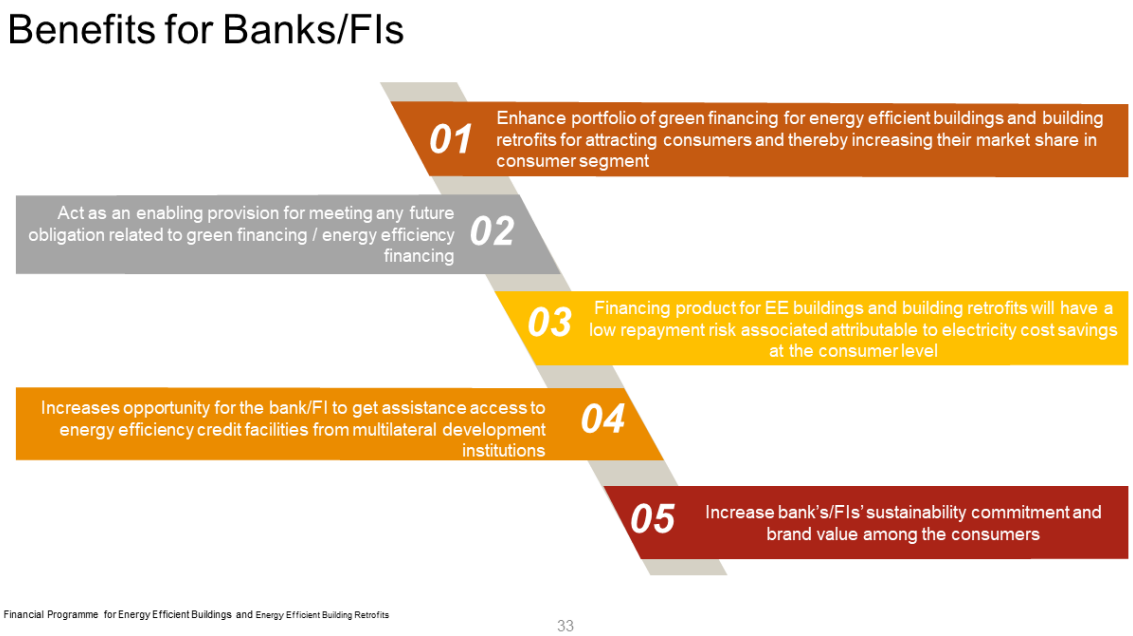
Benefits for Banks/FIs
01
Enhance portfolio of green financing for energy efficient buildings and building retrofits for attracting consumers and thereby increasing their market share in consumer segment
Act as an enabling provision for meeting any future obligation related to green financing / energy efficiency financing
02
03
Financing product for EE buildings and building retrofits will have a low repayment risk associated attributable to electricity cost savings at the consumer level
Increases opportunity for the bank/FI to get assistance access to energy efficiency credit facilities from multilateral development institutions
04
05
Increase bank's/FIs' sustainability commitment and brand value among the consumers
Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits
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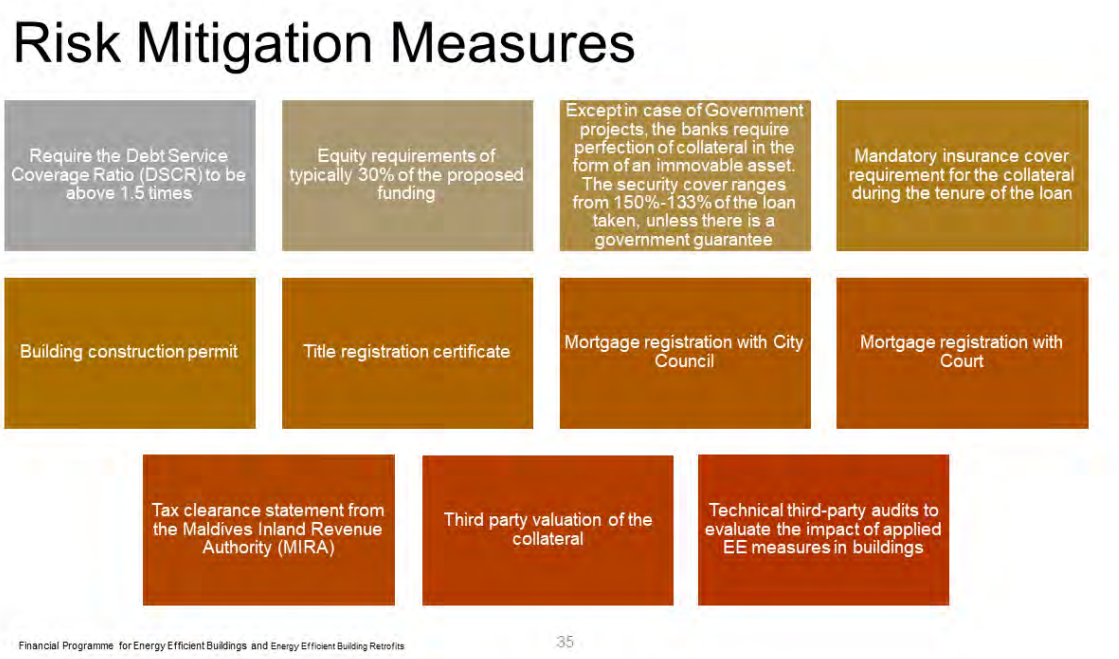
5
Risk Mitigation


Risk Mitigation Measures
Require the Debt Service Coverage Ratio (DSCR) to be above 1.5 times
Equity requirements of typically 30% of the proposed funding
Except in case of Government projects, the banks require perfection of collateral in the form of an immovable asset. The security cover ranges from 150%-133% of the loan taken, unless there is a government guarantee
Mandatory insurance cover requirement for the collateral during the tenure of the loan
Building construction permit
Title registration certificate
Mortgage registration with City Council
Mortgage registration with Court
Tax clearance statement from the Maldives Inland Revenue Authority (MIRA)
Third party valuation of the collateral
Technical third-party audits to evaluate the impact of applied EE measures in buildings
Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits
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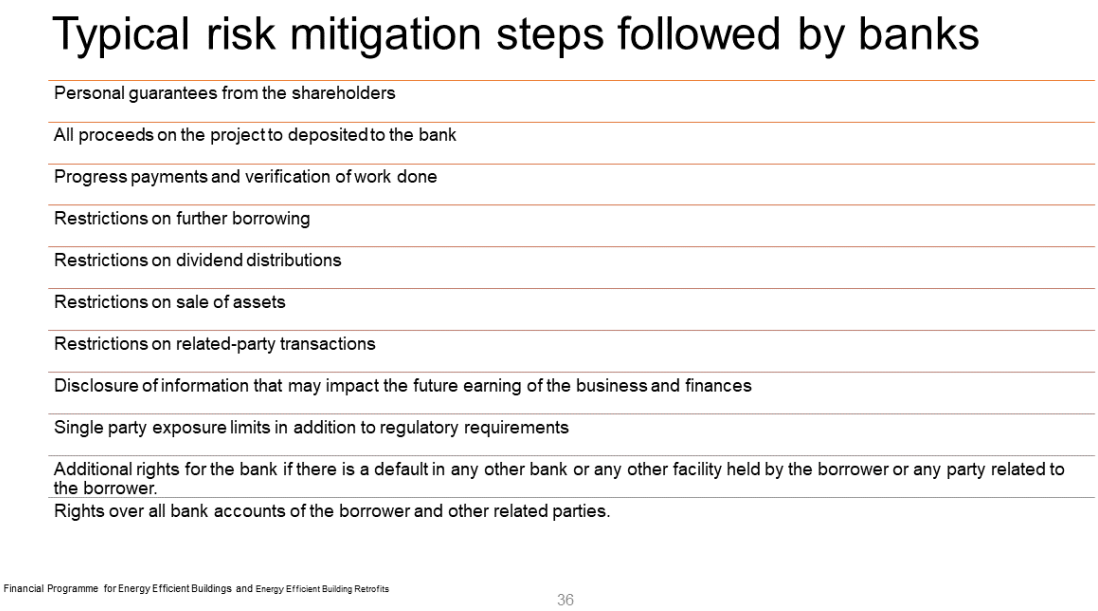
Typical risk mitigation steps followed by banks
Personal guarantees from the shareholders
All proceeds on the project to deposited to the bank
Progress payments and verification of work done
Restrictions on further borrowing
Restrictions on dividend distributions
Restrictions on sale of assets
Restrictions on related-party transactions
Disclosure of information that may impact the future earning of the business and finances
Single party exposure limits in addition to regulatory requirements
Additional rights for the bank if there is a default in any other bank or any other facility held by the borrower or any party related to the borrower.
Rights over all bank accounts of the borrower and other related parties.
Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits
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Measurement, Reporting & Verification

- The empanelled bank/financial institution will have to provide certain information to the Ministry of Environment, Climate Change and Technology at a **frequency decided by the Ministry**
- The details to be provided are mentioned in the table
- The Ministry in consultation with the Bank / FI shall develop a **Management Information System (MIS)** with predefined reporting formats and templates

The details required for reporting are mentioned here

1. Name of the borrower
2. Loan disbursement amount (MVR)
3. Loan disbursement date
4. Loan tenure
5. Interest Rate
6. Monthly EMI (MVR)
7. Verification of energy savings by technical auditor
8. Electricity consumption reduction from electricity bills
9. Reduction in operations and maintenance costs over a period.
10. Reduction in Co2 and GHG emissions from the ECMs

Financial Programme for Energy Efficient Buildings and Energy Efficient Building Retrofits

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Annex 3: List of Participants

No.	Organization	Participant	Designation
1	Bank of Ceylon	Mr. Wasiu Abdul Gadir	Credit Card Officer
2	Bank of Ceylon	Ms. Fathimath Shuhaila	Credit Officer
3	Bank of Ceylon	Mr.Chamara Rajapakasha	Senior Credit Manager
5	HDFC	Mr. Ahmed Waseem	Technical Officer
6	HDFC	Mr. Muhannadhu Musthafa	Technical Officer
7	HDFC	Ms. Aishath Naseera	Credit Officer
8	HDFC	Mr. Ahmed Azeem Ali	Executive Officer - Accounts
9	Maldives Islamic Bank	Fathimath Mohamed Manik	Officer - Business Department
10	Maldives Islamic Bank	Samaha Hussain	Officer - Business Department
11	Maldives Islamic Bank	Mariyam Saidha	Officer - Business Department
12	Maldives Islamic Bank	Aminath Lubna	Senior Officer - Risk Management & Compliance Unit
14	SDFC	Ms. Sofoora Ali	Senior Credit Analyst
15	SDFC	Ms. Aminath Muha	Senior Credit Analyst
16	SDFC	Mr. Ali Maiz Asad	Senior Credit Analyst
17	SDFC	Mr. Ahmed Misbah	Senior Credit Analyst
18	State Bank of India	Mr. Himanshu Agrawal	Assistant Vice President (Credit 2)
19	State Bank of India	Mr. Shobhit Mathur	Assistant Vice President (Credit1),
20	State Bank of India	Mr. Mohamed Rafsan Hassan	Assistant Manager
21	State Bank of India	Ms. Aishath Samahath Mohamed	Assistant Manager
22	MECCT	Aishath Aileen Niyaz	Assistant Director
23	MECCT	Mohamed Inaz	Project Manager
24	MECCT	Fathimath Raufa Moosa	M&E Officer