UN environment programme

50 1972-2022

Making the Business Case for Climate

Smart Investments: Guidelines for the Tourism Sector

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The full report should be referenced as follows:

United Nations Environment Programme (2021). *Making the Business Case for Climate Smart Investments: Guidelines for the Tourism Sector.* Paris

Acknowledgements

This publication has been commissioned by the Economy Division of UNEP as part of the "Transforming Tourism Value Chains in developing countries and Small Island Developing States (SIDS) to accelerate more resilient, resource efficient, low carbon development" project developed in the framework of the International Climate Initiative financed by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety.

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The working version of the guide was tested during the implementation of the Transforming Tourism Value Chains Project in Dominican Republic, Saint Lucia, Mauritius and Philippines by local partners. UNEP is grateful for their committed work in testing and applying the methodology and for their invaluable feedback from this experience.

UNEP acknowledges the expert advisory group of the project and following people who provided comments to the guideline:

Pablo Montes, Maëlys Nizan, Toyo Kawabata, Peggy Lefort, and Marco Duran, UNEP

Dagmar Lund-Durlacher, Modul University Vienna, Susanne Becken, University of Surrey, and Alexander Hadzhiivanov, European Bank for Reconstruction and Development, Cláudia Vieira Lisboa; UNWTO, Gordon Sillence, ECOTRANS

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The project Transforming Tourism Value Chains in Developing Countries and Small Island Developing States to accelerate more resource efficient, low carbon development is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

ABOUT THE PROJECT:

The project aims to reduce greenhouse gas emissions and increase resource efficiency in three tourism value chains: food and beverage, accommodation and Meetings, Incentives, Conferences and Events (MICE). The project is implemented in four countries: Philippines, Dominican Republic, Mauritius and Saint Lucia.

TRANSFORMING TOURISM

To learn more about the project, visit https://www.oneplanetnetwork.org/value-chains/transforming-tourism

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1 Background and scope of guidelines

According to the UNEP Finance Initiative, climate change is referred to by leading economists as the greatest market failure in human history, with potentially disruptive implications for the social well-being, economic development, and financial stability of current and future generations. Conservative estimates see unabated climate change leading to global costs equivalent to losing five to 20 per cent of global gross domestic product (GDP) each year, now and forever.

As a result, public and private decision-makers around the world are faced with the dual imperative of:

- Significantly – and rapidly – reducing greenhouse gas (GHG) emissions worldwide, in order to prevent the mean global temperature reaching dangerous levels.

- Adapting global consumption and productions patterns, lifestyles, and the underlying value chains, to the physical – meteorological, hydrological – impacts of climate change that are now unavoidable.

At the United Nations Climate Change Conference (COP-21) in Paris in December 2015, countries decided to adopt the Paris Agreement under the UN Framework Convention on Climate Change. This was the first time that the 195 countries that were parties to the convention had agreed on a universal, legally binding climate instrument. The Paris Agreement aims to strengthen the global response to the threat of climate change in the context of sustainable development.

Under the Paris Agreement, countries are required to undertake and communicate to the UNFCCC Secretariat their post-2020 climate efforts, known as Nationally Determined Contributions (NDCs) to keep the global temperature limit to well below 2°C, while pursuing efforts to limit it to 1.5°C.

In 2018, in its last Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related GHG emission pathways, the Intergovernmental Panel on Climate Change (IPCC) underlines the need for strengthening the global response to climate change in the context of sustainable development and efforts to eradicate poverty and limit global warming to 1.5°C to avoid the worst effects of climate change (IPCC, 2018). This implies that net zero emissions need to be reached globally CO_2 around 2050 and concurrent deep reductions in emissions of non forcers, particularly methane[1]."

The UNEP Emissions Gap report states that despite a brief dip in carbon dioxide emissions caused by the Covid-19 pandemic, the world is still heading for a temperature rise in excess of 3°C this century – far beyond the Paris Agreement and the IPCC recommendation. However, a green pandemic recovery could cut about 25 per cent off the GHG emissions predicted in 2030 and put the world close to the 2°C pathway.

The NDC of a country sets out its efforts to combat climate change, including its mitigation goal. At the national level, NDCs will be implemented through individual policies and measures, which countries are now in the process of designing. The information collected from these individual policies and measures can be used nationally to monitor the level of achievement of mitigation goals and contribute to the reporting of progress in implementing NDCs to the UNFCCC.

The private sector will be an important player in meeting national mitigation commitments. Transitioning from the current development pathway to a low-emissions one will require significant investment and innovation. Implementing mitigation options by adopting low-emissions technologies, solutions, and by changing behaviours should allow companies to optimize their re-

1 IPCC, 2018

source use, reduce their operation costs, and increase their efficiency while improving their environmental performance and tackling climate change.

These guidelines have been commissioned by UNEP and funded by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) to address the challenges the private sector faces in financing climate mitigation actions in the tourism sector.

1.1. Scope

These guidelines aim to support tourism sector businesses in identifying potential sources of finance, and in structuring and developing finance proposals for mitigation actions. Although the guidelines focus on accommodation service providers and event organizers with their own venues, the general guidance could also apply to other tourism businesses planning to develop a financial proposal for mitigation actions. The guidelines start with an overview of the mitigation actions that can be taken in the tourism accommodation sector (Chapter 2). Next, they go through key financial concepts that a business must know in order to develop a business proposal (Chapter 3). Finally, the guidelines provide an explanation of the steps that a business should follow to develop financial proposals within the tourism accommodation sector for a mitigation action (Chapter 4).

The accommodation sector referred in this document covers hotels, lodges, resorts etc., including conference facilities. More than 80 different accommodation categories such as hotels, motels, pensions, bed and breakfast, self-catering accommodation, bungalows, vacation homes, holiday villages, campsites, farms etc. have been identified internationally (UNWTO and UNEP 2008). The guidelines can be applied to all of them.

1.2. Contribution of the tourism sector to the economy, global GHG emissions and impacts of climate change

In 2019, the tourism sector accounted for about 330 million jobs worldwide, equivalent to one in 10 jobs globally, according to the International Labour Organization (ILO). Related sectors such as hospitality, hotels and food service industries employed an additional 144 million workers in both developed and developing countries. Failure to recover from Covid-19 could reduce global GDP by 1.5 to 2.8 per cent. As borders closed, hotels shut and air travel dropped dramatically, international tourist arrivals decreased by 56 per cent and $320 billion in exports from tourism were lost in the first five months of 2020 – more than three times the loss during the Global Economic Crisis of 2009 (UNWTO, 2020).

In some Small Island Developing States, tourism accounts for 30 per cent of export revenues (UNWTO). Small businesses, responsible for 80 per cent of the industry, are particularly vulnerable, as well as women, who make up 54 per cent of the tourism workforce, according to studies by ILO and the UN World Tourism Organization (UNWTO).

The accommodation/hotel sector is an essential part of the tourism sector and can have an impact on the environment, economy and society in a variety of ways. This is because accommodation providers and event venues require a constant and consistent supply of resources such as water, energy, and food and drink. While using these resources the businesses also generate GHG emissions and cause pollution e.g. discharging greywater.

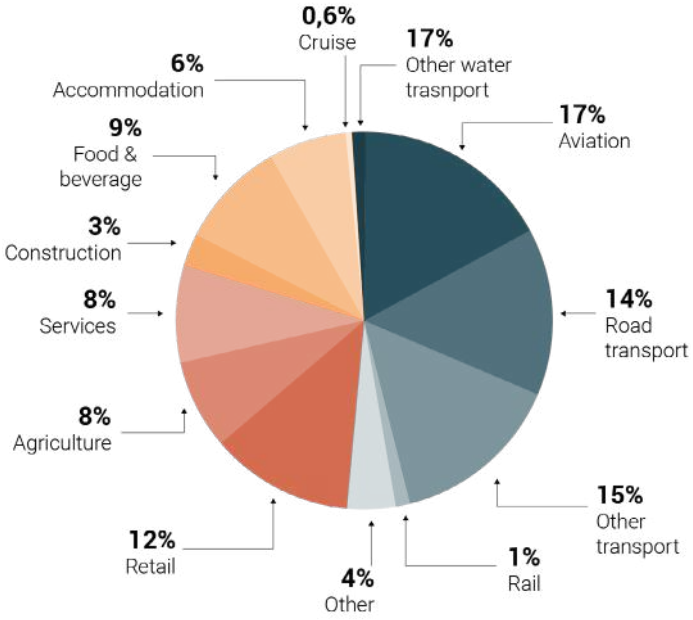
The tourism sector has a dual relationship with climate change, being both victim and contributor. The sector will suffer from

several direct and indirect impacts of climate change. Sea-level rise could threaten coastal tourism infrastructure while rising temperatures may affect winter sports seasons. Eco-tourism could also be affected by climate change-induced impact on biodiversity. Exact figures for the global GHG emissions of tourism are difficult to provide, considering the broad nature of tourism activities, which all contribute to a different extent to climate emissions (heating, air-conditioning, construction, etc.).

Despite these difficulties, UNWTO (2010) estimates indicate that tourism was responsible for about five per cent of global CO_2 emissions in 2008, of which accommodation contributed about 20 per cent (scope 1 and 2 emissions). **Just before the Covid-19 pandemic, GHG emissions from tourism increased substantially with estimates reaching eight per cent (UoS 2018). Tourism industry emissions reached about 4.5 gigatonnes (Gt) in 2018 of carbon dioxide equivalent (CO_2e) from 3.9 $GtCO_2e$ in 2009 and continue to increase, particularly in emerging economies.** Tourism sector emissions are from travel, accommodation, food production etc. (Lenzen et al. 2018; Coghlan Andy 2018). A recent WTTC/UNEP report (2021) takes into account value chain GHG emissions (scope 3), and states the travel and tourism emissions contribution pre-pandemic ranges between eight and 11per cent of global GHG emissions, and that the accommodation sector remains an important contributor with a share of six per cent.

Accommodation contributions to GHG emissions come primarily from heating, air-conditioning and lighting, but other activities such as maintenance of bars, restaurants, and pools are important contributors. In accommodation, most of the emissions originate from the value chain and purchased services (Scope 3, 55 per cent), while Scope 2, representing energy consumption, is the second most notable emissions source (37 per cent). **The report also highlights that the accommodation sector differs significantly with respect to their footprint, due to the different business models (resorts, franchising hotels, etc), geographies, and corresponding emission profiles**.

Figure 1: Split of GHG emissions by industry (pre-pandemic), including major value chain industries



Source: *Based on Lenzen et al. 2018, Skift 2021, WRI (2018); adapted by Accenture, WTTC, UNEP, 2021*
Note1: The above emission share has been updated for aviation by using the latest IATA's Aviation and Climate Change Fact Sheet pre-pandemic estimates. Cruise was separated from water transport by conducting a bottom-up estimation based on sustainability reports.
Note 2: The above chart includes shares of most contributing scope 3 emission sources (e.g. agriculture)

The International Tourism Partnership (ITP) study indicates that the hotel industry will need to reduce its GHG emissions by 66 per cent by 2030 and 90 per cent by 2050 to stay within the 2˚C limit of global warming agreed at COP21.

The 2020 UNEP Emissions GAP report highlights that the shipping and aviation sector, whose five per cent contribution to global emissions is growing, will require more attention. If current trends continue, combined international emissions from shipping and aviation are likely to reach between 60 and 220 per cent of allowable CO_2 emissions by 2050 under the 1.5°C scenario. Improvements in technology and operations could improve the fuel efficiency of transport if incentivized, but projected increases in demand mean this will not result in decarbonization and absolute reductions of CO_2¬. Both sectors need to combine energy efficiency with a rapid transition away from fossil fuel. Additional policies are required to drive changes in technology, operations, fuel use and demand.

1.3. Why should the tourism sector implement mitigation options?

Tourism has a high potential for mitigating GHG emissions. In the case of accommodation, a range of accessible low-carbon options are available (Section 2). Those go from technology-based options to soft measures. The acquisition, implementation and maintenance of many technologies are associated with financial savings, e.g. replacing incandescent and compact fluorescent (CFL) bulbs by LEDs, and air-conditioning systems with more efficient ones, etc. However, in some cases, there are additional costs for companies, and countries must adopt adequate policy, regulatory and financial frameworks at sector and national level to incentivize investment in mitigation options.

According to the Hotel Energy Solutions toolkit (UNEP, UNWTO 2011), implementing mitigation actions is fundamental for the sustainable development of the tourism sector. It would also bring several important benefits:

a. Investments in mitigation actions can significantly reduce operating costs and energy consumption, with relatively short payback periods.

b. Energy represents the single fastest growing operating cost in hotel or events venues. Improving energy efficiency and using renewable energy can significantly reduce the risk of unexpected costs from an energy shortfall or cost increase.

c. Taking mitigation actions can keep the facility secure and safe from environmental and climate change liability concerns.

d. Investing in energy efficiency and renewable energy technologies increases the market value of the building/facilities

e. Better energy management through energy efficiency and renewable energy implementation can extend equipment life, deferring replacement costs for years.

f. Energy efficiency and conservation practices can improve a tourism business's reputation among guests and others and assist it in maintaining and expanding its number of loyal clients.

Money saved as a result of reduction in energy consumption directly contributes to the bottom line of tourism businesses and increases profits, thereby improving competitiveness. Savings derived from the mitigation actions can be reinvested elsewhere. It is often easier to increase the profitability of a business by reducing costs than by increasing sales or turnover. In terms of investment, mitigation technologies can provide a predictable cash

flow and can offer substantial clarity for making strategic financial decisions. It is easier and more accurate to predict expenses and profits from energy efficiency and renewable energy investments than, for example, from investment in a new swimming pool or the refurbishment of a lobby, where it is difficult to predict the resulting profit or potential income increase.

In conclusion, tourism companies that invest in climate mitigation can save money while reducing GHG emissions.

1.4. Covid-19 and tourism climate mitigation

The Covid-19 pandemic has triggered an unprecedented crisis in the tourism economy, given the immediate and immense shock to the sector. The COVID-19 crisis has had a direct impact on energy use and greenhouse gas (GHG) emissions at global level,[2] and led to a 7 per cent reduction of GHG emissions worldwide in 2020 (a fall of 2.4GtCO_2 compared to 2019).[3] UNWTO estimates that the pandemic has resulted in a 73 per cent decline in international tourism in 2020. The impact is being felt throughout the entire tourism value chain and reopening and rebuilding destinations will require a joined-up approach.

The hotel, events, leisure and aviation sectors, which are characterized by a large demand for energy, have been hit hard, and are asking for bailouts. These bailouts, if not made conditional on an increase in energy efficiency and use of technologies and systems with low global warming potential, could lock tourism destinations into a highly polluting pathway and significantly increase energy costs for businesses. Existing financial models could provide efficient, climate-friendly cooling with minimal upfront costs for businesses, which in turn, could lead to a faster path back to profitability. Tourism destinations relying on fossil fuel imports to fulfil their energy demand have been shown to be vulnerable to disruptions of global value chains. Renewable energy is a resilient and climate-friendly option.

According to the ILO, about 80 per cent of tourism businesses are micro-, small- and medium-sized enterprises (MSME) with fewer than than 50 employees. MSMEs are highly exposed to economic fallout from crises, especially those in developing and transition countries where economies are more fragile and government support for financial packages and social protection is not enough. In the accommodation and food services, 51 million businesses are facing an extraordinarily difficult business environment with major impacts on employment opportunities (ILO, 2020).

2 European Environment Agency (2020) 'Air pollution goes down as Europe takes hard measures to combat coronavirus'. 25 March 2020 (updated 23 Nov 2020). Available at: https://www.eea.europa.eu/highlights/air-pollution-goes-down-as. (Accessed: 23 February 2021)

3 McSweeney, R and Tandon, A. (2020) Global Carbon Project: Coronavirus causes 'record fall in fossil-fuel emissions in 2020, CarbonBrief, Available at: https://www.carbonbrief.org/global-carbon-project-coronavirus-causes-record-fall-in-fossil-fuel-emissions-in-2020

2

Mitigation actions in the tourism sector

The tourism sector comprises a wide range of businesses that provide services such as accommodation, transport, food, sightseeing, etc.

UNEP Guidebook on tourism proposes a framework for carbon neutrality (Figure 1) that allows businesses to address their GHG emissions by eliminating, reducing, substituting or offsetting them (Simpson et. al., 2008). Businesses can take mitigation actions within three spheres of influence: (i) within their internal operations, i.e. on operations directly under their control; (ii) within their supply chains, i.e. by making choices about supply chain partners, and so indirectly affecting the decisions of these partners; (iii) within their consumer community, i.e. by making choices on the activities directly related to that community. **As the focus of these guidelines is the implementation of mitigation actions by businesses, the sphere of influence addressed in this document is on their internal operations.**

Tourism companies can use mitigation options in many parts of their businesses, i.e. air-conditioning, water heating, cooking, lighting, appliances, MICE equipment, transport, laundry, waste treatment or power generation. **However, the following are important considerations for decision making: the level of the upfront cost for the mitigation option, the amount of climate financing required if the option does not pay back itself, and the fit with its business model (e.g. value proposition to customers, operational considerations, staffing model, etc.).**

Annex I provides an example that classifies mitigation options in terms of capital cost and climate finance requirement (little, moderate and high). The climate finance requirements are in line with the mitigation cost (or abatement cost of CO_2) measured in US dollars per tonne of CO_2 (tCO_2). If the mitigation costs are negative then the option can pay back itself and so the climate finance requirement is little. However, if the mitigation costs are positive then, without climate financing (in the form of a grant, concessional loan, or risk cover), the project cannot be financially viable. The mitigation cost calculation has been done using the GACMO model[4] in the case of Dominican Republic and can help a business to explore which options are worth investing in. It has to be noted that this classification will change over time as the costs of the options are evolving. **Therefore, a business should make its own classification and update it regularly before taking any final investment decision.**

A short overview of the different mitigation options that can be implemented by tourism businesses is provided below by main activity area.

4 GACMO (Greenhouse Gas Abatement Cost Model) is an Excel-based accounting model developed by the UNEP DTU Partnership for calculating the impacts of climate actions. The report refers to the GACMO Hotel model that has been developed for the hotel industry. It contains 51 GHG reduction options and was applied in Dominican Republic.

Figure 2: Four steps to carbon neutrality for businesses and institutions.

Source: *Simpson et al., 2008*

	Internal operations	Supply Chain	Consumers Community
Eliminate Reduce Substitute Offset	**Decisions** Related to practical measures a company or institution can take to eliminate, reduce, subtitute or offset its climate footprint	**Choices** That can be advocated to the supply chain in order to eliminate, reduce, subtitute or offset its climate footprint	**Influence** A company or institution may have in the consumer's choices to eliminate, reduce, substitute or offset their climate footprint

2.1. Building space cooling

Energy is used in accommodation for central heating or cooling (air-conditioning). In countries with tropical climates air-conditioning is the single largest end-use demand for energy, while in northern latitudes, it is central heating (Simpson et. al., 2008). According to a market assessment carried by the Caribbean Cooling Initiative in 2019 in eight hotels in Saint Lucia and 20 in Dominican Republic, the cost of electricity for air-conditioning as a percentage of the utility bill is 40-60 per cent for the Dominican Republic hotels and 40-50 per cent for Saint Lucia. Replacing inefficient air-conditioners with more efficienct models could almost halve this electricity consumption in many cases. **The demand for cooling and heating, and the GHGs produced by these activities, can be reduced through three broad strategies: (i) building and envelope design that reduces demand for heating and cooling; (ii) behavioural changes of consumers; (iii) technological interventions related to ventilation, heating and cooling systems.**

i) Building and envelope design

Building design relates to the orientation and layout of the building to make the most of the sun's arc to heat it and natural airflow (breeze) to cool it. In contrast, envelope design deals with improving the insulation properties of the building so that inside temperatures can be maintained. These mitigation options are more relevant where new accommodation is being developed and may require substantial investment. However, some changes in envelope design can happen even in older buildings, for example, replacing the roof or windows or adding insulation.

In developed countries, building and envelope design has been a long-time focus driven through concepts such as passive houses or nearly Zero Energy Building (nZEB). Often the implementation of these concepts is enforced through regulations. For example, in the European Union there is the Energy Performance of Buildings Directive (EPBD) to drive innovation in energy consumption in buildings. The guidebook Technologies for Climate Change Mitigation: Building Sector (Cam, 2012) describes the options available to achieve passive housing design.

Building designs that feature improved ventilation, insulated walls, low-solar heat-gain windows, intentional orientation to minimize heat from the sun, or biomaterials with low thermal capacity and high insulation qualities can provide thermal comfort. In turn, these features can reduce the amount of energy used and GHG emissions produced by mechanical cooling.

ii) Technological intervention

Technological intervention covers mitigation options for air-conditioning related to ventilation, heating and cooling systems, which generally have a large hardware component. Air-conditioning systems comprise relatively high-energy devices such as compressors, chillers, fans, etc. For businesses, it is important to keep the filters and coils in air-conditioning units clean and to introduce systems to shut down air-conditioning automatically when there are no occupants in the room.

The primary focus of technological intervention is to select efficient cooling systems based on the project requirements (e.g. radiant cooling system, ground source heat pump) followed by energy-efficient equipment like room air-conditioners or equipment used within centralized systems such as chillers and motors. The investment and abatement costs for the different technologies used in the air-conditioning are provided in Annex 1. Room air-conditioners, positive displacement chillers, and variable frequency drives for chillers are not capital intensive (unit cost is less than $US 10,000) and the abatement costs are also negative, which means these options can pay back on their own.

For facilities with centralized air-conditioning systems, the use of energy monitoring and management systems (EMMS) can optimize system efficiency and lead to savings of 20-40 per cent. EMMS has become more accessible and powerful through the deployment of Internet of Things (IoT) and data analytics using Machine Learning (ML)/ Artificial Intelligence (AI).

iii) Behavioural change

Behavioural interventions are non-technological in nature and can help in curtailing demand, as well as promote adoption and acceptance of efficient technologies. These mitigation options don't require major investment, but softer measures such as training of staff, communications targeting guests, etc. **Behavioural change, however, requires involvement of all target groups: guests because they have significant influence on energy use (hot water, air-conditioning, towel and bed linen changes, food consumption), and staff and management for education and training to raise awareness (Gossling & Lund-Durlacher, 2021).** As an example, in tropical countries, temperatures in conference rooms / guest rooms are often adjusted to lower room temperatures than 20°C whereas the comfortable temperature is anywhere between 20–25°C (Simpson et. al., 2008). This is despite the fact that tourists generally accept substantially higher values. For example, Hilton Seychelles reports that guests accept 25°C without complaints.

2.2. Food preparation

Energy is used for cooking in three main activity areas: (i) heat used for cooking, pre-heating and heating; (ii) refrigeration; (iii) cleaning. Also, there is energy embedded with the food if we consider energy used to grow food and transport it. Since a large amount of the energy used for cooking is based on fossil fuels, this activity results in CO_2 emissions.

i) Cooking heat

Heat for cooking can come from a range of energy sources such as electricity, biomass, coke, oil (kerosene), or gas (LPG/CNG). Energy sources convert to heat at different rates of efficiency, and can depend on the type of cook stove used. **Therefore, one option is to go for efficient stoves, such as the electric stove option (including induction hobs) shown in Annex 1. Another option is to move from using specific fossil fuel for heating/ cooking to a fuel with a lower CO_2 emission factor, such as moving from using kerosene to biogas as shown in Annex 1.** The efficient cook stove option has negative abatement

cost and low investment and so is possible without any additional financial support. The biogas option, which also includes the development of a small biogas plant, has a positive abatement cost and low investment and would require additional financial support or innovation to the business model for implementation.

ii) Refrigeration

Refrigeration is required to prevent food spoilage and for storing frozen items. Refrigeration-related GHG emissions come from the energy used for chillers and compressors, and also from leakage of refrigerants, which have high global warming potentials. **One option for reducing GHG emissions is to avoid the refrigeration process, by using local fresh vegetable instead of frozen foods. Another option is to use efficient refrigeration equipment.** Annex 1 shows four different efficient technologies: efficient hotel refrigerator, efficient cooling room, efficient freezer, and efficient freezer room. The three first options have a positive and high abatement cost of mitigation but relatively low investment costs, so substantial climate financing is needed. From a mitigation point of view, it is important to note that these three options will also result in reduction in GHG emissions due to lower loss of coolant, which is not monetized. The last option, efficient freezer room, shows a negative abatement cost since electricity savings are much higher for this option.

There are also a number of zero investment or softer measures to reduce the need for energy in refrigeration activities (Simpson et al, 2008). For example:

- Allowing hot food to cool before storing it in refrigerators and freezers.
- Not overfilling refrigerators, as best cooling occurs when air can circulate.
- Ensuring proper maintenance and upkeep of refrigeration equipment.

iii) Cleaning

Mechanized cleaning needs both water and energy. GHG emissions are due to the energy used in cleaning equipment, so reductions in GHG emissions can be achieved by using efficient cleaning equipment. Two examples are provided in Annex 1: efficient pre-rinse spray valve (PRSV) and efficient dishwasher. Both these options show a negative abatement cost. For PRSV the investment is also negligible, and therefore this option could be taken within the operational budget.

iv) Food planning and operational measures

Tourism businesses can make substantial contributions to sustainability and emission reductions by choosing fewer frozen foods. Choice of foods has a large influence on the GHG footprint of food served. Generally, locally produced food will have a considerably smaller footprint. This is particularly relevant in small tropical islands, where food may often be imported by air. Using local resources, for instance by serving mostly local seafood instead of imported meat dishes, is one such measure. Generally, this is well accepted by guests and can be promoted as indicating higher restaurant standards. Furthermore, low-emissions and plant-based diet offers can be included in the menus and can also address the new consumer demand for more healthy diet options.

Refrigeration appliances and diswashers have a considerable residual heat and using this waste heat can save a lot of energy (Lund-Durlacher & Gossling, 2020). Another way of saving energy can be from using innovative technology and modern preparation methods and providing training to staff in using these technologies and methods (Lund-Durlacher & Gossling, 2020).

Reducing food waste starts with better planning for menus; for example, reducing the number of dishes and ingredients used in

food preparation (Lund-Durlacher & Gossling, 2020). Reuse of leftovers and making use of all parts in "nose to tail" concepts can help in reducing food waste (Lund-Durlacher & Gossling, 2020).

2.3. Lighting

Lighting-related GHG emissions come from the energy used in the lighting equipment, so reducing them can be achieved by cutting the energy demand related to lighting equipment. This can be achieved through three strategies: (i) making good use of natural light; (ii) using more efficient lighting technologies e.g. LEDs; (iii) using technologies that limit the waste of lighting. Examples of how to make use of natural light can be found in the guidebook *Technologies for Climate Change Mitigation: Building Sector (Cam, 2012).* In the past years, there has been a dramatic improvement globally in the efficiency of lighting technologies, with the wide-scale diffusion of LEDs). Annex 1 shows that the LEDs mitigation option can be applied in guest rooms, restaurants, meeting rooms, etc. In all the cases, this option has negative abatement costs and a low per-unit investment cost, so does not need large-scale financial support. Another option is the introduction of keycards for hotel rooms that turn lights on when inserted in a slot close to the door. This option shows high abatement costs and would need some financing support. However, this option may make sense if it can also switch off appliances within the room besides the lighting. Other low-cost options include energy-saving lighting systems and motion detectors in floors and common areas.

2.4. Transport

Emissions from transport activities in tourism come from the use of fossil fuels in the vehicles. These emissions can be reduced using the avoid-shift-improve (ASI) framework[5].

i) Avoid

The avoid strategy relies on getting rid of all unnecessary trips. In tourism, it is a little challenging to reduce trips since tourists come to a country for sightseeing. However, hotels can help in better organizing their trips, which can reduce the overall amount of trips, or the distances travelled, without comprising tourists' experiences.

ii) Shift

It is common for hotels to engage fleets of larger cars and SUVs. Hotels should instead make available smaller cars with low emissions (<120g CO_2/km), shared taxis, and buses for transportation. SUVs, which are high-fuel consuming vehicles, should be used as an exception.

iii) Improve

In general, cars should be regularly replaced by newer, more environmentally friendly models to stimulate innovation. Due to the rapid decline in battery costs, hotels and fleet operators should seriously consider the use of electric vehicles. Annex 1 shows the options corresponding to electric cars, vans and buses. All of them show positive abatement costs and relatively high investment in the case of buses. Therefore, electric vehicles would need financial support. On the other hand, better maintenance of vehicle fleets can improve vehicle efficiency at a negative abatement cost and with no additional investment. Biofuels and natural gas are also mitigation options. For biofuels, Annex 1 shows that the abatement costs are positive and therefore would need financial support. In addition, the broader sustainability challenges linked with the production of biofuels do make it difficult to make a clear

5 Banister, D. 2011. Cities, mobility and climate change. Journal of Transport Geography, Special section on Alternative Travel futures, 19(6): 1538-1546.

recommendation. Annex 1 shows that natural gas has a negative abatement cost and low investment.

2.5. Production of power and heat

Accommodation establishments are big users of power and heat. There are multiple strategies for reducing emissions. The first option is using renewable energy in place of fossil fuels for producing electricity. The large-scale reduction in the capital costs of key renewable technologies combined with lower battery costs have created a very favourable case for these technologies. **Accommodation establishments can install renewable energy sources, including photovoltaic or solar heating, or they can buy renewable energy from specialized power providers**. Owning renewable energy infrastructure, such as solar heating on rooftops, can be a visible sign of being green. Annex 1 shows that power generation using small wind turbines, micro-hydro and solar PV are mitigation options with negative abatement costs. This is because the unit generation costs are lower than price of electricity in the power grid. However, all three options assume that the accommodation is connected to the grid and without any storage. Therefore, caution should be taken when looking at this option, as the picture can change if storage costs are added. Since accommodation establishments also need hot water, combined heat and power (CHP) plants make a lot of sense since the high efficiencies of CHP plants make the cost of power and heat cheaper. Annex 1 gives the example of a biomass-based CHP option. The abatement cost for this option is negative but the capital investment is high. In addition, there would need to be local availability of biomass.

Many accommodation businesses in developing countries have diesel generators for back up. If natural gas is available, an option would be to shift from diesel to natural gas. Annex 1 shows that the abatement costs for this option are negative and that the capital investment is low.

2.6. Other options to reduce GHG emissions

i) Water conservation

Showers, pools, and laundry operations require a lot of water and heat. Energy is required for pumping and heating the water. Several measures can reduce the water and energy used. For instance:

- **Water temperatures in the heating system can be set at the lowest temperature.**
- **All taps and showers can be fitted with flow reducers, decreasing the amount of water used and the amount of heat required.**
- **Heating costs for outdoor swimming pools can be reduced by using solar water heaters, heat pumps and pool covers.**

ii) Appliances

All appliances, such as televisions, washing machines, clothes dryers and minibars, should be replaced every five years as new equipment uses considerably less energy, and so reduces GHG emissions. New equipment also improves consumer satisfaction. Annex 1 provides the details for several appliances. In many cases the abatement costs are positive. Therefore, businesses should evaluate first if replacement at the end of five years makes sense. Service-oriented contracts with providers (e.g. cooling as a service), and/or contracts with product take-back and extended producer responsibility considerations can mitigate the material footprint of replacing appliances.

iii) Establish environmental management systems

Environmental Management Systems (EMS) monitor and report environmental performance to internal and external stakeholders of a firm. The most widely used standard for EMS is based on the International Organization for Standardization (ISO) 14001. EMS helps gain the confidence of funders and improves transparency of mitigation action. EMS helps a business understand its resource consumption and identify areas where resources can be saved.

For businesses seeking to reduce emissions, there are international organizations that can help to implement energy conservation and efficiency measures as well as ISO 14001. For instance, the International Tourism Partnership (https://www.tourismpartnership.org/resources/) provides tools for water and carbon measurement.

iv) Recycle waste

Hotels can substantially reduce waste sent to landfills by improving recycling rates. First, hotels should segregate waste into bio waste, plastics, hazardous and other waste. This will allow for better waste management, e.g. bio waste can be put for composting. All these options will indirectly reduce the emissions related to waste disposal in landfill.

Appliances and equipment that reach the end of their life should be disposed of properly. Efforts should be made to check whether they can be recycled or returned to their producer for the recovery of materials and components.

v) Sustainable procurement

The development of sustainable procurement lists to provide better criteria to purchasers will contribute to the selection of energy-efficient and climate-friendly equipment and appliances in the tourism sector. Having holistic criteria – including life-cycle cost considerations and refrigerant global warming potential and efficiency considerations for cooling products – is key to unlocking significant costs savings and emissions reductions. Some governments have already adopted minimum energy efficiency performance standards and energy labels for appliances. The highest performing tiers of these levels (if not outdated) can be taken as a reference of a superior performing product for the assessment.

3

Basics to write a business proposal

3.1. Sources of finance

The increasing flows of climate finance have been driven by the urgency to address climate change. The Paris Agreement commits developed countries to mobilizing $US 100 billion annually to implement climate interventions in developing countries. A review of global climate finance flows[6] (Figure 2) reveals a few tendencies:

1. **Private actors provided 49% (USD 310 billion) of annual climate finance; public actors provided 51% (USD 321 billion) of annual climate finance (CPI, 2021).** This highlights the need to include the private sector when considering financing climate action.
2. **Most investment are made within the country from which the finance is sourced** (CPI, 2021). Corporations and commercial financial institutions, account for the majority of private sector finance (CPI, 2021).
3. **Investments in renewable energy are the largest beneficiary of total climate finance flows.** Renewable energy used to be the largest beneficiary of public investment, but has in recent years been outpaced by investments in transport (CPI, 2021). This development mirrors the decreasing costs for renewable energy technologies over time, a mature renewable energy market, and investments perceived to be less risky, thus shifting from the public to the private domain.
4. **Public funding is a large contributor to investments in energy systems, transport, and projects with cross-sectoral impacts** (CPI, 2021). Domestic, bilateral, and multilateral development finance institutions (DFIs) account for most of public finance, with national DFIs being the largest providers of climate finance among DFIs (CPI, 20219).
5. **Grants only account for a small portion of total climate finance.** Almost all grants originate from public sources, and have mostly public recipients as beneficiaries and therefore not something to hope for by private businesses.
6. **Debt remains the most important financing instrument, with market rate debt provided mainly at the project level, but also as balance sheet borrowing being the most used financing instrument** (CPI, 2021). Concessional (low-cost) debt almost completely originates from public sources. The second-largest instrument type is equity, mostly being balance-sheet equity, but also invested at the project level (CPI, 2021).

3.2. Structuring of finance

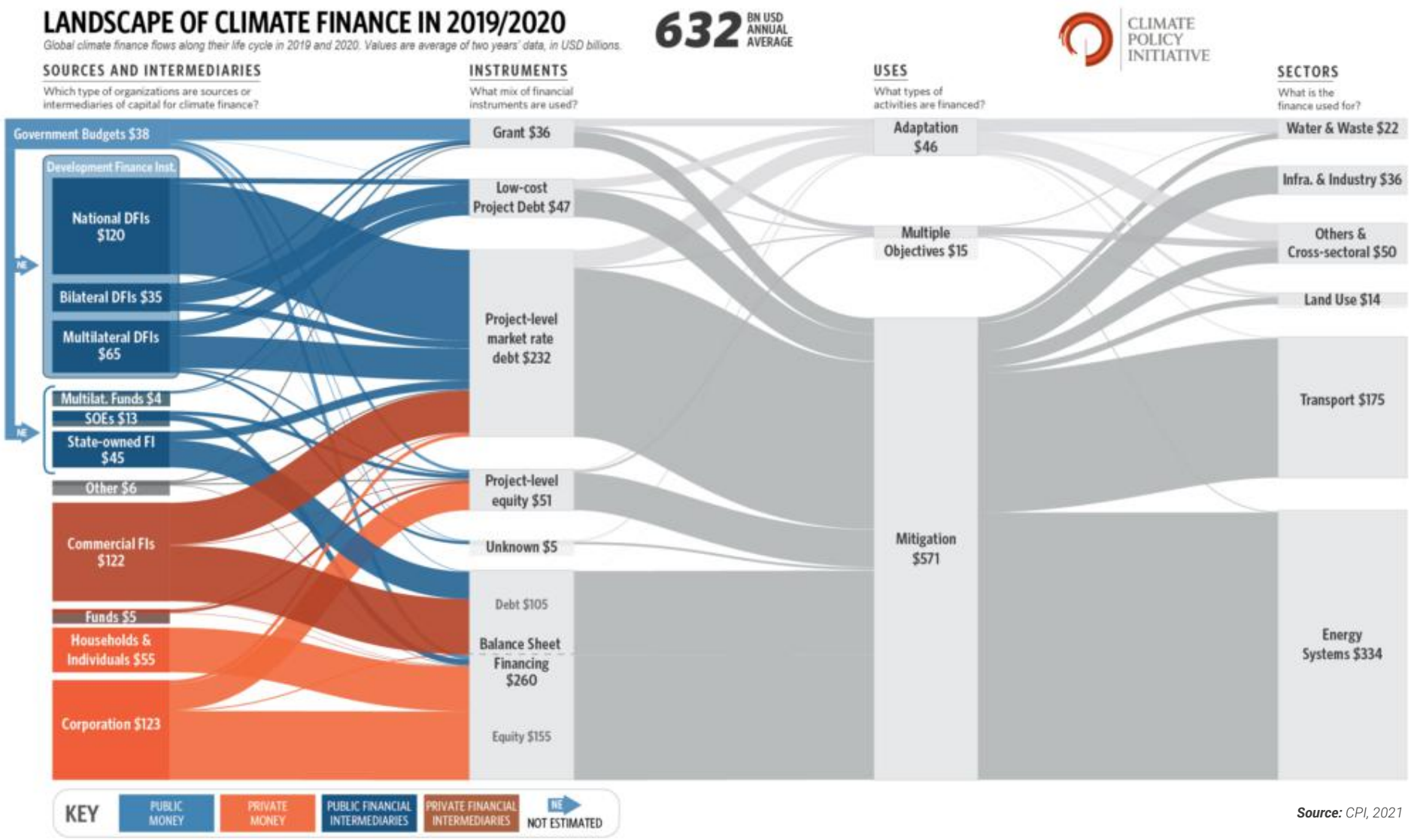
When preparing a proposal for a climate intervention, developers must strive to structure the financing in the most effective way, based on the most appropriate financing instruments, related to the specific financial barriers the intervention/technology is facing. **This chapter presents financing instruments and relates them to principles of climate finance, while contextualizing this in the context of different climate finance providers.**

i) Financial instruments

A number of financial instruments that are commonly used are briefly defined in Table 1.

6 Climate Policy Initiative publishes yearly updates in its Global Landscape of Climate Finance series. They can be found at https://climatepolicyinitiative.org/climate-finance/

Figure 3: **Landscape of Climate Finance Flows.**



Source: *CPI, 2021*

Table 1 Financial instruments listed alphabetically

Financial Instrument	Description	Funds Provider*
Aggregation	Aggregation of small-scale investments with similar features e.g. technology, stakeholders, business case in a larger portfolio, with the benefit of lowering of transaction cost and risk exposure.	National Development Banks, Microfinance, NBFI, Private Equity Funds. ESCOs
Blended finance	Blended finance refers to the strategic use of initial public development finance investments e.g. use of grants, equity or concessional loans to leverage additional private capital such as commercial loans or equity that does not primarily target development outcomes in developing countries. Blended finance enables scaling up finance due to the reduction of risks. It is increasingly used by multilateral development banks, and climate investment funds.	Multilateral Development Banks, National Development Banks
Bonds	A bond is a fixed income instrument that represents a loan made by an investor to a borrower (typically corporate or governmental). Bonds are used by companies, municipalities, states, and sovereign governments to finance projects and operations. Owners of bonds are debtholders, or creditors, of the issuer.	Individuals, Banks, Weath Funds, Pension Funds, Insurance Companies,
Carbon credits	Carbon credits became known under the Kyoto Protocol, as a Certificate of Emissions Reduction demonstrating the reduction of 1 tonne of CO_2e. Carbon credits are generated from climate mitigation interventions, and sold to entities, companies or governments in need to deliver additional mitigation outcomes outside their jurisdiction, in order to meet their emission reduction targets. Carbon markets and bilateral exchange of credits are also envisioned under the Paris Agreement.	Governments and private companies that need to offset, or voluntarily offset, their mitigation commitments
Concessional loans	Concessional / soft / preferential loans are loans provided below the market rate i.e. with low interest rates, long terms and possible grace periods. Concessional loans are among others provided by multilateral development banks and climate investment funds.	National Development Banks, Multilateral Development Banks
Crowd finance	Raising capital/finance through a collective effort of a large pool of individuals or peer-to-peer lending, typically facilitated through social media and web platforms. Can include different types of finance e.g. donations, guarantees, equity etc.	Crowd Funding Platforms
Debt	Debt is an amount of money borrowed by one party from another. The borrowing party borrows money under the condition that it is to be paid back at a later date, usually on an agreed schedule, with interest. Borrowers usually need assets as collateral as reassurance to the lender. The most common forms of debt are loans, credit, mortgages and leasing.	Banking Institutions, National Development Banks, Multilateral Development Banks, Microfinance, NBFI, Private Equity Funds, ESCOs, Pension Funds, Utility

Financial Instrument	Description	Funds Provider*
Equity	Equity represents the amount of money invested by a shareholder in a company, and that would be paid back if all of the assets were liquidated and all of the company's debt was paid off. Equity financing consists of selling a share of the company to investors, who expect to share the profits of the revenues created.	National Development Banks, NBFI, Private Equity Funds
Energy Service Companies	Energy service companies (ESCOs) are companies that finance energy related projects for their customers through the expected energy savings, reduced energy costs, and/or operations and maintenance costs. In general, ESCOs take on the technical and performance risks of the project and use performance-based contracts, so their revenue is directly linked to the actual energy cost savings	Energy service providers / technology providers offering energy performance contracts
Grants	Grants are contributions (in cash or in-kind) given by one entity (often government, foundation or trust) for specified purposes. Grants are usually conditional upon specific circumstances and purposes.	National Development Banks, Multilateral Development Banks, Government
Green bonds	A green bond differs from regular bonds in that they are designated for investments that are climate-related or other types of environmental projects. A bond is debt provided for a specific period of time and at a particular interest rate, and is usually combined with tax exemption and tax credits to increase their attractiveness. A bank may sell a green bond to raise money to finance climate-related interventions.	Banking Institutions, National Development Banks, Multilateral Development Banks, Pension Funds
Leasing	A lease is a contract under which one party rents property owned by another party. It provides the tenant access to an asset without having to lay down the otherwise required upfront full investment to purchase the asset, and guarantees the lessor / property owner, regular payments for a specified period in exchange.	Service providers, technology providers, land owners
Subordinated loan	Subordinated loan, also known as "first loss" or "junior loan", where the financial institution accepts to take the first loss, and that others are paid back first, in case of borrower default creditors with subordinated loans will only be paid after other debts or "senior loans" are paid in full. Examples of subordinated loans are mezzanine[7] loans and assets-backed securities.	Banking Institutions, National Development Banks, Multilateral Development Banks, Microfinance, NBFI, Private Equity Funds, ESCOs, Pension Funds, Utility
Risk mitigation instruments	Financial instruments, such as credit, currency, political or inflation guarantees and insurance, to mitigate the risks of investments, which help reducing financing costs and mobilize private capital, especially relevant in countries with high investment risk environments and low creditworthiness.	Insurance companies, Guarantee institutions
Performance-based finance	Finance agreement, where the recipient is paid based on the performance. REDD is a form of performance-based payment scheme where reduced deforestation and degradation is paid based on performance. Another example is ESCO, which are paid by the energy efficiency savings.	Private Equity Funds, ESCOs

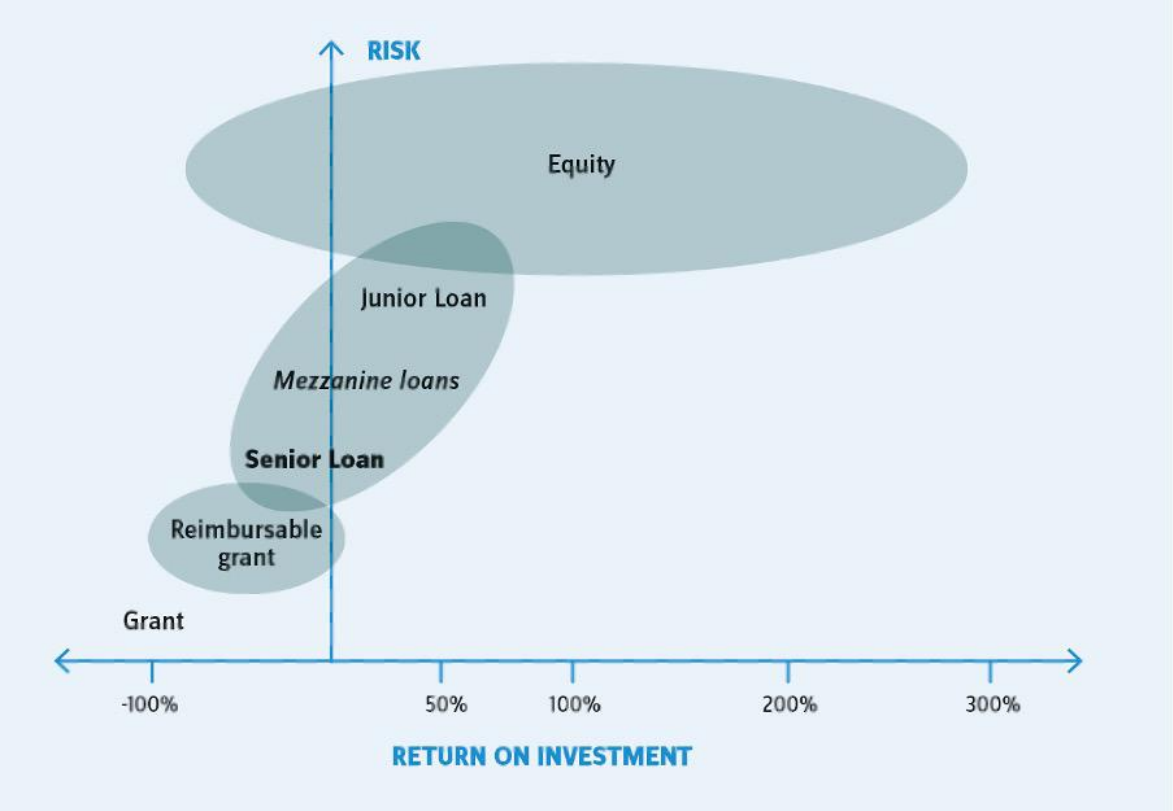
**Funds provider has been taken from Base, 2019: Manual of financing mechanisms and business models for energy efficiency*

7 Mezzanine loans are one of the highest risk form of debt and under certain conditions can be converted to equity. They are riskier that senior loans but can provide higher returns to investors (figure 2)

Different types of financial instruments presented in Table 1 are associated with varying degrees of risk and associated with different stakeholders (Figure 3). A grant carries low risk for investor, because there is no requirement of pay back, while a reimbursable grant carries some risk of no repayment. Junior loans are riskier for investors than senior loans, which will be described in the below section on concessionality. Equity has the highest risk, as the investor becomes a shareholder with all the obligations it entails, and there is no pre-determined agreement on financial return. For bearing the risks the investor might gain higher returns compared to the return on a loan interest rate of financial instrument is determined by the risk associated with the investment. **Risk, whether real or perceived, is probably the most important factor that prevents climate -related projects from finding investors.**

It is essential to seek to meet investors' risk-return needs. For instance, public-sector risk-reducing instruments, such as guarantees and credit-enhancement mechanisms, help investors mitigate diverse political, market, regulatory or technology risks. Other public mechanisms aim to enhance investment returns, including financial policies such as feed-in tariffs, tax and other incentives.

Figure 4: Risks and Returns of Different Financial Instruments



Source: Canu et al., 2020

In this context, developers of proposals for climate interventions must understand the basic concept of risk seen from the point of view of an investor or finance provider. The decision related to the choice or composition

Guarantees play a central risk coverage role. Guarantee models are designed to provide the necessary trust among financiers who balance the price of their money with the risk of losing it. Guarantees help not only to provide capital in the first place, but also to

reduce the price of financing and to extend patience and confidence of investors. The different instruments for covering risks and guarantees are provided both by the public and the private sector. **Governments will normally provide political guarantees; government agencies, such as export credit agencies, may be insuring financial guarantees; the private sector, usually technology providers, can provide performance bonuses and technical risk coverage (technology guarantees), while private insurance companies can offer additional insurance.**

As mentioned, the instruments are often mixed in a financing mechanism. Different projects/investments are more relevant for certain instruments, and financial institutions specialize in specific instruments. For example, in wind energy, which by now is a well-known technology, it is possible to invest with an equity share of 20-25 per cent. The remaining 75-80 per cent can be financed by loans through banking institutions. Investments in types of interventions that are less well known, can have equity requirements of 50 per cent or more for a bank to be willing to lend the remaining 50 per cent, and the interest rate might still be restrictive to make the investment viable. The exact combination of equity to loan, and the interest rate, depends on a number of factors besides technologies, e.g. the regulatory regime, the country, in which the investment is made – all of it representing a certain risk. **Using a blend of instruments from various sources can help spread the risk and leverage the needed finance to make the investment viable.**

In the mixing, blending, and structuring of the finance for a climate investment, a wider interaction between national and international, public and private development, and commercial banks and funds, is required. Public funding, for example that is channelled through international climate funds or development banks, typically offers concessional terms to unlock private finance and markets.

ii) Role of private sector finance

Equity financing

Equity is the investment made directly in projects or operating assets by investors and in a going concern it is the money that will be returned to equity investors (shareholders) if all the assets were liquidated and all the companys debt was paid out. Equity investors are typically private companies and individuals running hotel and tourism businesses. Besides the businesses equity can also be provided by venture capital funds, public risk capital funds (hybrids) and pension funds. Equity rarely stands alone, but it is mixed with other financial instruments. Equity is a fundamental source of climate finance for hotel and tourism businesses that want to invest in innovative technologies for mitigation or adaptation projects. The availability of capital for entrepreneurs that seek high returns or seed capital for their business models depends on private funds, such as:

- Private equity capital – Firms provide capital at mature stages of companies. They offer the investors lower returns and lower risk within projects.

- Venture capital – Investments that focus on earlier stages of companies, offering higher return and risk. These funds mostly focus on technology companies.

- Institutional investors – Pension funds and insurance companies that have larger investment horizons and lower risk.

Debt financing

Debt instruments are less risky than equity (seen from the point of view of the investor), offering a pre-determined return. For the private sector, loans represent opportunities in case of limited access to own finance. In the case of climate finance, multilateral financing mechanisms have opened the way

for green financing instruments and concessional loans that are especially useful for renewable energy, energy efficiency, and other infrastructure projects that are capital intensive and require long-term funding.

Commercial and development banks increasingly offer dedicated loans for mitigation and adaptation projects, some of them with concessional features. The advantage of having concessional loans is that projects obtain preferential credit lines, which can also be combined with grants from climate funds to lower the risk for private companies. These loans can be senior, subordinated, or quasi-equity, depending on the desired risk for the projects. The main goal of green credit lines is to overcome market and cost barriers.

Microfinance

MSMEs, particularly in developing countries, lack access to traditional credit due to their limited capital, assets, collateral and structure. Financial institutions develop and offer small-scale loans to low-income businesses or individuals with climate mitigation or adaptation activities. Many of these instruments support rural and cooperative projects.

An example that illustrates private-sector debt financing is a recent climate change adaptation project in Croatia. The European Investment Bank (EIB) is giving a multi-beneficiary intermediate loan to the Croatian Bank for Reconstruction and Development (HBOR) for nature-based climate adaptation, targeting eco-tourism and green infrastructure. The purpose of the loan is to finance private SMEs. The EIB will supervize how the credits are assigned to SMEs, where HBOR acts as the intermediary financial institution. This is a €15 million loan that started in 2018 and looks to enhance the possibilities of SMEs to engage in direct climate action. Since HBOR has a stable credit rating, the project can initiate with a lower risk for the EIB as an international bank.

iii) Role of public sector

One of the main roles of the public sector is to offer finance and policy incentives to accelerate climate change investments. These can include policy risk guarantees, carbon pricing, green taxes, tax incentives, feed-in tariffs, and subsidies (GCF, 2019). Incentives can, however, place a burden on the national budget, and are generally time-bound to provide an initial push for market development. Incentives also tend to distort markets, and so it might be more efficient to remove incentives on currently used technologies, for example, fossil fuel subsidies.

The public sector has a key role to enable the arrangement of blended finance and catalysing private investment through provision of concessional finance in the form of grants, concessional loans, subordinated loans, etc.

iv) Financial principles

Having established which financial instruments are available and the suppliers, this section provides a description of the main financing concepts and principles applied – such as incremental costs, co-finance and concessionality – which will structure the argument for why the selected financial instruments are the most appropriate.

a. Concessional finance

The concept of concessionality expresses how "soft" or at how favourable terms the finance is given e.g. compared to a regular market instrument. Concessionality outlines a continuum with a range of possibilities.

At the one end of the continuum is a grant. A grant can be considered a fully concessional instrument, as the funds are given and no repayment is required. At the other end of the continuum, a loan at market terms/rate would have no concessionality, as there is no favourable term attached to it. In simple

terms, if the normal interest rate for a loan is 10 per cent, but a loan with a favourable 5 per cent rate is provided, the concessionality of that loan, or "grant equivalent", would be the present value of the 5 per cent difference.

While the example above describes a grant, a loan, and an interest rate, there are other ways to express degrees of concessionality:

- Concessional loan, low interest rate (as above), long pay back periods, or extended grace periods.[8]
- Subordinated loan, also known as "first loss" or "junior loan", where the financial institution accepts to take the first loss, and that others are paid back first, in case of default.
- Capital investment (equity) – losses (and profits) are shared.
- Guarantees – provided by financial institutions, which accept the losses of other investors in case of default.
- Reimbursable grants – must be paid only under certain conditions e.g. if it is profitable

The rationale for concessionality within climate finance is that some climate investments need to be given favourable conditions, because the market is not yet facilitating these investments by itself e.g. climate action is under-valued/priced (and often not privatized), leading to sub-optimal decisions/investments, and necessary climate action would not take place unless concessionality was applied. The source of concessionality is often public finance. As mentioned earlier, scarce public finance should be used to catalyse private finance, but it is key that the public finance is not replacing private finance on market terms, but only used where concessionality is needed. It is therefore required to establish the "minimum level of concessionality" (on the continuum), while ensuring that the concessional finance does not "crowd out" private sector and distort markets, but instead addresses the root cause of market failure.

b. Incremental cost

Incremental cost is a term often used within climate finance. It means the additional expenses (costs) to produce the necessary outputs that results in climate mitigation. For instance, energy efficiency measures need to be considered in property investments. However, these extra or incremental costs are not always covered as part of the investment. It is of vital importance for any investment to clearly delineate the costs of business-as-usual (BAU) development (i.e. the investments in development that would/should happen even in the absence of climate change) and the costs of implementing the activities necessary to make development less carbon intensive than BAU. In practice, separating BAU development costs, or non-climate costs, and the cost of mitigation, dollar by dollar, is a challenge and some degree of approximation and estimation is needed, and generally accepted.

To illustrate the principle more concretely, a hotel chain in a Pacific island purchases 100 power plants at $US 10,000 each implies an investment budget of $US 1 million. Assuming a more climate friendly technology should be used, solar panels (which are more expensive) could be purchased, at $US 20,000 each. A typical proposal would be to ask for $US 2 million in concessional finance to buy 100 solar panels. This approach is likely to fail among donors. In contrast, the incremental cost approach would mean to still invest $US 1 million of your own funds in the project, and use the 1 million concessio-

8 Time the borrower can refrain from paying instalments from the time the loan is issued, or time allowed for payment beyond the due date of instalments without any penalty fee.

nal component to pay for the additional solar panels. This approach helps fund the project without replacing part of the original budget.

c. Co-finance and overview of other principles and their application

One of the principles often applied by development or climate finance institutions is that the project/investment should seek to incorporate appropriate levels of co-finance. **Co-finance shows a commitment of the project proposer (and potentially other financiers), and it ensures that the impact of the scarce development/climate finance resources available is maximized.** Donors providing concessional finance expect that the non-climate related costs are covered through co-finance, while they will provide finance for the additional / climate costs of the intervention. Co-finance types can vary and be defined in different ways. Below are some types and definitions:

- **Direct co-finance:** Financial resources, either public or private, that flow alongside the finance from the development/climate finance institution into the investment in the intervention, and in direct causal relationship (the co-finance exists because of the finance from other sources). For example, a multilateral development bank provides a senior loan, conditional on the provision of a junior loan by a climate fund.

- **Indirect co-finance:** All finance, either public or private, from third parties that indirectly flows into the intervention funded by the development/climate finance institution, and with causal links. For example, private-sector companies' equity investments, when accessing dedicated credit lines supported by concessional finance sourced by a climate fund.

- **Leveraged/mobilized/catalysed finance:** Includes all direct and indirect co-finance reasonably assumed to be a result of the finance from the development/climate finance institution.

- **Sequenced finance:** Finance flows alongside the concessional finance, but earmarked for other outcomes, and with no causal relationship. For example, a flood early warning system, and climate resilient riverbank infrastructure, which are financially non-related.

Types of co-finance are not mutually exclusive, as there are overlaps and grey zones, where it can be difficult to determine the type e.g. the causal links between finance. In the tourism sector a good example of concessional finance and co-financing is IDBs mezzanine facility for Selina[9]. IDB Invest, a member of the IDB Group, provided a $50 million mezzanine facility for Selina, a global chain of lifestyle hotels, to support the continuity of its expansion plans in Latin America and the Caribbean. IDB Invest's financing, which includes funds mobilized from "Blue like an Orange Sustainable Capital", will allow Selina to enhance its liquidity during the Covid-19 pandemic, and expand its geographic presence in Latin America and the Caribbean. IDB Invest's mezzanine financing consists of a $35 million loan from IDB and the mobilization of a $15 million loan (co-finance) from "Blue Like an Orange Sustainable Capital". Each property is developed using recycled or up-cycled materials for construction and decoration and several properties are in rural areas that had limited international tourism before Selina's entrance. The company has adapted to the Covid-19 crisis by being focused on more efficient operations, longer-term stays, and its newly launched subscription model.

9 https://www.idbinvest.org/en/news-media/idb-invest-promotes-reactivation-sustainable-tourism-latin-america-and-caribbean-50

3.3 Financial analysis of a business proposal

Although the world of finance is full and complex, mastering just six concepts with a pencil, paper, calculator or computer is sufficient grounding to have the most sophisticated conversations with "experts". These concepts are: **interest rate, return on investment, net present value, internal rate of return, debt service, and debt service coverage ratio.** These six concepts are explained below, and an Excel-based financial calculator is also provided to help users make these calculations for their proposals.

Interest rate: Interest is the concept to account for time value of money. Usually quoted as a percentage (and most often quoted as a fixed percentage per year or month), it is the fee paid by a borrower to a lender in return for the lender making funds available to the borrower.

If an amount of 1 000 is borrowed at 12 per cent a year at simple interest for five years, the future value of this after after years can be calculated using using the following equation:

$$FV = P(1 + R)^N$$

Where:

FV = future value
P = principal (initial amount)
R = annual rate of interest
N = number of years
FV = 1000(1+.12)5
1000 * 1.7623 = 1762.34

Return on investment (ROI): is a commonly used measure of evaluating performance of an investment. It is calculated by taking the difference between current or expected value of an investment and original value divided by the original value and multiplied by 100. For example, for a bank which has loaned 1000 at 12 per cent, the ROI at the end of five years is:

= (1762 -1000)/1000 x 100 = 76.2%

ROI does not consider the time aspect and it is therefore difficult to compare projects with different time horizons.

Net Present Value (NPV): is a financial ratio that is widely used and takes into account the time aspect of cash flows. It can be mathematically calculated using the folowing formula:

$$NPV = C_0 + \frac{C_1}{(1+r)^1} + \frac{C_1}{(1+r)^2} + \frac{C_1}{(1+r)^3} + ..$$

where C_0, C_1 are the cash flows in year 0, 1, …

r is the discount rate which is generally the weighted average cost of capital

The technique is quite simple to perform, either manually with a calculator or with a spreadsheet such as Excel by using function NPV. If the NPV of an investment is a positive number then it is one measure of the profitability of a proposal. If the number is zero or negative, that is a good estimate of the additional funding needed (whether by grants, subsidies, cost-cutting or revenue improvements). The most important step is selecting an appropriate discount rate. Usually the discount rate is based on the opportunity cost for the investors and relates to the alternative investment opportunities. In Table 2 NPV calculations for two projects are provided and it can be seen that project is profitable and would be selected among the two for investment.

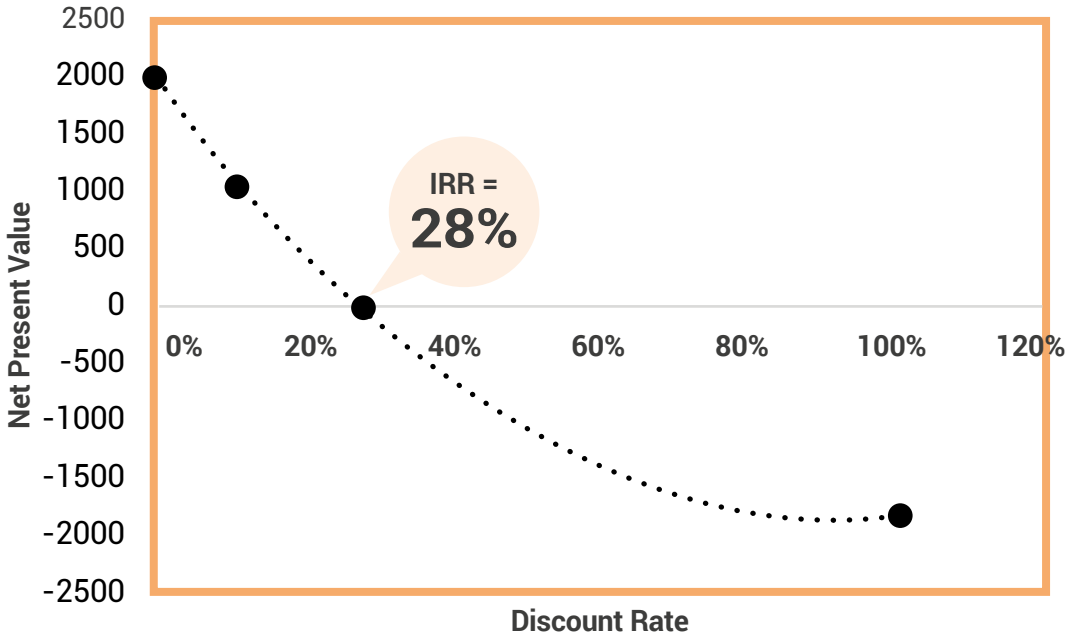
Table 2: NPV, IRR and Pay Back Calculations for Project A & B at a discount rate of 12

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Project A	-1000	120	200	350	400	500
NPV	47.88					
IRR	14%					
Pay back period		4				
Project B	-700	100	150	200	250	250
NPV	-42.90					
IRR	10%					
Pay back period	4					

Internal Rate of Return (IRR): The internal rate of return is defined as the annual rate of growth an investment is expected to generate. In mathematical terms, it is the rate of discount that makes NPV equal to 0.

provides highest R2 value). The point where the trend line crosses x axis is IRR. A quicker and more accurate to use a computer spreadsheet e.g. Excel, which has a function called IRR for calculating IRR.

Figure 5: Internal Rate of Return



The IRR can be calculated by using a scatter plot of combinations of NPV and discount rate on a graph like Figure 4. Next we put a trend line that shows the highest fit (e.g. the trendline used in Figure 3 is polynomial and

Debt service: is the amount paid each year to repay a loan. It consists of principal repayments (the amounts borrowed) and interest payments (the cost of money). Debt service equals principal plus interest (p+i). There are

three different debt profiles. It is possible to pay only the interest on a loan for a period of time and then pay the principal amount in one or more payments. When a single payment of principal is made at the end, this is called a "bullet" payment. It is possible to pay the same amount every period. This is called the "mortgage payment" method. The third of 12 per cent a year. The debt service for five years under the three plans is provided in the table 3 below.

Debt service coverage ratio (DSCR): calculation compares the amounts available by year (and for the total period of the loan) to see if there is a match (or mismatch)

Table 3: Debt Service under different repayment plans for a loan of 1000 @ annual interest of 12%

Payment options	Formula Used	Year 1	Year 2	Year 3	Year 4	Year 5
Bullet						
Interest Payment	Opening Balance*12%	120	120	120	120	120
Principal Payment		0	0	0	0	1000
Total annual repayment		120	120	120	120	1120
Closing Balance end of Year		1000	1000	1000	1000	0
Mortgage						
Interest Payment	Opening Balance*12%	120	102	81	57	31
Principal Payment	Difference between Annual repayment and interest payment	157	175	196	220	246
Total annual repayment	Using PMT function (Excel)	277	277	277	277	277
Closing Balance end of Year		843	667	471	250	4
Equal principal						
Interest Payment	Opening Balance*12%	120	96	72	48	24
Principal Payment	Principal / No of Repayments	200	200	200	200	200
Total annual repayment		320	296	272	248	224
Closing Balance end of Year		800	600	400	200	0

makes equal payments of principal amounts over a specified period of time. The interest amount paid at each time varies because the balance of the loan is declining. Let us say for project A the capital investment of 1 000 is funded through a loan at an interest

between the amounts to be paid under the different payment plans and the amounts required to be paid. Mathematically:

DSCR = Net Operating Income / Total Debt Service

A DSCR inferior to 1 means negative cash flow i.e. the borrower will need to pay the debt service from other sources. Lenders generally require a minimum level of DSCR. To make this clearer let us use the cash flows presented earlier for project A and the amount required to service the debt (Table 4).

3.4. Analysing the non-financial impacts of a business proposal

When deciding whether to implement a mitigation action, a business should also consider the non-financial impacts. **Positive impacts may bring additional benefits to the business, which may play in favour of this business in the longer term. Non-financial impacts are important to get financing from certain schemes or instruments** (e.g. green bonds/loans, sustainability-linked bonds/loans) with a requirement to measure and monitor impact. It helps if the project is categorized as green or sustainable in the investor/lender portfolio.

Table 4: DSCR calculation for Project A under different repayment plans

		Year 1	Year 2	Year 3	Year 4	Year 5
Project Net Inflows		120	200	350	400	500
Re-Payment options for 1000 @ 12 % annual interest						
Bullet		120	120	120	120	1,120
	DSCR	1.00	1.67	2.92	3.33	**0.45**
	Avg DSCR	0.98				
Mortgage		277	277	277	277	277
	DSCR	**0.43**	**0.72**	1.26	1.44	1.81
	Avg DSCR	1.13				
Equal principal		320	296	272	248	224
	DSCR	**0.38**	**0.68**	1.29	1.61	2.23
	Avg DSCR	1.15				

DSCR is an important ratio for donors or entities that provide loans since they would like to understand how loans will be paid over time, especially in years with a DSCR less than 1. For example, Bullet schedule is good for the project developer in that it frees up much cash in the early years to reinvest in the project. It is bad for the lenders because it produces the lowest overall debt service coverage ratio and has a very risky fifth year. DSCR can also provide an opportunity to project developers to build a case for operating subsidies.

Payback period: is the time required to recover the upfront investment. It is simply the time in years where cumulative net inflows equals the initial investment (See Table 3 for illustration for two project cash flows)

When considering a mitigation action, an inherent non-financial positive impact is the reduction of GHG emissions. It is important to note that under article 6 of the Paris Agreement, initiatives are being proposed to engage the private sector in the implementation of NDCs through the trading of emission reductions (ERs). Trading of ERs can allow converting the non-financial impact of ERs into a financial component. In addition, mitigation actions can have other non-financial benefits such as social and environmental (other than emissions reductions) benefits. This is, for example, the case of an accommodation bu-

siness that chooses local food over imported frozen products. **This business would support local producers (social and economic benefits) and at the same time would probably reduce the GHG emissions related to the refrigeration and transport activities linked to imported products.**

It is important for a business to assess the non-financial impacts of mitigation actions and to include these considerations in the development of a business proposal.

From a mitigation point of view, the assessment of non-financial impacts can be divided into the reduction of GHG emissions and other positive impacts (social, economic and other environmental impacts) considered as co-benefits.

i) Assessment of greenhouse gases impact

If a business wants to develop a financial proposal for a mitigation action, it is relevant to quantify the reduction of GHG emissions that would be achieved. It has to be noted that if the business needs to request a loan (or any other type of financial instruments) to support investment and implementation costs, some climate funds e.g., Green Climate Fund include the assessment of the reduction of GHG emissions as a criteria to be included in the financial proposal. This criteria is then usually expressed as the cost related to the option for reducing one mass unit of CO_2.

Depending on the type of mitigation action considered by the business, there are many methodologies and tools available for assessing GHG emissions. **The UNEP guideline "Measuring and monitoring resource efficiency and greenhouse gas emissions" in tourism gives an overview of the general methodology for assessing GHG emissions as well as an overview of tools available, including the GACMO tool.** Annex 1 provides the emission reduction calculation for different mitigation options that was done using the GACMO model for the tourism sector in the Dominican Republic, as a reference.

ii) Assessment of other sustainable development co-benefits

For a business, assessing the co-benefits of a mitigation action on top of the financial proposal will demonstrate socio-economic-environment benefits of the action and strengthen the justification for it. Therefore, by doing this assessment, a business will increase the attractiveness of the financial proposal for potential donors.

There are many approaches and methodologies available for assessing co-benefits. However, they usually follow the same series of steps. The "Sustainable Development methodology: Assessing the environmental, social and economic impacts of policies and actions[10]" provides a clear description of these steps and proposes an approach for qualitative and quantitative assessment of these impacts. It has to be noted that this methodology has been developed for supporting countries in assessing the sustainable development impacts of mitigation policies and actions. However, the steps and approach are easily transposable in a business context. The key steps (adapted from this methodology) are:

Determine the objectives of the assessment: The primary objective is to improve the design of the mitigation action and maximize its net benefits by understanding the environmental, economic and social impacts. It has to be noted that the economic co-benefits considered in the assessment would be those achieved outside of the business by a third party, for example the economic benefits made by local farmer resulting from the

10 ICAT (Initiative for Climate Action Transparency) (2020). Sustainable Development Methodology: Assessing the Environmental, Social and Economic Impacts of Policies and Actions, D. Rich, R. Song and K.H. Olsen eds. Washington D.C.: World Resources Institute; Copenhagen: UNEP DTU Partnership. https://climateactiontransparency.org/ icat-toolbox/sustainable-development

purchase of local food products by an accommodation business.

Clearly describe the policy to be assessed and choose which impact categories to assess: In the case of a business, the following impact categories are relevant and significant, and could be assessed: air quality and health, waste, quality and safety of working conditions, local jobs creation, protection of local biodiversity, and so on.

Identify indicators for each included impact category: An indicator is a measurement that can be estimated to indicate the impact of an action on a given impact category. To assess impacts, appropriate indicators need to be identified for each impact category that has been selected. One or more indicators may be relevant for each impact category. Indicators can be defined in a variety of ways. Such indicators could be defined as qualitative or quantitative. The choice of specific indicators should take into consideration the types of data available and should follow the principles of Relevance, Credibility, Validity, Reliability and Feasibility.

Example of selected impacts, impact categories and indicators are provided in table 5. However, for a more comprehensive coverage, refer to the Sustainable Development methodology: Assessing the environmental, social and economic impacts of policies and actions of ICAT.

Assess qualitative indicators: Each indicator is assessed based on its likelihood of occurring, its expected magnitude (major, moderate or minor), and the nature of the change (positive or negative)

Table 5: Impact Categories for non-financial impacts

Impact	Impact category	Indicator
Environment impacts	Air quality and health	• Emissions of air pollutants such as particulate matter • Indoor and outdoor air quality (air quality index)
	Protection of local biodiversity	• Contribution to local conservation of terrestrial or marine ecosystems
	Waste generation and disposal	• Solid waste generated (tonnes/year) • Wastewater generated • Recycling rate (percentage of waste recycled)
Social impacts	Quality and safety of working conditions	• % of employees who think that health is at risk because of work
Gender impacts	Gender equality	• % of women who are employed in tourism sector • % of women in unstable jobs • % of women affected by pollution compared to men (and by health issues related to poor air quality)
Economic impacts	Local jobs creation and income Economic productivity	• Number of people employed • Income per capita • Agricultural productivity

Assess quantitative indicators: Estimate baseline value for each indicator, i.e. the value of the indicator if the mitigation action is not implemented; estimate the value of the indicator resulting from the implementation of the mitigation action.

4

Steps to write a business proposal

In order to explain the steps that a tourism business should follow to write a proposal, this section uses the example of one mitigation action, efficient chiller, and runs through the eight tasks for writing a business proposal as provided in the UNFCCC Finance Guidance (UNFCCC, 2006). These eight steps will help to answer the following questions

- What is being proposed? The core concept
- Where will the proposal be implemented? The setting
- Who will lead the proposal and see it to completion, and who else must be involved? The team
- How will the proposal be implemented? Implementation plans
- Why is the proposal important and why should it be supported? Expectations
- What if things do not go as planned? Risk
- To whom is the proposal addressed? The audience

4.1. Task 1: Describing the concept

The first task is to answer the question "What is being proposed?", keeping the service, technology and customer in the mind. It is also important at the concept stage to define the objectives and impacts of the project.

i) Service description

Chapter 2 describes different mitigation actions. Each of these options caters for some service e.g., air-conditioning, cooking, lighting, heat and power, etc. Therefore, at the start, it is important to define the nature of, and demand for, this service. It is also important to describe if and how this service is being met currently, or if is it a new service.

The mitigation option used as an example in this document is a more efficient chiller. The hotel is using an air-cooled chiller with R134a as a refrigerant, which has a high global warming potential. The more efficient option would be using water as a coolant and, therefore, loss of refrigerant does not lead to global warming.

ii) Technology description

A clear description in non-technical terms, combined with references for further information, should be provided at this stage. It is important to describe the approximate size of the technology, costs, inputs required and possible alternative options that can deliver similar service.

The project idea is to replace the existing 120 TR[11] air-cooled chiller with a water-cooled efficient chiller of 120 TR capacity at a capital cost of about $US 192,326. The plant would have an efficiency of 0.6 Kw per TR and require 630,720 Kwh annually compared to 1,261,440 Kwh, resulting in electricity savings. In addition, the air-cooled chiller loses about 0.001 ton of refrigerant (R134a) annually. R134a has a high global warming potential of 1300.

iii) Description of client group or customers

The concept should describe the clients and customers for the service and how they will be affected by the introduction of the technology. In many cases, the technology may be change the service significantly, so clients may be agnostic. However, in some cases, the service can undergo a transformation.

The replacement of chiller with a more efficient model may help in freeing electricity for other more productive uses, but, in terms of air-conditioning quality in the rooms it may not be visible.

11 one ton of refrigeration (1 TR) is the amount of heat used to melt one ton of ice in one day = 12000 BTU/h = 3.517 kW)

iv) Project design

Mitigation actions seeking funding are expected to bring about a broader transformation in the sector. Therefore, it is important to show this within the proposals. Green Climate Fund uses the Results Management Framework (GCF, 2014) which has a logic model running from Inputs to Paradigm Shift (Figure 5)

Figure 6 The logic model within the Results Based Framework of GCF

Source : *GCF, 2014*

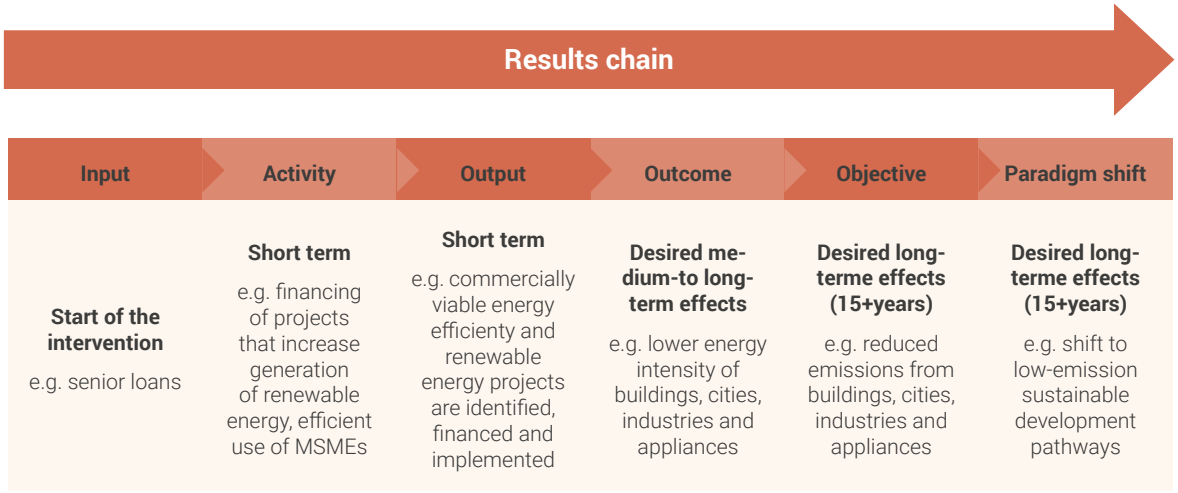


Figure 7: The logic model within the Logical Framework Approach

	Intervention Logic (Objective Hierarchy)	**Performance Indicators** (Objectively Verifiable)	**Sources of Verification** (Means of Verifications)	**Assumptions** (External Factors)
Overall Objective				
Project Purpose				
Results or Outputs				
Activities				

Irrespective of which logic model is used, the project design helps in defining the project's overall objective, outputs and main activities.

4.2. Task 2: Describing the setting

In this task, the question "Where will the proposal be implemented?" should be addressed in a balanced and transparent manner to show that the local settings are understood.

i) Macro-economic setting

A short overview of the macro-economic conditions within the country with regard to foreign currency exchange rate, inflation, and interest rates on the commercial loans is required, since some of these variables will be necessary for financial analysis.

ii) Regulatory setting

In order to implement the mitigation action there needs to be an understanding of the various regulations and rules that must be complied with. Regulations create an enabling environment for the technology, but, in some cases, may be creating barriers for implementing the technology. The rules / regulations that should be looked at include:

- Permits needed to start a business e.g., business registrations, sales tax registration.
- Permits needed to use a natural resource.
- Permits needed to use roads or cross public lands.
- Construction permits.
- Operating permits.
- Environmental regulations.
- Health and safety requirements.
- Energy regulations (fuel pricing, electricity pricing).
- Applicable taxes and regulations.

4.3. Task 3: The team

This task will answer the question of who will lead the proposal, and who else must be involved. It is a mapping of the team for project implementation. The skills within the team that may be required may be in the following areas:

- Marketing and sales.
- Operations and management.
- Financial planning.
- Legal and regulatory matters.
- Negotiations.
- Bank and investor relations.
- Design, engineering, procurement and purchasing.
- Construction.

The owners of the business should also be involved to understand their commitment to the project.

4.4. Task 4: Developing the implementation plan

This task deals with answering the question "How will the proposal be implemented?". It takes forward the concept defined in Task 1 into an operational form. In Task 1 the main activities have been identified and these can be converted into a plan through three steps.

i) Organizing activities according to project development cycle

The activities defined in Task 1 are organized according to the project development cycle, starting with proposal preparation and ending with the operation of the project. While doing this, additional activities important from an operational standpoint can be added.

ii) Assigning responsibilities for activities

The implementation plan also needs to describe who will be responsible for different activities. It would involve delegation of the different activities to the members within the team defined in Task 3, and, if required, adding additional persons.

iii) Estimating costs and revenue

The implementation of activities requires resources and has costs, which have to be estimated. Similarly, the sale of project outputs can generate revenues that also need to be estimated.

iv) Assigning duration for activities

Since the activities are organized according to the project development cycle, there is a time element associated with them. Specific start and end dates need to be provided for each activity.

Table 6 illustrates for the efficient chiller example the setting milestones, estimating and classifying costs, revenues and activities for a typical project, and most important, fixing responsibility. This is the first building block of financial planning for a proposal.

It is important from the standpoint of financial planning since timing can influence incomes and expenses and so can change the financial viability.

Table 6 Activity Table with costs and revenue

	Activities	Responsible Person	Estimated cost	Month Start	Month Finish
	Proposal preparation				
P1	Permits		5,000	1	12
P2	Technical analysis /Detailed Engineering		10,000	1	12
P3	Negotiating and preparing contracts I		5,000	1	12
P4	Negotiating and preparing contracts I		10,000	13	24
	Sub Total		**30,000**		
	Construction & pre-operation				
C1	Land acquisition	Not Needed			
C2	Engineering	Covered in P2			
C3	Equipment		403,900	6	12
C4	Installation		90,000	13	24
C5					
C6					
C7	Testing and commission		10,000	25	36
C10	Interest during construction		53,250	6	36
	Sub Total		**557,150**		
	Operation Phase				

	Activities	Responsible Person	Estimated cost	Month Start	Month Finish
R1	First year revenue		Table 10	37	48
R2	Second year revenue		Table 10	49	60
R15	Fifteenth year revenue		Table 10	216	228
OP1	First year labour – payroll		Table 11	37	48
OR1	First year rent		Table 11	37	48
OM1	First year materials		Table 11	37	48
OA1	First year general administration		Table 11	37	48
	Finance and administration				
F1	Financial closing				12
F2	Accounting manual and system			13	36
F3	Report to investors/				15

4.5. Task 5: Describing the benefits and impacts

As more and more financing institutions are greening their activities, including an analysis of the environmental, social and financial benefits and impacts may increase the robustness of a business proposal when requesting a loan (or any other type of financial instruments) to support the investment and implementation costs of an option. It may also help to get access to financing with better conditions (e.g. sustainability linked loans). Besides, some national or international development banks, as well as international funds, have their own criteria that need to be considered in a proposal.

i) GHG impacts and benefits

The impact of a mitigation action on GHG emissions is an inherent benefit of such action. Therefore, the amount of GHG emissions reduction achieved through the action is a key criterion to include in the proposal. This criterion will include information about the CO_2 abatement cost for the action and therefore about the value for money of the mitigation action.

Many tools and methodologies are available for estimating GHG emissions reduction. One of them is the GACMO model for the tourism sector.

The example used in this publication considers a 350 TR capacity efficient chiller that is replacing an existing air-cooled chiller. The mitigation impacts for a efficient plant of 350TR capacity are estimated as 1076 tons CO_2 a year (refer Annex I, Efficient Chiller Centrifugal). It has to be noted that these estimations are for the Dominican Republic and will vary for other countries. These reductions should be mentioned in the proposal and will help in making a justification for concessional finance. In the example, it is anticipated that project developers will be able to monetize the carbon revenues using some carbon price mechanism. The carbon prices varied widely in 2019, from $US 1 to 127 per tCO_2 and therefore a modest carbon price of $US 8.5 per tCO_2 (Table 10) is assumed. This low price was taken since more than 51 per cent of emissions covered are below $US 10 per tCO_2.

ii) Other non-financial co-benefits

Other non-financial co-benefits should be included in a proposal at this stage as they will strengthen the case. They may also provide information about the sustainability of the proposal beyond the financial considerations related to the business itself. Key indicators will have to be identified and quantified for the different impact categories using a methodology as suggested in Chapter 3.5.

Many tools and methodologies are available for estimating non-financial co-benefits of mitigation actions. One of them is the Sustainable Development Methodology developed under the ICAT initiative[12] or the Handbook – Harmonized Framework for Impact Reporting developed by ICMA[13].

In the efficient chiller example, other non-financial co-benefits that can be highlighted for funding institutions and relevant stakeholders are provided in Table 7.

Table 7 Time period wise allocation of costs for proposal preparation phase

Impact category	Indicator	Impact Description
Air quality and health	• Emissions of air pollutants such as particulate matter	*Moderate Impact* The efficient chiller will reduce demand for electricity and therefore help in reducing supply from fossil-based power plants that are at the margin. However, the impacts on air quality will be site-specific and depend on contributions from other pollution sources.
Local jobs creation and income	• Number of people employed • Income per capita	*Moderate Impact* The efficient chiller plant would create some jobs during construction phase and later during the operation the existing operators can be trained in the operation of new chiller. The project will entail a capital investment of around $US 0.5 million and it is estimated that this can generate around three jobs[14] in the construction sector.

12 ICAT (Initiative for Climate Action Transparency) (2020). Sustainable Development Methodology: Assessing the Environmental, Social and Economic Impacts of Policies and Actions, D. Rich, R. Song and K.H. Olsen eds. Washington D.C.: World Resources Institute; Copenhagen: UNEP DTU Partnership. - https://climateactiontransparency.org/icat-toolbox/policy-assessment-guides/sustainable-development/

13 https://www.icmagroup.org/sustainable-finance/impact-reporting/

14 Assuming 1 billion Euro of investment creates 5665 construction jobs (Purohit & Dhar, 2018)

4.6. Task 6: Building the base case:

When investors or potential financiers evaluate a proposal, they will need documentation on the expected return on investment throughout the implementation of the intervention, and information to assess the risk of their investment. The financial model and financial plan with a clear description of costs and revenues provide this crucial information and forms the backbone of any proposal. Investors / lenders also need to understand the key assumptions for the financial model and an analysis of potentially stressed scenarios. This chapter will show how to develop a financial model, and a simple Excel workbook is also provided for developing a financial model.

A proposal consists of a "project proponents" plan to do something, combined with a request to an "enabler" for resources. In order to build a base case it is helpful to think of activities in terms of blocks of time, i.e. proposal preparation phase, construction and pre-operation phase, and operation phase. In section 4.4 some elaboration of this has been done.

Proponents should go through each activity in Table 6 and identify costs and revenues for all the activities and distribute them over time. The year when operations start can be designated as 1 whereas activities that happen before this can be put under years 0 and below. Table 8 gives an example for the proposal preparation block. A similar approach can be taken for construction and pre-operation phase.

Table 8 Time period wise allocation of costs for proposal preparation and construction phase

Cost Heads	Year -2 months 1–12	Year -1 months 13–24	Year 0 months 25–36	Total
Planning costs				
Obtaining all permits	5,000			5,000
Technical analysis /Detailed Engineering	10,000			10,000
Negotiating and preparing contracts	5,000			5,000
Negotiating and preparing contracts		10,000		10,000
Sub Total	**20,000**	**10,000**		**30,000**
Construction Costs				
Land acquisition				
Equipment	40,390	363,510		403,900
Installation		90,000		90,000
Testing and Commissionng			10,000	10,000
Sub Total	**40,390**	**453,510**	**10,000**	**503,900**
Annual interest during construction @ 5% pa	2,020	24,796	26,435	53,250
Total	**42,410**	**478,306**	**36,435**	**557,150**

For the operations phase, both revenues and costs need to be estimated. It is helpful to identify all the different revenue streams from the project. For example, in the case of the efficient chiller plant, the revenue comes from the savings of electricity and carbon credits that the project generates (Table 9).

mind the rate of inflation in the economy. For simplicity, no inflation was assumed in the example shown in Table 10.

Once a time period wise allocation has been done for all phases of the project, grants and subsidies need to be considered in the project.

Table 9 Time period wise allocation of revenues

Revenues	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-15
Electricity Saved						
Units (Kwh)	1,839,600	1,839,600	1,839,600	1,839,600	1,839,600	1,839,600
Cost per unit (US $)	0.16	0.16	0.16	0.16	0.16	0.16
Revenue from electricity savings	**294,336**	**294,336**	**294,336**	**294,336**	**294,336**	**294,336**
Units (tCO_2)	1076	1076	1076	1076	1076	1076
Revenue per unit	8.5	8.5	8.5	8.5	8.5	8.5
Revenue from carbon	**9,146**	**9,146**	**9,146**	**9,146**	**9,146**	**9,146**
Total Revenues	**303,482**	**303,482**	**303,482**	**303,482**	303,482	**303,482**

A similar estimation can also be done for operating costs in terms of fixed costs (e.g. rent, administrative cost) and variable costs (e.g. fuel, labour, materials, etc). In the present example, which involves the replacement of an existing chiller, no changes in rent, communications and administrative expenses are expected. The fuel expenses are not counted since there will be fuel savings that are counted on the revenue side. For the long term, to remain realistic, costs and revenues can be increased every year, keeping in

A capital grant can be included in the application to the funding organization, and some nominal grant can be included to prepare the base case (Table 11). Also, a grant/subsidy can also be requested for the first year of operation if the revenues are low and the costs are high. Besides seeking grant finance, it is also important to check if there are any other subsidies that the project can tap into.

Table 10 Time period wise allocation of operating costs

Revenues	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6-15
Labour	12,000	12,000	12,000	12,000	12,000	12,000
Rent						
Communications						
Fuel						
General and administrative costs						
Total	**12,000**	**12,000**	**12,000**	**12,000**	**12,000**	**12,000**

Table 11 Time period wise allocation of grant and subsidies

	Grants and subsidies	Year -2	Year -1	Year 0	Year 1	Year 2
1	For planning or construction/ pre-operation			5,000		
2	For operation					
	Total	**0**	**0**	**5,000**		**0**

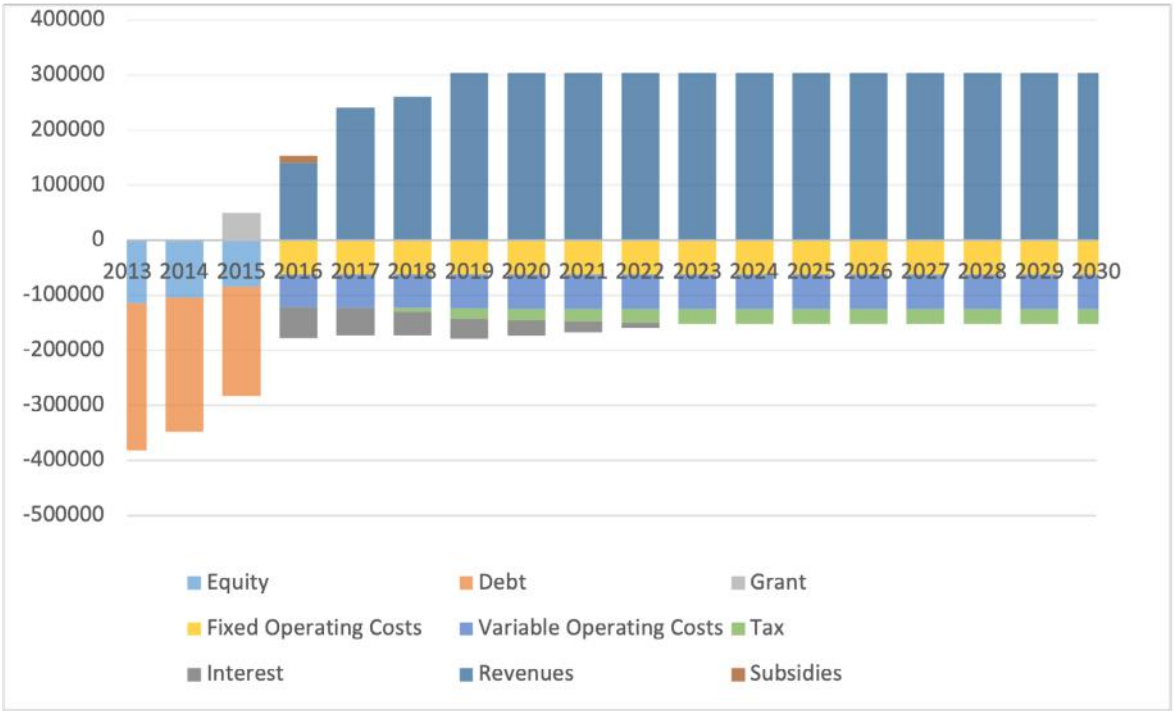
The information presented in Tables 8-11 needs to be complemented with assumptions regarding the interest rate on debt, tenure of debt, discount rate and tax rates to develop a base case for a financial plan. Using a financial calculator various financial ratios can be calculated such as net present value (NPV), internal rate of return (IRR), debt service coverage ratio (DSCR) and pay back period. Making these calculations using a financial calculator should be a straightforward job for someone familiar with financial concepts. The TNA project has developed the FICAM model for such analysis, and a light version of this model is available for a simple financial analysis as a complement to these guidelines.

The financial analysis for the efficient chiller plant can be completed, using the information provided in Tables 9-11. However, they need to be complemented with assumptions about the following macroeconomic indicators:

- Interest rate of Debt: 8%
- Income Tax Rate: 25%
- Discount Rate: 5%

The cash flows for the project are depicted in Figure 7 and assume a debt/equity ratio of 70 per cent / 30 per cent, and for the debt, the tenure of the loan is 10 years.

Figure 8: Projected Cash Flows



The financial analysis for the above case shows a post tax equity IRR[15] of 60.6 per cent, a positive NPV and an average debt service coverage ratio (DSCR) of 7.8. A negative NPV is a no-go for a project, butsince NPV is positive, this is not a concern. The DSCR is of interest for funding entities to establish whether their loan can get paid back and a low (below 1) is of concern to them. The most common ratio used for project appraisal is the IRR, and some rules of thumb to interpret IRR are provided below:

- If negative, revenues and existing grants cannot cover the capital and the operating costs of the proposal. Without additional revenues, grants or subsidy, the proposal is probably not financially viable.
- If positive but below the discount rate (five per cent in this case), the proposal is financially self-sustaining but may be of limited interest to the private sector. Specialized lenders, investors and donors who value development, environmental and market transformation impact may consider such a proposal.
- If positive and over five per cent (discount rate), the proposal's financial details (especially tax implications, debt structure and any additional revenues) need to be developed further and different financing schemes considered; the result may or may not be of interest to the private sector. Specialized lenders, investors and donors who see the blended value potential of investments are likely to be targets.
- If double of discount rate (over 10 per cent), the financial details need to be developed with a strong view towards engaging private-sector investors and lenders.

It is important to note that a good financial appraisal looks at both NPV and IRR together. This is because NPV measures the size of return whereas IRR shows how much the business earns per invested dollar. You might have a NPV of $US 1 million, which is not much if you needed to invest one billion.

4.7. Task 7: Scenario analysis

This task helps in answering the question "What if things do not go as planned?"

The base case gives a positive picture of the project. However, both equity investors and funding institutions that provide grants and loans would like a better understanding of the risks involved for their investment. It is also important to understand how changes to financial structuring, i.e. grants from donors, loans from lenders, and equity from owner-investors, will affect the project. A "what if" analysis can be undertaken to understand how potential changes in circumstances and assumptions can affect the business case.

Table 12 presents a "what if" analysis for the energy efficient chiller project for different scenarios (A to H). In all scenarios the project has an IRR more than the discount rate, i.e. the project is viable under all scenarios.

15 The Equity IRR represents the return for the investors (hotel business in this case) after taking account of the debt (loans taken for the project). If we also take into account the taxes that the business will pay on the profits it is referred to as the post tax equity IRR.

Table 12 What if Scenarios

Base Case		What If Scenarios				
Variable		**Scenario**	**Description**	**IRR**	**NPV**	**Avg DSCR**
Construction cost	503,900	**A**	**5% higher**	58.2%	1,544,648	7.0
Capital Grant	5,000	**B**	**No Capital Grant**	60.3%	1,559,129	7.7
Year 1 revenue	303,482	**C**	**20% lower**	56.2%	1,522,806	7.6
Revenue all years	4,522,230	**D**	**20% lower**	48.5%	1,163,261	6.2
Operating costs, all years	180,000	**E**	**15% higher**	59.9%	1,547,024	7.7
Cost of debt	8.0%	**G**	**Debt increased to 80%**	76.1%	1,559,953	6.8
Discount Rate	5.0%	**H**	**A+B+C+D+E Murphy's Law**	46.0%	1,132,244	5.9
Project IRR Pre Tax (IRR)	60.6%					
NPV	1,563,560					
Avg DSCR	7.8					

4.8. Task 8: Targeting the proposal

This task will help in answering the question "To whom is the proposal addressed?".

The identification of the appropriate financial partner/s is crucial to increase the chances of success, and will reduce the risk of wasting the significant expenses, time and energy expended in preparing unsuccessful proposals. There are certain aspects to consider when looking for sources of finance, related to the scope of the intervention, and the degree of needed concessionality of financing. In general terms, the higher the need for external financing and concessionality, the more requirements there will be from donors in and financiers (in terms of defining the financial additionality and transformational impacts), and the more difficult it will be to structure a proposal that responds to these requirements. The degree of difficulty in preparing a proposal increases with the degree of concessional finance (Figure 8).

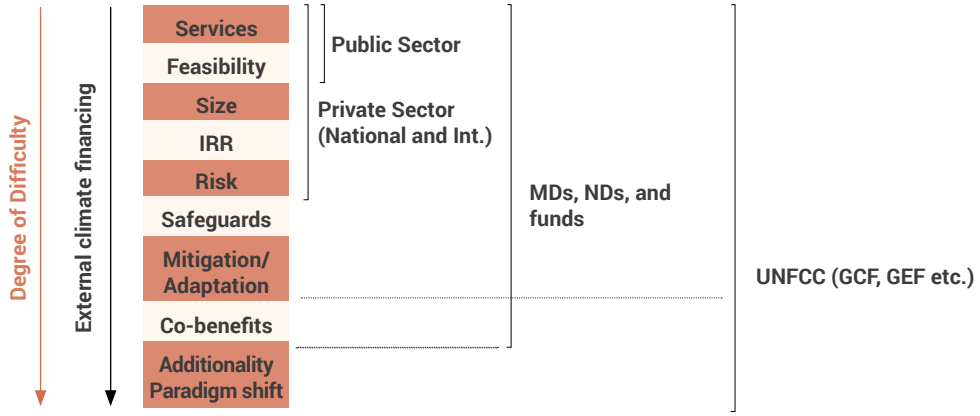
For a business working in tourism sector accessing public funds from the government budget is a possibility for mitigation actions related to building space cooling, transportation, energy efficiency, etc where there are sometimes programmes from federal and local governments (Gossling & Lund Durlacher, 2021). These programmes comprise subsidies, bonuses and concessional loans.

Tourism businesses can target funding from the private sector. Private-sector funders will consider the services provided, feasibility, and most crucially, the total returns for the investors (size of the investment and IRR), the risk of the returns not materializing, and the risk of default. Attracting concessional finance will only be possible if it is needed to make the investment viable, and if reasons are well documented. If the need for concessional finance is substantial, then it is better to look at development banks. However, they will require that the proponents have environmental and social safeguards in place, and that the mitigation impacts and potential co-benefits are well-documented and will be monitored. This further increases the difficulty of preparing the proposal. Finally, if the need for concessional finance is even higher and requires a change in the enabling conditions at a sectoral level, it is better to look at dedicated

climate funds, e.g. the GCF. However, these funds will have additional requirements, e.g. related to the transformational / paradigm shift potential of the intervention, contribution to the achievement of NDCs etc. In addition, this approach will require approval and close coordination with government entities.

ldwide during 2020, after years of steady growth (UNWTO, 2021). On the other hand, the sector now has a great opportunity to attract finance from public sources and climate dedicated funds, as part of recovery plans and the global response to the climate threat.

Figure 9: Priorities of different finance providers



Source: *Lütken, 2018*

As a response to the Covid-19 pandemic, the tourism sector and especially countries depending on tourism are considering options for recovery. The recovery interventions should strive to provide solutions that can enhance the resilience of the sector towards external shocks, such as pandemics and natural disasters. Many of the potential interventions aimed at making the tourism industry more efficient and more self-reliant, are well aligned with a wide range of mitigation options, e.g. investments in energy efficiency and renewable energy technologies can reduce energy costs and provide new sources of income. Initiatives such as the Covid-19 Technical Assistance Package for Tourism Recovery, offered by the UN World Tourism Organization, illustrate how the Covid-19 recovery for the tourism sector can have a "green" approach, and contribute to the Sustainable Development Goals, including No. 13 on Climate Action.

Private sources of finance might be reluctant in investing given the perceived risk of the sector, having experienced a 74 per cent decrease in international tourist arrivals wor-

Multilateral climate funds

Multilateral climate funds represent only a small share of international climate finance flows, but they are nonetheless important contributors to finance climate action that would otherwise not be possible under normal market conditions, playing a crucial role in leveraging additional private finance. They support most notably the implementation of the Paris Agreement signed by countries under the UN Framework Convention on Climate Change .

The major multilateral climate funds, the GCF and the CIF, provide all types of financial instruments (grants, loans, equity, and risk mitigation instruments) to support project implementation, and finance is also targeted to private businesses. For businesses working in the tourism sector, the Green Climate Fund (GCF) and the Climate Investment Funds (CIF) are quite relevant. Although, accessing these funds will usually require approval and collaboration with government institutions, there are some newer opportunities for pri-

vate sector financial institutions to receive project financing, such as through the GCF. For example, Mongolia's XacBank, Deutsche Bank, BNP Parisbas, are among the institutions accredited as a financial intermediary by the GCF and having signed partnership agreements with the GCF directly.

The size of finance provided by these funds is substantial, but is usually aimed at supporting national/sectoral programmes, in order to have large impacts both in terms of scale and reach. Therefore, they are not targeted at single private businesses. Businesses should instead aim for proposing sectoral programmes e.g. a Covid-19 recovery package aimed at decarbonizing the tourism sector, in collaboration with government entities that can present these programmes to the funds. Access to the funds usually happens through dedicated accredited entities, which may be international, local or regional financial institutions, including multilateral development banks (MDBs). In addition, the GCF supports innovative public-private sector partnerships which businesses can directly access funds. For example, the Deutsche Bank's Universal Green Energy Access Programme combines capital from GCF with private sector investors to finance renewable electricity access for nearly half a million people and small and medium sized enterprises in cooperation with local banks in Africa[16].

Multilateral development banks

MDBs play a prominent role in participating and delivering multilateral climate finance, not solely as partners or implementing entities for the Multilateral Climate Funds, but also because most have incorporated climate change considerations into their core lending and operations. They also provide climate finance with a regional or thematic scope (Table 13).

Table 13 Climate Funds and Initiatives of Multilateral Development Banks

Multilateral Development Banks	Climate funds and initiatives
World Bank	Partnership for Market Readiness (PMR), assists developing countries in the establishment of market-based mechanisms.
European Investment Bank	EU Global Energy Efficiency and Renewable Energy Fund (GEEREF) invests in renewable energy and energy efficiency private equity funds in emerging markets.
European Bank for Reconstruction and Development (EBRD)	Supports middle-income economies in Europe and Central Asia, under its Green Economy Transition approach in the areas of energy & resource efficiency, circular economy, renew-able energy, and climate resilience.
African Development Bank (AfDB)	Africa Renewable Energy Initiative (AREI) aimed at financing renewable energy in the African continent.
Asian Development Bank (ADB)	Climate Change Fund focusing on clean energy, sustainable transport and low-carbon urban development, deforestation and degradation and improved land-use management.
Inter-American Development Bank (IDB)	NDC Invest supports countries in the development and implementation of NDCs, including financing mitigation and adaptation inter-ventions.

16 ttps://www.greenclimate.fund/news/deutsche-bank-signs-accreditation-master-agreement-with-green-climate-fund

National funds for climate finance

Several developing countries have established regional and national channels and funds, resourced through international finance and/or domestic budget allocations and the domestic private sector (CFU, 2019). **The Indonesian Climate Change Trust Fund (ICCTF)** was one of the first to be established. **Brazil has a National Fund on Climate Change,** mainly financed by revenues generated from a tax on oil companies, **and the Amazon Fund, both administered by the Brazilian National Development Bank (BNDES)**. There are also national climate change funds in Bangladesh, Benin, Cambodia, Ethiopia, Guyana, the Maldives, Mali, Mexico, the Philippines, Rwanda, and South Africa.

Also developed countries have established funds accessible to a wide variety of stakeholders, including non-profit companies and commercial enterprises. One example is the **German Government's International Climate Initiative (IKI)** which supports international climate action and biodiversity projects in developing and emerging countries.

Many more countries are planning the establishment of national climate funds to facilitate investments in climate interventions. **National climate change funds are great vehicles for the financing of climate action, as their independent governance structures can channel finance quickly to projects.**

Conclusion

A variety of financial instruments exist to address additional cost and/or varying degree of risk associated with climate mitigation investments. Risk, whether real or perceived, is probably the most important factor to meet investors' risk-return needs for mitigation solutions in tourism companies and projects, such as for air-conditioning, water heating, cooking, lighting, appliances, green transport, laundry, waste treatment or power generation.

Tourism continues to be one of the sectors hit hardest by the COVID-19 pandemic. Rescue and stimulus financial packages are likely to continue throughout the recovery phase of the tourism sector post-Covid 19. Thus, businesses and project developers should propose sectoral programmes combining recovery measures with climate mitigation options.

Private-sector financing will have to play an increasing role, especially post-Covid when public finances are strained. Private financing will happen when there is a reasonable, predictable, and relatively good rate of return on investment. Public-sector financing, on the other hand, is driven more by the impacts of the projects, especially climate and non-financial impacts. Therefore, to attract public (co-)financing, quantification of impacts is important. In general, a wider interaction between the public and private sector will be essential to scale-up the investments needed to reach net zero emissions by mid-century in the tourism sector

The need for tourism companies and project developers to access climate finance depends on the:

- Upfront cost for the mitigation option.
- Amount of climate financing required if the option does not pay back itself.
- Fit with the business model of the tourism company or project.

Climate mitigation investments in hotels, and the tourism sector mostly show negative mitigation costs when using the GACMO tool to calculate mitigation costs to ascertain financing needs (especially projects related to energy efficiency improvement). This is illustrated by the analysis undertaken for the Dominican Republic (Annex 1). Therefore, the need for such things as grants and concessional climate financing for these projects is minor.

There are, however, projects (e.g. those related to the electrification of transportation fleets) that could have positive mitigation costs. These will require climate finance (including grant financing, concessional loans, or risk cover). Therefore, the national governments of developing countries have an important role in creating the enabling conditions to attract public and private investments. This will require capacity- and institution-building steps to reduce uncertainty, regulatory barriers, and transaction costs for investors. Financing through the instrument of grants in most projects would not be required for the businesses but for creating policies and programmes that establish an enabling environment for businesses to take action.

When preparing a proposal, developers must strive to structure the financing based on the most appropriate financing instruments and analyse the business proposal in terms of its financial and non-financial impacts and the key financial barriers the intervention/technology is facing. Finance instruments include debt or equity financing, green bonds, leasing, crowdfunding,

Access to funds from development banks is important in (co-)financing climate actions in the tourism sector that would otherwise not be financially viable and implementable. Although increasingly access for the private sector is facilitated, e.g. in the GCF, finance is usually not aimed at individual businesses or project developers. Thus, businesses and project developers should collaborate with government entities on larger sectoral approaches to be presented to the funds for financing. Increasingly developing and developed countries have also created national funds to finance climate mitigation and adaptation projects that are accessible to diverse stakeholders, including companies.

Currently, recovery funds and stimulus packages could also be accessed to finance climate projects in the tourism sector. While trying to obtain climate financing for projects, including of COVID-19 recovery packages, the focus of businesses should remain on the following:

- Financial viability of the projects and the risks.
- Mitigation contribution of the project.
- Non-financial impacts of the project.
- Local capacities and ability to build on them.

A strong financial proposal is thereby essential for a business to obtain funding. This guidance provides a stepwise approach for financial analysis, including eight steps for developing a project proposal in order to obtain funding for climate mitigation actions in the tourism accommodation sector, i.e. describing the core concept, the setting, the team, the implementation plan, expectations, risks, and the audience.

An Excel-based calculator (GACMO) is also available to help the businesses calculate whether climate finance is needed and to which extent. This calculator helps determine the financial additionality for projects and makes a stronger case for seeking climate financing (including concessional financing). However, when doing this analysis, the businesses should clearly quantify the projects' mitigation benefits and lay down the non-financial benefits of the projects in terms of contribution to jobs, local environment, and ecosystems.

In general, a mix of public and private finance between national and international, public and private development, and commercial banks and funds is recommended to accelerate investments in climate mitigation options for the tourism sector. Public finance covers the additional financial costs to make the projects viable and reduce the risks.

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Annexes

Annex 1 Mitigation Options for Tourism Sector : Dominican Republic (Extracted from GACMO Model)

Activity area	Area	GHG mitigation options	Mitigation Cost US$/ton$CO_2$	Unit Size	Emission reduction t CO_2/ unit	Investment Cost/ Unit kUS$	Climate financing needs
Air conditioning & isolation	• Air-conditioning • Isolation	Air conditioning in guest rooms		1 Air conditioner			
		Efficient chiller (centrifugal > 300 TR) - 1TR	-177.4	350 Ton of cooling (1 TR)	0.8	0.1	Low
		Efficient chiller (PD < 300 TR) - 1 TR	-211.9	1 Ton of cooling (1 TR)	1076	503.9	Low
		Adding a VFD to an existing centrifugal chiller	-93.2	1 Ton of cooling (1 TR)	0.8	0.3	Low
		Efficient motors	-190.0	1 KW motor	0.1	0.1	Low
		Low emission window (2 layers of glass)	-172.5	1 guest room	0.4	0.1	Low
			31.0		0.3	0.6	Moderate
Water heating	• Swimming pool pumps	Solar water heater	-212.8	71 m2	36.53	15.62	Low
		Efficient pumps	-12.8	1000 m3/year)	0.2	0.4	Low
Cooking	• Biogas • Food prepara-tion • Cleaning • Cleaning • Refrigerators for restaurants • FreezersFreezing room • Cooling room	Biogas replacing kerosene	21.0	One 2m3 unit	1.2	0.25	Moderate
		Efficient electric stoves	-207.8	1 stove	1.0	0.07	Low
		Efficient Pre-Rinse Spray Valve (PRSV)	-169.5	1 PRSV	0.7	0.08	Low
		Efficient dishwasher	-169.0	1000 meals/day	26.2	8.50	Low
		Efficient hotel refrigerator	906.5	458 liters	0.5	4.0	High
		Efficient freezer	888.8	458 liters	0.5	4.2	High
		Efficient freezer room	-78.8	1 freezer room	6.2	8.4	Low
		Efficient cooling room	202.6	1 cool room	1.5	6.0	High
Lighting	• Guest rooms	Room lighting with LEDs replacing incandescent	-243.9	1 Bulb	0.04	-0.01	Low
		Room lighting with LEDs replacing CFL	-173.3	1 Bulb	0.005	0.00	Low
		Equipment turned off when unoccupied	1,299.5	1 Unit	0.01	0.12	High
	• Reception areas/ corridors	Room lighting with LEDs replacing incandescent	-239.4	1 Bulb	0.09	-0.01	Low
		Room lighting with LEDs replacing CFL	-190.9	1 Bulp	0.01	0.00	Low
		Light dimming - occupancy sensors	-139.6	1 Unit with 10 bulbs	0.20	0.10	Low
	• Restaurants	Room lighting with LEDs replacing incandescent	-239.4	1 Bulb	0.09	-0.01	Low
		Room lighting with LEDs replacing CFL	-190.9	1 Bulb	0.01	0.00	Low
	• Kitchens and public areas • Outdoor light	Replace T12 with LED tube	-203.5	1 Lamp	0.04	0.00	Low
		Efficient outdoor light	-206.7	1 lamp	0.04	0.00	Low

Activity area	Area	GHG mitigation options	Mitigation Cost US$/ton$CO_2$	Unit Size	Emission reduction t CO_2/ unit	Investment Cost/ Unit kUS$	Climate financing needs
Laundry	• Bed linens/towels / table cover	Efficient washing machine	33,725.3	1000 GN per year	0.08	20.5	High
		Efficient drying machine	5,778.2	1000 GN per year	0.2	10.4	High
Waste	• Solid waste	Landfill gas flaring	1.17	1 ton MSW/day	622.1	4.4	Moderate
		Composting MSW	1.76	1 ton MSW/day	622.1	8.1	Moderate
Power & Heat production	• Wind • Hydro • Biomass • Natural gas • Solar electrici-ty	Small wind turbines	-104.3	3 kW	3.5	5.1	Low
		Micro hydro power	-139.4	4 kW	7.0	8.0	Low
		Biomass power from biomass residues	-68.2	25 kW CHP plant	87.6	25.0	Low
		Natural gas replacing diesel oil	-1,178.1	1 TJ use of diesel oil	18.0	7.8	Low
		Solar PV	-186.5	1kW unit	1.1	0.5	Low

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