EVALUATION OF THE GEF FOCAL AREA STRATEGIES

TECHNICAL PAPER 2: CLIMATE CHANGE MITIGATION

(UNEDITED)

(Prepared by the GEF Evaluation Office)

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1. INTRODUCTION

The *Evaluation of GEF Focal Area Strategies* is designed as a formative[1] evaluation emphasizing learning as its primary goal. Accordingly, the evaluation's main objective is to collect and assess information related to the GEF-5 Focal Area Strategies to gain a systematic understanding of the elements and causal links each strategy envisions. The evaluation encompasses the analysis of the following Focal Area Strategies: Biodiversity, Climate Change Mitigation, International Waters, Land Degradation, Chemicals, Sustainable Forest Management/REDD+, and Climate Change Adaptation (under LDCF/SCCF). The evaluation focuses on the most recent GEF-5 Focal Area Strategies and LDCF/SCCF Strategy covering the period from 2010 to 2014.

The *Evaluation of GEF Focal Area Strategies* focuses on the analysis of the GEF-5 Focal Area Strategies as they are formulated, emphasizing the strategies' intended rationale and internal logic. Using a theory-based approach, the evaluation takes a detailed look at the logic chains of causality that each strategy identifies to achieve its objectives. Based on the "theory of change" (TOC) analysis, the evaluation provides an assessment of the extent to which the causal pathways identified by the strategies reflect guidance provided to the GEF by the international conventions (UNFCCC, CBD, UNCCD and Stockholm Convention) as well as the current state of scientific knowledge on aspects relating to the strategies. The analysis provides the foundation for a subsequent assessment of the implementation of Focal Area Strategies in GEF projects, which will be conducted in the context of OPS5.

Aiming to improve the understanding of elements and causal links reflected in GEF Focal Area Strategies, the *Evaluation of GEF Focal Area Strategies* employs a four step approach:

a) **Construct the theories of change**: What are the elements, causal links and overall rationale reflected in each Focal Area Strategy? What are the identified causal pathways envisioned to lead to the achievement of the strategy's objectives?
b) **Review the relationship with convention guidance**: To what extent and in what way do the objectives formulated in the Focal Area Strategies relate to respective convention guidance?
c) **Assess the connection with scientific knowledge**: To what extend do the Focal Area Strategies correspond with current scientific knowledge?
d) **Make recommendations for future strategies**: Based on the findings of steps 1-3, what recommendations for the development of future GEF Strategies can be provided?

The Technical Papers 1-7, covering each of the Focal Area Strategies individually, present the findings from three separate processes of data collection and analysis conducted to answer the evaluation questions outlined above. They illustrate the construction of the Theory of Change for each Focal Area Strategy (chapter 2), present the review of convention guidance and the guidance-strategy mapping where applicable (chapter 3), and summarize the results of the Real-Time Delphi consultation that engages the scientific community in a discussion on the relationship between the Focal Area Strategies and the current state of scientific knowledge (chapter 4).

[1] The evaluation literature distinguishes between "summative" and "formative" evaluations. Summative evaluations focus on the assessment of performance and progress measured against expected targets and are used to evaluate accountability of a given system. In contrast, formative evaluations analyze evidence in order to learn from past experiences to inform improvements of a given system moving forward. See: Scriven, Michael (1967). "The methodology of evaluation". In Stake, R. E. Curriculum evaluation. Chicago: Rand McNally.

2. THEORY OF CHANGE FOR THE CLIMATE CHANGE MITIGATION FOCAL AREA

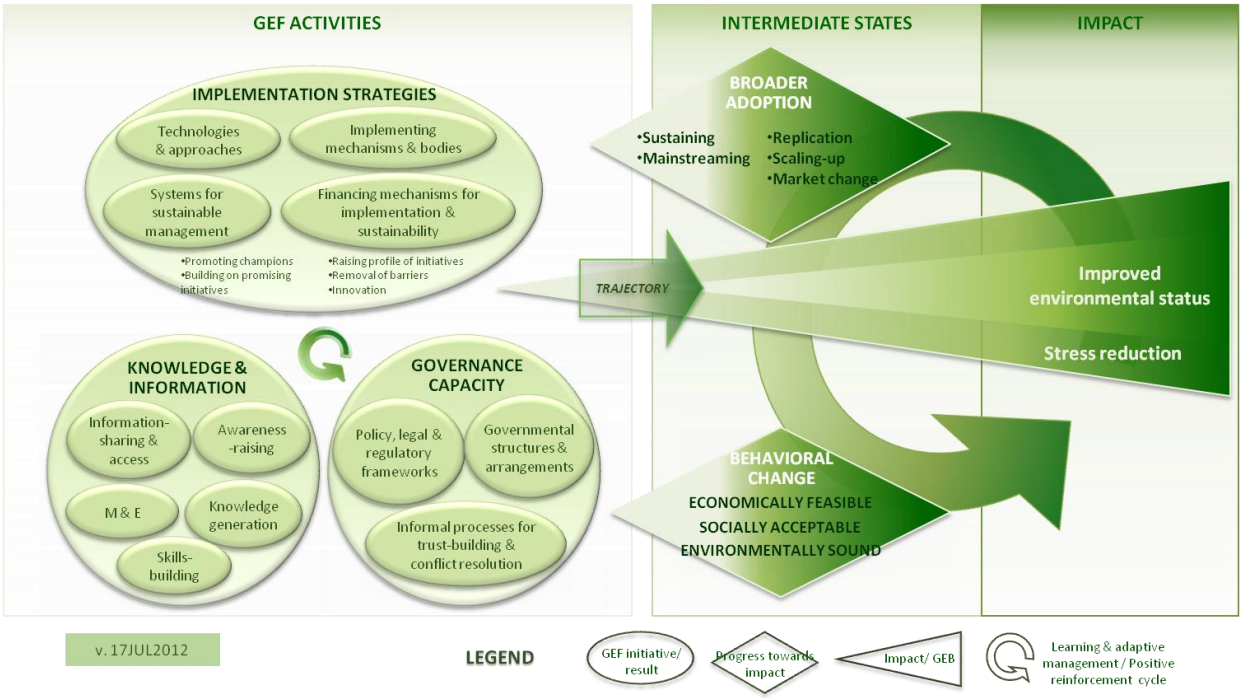
2.1 TOC Approach

A theory-based evaluation is designed around the "theory of change" (TOC) of an activity or strategy. The TOC systematically examines the elements and causal links that constitute the activity/strategy in order to understand and describe the logic of how the activity/strategy is expected to lead to the desired results (Fitz-Gibbon and Morris 1996, Weiss 1972). A theory of change may have been made explicit when the activity/strategy was designed; sometimes it is implicit, which requires the evaluators to reconstruct it. In the case of the GEF-5 Focal Area Strategies, the TOCs are mostly implicit and their reconstruction constitutes a major part of the *Evaluation of GEF Focal Area Strategies*.

General Framework for GEF TOC

In preparation for OPS5, the GEF Evaluation Office has developed a General Framework for the GEF TOC drawing on a large amount of evaluative evidence gathered over the years. The *Evaluation of GEF Focal Area Strategies* uses the General Framework to guide the construction of Focal Area Strategy TOCs. The purposes of the General Framework for GEF's TOC framework are to classify GEF activities and locate them within the intended causality chain towards the generation of GEBs; establish links between different elements of GEF support as well as between GEF activities and contributions of other actors; assess GEF contribution to progress towards GEBs, including the GEF's interaction with other actors; and identify constraints on further GEF contributions to progress towards GEBs.

Figure 1: General Framework for GEF Theory of Change



The framework classifies GEF support into three categories that are interdependent and in most cases realize their full potential through their interaction with each other. A specific GEF project often features a combination of elements from different categories:

a) **Knowledge and information**, including activities to support the generation and sharing of pertinent knowledge and information, awareness-raising activities, improvement of technical skills, as well as monitoring and evaluation.
b) **Governance capacity**, encompassing support for the development and formulation of policy, legal and regulatory frameworks at the appropriate scales of intervention, assistance for the improvement of governmental structures and processes, as well as support for informal mechanisms for trust-building and conflict resolution.
c) **Implementation strategies**, covering a broad range of activities including investments in physical assets, establishment of financing mechanisms and organizational arrangements, as well as improvements of sustainable management approaches, among many others. This category entails the testing and demonstration of new technologies, instruments and approaches, as well as efforts to support broader deployment of proven strategies.

Changes directly linked to GEF activities are referred to as GEF outputs and outcomes. In working towards envisioned outputs and outcomes, the different elements within a GEF project are often designed to complement each other and interact with contributions of other actors. GEF projects are usually conducted within the context of previous and ongoing initiatives carried out in part by non-GEF actors (national governments, international organizations, CSOs, private sector). GEF projects often build on and/or supplement contributions of other actors. In addition, GEF activities are implemented under national circumstances that influence the initiative and are largely outside GEF control. The General Framework helps to assess the interactions of GEF activities with contextual factors.

GEF support is typically envisioned to catalyze progress towards impact at a broader level including the broader adoption of technologies, approaches and instruments. The nature of GEF involvement in catalyzing broader adoption is different between individual projects and across Focal Areas. In a number of cases, GEF activities include direct support for the facilitation of broader adoption in collaboration with other actors, turning broader adoption into a direct GEF project outcome as described above. In these cases, broader adoption is directly integrated in the design of the GEF activity. In other cases, broader adoption is following the example of GEF activities, but emerges without direct GEF support which puts broader adoption beyond the scope of implementation of the GEF project itself. Under both approaches, the GEF aims at developing initiatives to trigger a broad range of stakeholders to use the projects' results beyond their direct objectives. The General Framework identifies five general categories of ways towards broader adoption within or beyond the limits of direct GEF influence:

a) **Sustaining:** Technologies/approaches originally supported through the GEF activity continue to be implemented beyond actual project duration through integration into the regular activities and budget of the government and/or other stakeholders.
b) **Mainstreaming:** Information, lessons, or aspects of a GEF initiative are incorporated into a broader initiative such as policies, institutional reforms, and behavioral transformations.
c) **Replication:** Results of GEF activities are reproduced at a comparable scale, often in different geographical areas or regions.

d) **Scaling-up:** Results of GEF activities are expanded to address concerns at larger geographical, ecological or administrative scales.
e) **Market change:** GEF activity catalyzes market transformation, which might encompass technological changes, policy and regulatory reforms, and financial instruments that increase demand for goods and services likely to contribute to global environmental benefits.

Broader adoption goes hand in hand with behavioral change, meaning sustained and significant changes in stakeholder choices towards more environment-friendly actions. The TOC framework highlights the reinforcing interactions between broader adoption, behavioral change and environmental improvements.

TOC construction for GEF-5 Focal Area Strategies

The *Evaluation of GEF Focal Area Strategies* applies the general framework to each of the GEF-5 Focal Areas as well as the LDCF/SCCF Strategy. The resulting TOCs map out the strategies' elements and causal links, depicting the means-ends linkages envisioned explicitly or implicitly in the strategy and thereby identifying the logical chain of actions that are supposed to lead to the achievement of the strategies' objectives.

The purpose of the Focal Area Strategies TOCs, serving to establish the foundation for a subsequent evaluative effort on the implementation of GEF Focal Area Strategies, is to gain a better understanding of the elements, causal links and assumptions underlying the GEF-5 Focal Area Strategies as initially formulated, without incorporating the evolution of the strategy that occurred during its implementation. The implementation of the strategies through GEF-5 projects including the evolution since the formulation will be analyzed as part of OPS5. Accordingly, the current TOC reflects the information as provided in the actual text of the GEF-5 focal area strategy document and results framework. While additional reports[2] have been consulted to provide contextual information, this document strictly presents the TOC of the strategy itself, meaning that it is solely based on the strategy text plus documents that the strategy directly references.

The construction of the TOCs proceeded in two steps. First, each strategy is disaggregated into its objectives in order to systematically identify different GEF activities articulated by the strategy, to assess the causal links between elements and to recognize the underlying assumptions these causal chains are based on. Second, the identified elements and causal links are consolidated in one overarching Focal Area Strategy TOC, illustrating the causal pathways the strategy envisions and the underlying assumptions the pathways are based on. Throughout the TOC process, the evaluation team consulted with the respective GEF Secretariat teams to ensure correct interpretation of the strategy documents and establish agreement on the central aspects of the TOC.

Figures 2 shows examples for the relationship between the general categories of GEF activities as proposed by the General Framework and concrete activities described in GEF-5 Focal Area Strategies. Figure 3 presents an example for a causal chain implicit in several GEF-5 Strategies.

[2] Supporting documentation used: "Investing in Energy Efficiency"; "Investing in sustainable urban transport"; "Investing in Renewable Energy"; "Transfer of Environmentally Sound Technologies"; "GEF-5 Sustainable Forest Management (SFM)/REDD-PLUS Strategy".

Figure 2: Categories of elements of GEF and examples from GEF-5 Focal Area Strategies

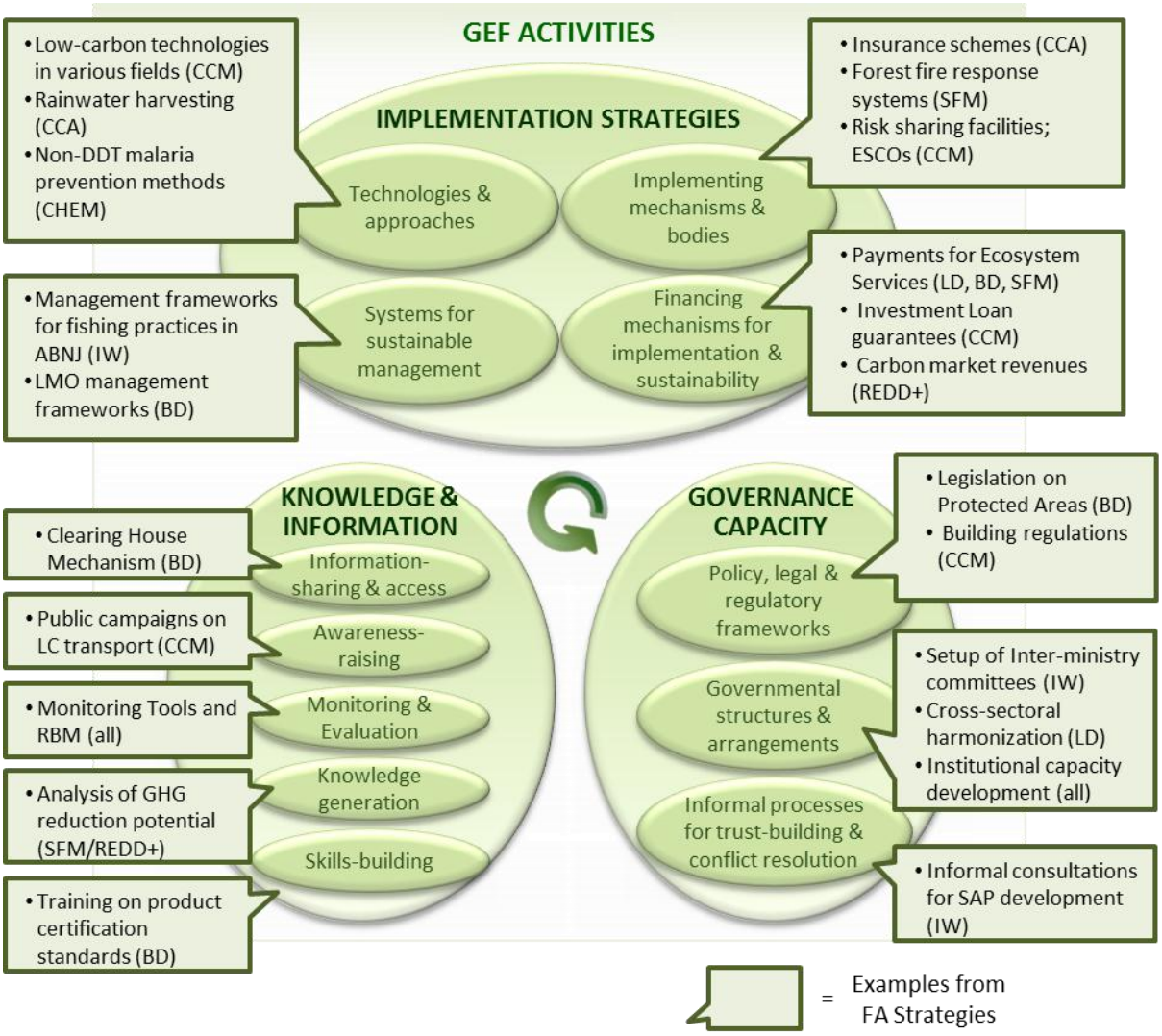
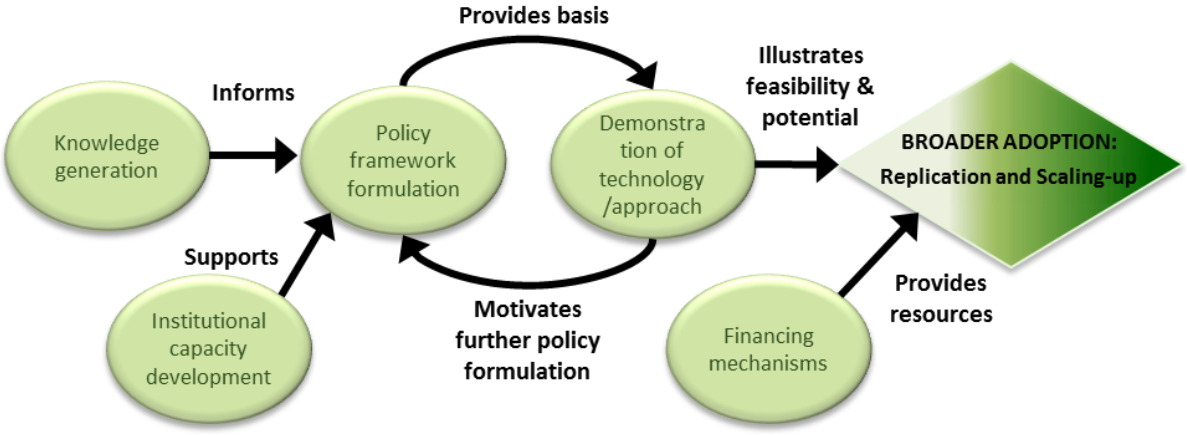


Figure 3: Example for frequent chain of causality implicit in several Focal Area Strategies



2.2 Construction of CCM Focal Area Strategy TOC

Overview of CCM Focal Area Strategy objectives

Table 1 presents an overview of CCM Focal Area Strategy objectives including the indicative GEF-5 allocation as approved by the GEF Council as part of the GEF-5 Focal Area Strategies. The indicative allocations are compared to the resources programmed for GEF activities under the respective objectives as of 30 June 2012.

Table 1: Overview of objectives and resource allocations

Climate Change Mitigation Focal Area			
Goal	To support developing countries and economies in transition toward a low-carbon development path		
Objectives		Indicative allocation	Approved resources (as of 30 June 2012)
Objective 1: Promote the demonstration, deployment, and transfer of innovative low-carbon technologies		$300m / 24.0%	$62m / 31.1%
Objective 2: Promote market transformation for energy efficiency in industry and the building sector		$250m / 20.0%	$140m / 29.5%
Objective 3: Promote investment in renewable energy technologies		$320m / 25.6%	$104m / 21.9%
Objective 4: Promote low-carbon transport and urban systems		$250m / 20.0%	$58m / 12.2%
Objective 5: Promote conservation and enhancement of carbon stocks through sustainable management of LULUCF (*$100 million contribution to the separate SFM/REDD+ incentive mechanism)		$50m / 4.0%	$75m / 15.8%
Objective 6: Support EAs and capacity building under the Convention		$80m / 6.4 %	$35m / 7.4%
Total		$1.25b / 100%	$474m / 100%

Note: NA – not available.

Source: Indicative allocations from GEF/C.37/3; Approved resources are estimates from the GEF Secretariat.

CCM-1: Promote the demonstration, deployment, transfer of innovative low-carbon technologies

Table 2: CCM-1 results framework

Objective	Expected Outcomes and Indicators	Outcome Targets	Core Outputs
CCM-1	• Technologies successfully demonstrated, deployed, and transferred **Indicator:** Percentage of technology demonstrations reaching its planned goals • Enabling policy environment and mechanisms created for technology transfer **Indicator:** Extent to which policies and mechanisms are adopted for technology transfer (score of 0 to 4) • GHG emissions avoided **Indicator:** Tons of CO2 equivalent	Demonstration and deployment of 3-4 innovative technologies in 10-15 countries 80% of the projects reaching the planned goals on the ground	Innovative low-carbon technologies demonstrated and deployed on the ground National strategies for the deployment and commercialization of innovative low-carbon technologies adopted

Elements and chain of causality

CCM-1 focuses on the early stages of the technology development cycle and innovation chain, aiming to provide a technology push through demonstration and technology transfer that will take "new, emerging technologies" from R&D stages to market readiness and the beginning of commercialization. The CCM strategy thus responds to the challenge that, in addition to the general risks associated with in-vestments in emerging technologies, low-carbon technologies often face a lack of existing market incentives that would promise future profits and thereby justify the risk of engagement in the technological innovation and demonstration process. Representing a typical case of market failure, under unregulated conditions market demand for low-carbon technologies remains below the socially optimal equilibrium since the negative externalities of competing products/approaches are not reflected in prices.

Activities addressed under CCM-1 target the facilitation of demonstration and transfer of emerging low-carbon technologies. Efforts to achieve fundamental adjustments of the incentive structures and financing mechanisms for low-carbon technologies in the entire market are addressed through CCM objectives 2-5. Therefore, the activities envisioned under CCM-1 are closely linked with the other CCM objectives that continue the causal pathway following the demonstration phase.

Link between TOC framework and identified barriers for technology dissemination

GEF supported activities under CCM-1 can be systematized along their contribution to lower a set of barriers to technology transfer in recipient countries. Supporting documentation identifies five potential barriers to "more efficient, market-driven dissemination of technologies". CCM-1 entails elements to contribute to the removal of each of these barriers, which will be summarized below following the general categories of GEF activities as identified in the General GEF TOC

Framework. The following table illustrates the relationship between the identified barriers and the categories of GEF activities as used in the general TOC framework:

Table 3: Link between barriers and TOC framework categories

Identified Barrier	TOC framework category of GEF activities
a. Policy frameworks: Governments must play an essential role in setting policies favorable to the adoption of ESTs.	→ Governance capacity
b. Technology: Should be robust and operational. The more mature a technology, the easier it is to transfer.	→ Knowledge & Information + Implementation strategies (technologies & approaches)
c. Awareness and information: National stakeholders, especially market participants, must be aware of the technology and have information on its costs, uses, and markets.	→ Knowledge & Information
d. Business and delivery models: Market-based approaches are preferred; businesses and institutions must be in place that can deliver to and service those markets.	→ Implementation strategies
e. Availability of financing: Financing must be available for technology dissemination, though it is insufficient in itself to ensure uptake of ESTs.	→ Implementation strategies

Governance capacity

In order to support governments in playing an essential role in setting up a favorable governance framework (→ a. Policy frameworks), CCM-1 activities assist the formulation of policy, legal and regulatory provisions intended to create an enabling environment for technology demonstration/transfer. This includes the support of relevant institutional capacity development. Activities under CCM-1 aim at targeted adjustments of provisions directly related to technology demonstration and transfer, not on systemic changes of market structures as addressed by CCM 2-5. Improvements of policy and legal frameworks are informed by the process of technology identification and knowledge generation (see Knowledge & Information). The enabling policy environment in turn supports the concrete implementation of demonstration and technology transfer activities (see Implementation strategies).

Knowledge & Information

CCM-1 envisions the identification and selection of suitable innovative technologies in a given national context (→ b. Technology) and the generation of knowledge about these technologies in the recipient country (→ c. Awareness and information).

To ensure that selected technologies correspond to the specific needs of a country, GEF activities under the CCM strategy are sought to be consistent with priorities identified by countries, for example through technology needs assessments (TNAs), national communications or other national policy planning documents. In addition, the strategy highlights two mechanisms of multilateral information-sharing as instruments for technology identification and knowledge genera-

tion: technology cooperation among developing countries, South-South Dialogue, and between developing and developed countries, South-North Dialogue.

Furthermore, CCM-1 envisions support to the strengthening of technical skills within recipient countries necessary for the demonstration of new technologies or adoption of exogenous technologies to local conditions. The development of technical skills and the mechanisms of multilateral information-sharing described above have significant potential to be mutually reinforcing.

Implementation strategies

The enabling environment is intended to facilitate the implementation of concrete GEF supported pilot projects demonstrating the marketability of new or transferred technologies/approaches within and beyond the recipient countries market. At the same time, demonstration activities create additional momentum for further enhancement of policy and legal frameworks, creating a reinforcing cycle. The CCM-1 strategy entails several elements to lower identified barriers (see barriers d. and e. above) to the realization of demonstration/transfer activities:

→ **d. Business and delivery models:** CCM-1 includes support for setting up **organizational structures** and facilitating stakeholder coordination and arrangements in order to facilitate the emergence of business as well as institutional structures necessary for technology transfer. Furthermore, the CCM strategy envisions the removal of legal barriers to the emergence of favorable business and delivery models, mentioning the purchase of technology licenses as an example.

→ **e. Availability of financing:** Under CCM-1, GEF activities provide direct financial resources supporting the **demonstration and deployment** of innovative low-carbon technologies, the establishment of mechanisms for technology transfer, the lowering of the initial costs barrier as well as mitigating the economic risk inherent in technological innovation. Furthermore, the demonstration of marketability is intended to move the respective technology towards commercialization and catalyze follow-up investments from other sources for replication and scaling-up. The establishment of concrete financing mechanisms for low-carbon technologies is supported under CCM 2-5.

Broader adoption and behavioral change

Given the CCM-1 focus on the early stage of the technology development chain, the effects on broader adoption and behavioral change are primarily of a catalytic nature and realize their full effect in combination with further investments in commercialization (for example as addresses through CCM 2-5, but also independent from GEF support). Demonstrating the feasibility of innovative low-carbon (LC) technologies/approaches is envisioned to push them towards marketability. The CCM strategy aims at the "demonstration and deployment of 3-4 innovative technologies in 10-15 countries", illustrating the potential of innovative technologies/approaches for replication and scaling up, not only within the recipient country implementing the respective demonstration/transfer activity, but also more broadly to stakeholders in other countries. The general knowledge on and acknowledgement of the feasibility of specific LC technologies by the private and public sector as well as broader public represents a necessary building-block for changes in stakeholder decision-making with regard to investments and purchase behavior.

Key Assumptions underlying CCM-1:

- Recipient countries' private and public sector engagement in emerging low-carbon technologies is impeded by a lack of enabling policy frameworks, insufficient information and knowledge, high economic risks, and inadequate market incentives/market failure
- GEF activities can contribute to the identification of country-specific barriers and the conditions for success (economic, organizational, and technical) for technology transfer and to putting in place the policies, organizational structures and mechanisms to lift them durably.
- Facilitating the demonstration and/or transfer of emerging technologies can lead to increasing acknowledgment of their operability, feasibility and potential for commercialization
- Technology demonstration/transfer can serve as a first step towards investment mobilization and corresponding broader adoption of low carbon technologies (with or independent from GEF support)

CCM-2: Promote market transformation for energy efficiency in industry and the building sector

Table 4: CCM-2 results framework

Objective	Key Expected Outcomes	Key Targets	Core Outputs
CCM-2	• Appropriate policy, legal and regulatory frameworks adopted and enforced **Indicator:** Extent to which EE policies and regulations are adopted and enforced (score of 0 to 4[3]) • Sustainable financing and delivery mechanisms established and operational **Indicator:** Volume of investment mobilized • GHG emissions avoided **Indicator:** Tons of CO2 equivalent	20-30 countries adopting EE policies and initiatives $1.2 billion investment mobilized for EE	EE policy and regulation in place Investment mobilized Energy savings achieved

Elements and chain of causality

CCM-2 facilitates the creation of favorable market incentives for energy efficiency improvements supported by financing mechanisms and other barrier removal instruments. CCM-2 activities are envisioned to lead to a change of market conditions that mobilizes and channels investments into energy efficiency initiatives. By simultaneously removing barriers to broader adoption (increasing availability of financing) and increasing profitability of corresponding investments (creating positive incentives through policies and regulation), CCM-2 seeks to create a market pull for energy efficiency in industry and the building sector.

Governance capacity

The strengthening of an enabling policy, legal and regulatory framework is a core element of GEF support to achieve market change and mobilize investments. The CCM strategy envisions GEF technical assistance for the formulation, adoption and enforcement of policy incentives as well as regulatory approaches conducive to the broad adoption of energy efficiency technologies and approaches:

a) **Policy incentives:** Examples for measures aimed at increasing the profitability of EE technologies/approaches include taxation and pricing instruments; subsidies supporting building retrofitting and adjustments of industrial processes etc.

b) **Regulatory approaches:** Examples for measures aimed at discouraging energy inefficient practices include building codes, product labeling or energy intensity standards for industrial processes etc.

The mix of policy incentives and regulatory practices depends on the national context. The CCM strategy highlights the need to tailor activities to reflect political and economic realities of the recipient country and to be compatible with national policy planning. For example, some coun-

[3] 0: no policy/regulation in place; 1: policy/regulation discussed and proposed; 2: policy/regulation proposed but not adopted; 3: policy/regulation adopted but not enforced; 4: policy/regulation enforced

tries already feature an adequate governance framework, meaning that further GEF support in this respect is not necessary. The CCM strategy also articulates the need to strengthen governmental structures and processes increasing institutional capacity to maintain an adequate governance framework and to increase ability to implement, monitor and enforce the provisions.

Knowledge & Information

Direct activities to improve the level of stakeholders' knowledge and information about potential benefits of energy efficiency (e.g. educational efforts, trainings) are not prominently addressed in the CCM-2 strategy text itself. Additional GEF documentation identifies the lack of information of market actors on the potential benefits of investments in EE as a barrier to broad adoption of EE technologies/approaches. Several causal links between knowledge and information of different stakeholder groups and the formulation of enabling policies and behavioral change of private sector and consumers can be assumed and are referred to in GEF documentation, but largely omitted in the CCM-2 strategy text.

a) **Policymakers:** Improving the knowledge of policy makers on the benefits of improved energy efficiency can increase political will to adopt an enabling governance framework and in turn supports the formulation of policy and regulatory measures.
b) **Market participants:** Enhancing private sector knowledge on the economic potential and possible returns on investments of energy efficient technologies and approaches can complement and amplify the effects of changing market incentives to mobilize private sector in-vestment, supporting the implementation of improved governance frameworks.
c) **Financial institutions:** Improved knowledge on the economic potential of energy efficiency investments among professionals in financial institutions can increase the availability of financing (see also Financial Mechanisms below).
d) **Consumers:** Consumer education can strengthen the changes in consumption behavior towards energy efficient products, supplementing regulatory approaches like energy efficiency labeling.

Implementation strategies

The CCM strategy highlights that even in countries with an adequate governance framework, institutional capacity, and existing market incentives, broad adoption of EE technologies/approaches faces challenges that require barrier removal strategies. The CCM strategy entails elements to address barriers to investment mobilization such as high risk perception of financial institutions, high initial cost of in-vestments and high transaction cost of complex organizational arrangements:

a) **Financing mechanisms/Risk sharing:** To react to policy incentives and regulatory approaches, market actors need financial resources. The CCM strategy identifies the lack of available and affordable financing within the recipient countries' financial systems as a barrier for investment mobilization. Correspondingly, CCM-1 entails GEF technical assistance and direct investments in the establishment of financing mechanisms, especially risk sharing facilities providing partial loan guarantees, loan loss reserve funds etc. In addition, energy service companies (ESCOs) play an important role in increasing and channeling available financing (see below). Another component for lowering the financing barrier is

the improvement of knowledge among professionals in financial institutions (see Knowledge & Information above), which is not elaborated in the strategy itself.

b) **ESCOs:** GEF support for the establishment and operation of energy service companies (ESCOs), while not explicitly mentioned in the CCM-2 strategy text, represents an important instrument for achieving CCM-2 strategic objectives. ESCOs play a crucial role in facilitating energy efficiency investments through identification of energy efficiency potential, design of corresponding initiatives, effective mobilization of available financing ("partial financing mechanism") and the provision of organizational structures and arrangements reducing transaction costs.

c) **Pilot activities:** CCM-2 envisions investments in pilot activities to support deployment of energy efficient technologies and approaches. These activities lower initial as well as transaction cost for potential long-term investors (champions) and demonstrate EE technologies' or financing models' feasibility under market conditions, increasing the incentives for private and public sector initial investments.

Broader adoption and behavioral change

GEF activities under CCM-2 first aim at the broad adoption and enforcement of and compliance with an enabling policy and regulatory framework based and contingent on recipient countries' political will to proactively facilitate EE development. Subsequently, supported by a number of implementation strategies described above, the policy/regulatory provisions are supposed to change market incentives and structures towards a situation with low entry barriers and strong incentives for investments in energy efficient technologies, products and practices in industry and the building sector. The desired behavioral change induced by this changed market situation includes increased mobilization of investments from the private sector as well as intensifying use of energy efficient technologies and approaches by users/consumers. The broader adoption as well as behavioral change is based on the proven feasibility of LC technologies/approaches as demonstrated for example by activities supported under CCM-1.

Key Assumptions underlying CCM-2:

- Prioritization: Energy efficiency in industry and building sector provides a sensible priority area for GEF engagement "to support developing countries and economies in transition toward a low-carbon development path"
- Potential investors and significant financial resources exist that can be mobilized and channeled into energy efficiency through changes in incentive structures and establishment of financing mechanism in combination with supporting implementation instruments (e.g. ESCOs)
- Given an enabling policy and regulatory framework, the main barriers for broad adoption of EE technologies and approaches are the awareness of profitability of EE investments and the corresponding lack of available financing to overcome initial cost as well as organizational/administrative capacity to streamline activities and lower transaction costs
- Improvements of knowledge, information and awareness represent important elements of the causal chain towards GEBs, but are not elaborated comprehensively in the strategy
- ESCOs play a central role as instruments for streamlining financing processes and removing implementation barriers, but are not elaborated comprehensively in the strategy

CCM-3: Promote investment in renewable energy technologies

Table 5: CCM-3 results framework

Objective	Key Expected Outcomes	Key Targets	Core Outputs
CCM-3	• Favorable policy and regulatory environment created for renewable energy investments **Indicator:** Extent to which RE policies and regulations are adopted and enforced (score 0 to 4) • Investment in RE technologies increased **Indicator:** Volume of investment mobilized • GHG emissions avoided **Indicator:** Tons of CO2 equivalent	15-20 countries adopting or strengthening RE policies and initiatives $1.2 billion investment mobilized 0.5 gigawatt new RE capacity installed	RE policy and regulation in place RE capacity installed Electricity and heat production from renewable source

Elements and chain of causality

CCM-3, addressing renewable energy (RE) generation, largely follows the same chain of causality as CCM-2: combining support for policy framework adjustments with a set of barrier removal instruments, especially financial mechanisms, to catalyze market change. CCM-3 aims at the expansion of installed RE capacity (including photovoltaics, solar water heating, wind turbines, geothermal, small hydro, me-thane from waste, and sustainable biomass applications for power and heat production). GEF activities under CCM-3 employ a barrier removal approach.

Governance capacity

The chain of causality with regard to policy framework adjustments is largely identical to CCM-2: formulation of policy incentives and regulatory approaches to create an overall favorable incentive structure for RE increasing investment mobilization. Examples for corresponding policy and regulatory instruments include capital subsidies, tax incentives, tradable energy certificates, feed-in tariffs and purchasing agreements, grid access guarantees, mandatory RE generation quotas for energy utilities, etc. Again, the GEF technical assistance for policy formulation is accompanied by corresponding institutional capacity development efforts.

The emphasis on country-specific measures already articulated under CCM-2 is particularly stressed by CCM-3. The strategy explicitly distinguished between emerging markets (focus on regulatory frameworks and removal of market barriers for on-grid renewable energy development) and least developed countries (more often concerned – but not exclusively - with direct pilot and large scale diffusion activities on decentralized structures for RE).

Knowledge & Information

As in CCM-2, the causal links between knowledge and information and the behavioral change supporting broader adoption of RE technologies are not explicitly elaborated on in the CCM strategy text itself. The “Investing in Renewable Energy” report identifies lack of stakeholder information as a barrier to broader adoption. The report particularly mentions the level of infor-

mation of potential investors regarding the economic risks and opportunities of RE technologies. Removal of the information barrier through GEF activities can enable market participants to make informed business decisions on RE technologies. In combination with favorable incentive structures created through adjustments of the policy/regulatory framework, this is sought to facilitate the mobilization of RE investments. Similarly, the "Investing in Renewable Energy" report identifies the importance of building community trust in renewable energy and improving public acceptance in order to change consumer behavior with regard to RE. Public awareness is not prominently featured in the CCM strategy itself. Support under CCM-3 also includes the improvement of technical skills on RE in recipient countries, building the basis for the implementation of pilot activities described in the following section.

Implementation strategies

High initial cost especially for the installation of power generation facilities, are identified as a major barrier to broad adoption even with an adequate incentive system in place. Based on the enabling policy framework (see above), CCM-3 approaches this challenge mainly through two strategies to facilitate implementation:

a) **Financial mechanisms:** Establishment of financing mechanisms to increase the availability of affordable financing, lowering the barrier of high up-front cost and thereby supporting investment mobilization. CCM-3 aims at strategic barrier removal targeted at financial intermediaries (banks, development finance institutions, and microlenders), suppliers, dealers, service companies, end-users or a combination of several or all. Financing mechanisms particularly highlighted by the strategy include provision of grants and contingent financing, mitigation of technology-specific project risks, initiation of microfinance schemes.

b) **Pilot activities:** Facilitate RE technology deployment to lower the initial cost for potential long-term investors and demonstrate the feasibility of RE technologies under market conditions. Given the capital intensity of RE installation, the CCM strategy acknowledges that GEF resources are insufficient to significantly lower the initial cost barrier through pilot activities in the case of larger beneficiary countries. Therefore, pilot activities under CCM-3 are explicitly aimed at "small, poor developing countries and LDCs".

The strategies to lower investment barriers go hand-in-hand with an enabling policy and regulatory framework: Support for initial investment facilitates market entry; favorable incentive structures ensure the longer term sustainability of renewable energy markets.

Another specific challenge CCM-3 faces is the **sustainability of biomass applications**. The strategy specifically highlights the necessity to observe sustainability criteria to make sure that to ensure that "GEF support to modernization of biomass use does not undermine food security, contribute to deforestation, reduce soil fertility, increase GHG emissions beyond project boundaries, or violate sustainability principles relating to biodiversity conservation or sustainable land and water management."

Broader adoption and behavioral change

Envisioned causal pathways to broader adoption and behavioral change closely follow the causality chain of CCM-2: Building on the adoption and enforcement of the favorable policy, legal and regulatory framework and supported by several instruments for barrier removal, market in-

centives and structures are envisioned to change. Desired behavioral changes encompass the increase of political will to support RE development, mobilization of private sector investments and consumer trust in and use of RE represent. Again, broader adoption and behavioral change is based on the proven feasibility of LC technologies/approaches, for example as demonstrated through CCM-1.

Key Assumptions underlying CCM-3:

- Prioritization: Promotion of renewable energy represents an effective way for the GEF "to support developing countries and economies in transition toward a low-carbon development path"
- Potential investors and significant financial resources exist that can be mobilized and channeled into renewable energy through changes in incentive structures in combination with supporting implementation measures
- Given an enabling policy and regulatory framework, the main barrier for broad adoption of RE technologies are the high up-front cost, which can be lowered through additional financing mechanisms and pilot activities
- Improvements of knowledge and information represent important elements of the causal chain towards GEB, but are not elaborated on in the strategy
- Biomass application can offer sustainable energy solutions if strict criteria are being observed

CCM-4: Promote energy efficient, low-carbon transport and urban systems

Table 6: CCM-4 results framework

Objective	Key Expected Outcomes	Key Targets	Core Outputs
CCM-4	• Sustainable transport and urban policy and regulatory frameworks adopted and implemented **Indicator:** Number of cities adopting sustainable transport and urban policies and regulations • Increased investment in less-GHG intensive transport and urban systems **Indicator:** Volume of investment mobilized • GHG emissions avoided **Indicator:** Tons of CO2 equivalent	20-30 cities adopting low-carbon programs $1.2 billion investment mobilized	Cities adopting low-carbon programs Investment mobilized Energy savings achieved

Elements and chain of causality

CCM-4 identifies transport and urban systems as one of the largest sources of future CO2 emission growth due to rapid urbanization and defines it as a priority area for GEF support. The GEF "Investing in Sustainable Urban Transport" report highlights "three ways to address the growing GHG emissions in the transport sector: reduce the demand to travel by car, shift travel to a more efficient mode, and improve the energy efficiency of car travel."

The chain of causality envisioned by CCM-4 puts a particular focus on the **behavioral change of the population regarding transportation choices**. Accordingly, many activities supported under CCM-4 attempt to enhance the quality of LC transport and increase the attractiveness to users to induce shifts towards LC modes of transportation. In turn, added demand for LC modes of transportation increases economic profitability of LC transport systems. In addition, CCM-4 highlights the integration of LC transport in **broader urban systems** and calls for GEF supported activities to address the overarching challenges of rapid urbanization in an integrated way.

Governance capacity

While CCM-4 includes policy and regulatory support towards changing market conditions (e.g. regarding low-carbon vehicles), the governance framework activities under CCM-4 put special emphasis on regulatory measures and governance capacity development to enhance planning and management of urban transport systems, improve quality and efficiency of public transport and reduce emissions from car travel:

a) **Low-carbon public transport systems:** The CCM strategy supports the development of institutional and administrative capacity for land use, urban and transport planning, management of public transit systems etc. These measures aim to enhance the quality and effciency of LC transport systems, especailly public transport, thereby making it more attractive for users and induce a behavioral change towards reduced car travel and a shift to

alternative travel modes. Policy and administrative instruments are complemented by supporting implementing strategies described below.

b) **Reduce emissions from vehicle transport:** The second lever addressed through CCM-4 is the reduction of emissions from individual travel. CCM-4 entails support for the establishment of regulatory instruments promoting and/or mandating vehicle efficiency improvements such as fuel economy standards as well as corresponding financial instruments. Furthermore, CCM-4 provides assistance for achieving improvements in traffic control and management. (On the trade-off between improved urban vehicle flow and shift to alternative transportation modes see "Key Assumptions", p. 23)

Implementation strategies

The administrative efforts to promote LC transport and urban systems are supported by barrier removal activities at the implementation stage. Building on enhanced governance capacity, the CCM strategy especially highlights two mechanisms to facilitate broader adoption of LC transport systems.

a) **Pilot and deployment investments:** The CCM strategy includes investments in piloting as well as commercially feasible deployment of demonstrated high-performance technologies. These investments cover a broad range of areas: promotion of clean, low-carbon vehicles; sustainable transport infrastructures including public and non-motorized transport infrastructure and fleet improvement are mentioned as examples. Within the chain of causality, investments are supported by the institutional capacity development and enhanced governance framework described above. In turn, pilot activities can demonstrate the feasibility of LC transport solutions to users (facilitating shift away from car travel) and to investors (facilitating replication and scaling-up).
b) **Financing mechanisms:** CCM-4 includes the "development of innovative financing mechanisms" as a component of GEF activities, but provides no further specification in the text itself. Within the portfolio, a broad range of financing mechanisms including for example differentiated tolling systems.

Knowledge & Information

CCM-4 explicitly states that "public awareness and participation will be an integral part of a successful program". The focus on public awareness reflects the **importance of a behavioral change of the public**, shifting modes of transportation. Information and awareness is envisioned to facilitate this behavioral change, complementing efforts to increase the attractiveness of alternative forms of transportation.

Again, direct activities on information-sharing and knowledge creation are not elaborated on in the GEF-5 strategy itself. Supporting documentation in this respect focuses on the provision and exchange of knowledge to public institutions related to planning and management of and public investments in urban transport systems, reflecting the central importance of public sector capacity in the context of CCM-4.

Broader adoption and behavioral change

The CCM-4 chain of causality features a particularly strong reciprocal relationship between behavioral change of users and the broader adoption of LC transport solutions. CCM-4 builds on

the improvement of policy frameworks and administrative as well as management capacity to enhance the quality of LC transport alternatives. Based on enhanced capacity, CCM-4 focuses on investments in technologies and infrastructure to support the emergence of advanced sustainable transport systems within the broader urban context. Ultimately, these activities are envisioned to lead to a significant public shift of mode of transportation. The resulting increase in demand for public, LC transportation in turn creates additional incentives for the public and private sector to invest in further replication and scaling–up, closing the reinforcing cycle.

Key Assumptions underlying CCM-4:

- Prioritization: The trajectory of CO_2 emission from urban transport (in combination with strong "lock-in effects" of transportation infrastructure) justifies GEF support for the promotion of LC transport/urban systems
- Behavioral change of consumers and the shift from individual vehicles to LC transport can be achieved by increasing the quality and effectiveness of LC transport alternatives supported by corresponding demonstration activities
- Public awareness regarding the benefits of LC transport/urban systems can facilitate a public behavioral change
- Trade-off: In terms of net emissions, CO_2 emission reductions from urban vehicle flow planning (e.g. reduced traffic congestion) outweigh the counter-effect of making individual vehicles more attractive as a means of transportation

CCM-5: Promote conservation and enhancement of carbon stocks through sustainable management of LULUCF

Table 7: CCM-5 results framework

Objective	Key Expected Outcomes	Key Targets	Core Outputs
CCM-5	• Good management practices in LULUCF adopted both within the forest land and in the wider landscape **Indicator:** Number of countries adopting good management practices in LULUCF • Restoration and enhancement of carbon stocks in forests and non-forest lands, including peatland **Indicator:** Hectares restored • GHG emissions avoided and carbon sequestered **Indicator:** Tons of CO2 equivalent	10-15 countries adopting good management practices and implementing projects	Carbon stock monitoring systems established Forests and non-forest lands under good management practices

Elements and chain of causality

The CCM-5 objective is two-fold: "one is to conserve, restore, enhance, and manage the carbon stocks in forest and non-forest lands, and the other is to prevent emissions of the carbon stocks to the atmosphere through the reduction of the pressure on these lands in the wider landscape."[4] The primary instrument to achieve this dual objective is the promotion of sustainable LULUCF practices. GEF as a whole has increased its attention to LULUCF management across focal areas in reaction to corresponding convention guidance and emerging scientific knowledge. An increased emphasis on forests is highlighted by the cross-focal GEF-5 Sustainable Forest Management (SFM)/REDD+ Strategy which combines forest related potential of the CCM as well as Biodiversity and Land Degradation. The SFM/REDD+ Strategy is connected to CCM-5 in terms of objectives and also through an incentive funding mechanism that matches CCM-5 activities with additional resources at a ration of 3:1 if combined with resources from Biodiversity and/or Land Degradation Focal Areas. Furthermore, CCM-5 is designed to be able to realize synergies with LULUCF related objectives of the Focal Area Strategy on Biodiversity as well as Land Degradation.[5]

Governance capacity

GEF activities include the support for the development and formulation of policies and regulations to avoid deforestation, securing carbon stocks and promoting sustainable management of forests. Closely linked with the improvements of the general governance framework, CCM-5 under GEF-5 puts a specific emphasis on activities to develop national systems to measure and

[4] GEF-5 CCM Strategy, Objective 5.

[5] The explicit connections of the different Focal Areas on LULUCF have resulted in almost all LULUCF projects being multi-focal area (MFA) projects. The implications of the increase in MFAs in terms of funding balance, strategic consistency etc. has been flagged as an important issue with regards to the GEF-6 Focal Area Strategies.

monitor carbon stocks and fluxes from forest and non-forest land, incl. peatlands, assisting institutions related to the national systems in facilitating the adoption of sustainable LULUCF practices at national and local scales. The governance capacity support is envisioned to be balanced across geographic scales from national to local, reflecting the range of intervention levels that need to be included to successfully conduct sustainable LULUCF.

Knowledge & Information

Establishing sustainable LULUCF practices is assumed to require corresponding awareness and knowledge on the national as well as local level. National level measuring, reporting and verification as well as inventory systems (see "Governance capacity") are crucial for providing information on the state and development of national carbon stocks, establishing the basis for attaching financial value and creating corresponding incentive mechanisms (see "Implementation Strategies"). Good management practices are also important for locally applied carbon management regimes and to develop alternative livelihood methods. CCM-5 supports knowledge and skill development of local communities through workshops, trainings, etc. Furthermore, the CCM strategy envisions support for participatory processes to develop alternative livelihood approaches based on sustainable LULUCF practices in collaboration with affected communities.

Implementation strategies

Measuring and monitoring systems: As discussed in the paragraphs above, "developing national systems to measure and monitoring carbon stocks and fluxes from forest and non-forest lands" and strengthening related policies and institutions is one of the core out-comes of the CCM-5 and the basis for successful incentive mechanisms.

a) Incentive mechanisms: "Establishing financing mechanisms and investment programs" represents one of the elements for the promotion of sustainable LULUCF practices across the spectrum of land-use categories. The strategy itself does not elaborate on the financial instruments to be employed. The SFM/REDD+ strategy, closely linked to CCM-5 (see above), as well as the Land Degradation strategy highlight Payment for Ecosystem Services (PES) as a suitable instrument to change incentive structures.
b) Pilot activities: The CCM strategy envisions support for "pilot investment projects designed to reduce net emissions from LULUCF and to enhance carbon stocks." These pilot activities are to be supported "where appropriate". Pilot activities can create a demonstration effect, illustrating the feasibility of alternative livelihood methods, thereby facilitating behavioral change of local communities.

Broader adoption and behavioral change

The combination of enhanced policy, regulatory and legal stipulations and the improvement of national systems for carbon monitoring and related technical and administrative capacity provides the basis for the establishment of financing and incentive mechanisms and pilot investments in alternative livelihood methods and sustainable LULUCF practices. The demonstration of feasibility and change in incentive structure is envisioned to facilitate the further replication and scaling-up of corresponding practices and alternative livelihood methods. The success of this broader adoption is contingent on a behavioral shift of local communities towards sustainable

LULUCF management, which is facilitated by GEF supported knowledge creation and information-sharing as well as demonstrational effects of pilot investments.

Key Assumptions underlying CCM-5:

- A sound legal and regulatory framework for protection, restoration, enhancement, and management of carbon sinks, backed by national measuring and monitoring systems and institutional capacity, can help assess and reduce unsustainable LULUCF practices
- National monitoring systems provide credible information that reduce investment risk so that financiers are willing to invest in carbon projects
- Support for the development and demonstration of alternative livelihood methods will improve broad adoption of and compliance with the legal and regulatory framework
- Financial incentive schemes can play a positive role in facilitating a behavioral shift towards sustainable LULUCF management on the national level as well as in local communities

CCM-6: Support enabling activities and capacity building under the Convention

Table 8: CCM-6 results framework

Objective	Key Expected Outcomes	Key Targets	Core Outputs
CCM-6	• Adequate resources allocated to support enabling activities under the Convention **Indicator:** Percentage of eligible countries receiving GEF funding • Human and institutional capacity of recipient countries strengthened **Indicator:** Countries and institutions supported by the GEF	100% of eligible countries receiving GEF funding in accordance with COP guidance	Countries receiving GEF support for national communication, etc. National communications, etc. completed and submitted to the UNFCCC as appropriate

Elements and chain of causality

The primary objective of CCM-6 is to support non-Annex I Parties in fulfilling their obligations to the UNFCCC. In particular, this includes the preparation of **National Communications** which in the context of climate change mitigation are envisioned to inform and facilitate CCM policy decision-making, prioritization of actions etc. Furthermore, National Communications inform, guide and assist activities on technology transfer, climate change adaptation (feeding for example into activities under the LDCF/SCCF Strategy) as well as capacity development. Thus, National Communications provide a broad basis for climate policy intervention at the national and in some cases regional levels. In addition, CCM-6 supports the preparation and update of TNAs, which feed into the national planning process and relate to activities under the other CCM objectives (see for example CCM-1). CCM-6 also includes other general capacity development activities, **supplementing the specific capacity development activities under CCM 1-5**.

Furthermore, efforts to explore opportunities for the recipient countries with regards to carbon markets are included under CCM-6. This encompasses support for an enabling policy, legal and regulatory framework conducive to carbon market engagement as well as the exploration of a set of instruments to support carbon market activities ranging from demonstration activities to financial mechanisms (risk guarantees, co-financing of carbon market projects).

The chain of causality envisions enabling activities to inform and reinforce each other and support the improvement of knowledge, awareness and political will regarding CCM activities. Enabling activities are to facilitate the mainstreaming of CCM into national policy planning.

2.3 Overall TOC for GEF-5 Focal Area Strategy on Climate Change Mitigation

The elements and chains of causality under each of the CCM objectives can be summarized in five closely interrelated causal pathways working towards the generation of Global Environmental Benefits:

Causal pathway 1: Preparing the ground through technology transfer and demonstration

Making suitable technologies available for application in a given recipient country and achieving broad acknowledgement of the technology's feasibility and potential represents a prerequisite for subsequent replication and scaling-up. The CCM strategy supports the transfer and demonstration of innovative low-carbon technologies through corresponding pilot activities. These activities demonstrate the feasibility of innovative technologies and help to better understand the technology's potential in a given national context, the elements defining its viability as well as the exact conditions under which this potential can best be realized.

The pilots are based on an enabling environment for technology transfer created through GEF supported barrier removal activities: the identification and selection of technologies is envisioned to be helped by TNAs and international technology cooperation ; policy and legal provisions provide a framework supportive of TT activities; technical skill development removes technical barriers to TT; legal barriers are sought to be tackled, in some cases, with the purchase of technology licenses; and GEF support to the establishment of organizational structures and arrangements lower transaction cost. The demonstrations themselves help assess the conditions of further deployment. Ultimately, the demonstrated/transferred technologies are ready to enter the commercialization stage (addressed by CCM 2-5).

Causal pathway 2: Changing markets through policy incentives, regulatory approaches and improvement of alternatives

Facilitating market change towards an incentive structure that favors the broader adoption and, where applicable, commercialization of LC technologies/approaches is at the core of the CCM strategy. GEF supported activities aim at creating country-specific frameworks of policy incentives and regulatory approaches to **increase the attractiveness of LC technologies/approaches for potential investors**, mobilizing investments. The creation of policy, legal and regulatory frameworks is supported by enabling activities, especially National Communications. Institutional capacity development facilitates policy formulation, implementation, enforcement and monitoring (e.g. systems to monitor carbon stocks for the enforcement of LULUCF related provisions).

Furthermore, the CCM strategy supports measures that ultimately aim at increasing the **attractiveness of alternative, low-carbon practices to consumers/users**, for example the improvement of LC transport systems planning and management, which in turn raises LC transport quality and is ultimately envisioned to lead to a behavioral shift away from use of individual vehicles. Improvement of alternatives is closely linked to demonstration effects of pilot activities described under pathway 4.

Causal pathway 3: Removing barriers to broader adoption

Broader adoption of LC technologies/approaches faces challenges even if an adequate policy and regulatory system is in place. Especially the availability of affordable financing as well as high initial costs and transaction costs are addressed by the CCM strategy. The main instruments employed by the CCM strategy are establishment of financial mechanisms to increase availability of financing resources, support of organizational structures to decrease transaction costs, and the implementation of pilot activities for initial deployment of selected technologies/approaches to decrease initial and transaction costs and demonstrate feasibility (see pathway 4). These strategies for barrier removal and the policy, legal and regulatory framework are closely interlinked, envisioned to reinforce each other in facilitating market change and broad adoption of LC technologies/approaches.

Causal pathway 4: Demonstrating feasibility of deployment

Directly connecting to causal pathway 1, which focused on the demonstration of technological feasibility, the CCM strategy entails support for pilot deployment of LC technologies/approaches. On the one hand, these pilots serve as a barrier removal strategy as described above, lowering initial as well as transaction cost for potential investors. On the other hand, these pilots are envisioned to create a demonstrational effect, illustrating the feasibility of deployment under market conditions to investors (e.g. RE or EE) and/or the effectiveness and quality of alternative LC practices to users/consumers (e.g. LC transport or sustainable LULUCF practices). Implementation of these pilot activities is again based on the corresponding policy and legal provisions.

Causal pathway 5: Facilitate behavioral change through knowledge and information

This causal pathway, while acknowledging to some degree by the CCM strategy, represents the causal chain **least elaborated and emphasized by the strategy.** The level of knowledge and information on the availability, benefits and potential of LC technologies/approaches is assumed to be causally linked to behavioral change of investors as well as consumers/users, enabling stakeholders to act upon the changes incentive structures, increased quality of alternatives etc. Without the necessary awareness and knowledge of key stakeholder groups, the value of other activities under the CCM strategy is limited. The strategy only elaborates on this causal pathway in some specific instances, most notably with regard to raising public awareness on LC transport.

In addition, the dimension of knowledge and information also entails a skill-building component. This is acknowledged by the CCM strategy pointing towards skill development as a prerequisite for technology transfer and demonstration (barrier removal), as well as by highlighting best practice sharing and participatory approaches with regard to designing alternative livelihood methods following sustainable LULUCF management. This aspect is, however, not elaborated with respect to the positive causal link between knowledge and information of policymakers and the quality of policy formulation as well as the level of political will to develop an enabling policy environment for the broader adoption of LC technology/approach.

Key Assumptions underlying the GEF-5 CCM Focal Area Strategy:

- Prioritization: Areas of activities defined by the CCM strategy (TT, EE, RE, LC transport/urban systems, LULUCF) represent the most effective and efficient fields of GEF intervention (within the confines of COP guidance) "to support developing countries and economies in transition toward a low-carbon development path"
- Externalities: Unregulated market conditions will produce a market equilibrium for low-carbon technologies below the social optimum due to externalities (market failure); GEF supported activities can effectively contribute to the internalization of externalities, increasing LC technology use
- Resources: Potential investors and significant financial resources exist that can be mobilized and channeled into low-carbon technologies if market and incentive structures are adjusted through policy incentives and regulatory approaches
- Barriers: Given an enabling policy and regulatory framework, other barriers to broad adoption of LC technologies/approaches exist that require barrier removal activities; most importantly, the availability of affordable financing can be increased through the establishment of additional financial mechanism; pilot activities and establishment of organizational structures can further reduce initial as well as transaction costs
- Alternatives: Behavioral change can be facilitated by increasing the attractiveness of LC alternatives, e.g. the quality of LC transport systems
- Information & Knowledge: The quality of policy frameworks, instruments, monitoring systems etc., ultimately leading to behavioral change, depends on the level of information and knowledge of stakeholder groups regarding the opportunities, benefits and potential of low-carbon technologies and approaches, e.g. the feasibility of sustainable LULUCF practices
- Demonstration: Pilot activities demonstrating the feasibility of LC technologies/approaches have a demonstrational effect on users/consumers and investors, facilitating an increase in demand/adoption as well as mobilization of investment

2.4 Framework diagrams for TOC construction

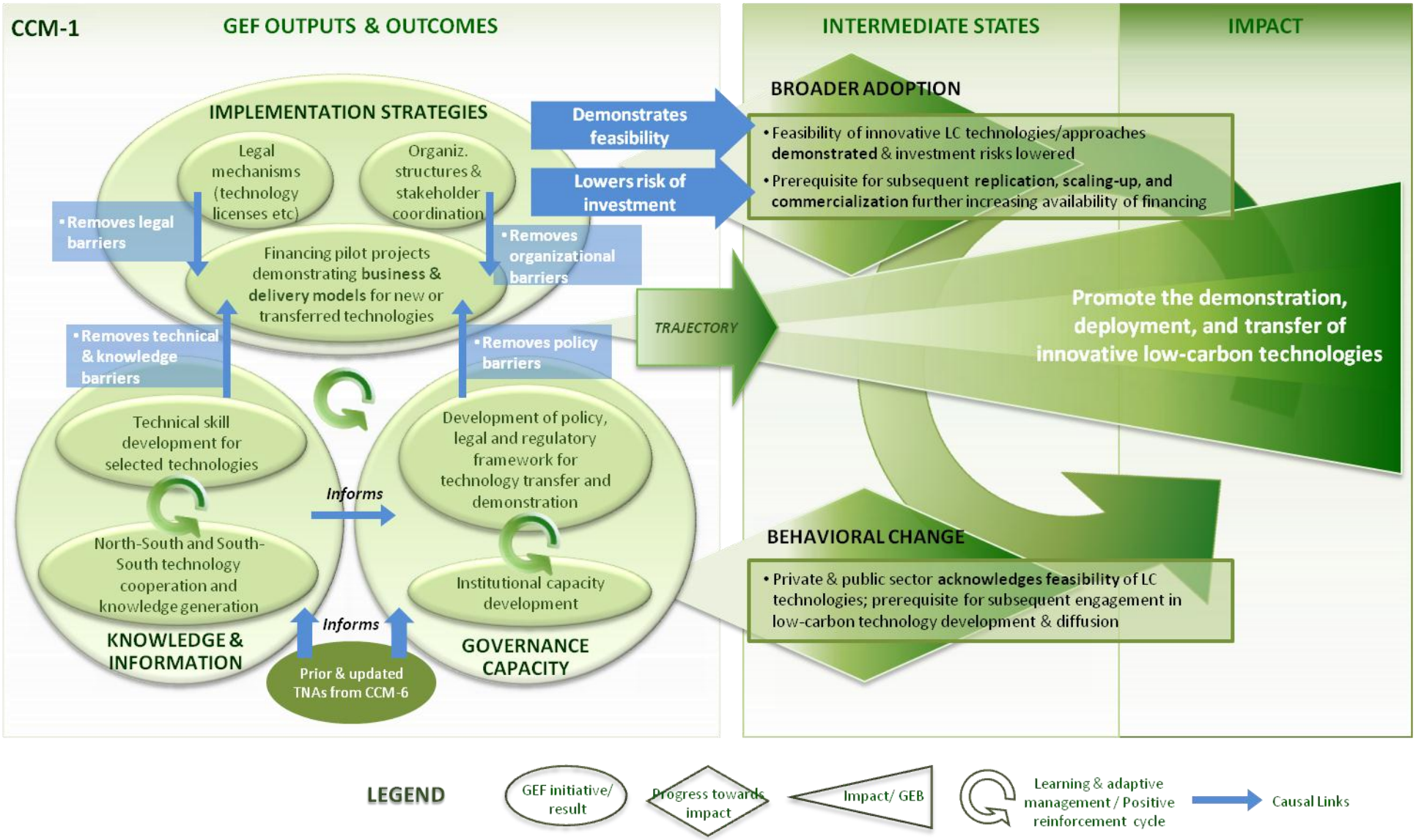


Figure 4: Elements and causal links of CCM-1

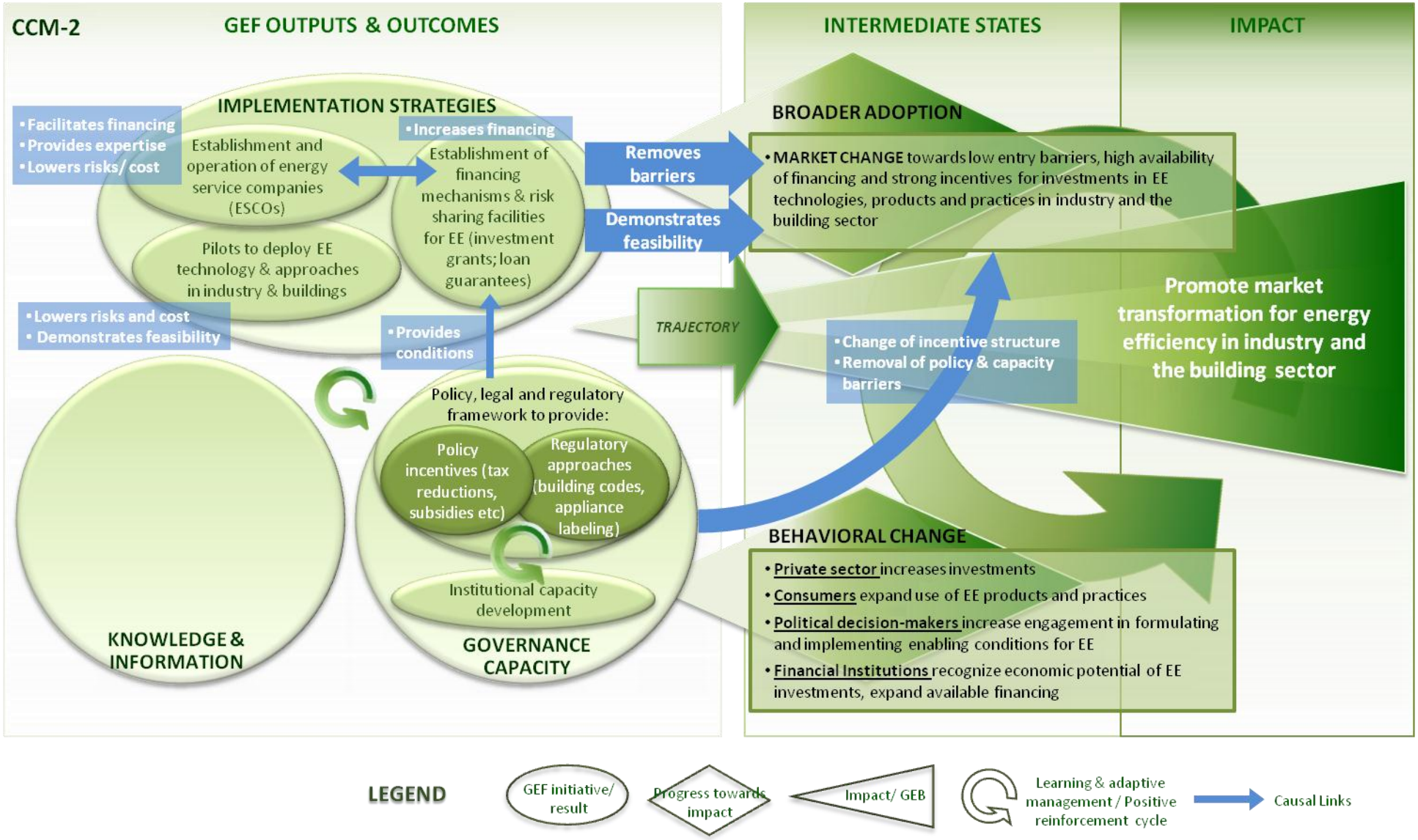


Figure 5: Elements and causal links of CCM-2

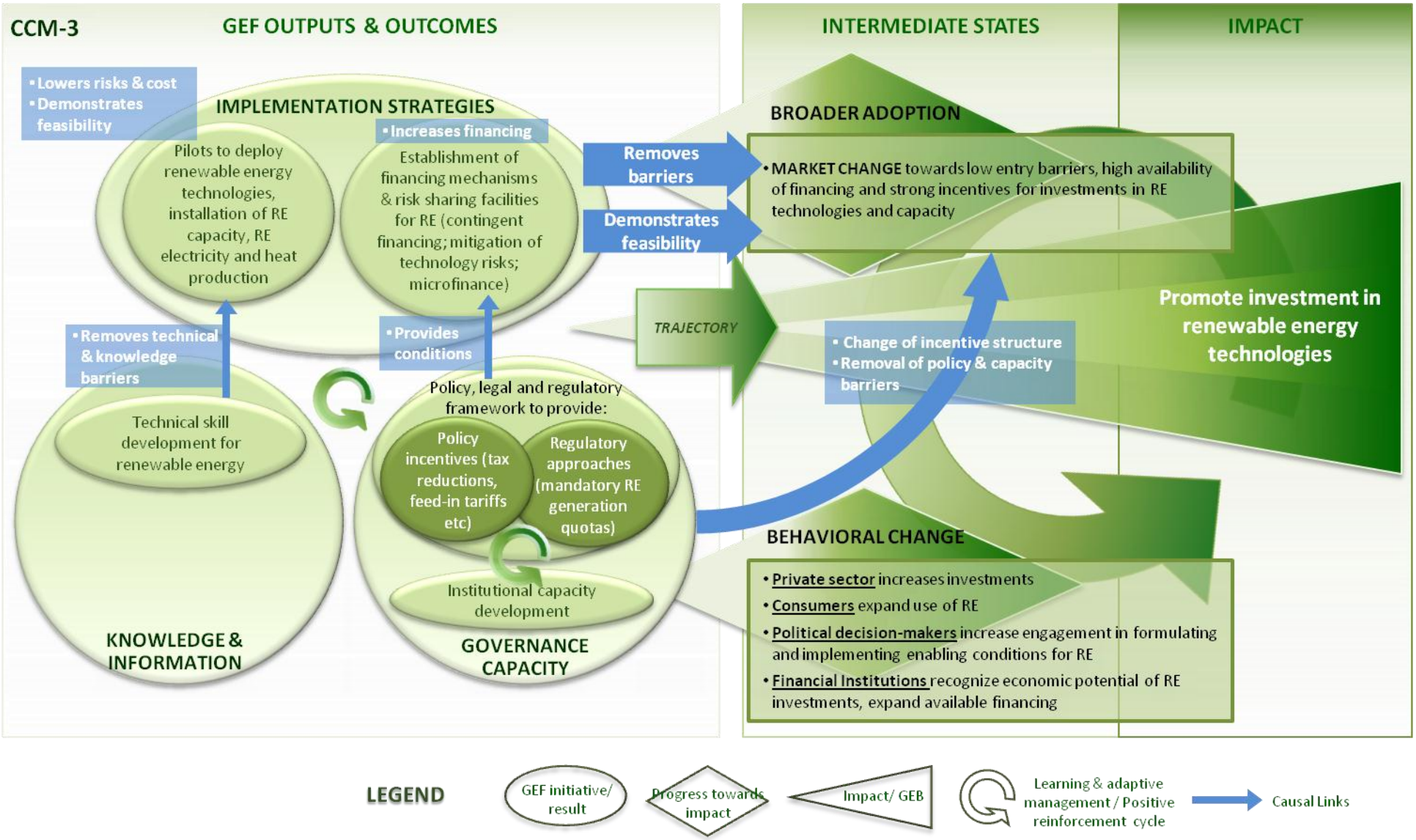


Figure 6: Elements and causal links of CCM-3

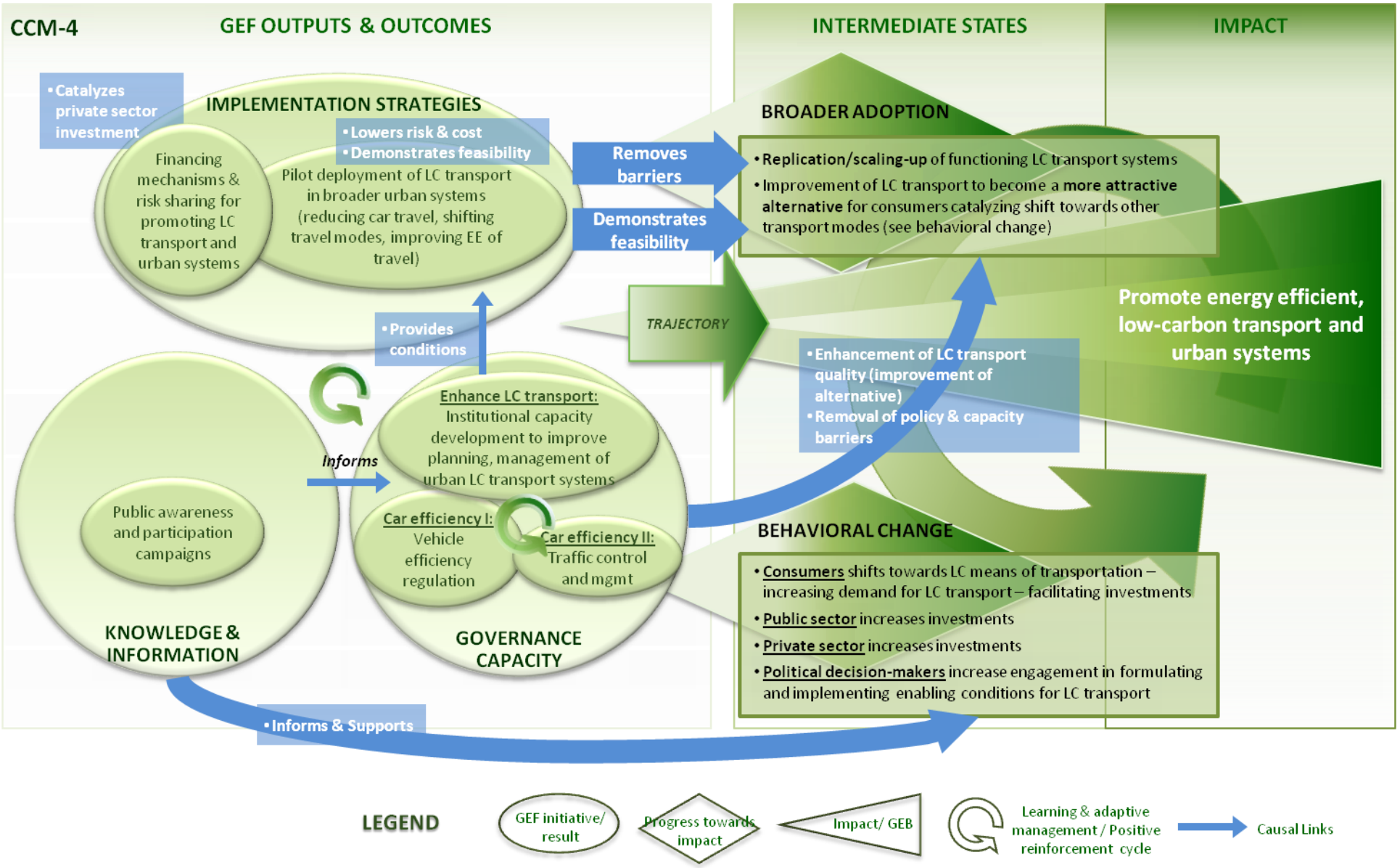


Figure 7: Elements and causal links of CCM-4

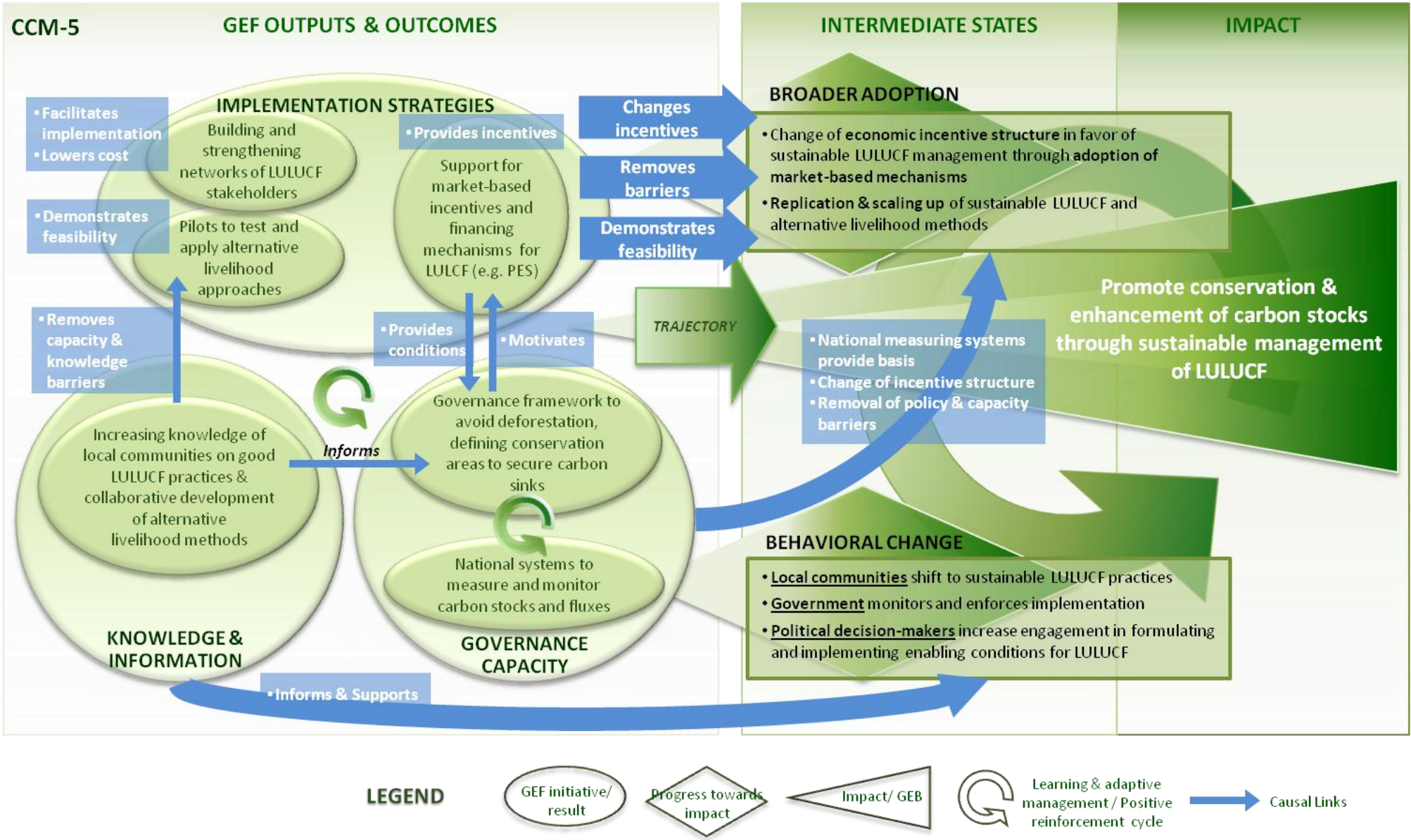


Figure 8: Elements and causal links of CCM-5

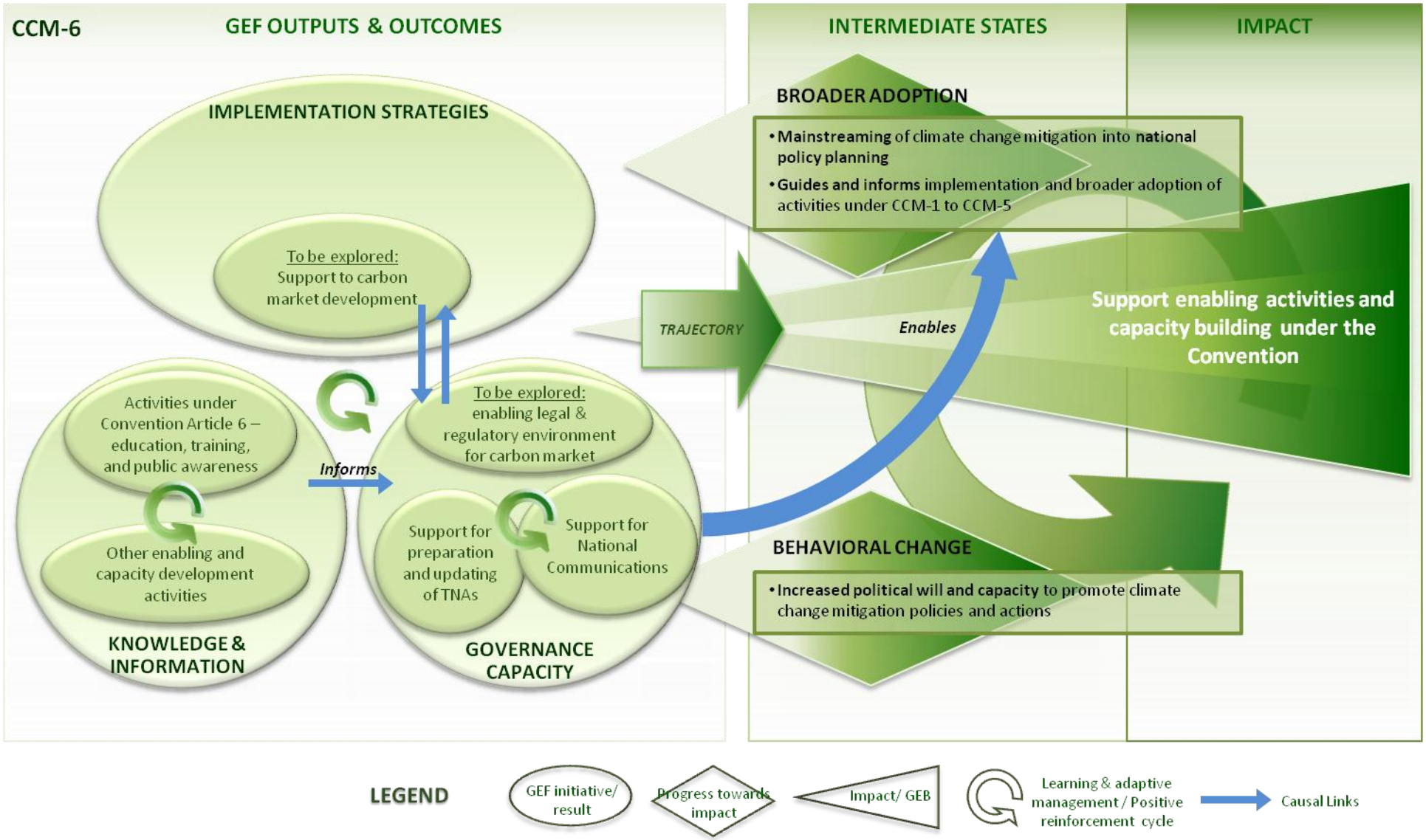


Figure 9: Elements and causal links of CCM-6

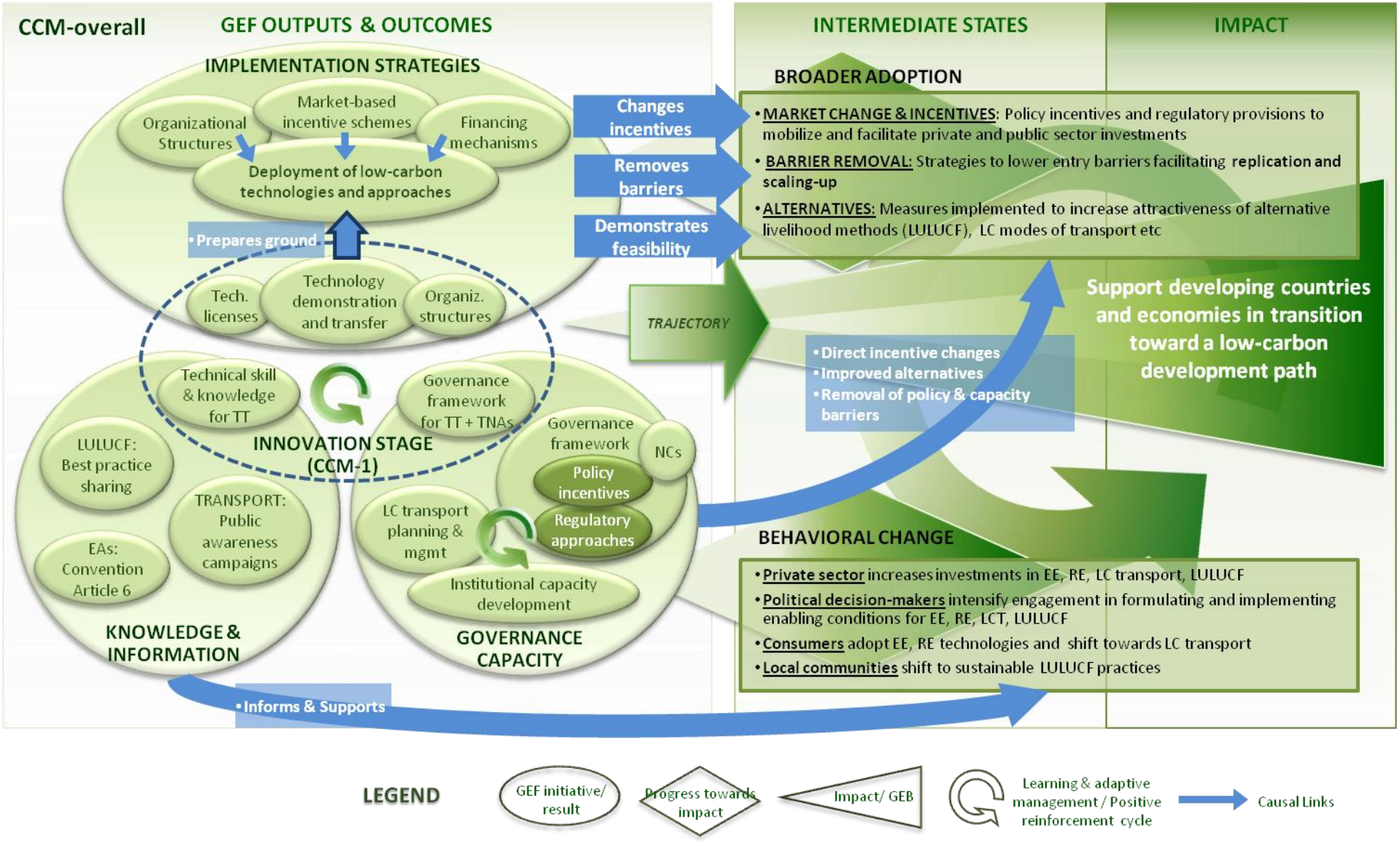


Figure 10: Elements and causal links of GEF-5 Strategy on Climate Change Mitigation

3. ANALYSIS OF CONVENTION GUIDANCE

3.1 Approach to convention guidance

One factor that influences the characteristics of the GEF Focal Area Strategies is the guidance the GEF receives from the Conference of the Party (COP) of international conventions. The influence of convention guidance on the GEF Focal Area Strategies is particularly important in the context of international conventions the GEF serves as financial mechanisms, namely the CBD, UNFCCC, UNCCD and the Stockholm Convention. Accordingly, the analysis of convention guidance primarily focuses on GEF support in the areas of Biodiversity, Climate Change, Land Degradation and Chemicals. In order to assess the way in which Focal Area Strategies reflect convention guidance the *Evaluation of GEF Focal Area Strategies* conducted a full review of convention guidance issued by the COPs. The review includes the identification of guidance relevant to the GEF, a quantitative analysis of guidance over time, and a qualitative classification of each individual item of COP guidance. The full compilation of COP guidance can be found in Technical Paper 8.

Based on the guidance review, the *Evaluation of GEF Focal Area Strategies* conducted a "Guidance-Strategy-Mapping" identifying the links between guidance and Focal Area Strategies. The mapping illustrates how topics raised by the convention are reflected in the strategies and how the strategies in turn are shaped by different kinds of guidance. Stakeholder interviews, especially with the GEF Secretariat and convention secretariats, provided additional information for the analysis of the relationship between Focal Area Strategies and convention guidance.

3.2 Quantitative summary of UNFCCC guidance

Note: One "item" of guidance is defined as a distinguishable piece of information within a COP decision, usually a paragraph or sub-paragraph.[6]

Classification of UNFCCC guidance to the GEF by themes

Table 9: UNFCCC COP guidance to the GEF

Theme/COP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	TOTAL
I. OVERALL																		
General	1	3		1								1						6
LDCF general						1	1											2
SCCF general						2	1											3
AF general							1											1
Funding principles	7	3					3	1					1			2		17

[6] On counting COP guidance: The table summarizing convention guidance to the GEF presented in OPS4 counts the number of Articles in COP Decisions directed to the GEF. The numbers presented in figure 7, which will also be used for OPS5, count all items of guidance defined as a "distinguishable piece of information within a COP decision" (usually a paragraph or sub-paragraph). Accordingly, the reported number is significantly higher than in OPS4.

(general)																		
CCA funding principles	1			1														2
LDCF – Funding principles								4	1		7							12
SCCF – Funding principles									2			1						3
Eligibility Criteria	1																	1
II. FUNDING PRIORITIES																		
Funding priorities (general)	1													1		1	1	4
Research and systematic observation				1			7		1	1								10
Education, training and public awareness	2			1			5	2	1	3		1	2			2		19
National communications		3		2	2		1	1	1	2	1	2	5	4		4		28
National communications follow-up							1				1		1	2		1		6
National programs & planning	3			1			2									1	1	8
Capacity Development	1	1		1			3	1	1	6		3		1			1	19
Technology transfer and TNAs				1			1	1				3	5	3				14
Response measure impacts										2								2
Carbon Capture and Storage											1							1
LULUCF												1						1
Energy efficiency												1						1
Biennial update report																	3	3
Technology Mechanism																	2	2
Green Climate Fund																	1	1
CCA funding priorities (general)	1					2						1				1		5
CCA preparation activities (stage II)							3											3
CCA disaster preparedness							3											3
LDCF – Funding priorities (general)						1	2				1					1		5
LDCF - National Adaptation Pro-								3	1					2		2		8

grams of Action (NAPAs)																		
LDCF - LDC work program														1				1
LDCF - National Adaptation Plans (NAPs)																	3	3
SCCF – Funding priorities (general)						1	2											3
SCCF - Adaptation overall (SCCF-A)									2									2
SCCF - Health							1		1									2
SCCF - Disaster management							2		2									4
SCCF - Technology transfer (SCCF-B)									2									2
SCCF - Sectors (SCCF-C)												5						5
SCCF - Diversification (SCCF-D)												5						5
III. OPERATIONAL ISSUES																		
Reporting & provision of additional information	1	4		1			3	4	1	4	2	3	3	3		2	2	33
LDCF reporting								1	1		1			1		1		5
SCCF reporting									1			1						2
Resource mobilization	1	1								1		1	1	1				6
SCCF Resource mobilization									1			1						2
LDCF Resource mobilization														1				1
Resource allocation												1		1		1		3
Resource approval and disbursement		1		3			5	2				1				4		16
SCCF Resource approval and disbursement									1									1
LDCF Resource approval and disbursement														1				1
Implementation of COP guidance								1				1				1		3
Incremental costs	1							1					1					3
Geographical consideration												2		1				3

Knowledge man-agement													1			1		2
Dialogue with COP secretariat		1																1
Dialogue with GEF agencies				1			2						1	3				7
Dialogue with countries												1	1					2
TOTAL	21	17	0	14	2	7	49	22	20	19	14	36	22	26	0	25	14	**308**

Overall amount of guidance

Figure 11: Overall amount of UNFCCC guidance to the GEF

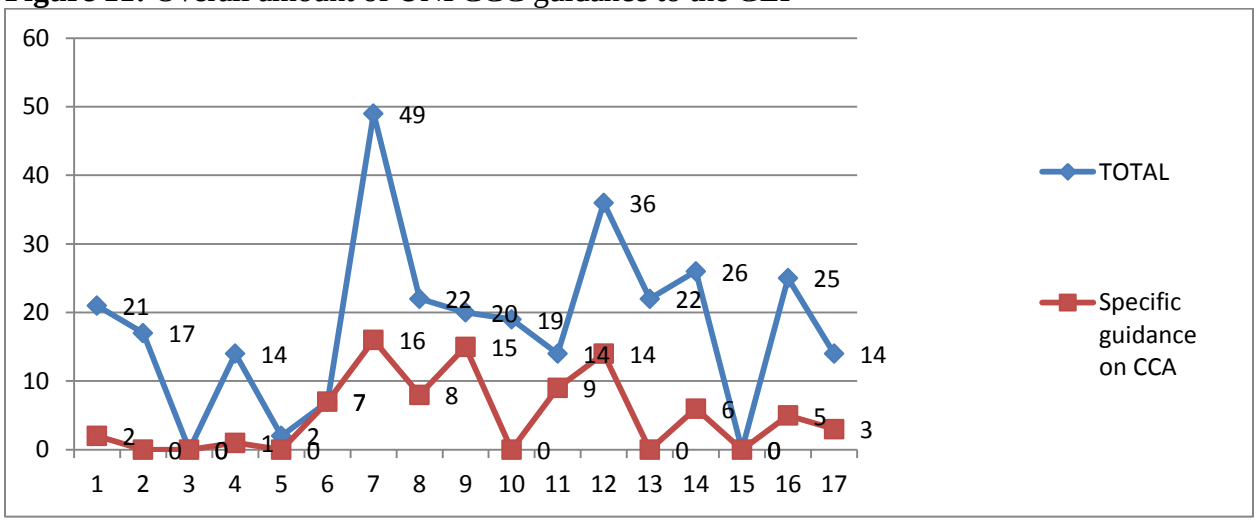
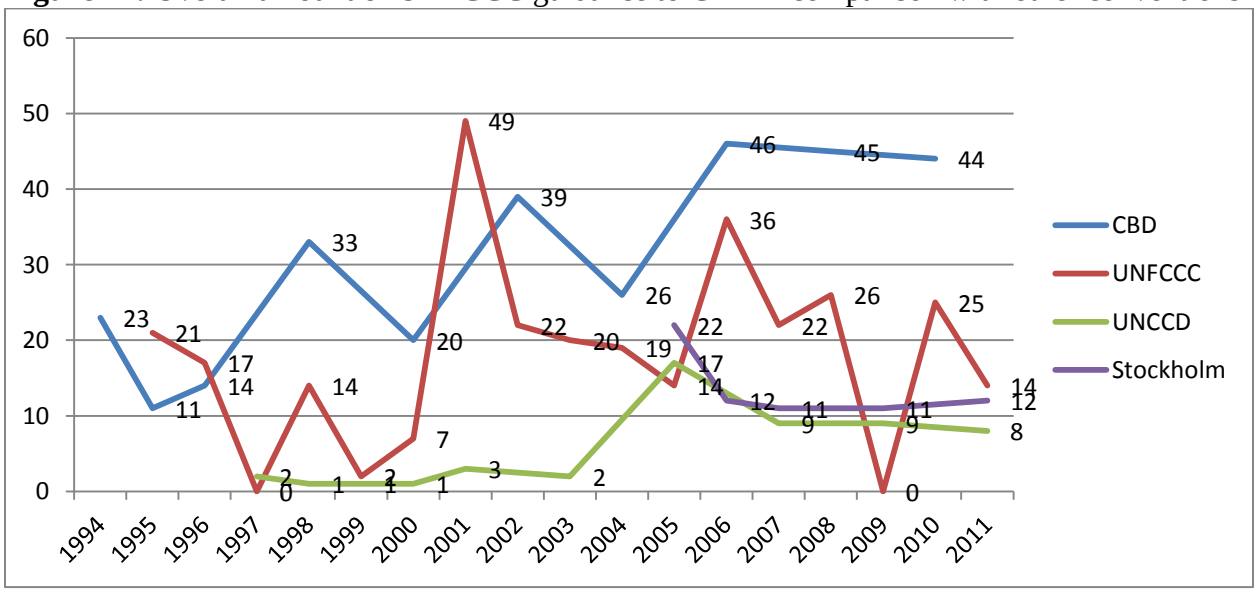


Figure 12: Overall amount of UNFCCC guidance to GEF in comparison with other conventions



Convention	CBD	UNFCCC	UNCCD	Stockholm
Time period	1994-2010	1995-2011	1997-2011	2005-2011
Cumulative items of Guidance	301	308	53	68

First COP mentioning of different program priorities

Table 8: First COP mentioning of different program priorities

Theme/COP	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Education, training and public awareness	X																
National programs & planning	X																
Capacity Development	X																
CCA funding priorities (general)	X																
National communications		X															
Research and observation				X													
Technology transfer and TNAs				X													
LDCF – Funding priorities (general)						X											
SCCF – Funding priorities (general)						X											
National communications follow-up							X										
CCA preparation activities (stage II)							X										
CCA disaster preparedness							X										
SCCF - Health							X										
SCCF - Disaster management							X										
LDCF - NAPAs								X									
SCCF - Adaptation overall (SCCF-A)									X								
SCCF - Technology transfer (SCCF-B)									X								

Response measure impacts										X							
Carbon Capture and Storage											X						
SCCF - Sectors (SCCF-C)												X					
SCCF - Diversification (SCCF-D)												X					
LULUCF												X					
Energy efficiency												X					
LDCF - LDC work program														X			
Biennial update report																	X
Technology Mechanism																	X
Green Climate Fund																	X
LDCF - NAPs																	X

3.3 Guidance-Strategy Mapping

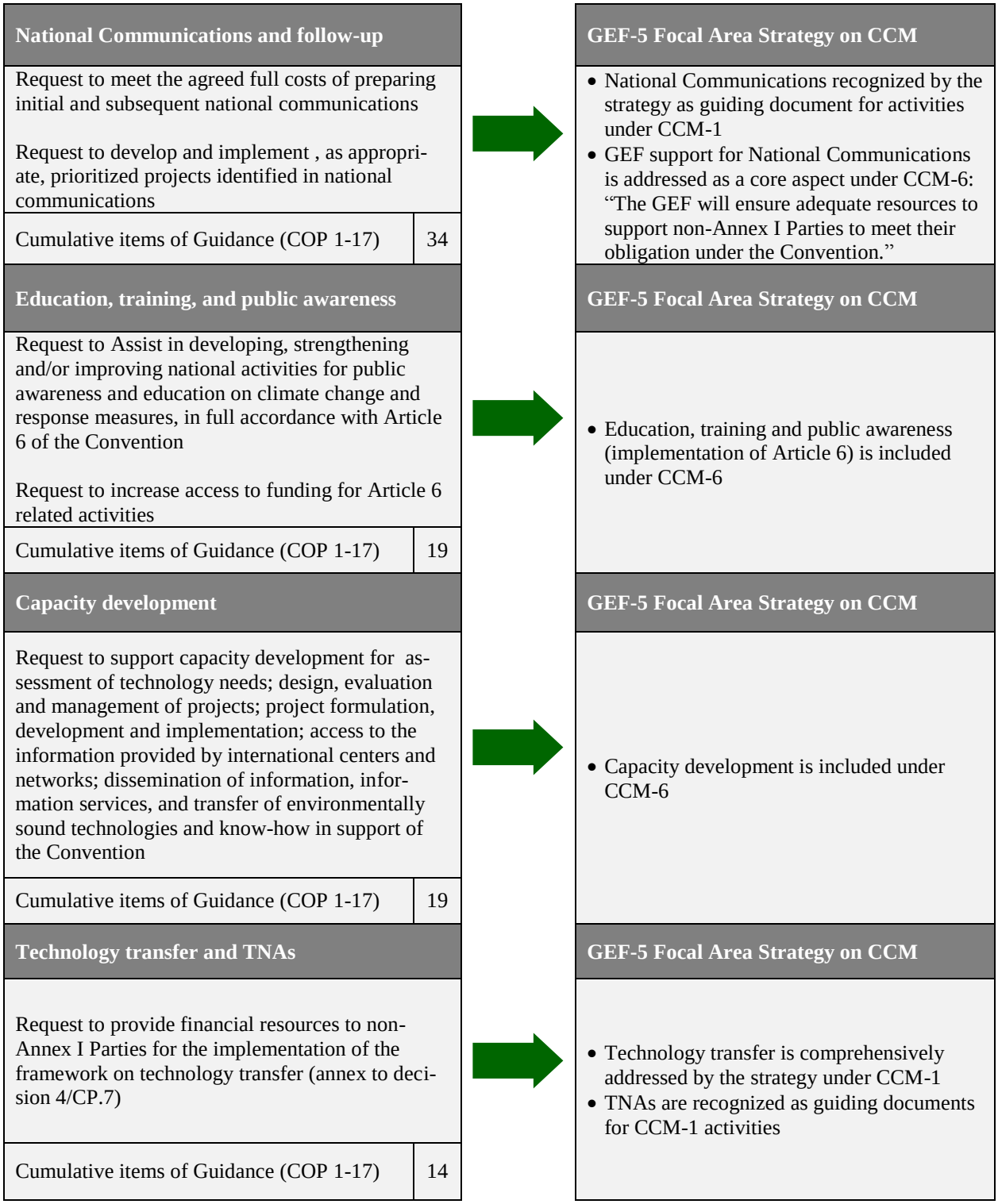
In the following mapping of convention guidance to the GEF-5 Strategy, only convention guidance is included that was issued before the GEF-5 Strategies went into effect on 1 July 2010. The mapping includes all topics of convention guidance that are to be addressed by the Focal Area Strategies. Operational issues concerning the overall procedures of the GEF (project cycle, co-financing, resource allocation etc.) as well as topics addressed by special GEF policies (gender, private sector engagement etc.) are addressed through channels other than the FA Strategies and are therefore not included in the Guidance-Strategy Mapping.

The Guidance-Strategy mapping illustrates that the GEF-5 Focal Area Strategy on Climate Change Mitigation largely reflects guidance of the UNFCCC. Convention guidance on CCM programming issues relevant for the GEF Strategy are comparatively few and leave significant interpretative freedom to the GEF in formulating the strategy. It needs to be noted that this observation primarily holds for UNFCCC guidance on CCM. Relevant guidance on Climate Change Adaptation under the LDCF/SCCF tends to be more frequent and specific (see Technical Paper 7).

The UNFCCC Secretariat highlighted concerns about the lack of GEF support responding to COP guidance on the implementation of Article 6 of the Convention (education, training, and public awareness). The issue is explicitly included in the CCM Strategy and identified to receive GEF support under objective 6. The lack of support therefore appears to be primarily a problem of implementation of the CCM Strategy as formulated. Accordingly, this aspect will be closely

examined during the assessment of FA Strategy implementation to be conducted in the context of OPS5.

Figure 13: Guidance-Strategy Mapping for GEF-5 FA Strategy on Climate Change Mitigation



Research and systematic observation			GEF-5 Focal Area Strategy on CCM
Request to build capacity for participation in systematic observational networks to reduce scientific uncertainties relating to the causes, effects, magnitude and timing of climate change		→	• GEF-5 Strategy does not explicitly mention support for research and systematic observation • Last COP guidance on this matter occurred at COP-10 in 2004; no related COP guidance was issued since
Cumulative items of Guidance (COP 1-17)	10		

Carbon capture and storage			GEF-5 Focal Area Strategy on CCM
Request to consider whether supporting carbon capture and storage technologies would be consistent with its strategies and objectives, and if so, how they could be incorporated within its operational programmes		→	• CCS is not included in the GEF-5 Strategy • The GEF-4 and other GEF documents elaborate on the issue and reiterate the need to "keep abreast" of further developments • STAP issued an Information Document to the GEF Council in 2008 (GEF/C.33/Inf.14) recommending a certain degree of GEF involvement on the awareness raising and capacity development level on CCS
Cumulative items of Guidance (COP 1-17)	1		

LULUCF			GEF-5 Focal Area Strategy on CCM
Request to explore options for undertaking land use and land-use change projects within the climate change focal area		→	• LULUCF is comprehensively addressed by the strategy under CCM-5 as well as through the CCM Focal Area's involvement in the SFM/REDD+ incentive mechanism and strategy
Cumulative items of Guidance (COP 1-17)	1		

Energy Efficiency			GEF-5 Focal Area Strategy on CCM
Request to continue promotion of energy efficiency project		→	• Energy efficiency is comprehensively addressed by the strategy under CCM-2
Cumulative items of Guidance (COP 1-17)	1		

Guidance issued after GEF-5 Strategy came into effect

Biennial update report			GEF-5 Focal Area Strategy on CCM
Request funding for the first biennial update report		→	• Guidance issued after GEF-5 Strategy came into effect
Cumulative items of Guidance (COP 1-17)	3		

Technology mechanism			GEF-5 Focal Area Strategy on CCM
Request support for the Climate Technology Centre and the mobilization of the services of the Network		→	• Guidance issued after GEF-5 Strategy came into effect
Cumulative items of Guidance (COP 1-17)	2		

4. RESULTS OF REAL-TIME DELPHI PROCESS

4.1 Real-Time Delphi approach

The Delphi method was originally developed at the RAND Corporation in the late 1950's as a method for collecting and synthesizing expert judgments. The Delphi methodology has since become a widely recognized technique of expert consultation. The Delphi methodology requires anonymity of participants to ensure equal weight of each participant's responses and reduce the bias caused by perceived authority of renowned experts. The original Delphi process features repeated rounds of responses from experts on a questionnaire with each expert receiving feedback on her/his peers' responses between rounds. This time-intensive method was further developed into a "round-less", online-based process that allows for asynchronous input and makes expert answers available to the entire group in real time eliminating the need for round-to-round feedback. Thereby communication time is considerably shortened. This form of a Delphi process is called Real-Time Delphi (RTD).

Seven online questionnaires, one for each Focal Area Strategy, were formulated by the Evaluation Team with extensive input from the Scientific and Technical Advisory Panel and embedded into a RTD online platform. Each question required a quantitative as well as qualitative response covering the central aspects of each Focal Area Strategy. The invitation to participate in the RTD process was distributed widely among environmental scientist using the international network of the International Council for Science and other scientific networks. Efforts to mobilize participants were implemented throughout the process.

RTD Questionnaire for Focal Area Strategy on Climate Change Mitigation

Question 1

Goal and objectives: To what extent do the objectives of the CCM Focal Area Strategy adequately and sufficiently address the strategy's goal in a way that corresponds to the current scientific understanding of how the goal can best be achieved? Does the set of objective leave significant gaps? Include considerations on the extent to which the goal and objectives contribute to the UNFCCC goal to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system.

Question 2

CCM1 - Low-carbon technologies: To what extent does current scientific understanding support the strategy's focus on demonstration and transfer of innovative low carbon technologies as a means of climate change mitigation [Objective 1] and the activities envisioned to achieve the objective? Consider if/how the expected key expected outcomes and key target [Results Framework, p. 31-32] reflect what current scientific understanding suggests as appropriate measures to achieve the objective?

Question 3

CCM2 - Market transformation for energy efficiency: To what extent does current scientific understanding support the strategy's focus on market transformation for energy efficiency in indus-

try and the building sector as a means of climate change mitigation [Objective 2] and the activities envisioned to achieve the objective? Consider if/how the expected key expected outcomes and key targets [Results Framework, p. 31-32] reflect what current scientific understanding suggests as appropriate measures to achieve the objective?

Question 4

CCM3 - Renewable energy technologies: To what extent does current scientific understanding support the strategy's focus on investment in renewable energy technologies [Objective 3] and the activities envisioned to achieve the objective? Consider if/how the expected key expected outcomes and key targets [Results Framework, p. 31-32] reflect what current scientific understanding suggests as appropriate measures to achieve the objective?

Question 5

CCM4 - Low-carbon transport and urban systems: To what extent does current scientific understanding support the strategy's focus on low-carbon transport and urban systems [Objective 4] and the activities envisioned to achieve the objective? Consider if/how the expected "key expected outcomes and key targets" [Results Framework, p. 31-32] reflect what current scientific understanding suggests as appropriate measures to achieve the objective?

Question 6

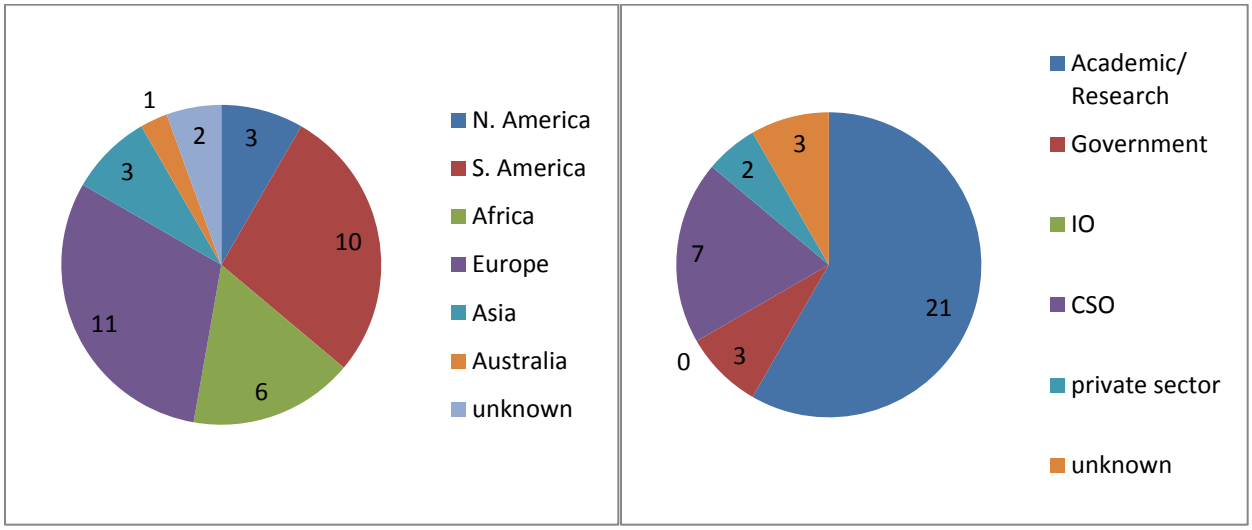
CCM 5 - FA partnerships LULUCF & SFM: To what extent is the partnership with Biodiversity and Land Degradation focal areas to promote conservation and enhancement of carbon stocks through sustainable management of land use, land-use change, and forestry supported by the current scientific understanding? Should it be prioritized over other issues that could be included for cross-focal area arrangements? Please consider and specify alternative opportunities for cross-focal area synergies that could/should be addressed by the strategy. Take note of other cross-focal area dimensions that are already mentioned in the strategy if any.

Question 7

What other issues not covered by the previous questions could be addressed by the CCM Focal Area Strategy to better reflect and utilize current scientific understanding?

Demographic information on participants in CCM RTD

Figure 14: Demographic information on participants in CCM RTD



4.2 Summary of quantitative results from RTD on Climate Change Mitigation

Rating scale: 1 to 10, where 1=not at all; 2=hardly; 3=slightly; 4=partly; 5=somewhat; 6=fairly; 7=considerably; 8=very; 9=highly; 10=fully (use "0" for "no answer").

Table 9: Quantitative responses of CCM RTD

CCM Focal Area Strategy – RTD quantitative responses				Participants: 36	
Question #	Mean	Min	Max	Median	Std. Dev.
#1 Overall goal and objectives	6.92	4	9	7	0.413
#2 Objective 1: "Low-carbon technologies"	6.63	4	9	7	0.431
#3 Objective 2: "Energy Efficiency"	5.72	3	10	5	0.643
#4 Objective 3: "Renewable Energy"	6.75	5	9	7	0.426
#5 Objective 4: "Low-carbon transport"	6.18	3	10	5	0.6
#6 Objective 5: "LULUCF and SFM"	6	1	10	6	0.761

4.3 Summary of qualitative results from RTD on Climate Change Mitigation

The overall assessment of the RTD expert group confirms that the CCM strategy and its different objectives are largely in accordance with current scientific knowledge. The group highlighted the importance of several aspects adequately addressed by the CCM Strategy, especially the central role of technology transfer and demonstration, the existing focus on innovative solutions in the area of renewable energy, as well as the increasing significance of low-carbon transport and urban planning as addressed by CCM-4. Several experts pointed out the mitigation potential of system level urban planning that should be emphasized even more in the future.

The expert group also discussed a number of aspects that can be further strengthened in future strategies. On the conceptual level, several experts recommended to further emphasize the framing the CCM Focal Area in terms of "Green Economic Development" and the nexus of climate change technologies and economic development opportunities. In addition, the expert group responses expressed a clear focus on the local level with regard to project implementation, stressing the importance of local leadership and local knowledge of relevant "traditions, conditions and possibilities". Several experts called for increased focus on enabling and engaging local champions as a key factor for success given the highly contextual circumstances CCM projects operate in.

In terms of open issues, the expert responses affirmed a very comprehensive coverage of important aspects by the GEF-5 CCM Strategy. One potential trade-off identified for further consideration is the management of waste generated by replacement of existing technologies with climate-friendly technologies (for example CFL).