MODULE 10

Co-Benefits for the NAMA Country

NAMAs in the refrigeration, air conditioning and foam sectors. A technical handbook.

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Proklima

Proklima is a programme of the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. Since 2008 Proklima has been working successfully on behalf of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) under its International Climate Initiative (ICI) to promote ozone-and climate friendly technologies.

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www.giz.de/proklima

The International Climate Initiative

Since 2008, the International Climate Initiative (ICI) of the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) has been financing climate and biodiversity projects in developing and newly industrialising economies, as well as in countries in transition. Based on a decision taken by the German Parliament (Bundestag), a sum of EUR 120 million is available for use by the initiative annually. The ICI is a key element of Germany's implementation of fast start financing. The Energy and Climate Fund launched by the German Government in 2011 is a further source of funding for international climate protection projects, and for activities to conserve biodiversity. Part of that funding is deployed through the ICI. That fund is replenished from the auctioning of emission permits. This innovative source makes Germany well-prepared to deliver long-term financing for climate and biodiversity projects worldwide.

The ICI is active in four areas: Mitigating greenhouse gas emissions, adapting to the impacts of climate change, conserving natural carbon sinks with a focus on reducing emissions from deforestation and forest degradation (REDD+), as well as conserving biological diversity.

www.international-climate-initiative.com

Contents

Executive Summary

This module gives guidance on how to analyse the potential co-benefits of nationally appropriate mitigation actions (NAMAs) in the refrigeration, air conditioning and foam (RAC&F) sectors. One can distinguish between the targeted benefit and co-benefits. In the case of national mitigation action, the reduction of direct and indirect greenhouse gas (GHG) emissions is the objective and therefore the targeted benefit of the project activity. Co-benefits are additional benefits that have social, environmental or economic implications for the country. This module describes how to take specific action on co-benefits during NAMA planning and implementation. The module explains the role of the private sector, and it describes how co-benefits could be supported and integrated into the development needs of a specific partner country.

In addition to direct and indirect emission reductions, a NAMA in the RAC&F sectors will reduce expenditures and dependence on the import of expensive fluorinated gases (F-gases), reduce waste during production, operation and maintenance and will bring other environmental, economic and social benefits.

Co-benefits are decisive factors for investors and political partners. The support of donors and financial institutions is strongly influenced by additional sustainable development benefits and in some cases, co-benefits catalyse NAMAs even more than greenhouse gas reductions (Comstock, 2012).

It is therefore important to identify and analyse possible effects and benefits carefully in the context of sustainable development (GIZ, 2013). Moreover, it is important to identify potential risks or negative side-effects, address these at an early stage of the NAMA and continue monitoring.

In the RAC&F sectors, co-benefits provide powerful incentives for the private sector and policy makers, motivating their acceptance and participation in a NAMA. Therefore, this module provides guidance specifically targeted towards a differentiated analysis of co-benefits in view of their policy and market incentives and introduces a corresponding analysis tool. The module also provides a set of possible indicators of sustainable development in the RAC&F sectors such as resource efficiency, social inclusion and economic viability (Figure 1).

This approach will help to identify, monitor and adjust co-benefits throughout the RAC&F value chain of productions, products, applications and waste management. Monitoring of co-benefits is proposed to be part of the MRV process and should be coordinated with relevant disciplines of development assistance.

FIGURE 1
Sustainable development

1. Introduction

With growing urbanisation, more and more people depend on well-functioning cold chains for their daily supply – refrigeration helps them to reduce the loss of foodstuffs. The operation of a fridge must be affordable in order to be of economic and social benefit. Specially developed and affordable solar equipment can ensure reliable refrigeration of medication or food also in areas off the grid. Energy efficient equipment saves electricity and increases the cost-effectiveness for the user. Air conditioning in industrial production and in the service sector plays a critical role in achieving economic success. And not least, people who work in buildings with a comfortable room temperature are more productive.

However, the growing demand for cooling implicates challenges such as very high energy costs, overloading of energy supplies and waste heat from appliances in urban areas.

Possibilities exist for improving the design of the entire life-cycle of cooling equipments from the choice and processing of raw materials, to production, maintenance, repair, and up to its environmentally sound recycling. Using natural gases as refrigerants and foam blowing agents avoids the continued exploitation of the world's rare fluorine deposits for the manufacture of F-gases. Climate friendly practices increase the competitiveness of companies and safeguards local jobs in the production and servicing sector. A trained and certified mechanic has better chances of proper employment and income. Skilled workers provide better maintenance, which reduces leakage of refrigerants by up to 50 %, makes the appliances and installations safer and prolongs their lifespan. Research on and development of improved RAC&F technologies and services help governments to adjust regulations and standards to higher safety and efficiency requirements.[1]

National mitigation actions in the refrigeration, air conditioning and foam sectors generally contribute to sustainable development and green growth. In addition to emission reductions, a NAMA in the RAC&F sectors will bring environmental, economic and social co-benefits. The range, type and inclusion of co-benefits in a NAMA are reflected in various United Nations negotiation texts[2]. In future, co-benefits can also be registered under the United Nations Framework Convention on Climate Change (UNFCCC)[3] in a NAMA registry, which is, however, still in an initial state.

NAMA stakeholders such as representatives of related industry sectors, policy-makers, non-governmental organisations (NGOs) and the general public should be informed and aware of the co-benefits of a NAMA. They should also know how to get involved in achieving them. Provisions for stakeholder involvement need to be in place from the early start.

Emphasising the co-benefits of a NAMA in the RAC&F sectors is essential for both the public and private sector in developing countries to get the necessary support for successful implementation. Figure 2 illustrates socio-economic and environmental benefits that can develop throughout the various steps of the value chain of RAC&F products.

1 cf. also GIZ (2012c), Proklima factsheet "Cool and sustainable". www.giz.de/proklima
2 FCCC/AWGLCA/2008/16/Rev.1 Ideas and proposals on paragraph 1 of the Bali Action Plan; FCCC/AWGLCA/2009/8 LCA Negotiating text
3 AWG-LCA negotiations, 2009

FIGURE 2
Selected co-benefits of NAMAs throughout the value chain of the RAC&F sectors

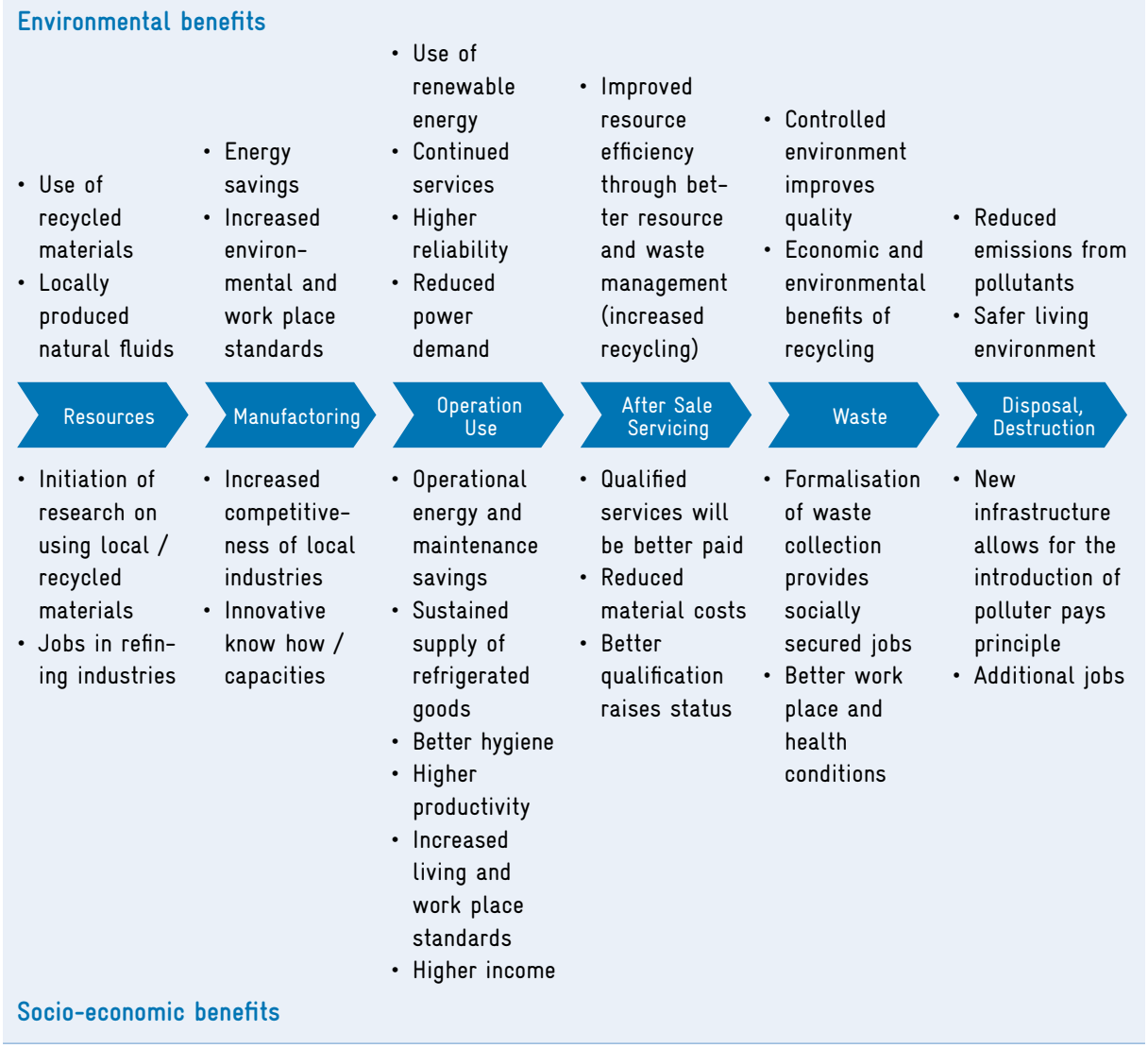


Table 1 provides an overview of concrete examples of social, economic and environmental benefits that developed in the frame of existing GIZ projects in the RAC&F sectors.

Nevertheless, objectives and impacts of projects in the RAC&F sectors are quite diverse and therefore need to be thoroughly analysed and assessed on a case by case basis.

The primary objective of this module is to identify, describe and assess co-benefits on a broader base. For more detailed policy impact assessment we recommend the impact assessment tools developed by the European Union (EU) for the new EU legislation. Methodology to assess the impact of development activities is also available in the GIZ Capacity WORKS tools (GIZ, 2011a) and the GIZ sourcebook for climate-specific monitoring (GIZ, 2011b).

TABLE 1
Examples for social, economic and environmental benefits from experiences in GIZ projects in the RAC&F sectors[4]

Sector activities	Country	Social benefits	Economic benefits	Environmental benefits
Introduction of distillation plant for production of hydrocarbon refrigerants	Cuba	Local employment and income for distiller	Reduced dependency on imports, no foreign currency spending	Resource conservation, replacement of hydrofluorocarbon (HFC) refrigerants
Conversion of air conditioners from HFC to hydrocarbons (HC)	China, India	Improved living and working conditions; positive impacts on health and working productivity	HC more cost effective after market diffusion, energy savings (air conditioning essential for developing industry and commerce)	40 % reduction of direct and indirect emissions, no emissions at end-of-life. High efficiency facilitates the introduction of new standards for air conditioning
Conversion of refrigerator production to hydrocarbons	Swaziland	Sustained employment in national production, capacity building in the refrigeration industry	At similar specification, HC refrigerators have lower cost than HFC models. Better options for export.	Elimination of HFC emissions in the refrigerator industry.
Replacement of old refrigerator technology with energy efficient hydrocarbon technology	Brazil	Hygienic and quality refrigerated food, elimination of detrimental health impacts of using old refrigerators, formalisation of residential status	Affordable refrigeration for poor households, income saving enables poor household to apply for a legal electricity connection	Up to 70 % reduction of emissions from household electricity consumption. Less waste of foods.
Conversion of supermarket refrigeration from HFC-404A to NH_3/CO_2	South Africa	Higher accuracy in controlling the temperature of refrigerated food.	25 % savings from operational costs (energy, refrigerants). Less food losses from equipment deficiencies and better temperature control	Reduction of 35 % of emission from the refrigeration equipment
Production of solar powered vaccine coolers with ice storage	Swaziland	Extending the pharmaceutical cold chain to non-grid areas, securing proper quality of vaccines for life-saving of rural people	It is the only reliable system in comparison to other coolers that depend either on sustained Kerosene or generator electricity	During operation the system has zero emission. No need for lead or other batteries. No local wastes from consumables.
Leak control project in the servicing sector	Kenya, India, Brazil	Securing employment of service technicians through education, formalise informal services and access to insurances etc.	Users spend less on electricity, refrigerants, and repair. Some amount is used to pay more for the higher quality service of the trained technicians	Good service saves energy (up to 15 % in the EU), recovery of refrigerants save GHG emissions from halocarbons, oils get properly disposed
Recycling of old refrigerators	Brazil	Formalisation of informal electric waste pickers, removes health risks from injuries and recycling toxic substances.	Industrial development, higher income for waste pickers from higher quality recycled materials. Opportunity to introduce producer enhanced liability	Material resource conservation, reduced GHG and ODS emissions from CFC, HCFC, HFC in cycle and foam, environmental safe removal of mercury and PCB.

4 More information on GIZ Proklima projects in the RAC&F sectors is available at www.giz.de/proklima

2. Methodology

This chapter first describes how to categorise and analyse potential co-benefits (chapter 2.1). It then describes the importance of government actions (chapter 2.2) and highlights the involvement of the private sector (chapter 2.3). The last part describes the need for monitoring (chapter 2.4) and potential integration of co-benefits into the country's development or overall NAMA strategy (chapter 2.5)[5].

2.1 Categorising co-benefits

Point in time (ex ante vs. ex post)

When planning and designing the NAMA in the country, potential co-benefits should already be known and taken into account during stakeholder consultations and cooperation agreements. Both the co-benefits to be expected (ex ante) and the co-benefits which actually have occurred (ex post) have to be monitored and evaluated. In the context of setting up a NAMA in the RAC&F sectors, the ex-ante analysis is crucial as it refers to project planning and implementation. The ex-ante analysis has to take place at an early stage of project planning in order to facilitate discussions and coordination with sector stakeholders.

Baseline

In order to measure a co-benefit of a NAMA activity it must be compared to the business-as-usual scenario (BAU). The BAU can be projected by taking representative data sets from existing installations, products or practices. A sample list of indicators can be derived from the annex to this module. However, since RAC&F activities are so diverse, there is no exhaustive list at hand and every assessment needs to consider and amend local circumstances case-by-case. Wherever possible, real time measurements should be taken, for example, on temperatures, energy consumption, refrigerant leakage and other consumptive issues. In addition, it is important to assess and validate the individual perceptions and behavioural characteristics of users, producers and experts. More detailed information on baseline assessment is provided in module 5.

Level of impact

One can distinguish between the targeted benefit and co-benefits. In the case of national mitigation action, the reduction of direct and indirect GHG emissions is the objective and therefore the targeted benefit of the project activity. Co-benefits of a particular NAMA in the RAC&F sectors are related to environmental protection, economic and social development at various levels. They can be achieved at global, regional, national or local level by various individuals and organisations (governments, communities, project developers, population etc.). Co-benefits that are perceived by individuals in the form of improved energy efficiency, better income, health or comfort are typically a market incentive for the introduction of a specific technology. Because RAC&F services and products are commercially distributed, this is an essential indicator for the potential acceptance of alternatives in the market.

Table 2 provides a selection of potential co-benefits and illustrates their categorisation.

5 see also GIZ NAMA tool 8.6 (2012b) step 2, GIZ NAMA source book (2012a) chapter 3.4, Climate results (GIZ, 2011b)

TABLE 2
Categorisation of potential co-benefits of a RAC&F NAMA: environmental, economic and social aspects

Co-benefit category (impact area)	Specific area of co-benefit	Co-benefits in the RAC&F sectors	Achieved through (example):
Environmental protection	Waste management	Recovery of valuable raw materials	Recycling plants
		Less waste	Better sealing, less leakage
	Improved energy supply	Improved energy efficiency, energy savings (leads also to cost savings)	Renewal of technology stock, replacement of old, inefficient equipment
Economic development	Economic growth Supply situation (components, gas, etc.)	Capacity development	Training, transfer of know-how
		Increased competitiveness for companies	Use of new, state-of-the art technologies, technology cooperation
		Dissemination of technology, improved acceptance of new technology, leading to replication of technology/knock-on effect	Well working new technologies
Social development	Education	Increased know-how, qualification and certification of local technicians, engineers	Awareness programmes, training
	Employment	Creation/preservation of jobs, mainly in small and medium sized enterprises	Long term technology, knowledge and capacity transfer, dissemination of state-of-the art technologies
	Housing	Increased living conditions	Access to affordable refrigeration
	Health	Improved health services	Dissemination of solar vaccine coolers in rural, off-grid areas
		Improved safety	Dissemination of correct use of technology
		Increased health	Properly cooled food storage through access to affordable refrigeration

Further classification of co-benefits

As illustrated above, co-benefits appear on market and societal level and are incentives to either market participants or policy makers. Therefore, co-benefits in the RAC&F can be subdivided into mainly market and policy incentives (Table 3).

TABLE 3
Categorisation of potential co-benefits of a RAC&F NAMA: market and policy level

	Social	Economic	Environment
Market level	Better quality of foods and access to pharmaceuticals	Less need for energy and maintenance, income saving	Less wastes and pollutants in production & service
Policy level	Food and health security, Formalisation of jobs	Higher employment, better electricity load management	Reduced pollution of water, soil, atmosphere and stratosphere

It is important to understand the different drivers for introducing RAC&F technologies. On the one hand, co-benefits at market level are incentives to those involved in the different steps of the value chain of a RAC&F product or service. Comparing market incentives also helps to understand the competitive advantage of one alternative technology over the other. On the other hand, co-benefits addressing externalities of RAC&F products and services from cradle to grave are incentives to national and international policy makers.

Analysis of co-benefits and evaluation of findings

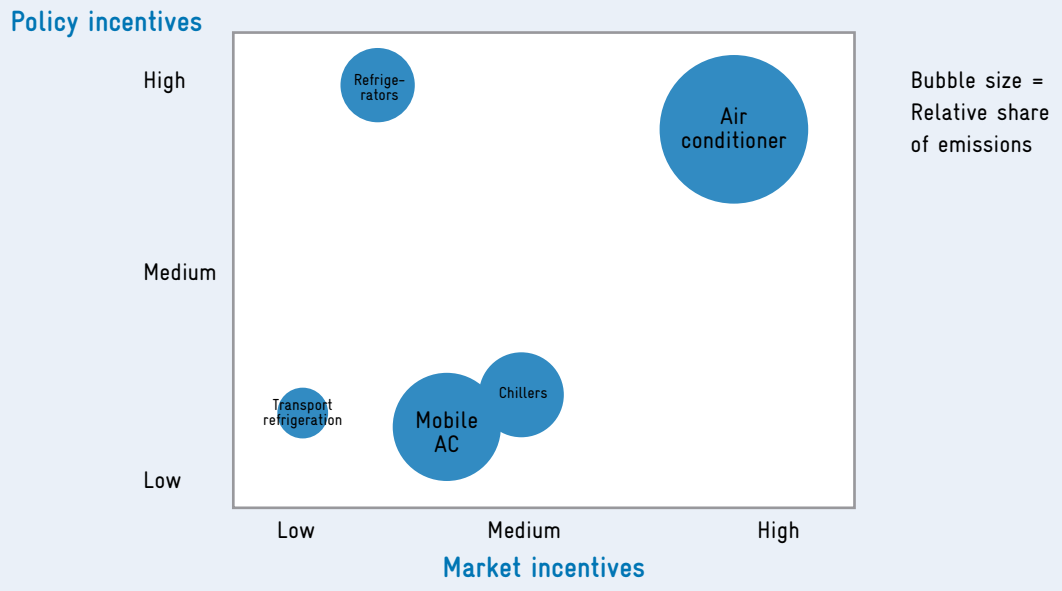
With increasing number of market and policy incentives, the chances for a successful NAMA will generally improve, provided they combine potential co-benefits with a significant mitigation potential.

On this basis a simple analysis can be done with the help of an adapted ranking matrix[6]. The RAC&F NAMA co-benefits tool is provided with this module.

In this matrix, co-benefits are ranked according to their market and policy incentive and in relation to their mitigation potential. The x and y axis describe the range of market and policy incentives, the size of the bubble describes the mitigation potential.

Figure 3 illustrates an example. The sample analysis shows that air conditioning would be the most beneficial technology to start with. The technology with the lowest impact would be transport refrigeration in the lower left of the chart. This chart serves only the purpose of illustration. In real cases, such an analysis will differ largely from country to country, depending on the existing baseline technologies and applied refrigerants (HFCF or HFC), energy supplies, local production or import patterns, etc.

FIGURE 3
Sample ranking matrix for the evaluation of co-benefits



6 cf. McKinsey matrix

The ranking indicates when there are higher incentives for market acceptance of a technology. Furthermore, a high ranking of policy incentives generally indicates a good potential for co-funding through development programmes or other multilateral environmental funding.

In conclusion, the chart could be interpreted in the following manner (Table 4):

TABLE 4
Interpretation of co-benefits ranking matrix

Upper left: Good policy incentives, best suited for supported NAMA with co-funding from other public sectors (ODA, waste, etc.)	**Upper right:** Best to start with and gain NAMA experience. Well suited for a supported NAMA.
Lower left: Offers the lowest incentives of all options. Good to approach at a later stage.	**Lower right:** High market incentives, best suited for unilateral NAMA.

Selecting indicators for evaluation and monitoring

Whether relevant technical, environmental, social and economical impacts are achieved is not only linked to the function and applicability of a technology, but also to behavioural aspects. For example, higher energy efficiency of an appliance reduces the cost for users. This may lower the barrier for the installation of that type of appliance, such as an air conditioner. A survey in Mexico, for example, indicated that the energy consumption of households increased significantly with the introduction of cost and energy efficient air conditioners. People perceived the new units as cheap, they installed more units than before, and paid less attention to switching them off when not needed (Davis et al., 2012). Behavioural aspects are difficult to control and monitoring is essential for ensuring that the impact is achieved. In the evaluation of results it is important to adjust strategies under the perspective of innovation and lessons learned.

The technologies used in the RAC&F sectors are so diverse in their characteristics and application that it is not possible to provide a comprehensive list of criteria that can be applied to all subsectors and applications. A sample list of general criteria that is relevant for the evaluation of many technologies in the RAC&F sectors is provided in the annex to module 10. The list includes various aspects of refrigeration, such as energy use, in kind and not in kind replacement, heat transfer, temperature control and consequences for the cold chain and national food and medical security.

Table 5 provides a short example of various criteria used in the evaluation and ranking of market and policy incentives of RAC&F projects.

TABLE 5
Sample list of criteria for the ranking of market and policy incentives of RAC&F projects

Market level	Policy level
Enhanced user productivity	Benefits for the local environment
Income saving effects	Lower carbon footprint
Improved supply of RAC/F products	Lower ozone footprint
Better after sales services	Positive effects on power supply and demand side management
Improved reliability/robustness	Improved social responsibility
Energy savings	Improved public health effects
Improved operational safety	General employment effects
Increased competitiveness of local vs. foreign industries	Higher resource efficiency
More user comfort	Less complex or higher rate of recycling
Better qualification of mechanics	Less persistent wastes
Availability of refrigerated goods and medicines	Higher security standards for foods and health services
Expansion/integration of cold chains	Increased utilisation of local resources
New production opportunities	Promotion of the use of renewable or cogenerated energy

Applying the GIZ Proklima co-benefit analysis tool

With the GIZ Proklima co-benefit tool, the result of such an evaluation can be plotted for illustration. Figure 4, Figure 5 and Figure 6 provide a sample evaluation of a refrigerator replacement activity for poor households. From a market view, economic incentives, higher comfort and inclusion in the electricity grid are effectively driving the introduction of new refrigerators. From a policy point of view, the impact for poor households in terms of food quality and accessibility, the possible adjusting of energy related standards, and aspects of national production are the main drivers.

FIGURE 4
Direct co-benefits of refrigerator replacement – market incentive

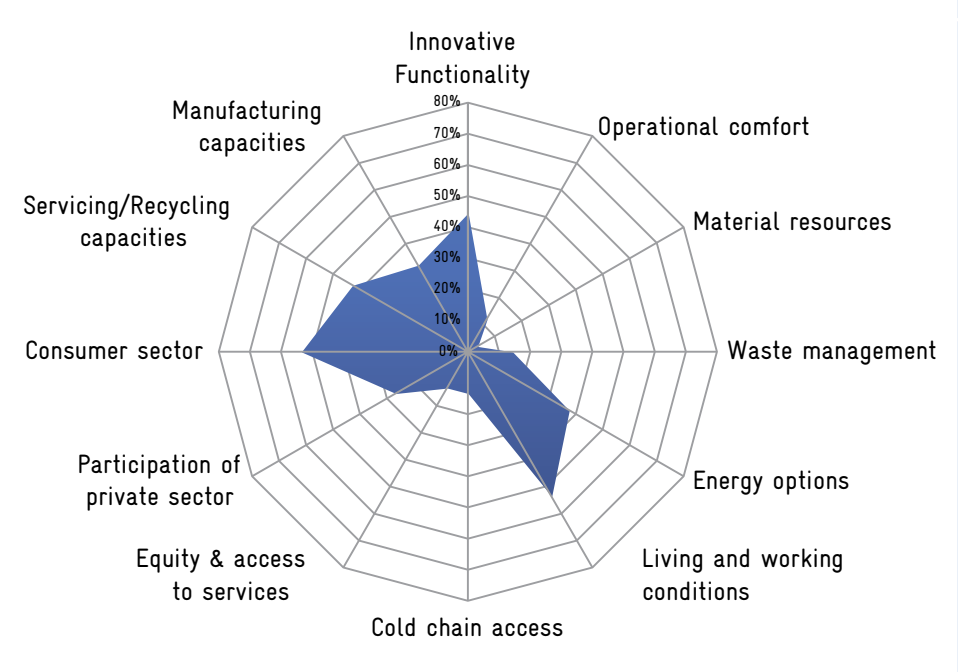


FIGURE 5
External co-benefit of refrigerator replacement – policy incentive

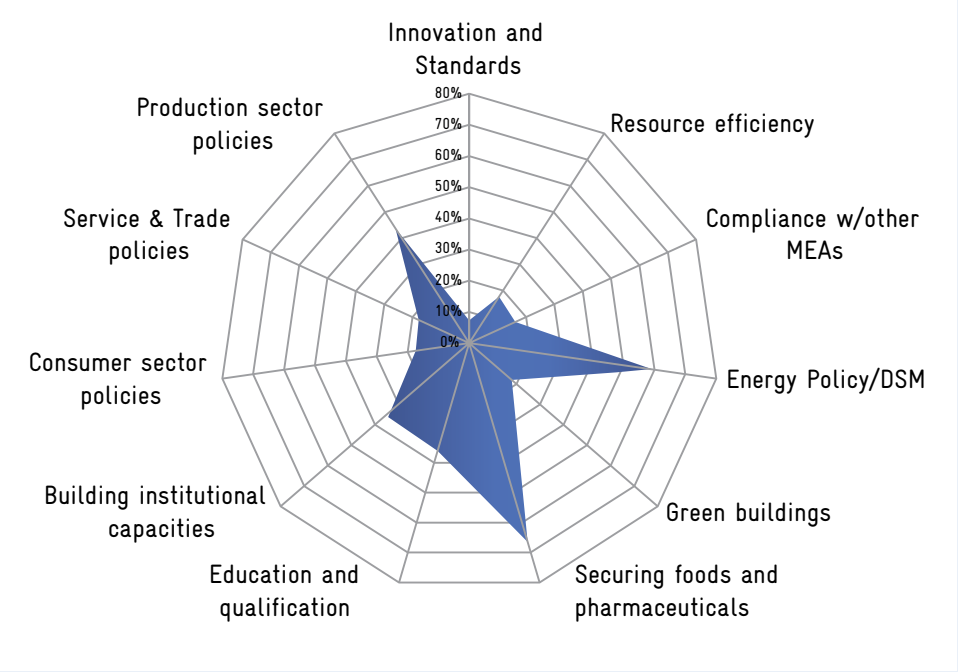
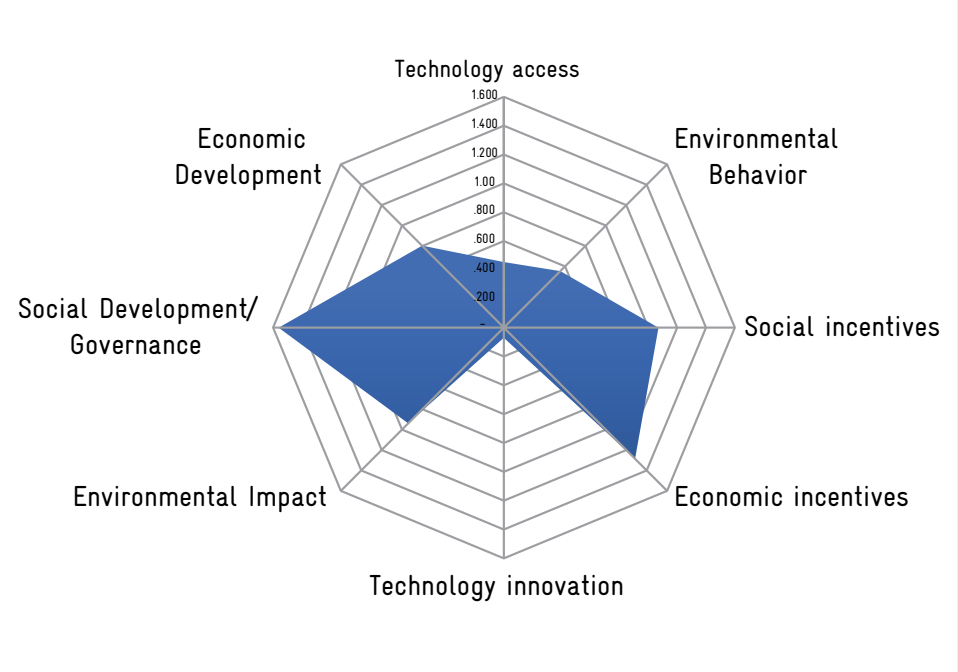


FIGURE 6
Co-benefits analysis of refrigerator replacement – aggregation and distribution of co-benefits



After categorising policy specific co-benefits of a NAMA in the RAC&F sector, the range of additional activities to support the achievement of the co-benefits can be identified.

2.2 Normative action to support the co-benefits of a NAMA

Governmental action may influence the achievement of the desired co-benefits, for example through enabling standards and regulations that are directed towards the area of the co-benefit. For example, in the RAC&F sectors, a regulation could ensure that utilities need to commit a certain percentage of their profits for the introduction of energy efficient equipment to socially sensitive entities such as poor households, schools, and hospitals. Another regulation may support this by introducing minimum performance requirements and a labelling scheme for relevant applications. Where relevant, governmental action is likely to confirm the appropriateness of specific support actions through inter-ministerial cooperation, stakeholder and interdisciplinary expert consultations.

Various governmental actions ranging from legislation to awareness raising programmes are taken into account by the NAMA developer in order to enhance the effectiveness of co-benefits. Standards are another effective instrument to support the introduction of new efficient equipment. A long-term plan for suitable standards and a framework for co-benefits should be established within the NAMA design. This will result in increased quality levels, standards and frameworks and facilitate better information exchange on co-benefits internationally.

Industrial and product standards are developed by national or international standard committees and are generally driven by private sector representatives. However, in many countries governments have the authority to initiate the formulation of new standards. This is not an automated process but requires intensive communication with stakeholders and close monitoring and verification of private sector action. For example, after several years of applying the industrial standards for refrigerators in Japan, a controlled field test of the top runner refrigerators in Japanese households revealed a 65 % higher energy consumption than labelled by the Japan industrial test standard (JRS, 2006).

More information on government action can be obtained in module 8.1 on policy framework.

2.3 Involvement of the private sector

The involvement of the private sector throughout the formulation of NAMA objectives, benefits and co-benefits and its support for governmental action is a crucial success factor. The private sector could provide significant contributions in the form of voluntary schemes or partnership programmes. For instance, in many countries efforts to reduce energy consumption in the RAC&F sectors are supported or even run by utilities in the form of demand side management activities. Participation of the private sector is also important for the leverage of finance and investment.

Furthermore, the private sector plays an important role in the design of sustainable features of products and systems. An example in this field is the development of the Ecodesign Directive in the EU. The private sector takes part throughout the entire process of this development. The design features will save material resources, energy, development of wastes and increase recycling rates. Guidelines are presently being developed for the following F-gas containing applications:

- Heat pump boilers,
- Water heaters,
- Room air conditioners,
- Commercial refrigeration (display cabinets, cold vending machines),
- Domestic refrigeration,
- Laundry dryers (heat pump dryers),
- Local room heaters,
- Hot air central heating systems,
- Commercial refrigerating equipment,
- Air conditioning and ventilation systems.

In addition, industry associations can develop their own guidelines on the assessment and implementation of performance standards. For example the energy efficiency guidelines for refrigeration equipment published by the German Engineering Federation (VDMA)[7] are widely applied by European manufacturers and operators of equipment.

Private companies specialised in certification and quality assurance are valuable partners in the design of enforcement schemes for technical performance or social standards of co-benefits.

2.4 Monitoring

Co-benefits need to be included in the measurement, reporting and verification (MRV) system. Metrics of sustainable development are used to formulate baselines and monitor qualitative and quantitative development of economic, health and social impacts, such as increased security of cold chains for food and pharmaceuticals, job growth and industry development (CCAP, 2012; Winkelman et al., 2011).

Criteria used for the ranking exercise forms a basis for developing a comprehensive list of indicators for baseline and impact formulation. During implementation of the project this will help to monitor the actual realisation of benefits, or in case of deviations to adjust and assess altered achievements. The GIZ Proklima co-benefit tool can be applied for monitoring the progress of co-benefits.

Monitoring co-benefits is part of the MRV process which is detailed in module 7[8]. The reduction of emissions such as from energy consumption or refrigerant leakage is at the core of the MRV process. This data can also partly be used in the quantitative analysis of cost related co-benefits. For most of the social co-benefits, such as employment, comfort, hygiene, health or productivity, additional sampling of data may be required to obtain information. This may include interviews with manufacturers, service providers and consumers or the revision of trade and government statistics. Cooperating with other NAMAs or programmes targeting similar social and economic development benefits will help to economise monitoring efforts.

7 www.vdma.org/article/-/articleview/681476
8 see also GIZ NAMA tool 8.6 (2012b) steps 5 and 9

The GIZ climate results sourcebook provides hands-on advice on how to establish comprehensive climate-specific monitoring for development (GIZ, 2011b).

2.5 Embedding the NAMA in development cooperation

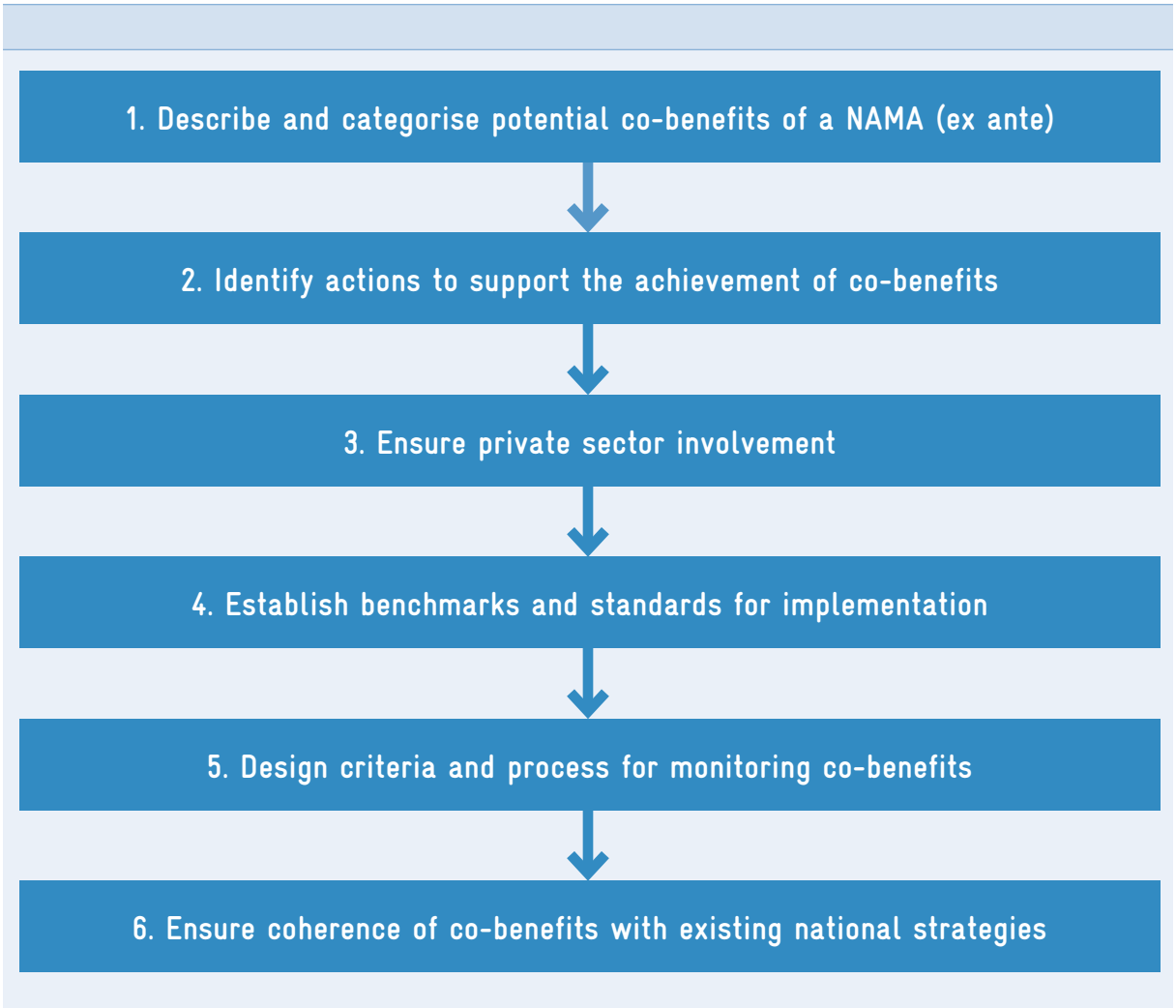
Most countries have formulated sustainable development plans, development cooperation agreements or so-called Low Carbon Development Strategies (LCDS) before entering into NAMA activities. The NAMA activities should be in line with existing national strategies, also in view of co-benefits. NAMA and co-benefits can be linked to already existing donor programmes, which may help to multiply co-benefits and strengthen governmental actions. Linking with various NAMAs and programmes has important advantages, for example when assessing impacts in the field. Monitoring could be combined with other sector activities such as energy efficient lighting, green building, urbanisation, etc. This will effectively reduce the burden and cost of implementing co-benefits in the frame of a NAMA in the RAC&F sectors.

Table 6 shows examples of co-benefits from a range of existing NAMA concepts and proposals with similar co-benefits in the field of industry, health, income and living standards as found with NAMAs in the RAC&F sector.

3. Practical application

The illustration below gives an overview of the stepwise process of assessing, selecting, planning, supporting and monitoring co-benefits in the frame of a NAMA in the RAC&F sectors. The identification and communication of social, economic and environmental co-benefits helps to support the acceptance of NAMAs by different stakeholders outside the climate regime.

Steps for assessing NAMA co-benefits:



Step 1: Describe and categorise potential co-benefits of a NAMA (ex ante)

Explore the range of potential co-benefits of innovative RAC&F technologies, before it comes to NAMA measures (ex ante approach). Understand their potential and importance to increase the acceptance of NAMA activities among decision makers in the public and private sectors. Examples of co-benefits are:

- improved coefficient of performance (COP)
- longer lifetime of equipment
- less noise
- material savings
- increased utilisation of local resources
- less waste
- export opportunities

An extensive list can be found in the GIZ Proklima Co-Benefits Tool. Contact GIZ Proklima to request the tool. As co-benefits are incentives to either market participants or policy makers, use the categorisation of the following table to classify the expected co-benefits:

TABLE 7
Categorisation of co-benefits

	Social	Economic	Environment
Market level	Better quality of foods and access to pharmaceuticals	Less need for energy and maintenance, income saving	Less waste and pollutants in production & service
Policy level	Food and health security, Formalisation of jobs	Higher employment, better electricity load management	Reduced pollution of water, soil, atmosphere and stratosphere

Use the GIZ Proklima Co-Benefit Tool, to explore and evaluate potential co-benefits in detail. The table below shows the categories of co-benefits (filled bullet points) of market and policy incentives, and further subcategories (empty bullet points) under which the co-benefits are evaluated in the GIZ Proklima Co-Benefit Tool.

TABLE 8
Categories of co-benefits

Market incentives	Policy incentives

• Technology access
• Innovative functionality
• Operational comfort
• Environmental behavior
  – Material resources
  – Waste management
  – Energy options
• Social incentives
  – Living and working conditions
  – Cold chain access
  – Equity & access to services
  – Participation of private sector
• Economic incentives
  – Consumer sector
  – Servicing / recycling capacities
  – Manufacturing capacities
	• Technology innovation
	  – Innovation and standards
	• Environmental impact
	  – Resource efficiency
	  – Compliance with other MEAs
	  – Energy policies
	• Social development / governance
	  – Green buildings
	  – Securing foods and pharmaceuticals
	  – Education and qualification
	  – Building institutional capacities
	• Economic development
	  – Consumer sector policies
	  – Service & trade policies
	  – Production sector policies

Step 2: Identify actions to support the achievement of co-benefits

Apply interdisciplinary expertise to understand the impact and potential of co-benefits for adjusting a supportive framework. Encourage exchange with economists, sociologists and experts from environmental sciences to assess the potential benefits. Cooperate with other governmental and associated organisations working on related development subjects. Ideally, the expected co-benefits from the RAC&F NAMA correlate with or add value to co-benefits from other activities in the country.

Step 3: Ensure private sector involvement

Discover how co-benefits can leverage private sector interest in NAMA and motivate their participation. Identify the economic value of co-benefits for private investors and their willingness to expand the impact of NAMAs with own finance and investment. Interesting co-benefits for the private sector could be, for example, enhanced qualification of technicians and a better supply chain management to enhance competitiveness.

Step 4: Establish benchmarks and standards for implementation.

Together with governmental and private stakeholder organisations, identify appropriate benchmarks and standards for the implementation of co-benefits. Coordinate the planning with experienced expert committees and organisations active in the field of certification and quality assurance of RAC&F technologies. The standards could be minimum performance requirements or a labeling scheme for relevant applications. Benchmarks might be introduced in the form that utilities need to commit a certain percentage of their profits for the introduction of energy efficient equipment to socially sensitive entities such as poor households, schools and hospitals.

Step 5: Design criteria and process for monitoring co-benefits

Develop relevant metrics for monitoring the achievement of co-benefits. Identify with stakeholders the needs and procedures for sampling and verification and integrate the monitoring of co-benefits with the general MRV process of the NAMA. Identify secondary data sources and cooperation partners for effective data sampling and benchmarking. A sample list of possible indicators is provided in the annex to this module.

Step 6: Ensure coherence of co-benefits with existing national strategies

Make sure that any of the co-benefits comply with or build on existing national strategies. Where potential conflicts arise, you should consult with relevant stakeholders and resolve discrepancies. Check where NAMA co-benefits can be linked to the goals of other sector activities and programes. This may also help to economise NAMA funding or raise the interest of additional donors.

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