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Documentation of IFAT 2016 Side Event Climate-friendly Waste Management through NAMAs in Emerging Economies and Developing Countries

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Documentation of IFAT 2016 Side Event Climate-friendly Waste Management through NAMAs in Emerging Economies and Developing Countries

by

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On behalf of the German Environment Agency

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Abstract

In the context of international climate policy the concept of Nationally Appropriate Mitigation Actions (NAMAs) allows emerging economies and developing countries to design waste management strategies and systems that lead to effective greenhouse gas (GHG) reductions. Emerging economies and developing countries can potentially reduce their GHG emissions by 12-18% by developing an integrated waste management system, as studies by the German Environment Agency[1] have shown. Although the instrument NAMA is widely-known already and the mitigation potential for the waste sector is significant, NAMAs that are focusing on waste management are still rare and often confronted with substantial challenges in implementation.

The German Environment Agency organized a side event on 2 June 2016 to open up the debate on Waste-NAMAs in emerging economies and developing countries at the international waste fair IFAT in Munich. The event brought together international experts from climate policy and waste management to exchange experiences on Waste-NAMA design and implementation. Key features of NAMAs on waste management were discussed, such as solid funding and financing, participatory processes across all levels to achieve a coherent governmental approach and involvement the private sector. Another challenge seemed that decision-makers in host-countries often favor other sectors over waste management despite its high mitigation potential at comparatively lower costs. The experiences on the monitoring, reporting and verification (MRV) of Peruvian Waste-NAMA demonstrated the workload involved and the need for continued efforts to achieve standardized methods.

A high attendance rate and vivid discussions showed the interest of the participants in NAMAs as an instrument to promote sustainable waste management projects in the future.

Kurzbeschreibung

Im Kontext internationaler Klimapolitik erlaubt das Konzept der National Angemessenen Minderungsmaßnahmen (NAMA), Entwicklungs- und Schwellenländern Abfallmanagementsysteme zu entwickeln, die zu signifikanten Emissionsminderungen führen. Moderne Abfallentsorgungssysteme können die Treibhausgasemissionen von Ländern um 12-18% senken, wie Studien des Umweltbundesamtes gezeigt haben. Obwohl das NAMA-Instrument in der Klimawelt weit bekannt ist, sind Abfallwirtschafts-NAMAs noch immer selten und häufig mit erheblichen Umsetzungsschwierigkeiten konfrontiert.

Das Umweltbundesamt organisierte ein Side Event am 2. Juni 2016, um eine Diskussion über Abfall-NAMAs in Schwellen- und Entwicklungsländern auf der internationalen Abfallmesse IFAT in München zu starten. Die Veranstaltung brachte internationale Experten aus Klimapolitik und Abfallwirtschaft zusammen, um Erfahrungen aus Abfall-NAMA Design und Umsetzung auszutauschen. Dabei wurden Besonderheiten von abfallwirtschaftlichen NAMAs diskutiert, wie zum nachhaltige Finanzierungsmöglichkeiten und partizipative Prozesse über alle Ebenen, um sowohl Regierung als auch den Privatsektor einzubinden. Als weitere Herausforderung stellte sich heraus, dass Entscheidungsträger häufig andere Sektoren dem Abfallsektor trotz seines hohen Minderungspotentials zu vergleichbar niedrigen Kosten vorziehen. Die Erfahrungen hinsichtlich Überwachen, Berichterstatten und Überprüfen (MRV) aus einem peruanischen Abfall-NAMA hoben den erforderlichen Arbeitsaufwand hervor, sowie die Notwendigkeit weiterhin Anstrengungen zu unternehmen, Methoden zu standardisieren. Eine hohe Teilnehmerzahl und lebhafte Diskussionen

[1] Vogt et. al. (2015): The Climate Change Mitigation Potential of the Waste Sector – Illustration of the potential for mitigation of greenhouse gas emissions from the waste sector in OECD countries and selected emerging economies; Utilisation of the findings in waste technology transfer". TEXTE 56/2015, German Environment Agency: https://www.umweltbundesamt.de/publikationen/the-climate-change-mitigation-potential-of-the

zeugten von dem Interesse an NAMAs als Instrument, um zukünftig nachhaltige Abfallprojekte in Entwicklungsländern zu fördern.

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List of Abbreviations

BMUB	Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety)
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
DB	Development Bank
DC	Developing Country
GCF	Green Climate Fund
GHG	Greenhouse gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
KfW	Kreditanstalt für Wiederaufbau
MRV	Monitoring, Reporting and Verfication
NDC	Nationally Determined Contribution
NAMA	Nationally Appropriate Mitigation Action
NSP	NAMA Support Project
PCG	Perspectives Climate Group
UBA	Umweltbundesamt (German Environment Agency)
UK	United Kingdom
UNEP	United Nations Environment Pogramme
UNFCCC	United Nation Framework Convention on Climate Change

1 Background

The concept of Nationally Appropriate Mitigation Actions (NAMAs) was developed within the post-Kyoto framework to promote climate change mitigation in emerging and developing countries (DC). They have been gaining importance over the course of the recent years and several financing institutions with a (potential) focus on NAMAs such as the Germany/UK NAMA Facility or the Green Climate Fund (GCF) were established. In order to validate the environmental integrity of the instruments, extensive monitoring, reporting and verification (MRV) is developed and applied. Although emerging economies and developing countries can potentially reduce their GHG emissions by 12-18% by developing an integrated waste management (studies by the German Environment Agency)[2] and the instrument NAMA is widely-known already, NAMAs that are focusing on waste management are still rare and often confronted with substantial challenges in implementation.

The Side Event brought together experts from different NAMA related institutions to exchange experiences with regard to currently ongoing and finalized Waste-NAMAs to discuss challenges of implementation, funding and MRV. It aimed to shed light on future developments and potential improvements in the development of Waste-NAMAs and generate a common understanding of the issue of Waste-NAMAs. At the same time, the need for integrated waste management systems, which focus on stopping the landfill of untreated municipal solid waste and switching instead to an energetically favorable utilization, was emphasized. This switch needs to be accompanied by a MRV system that demonstrates the climate-friendly effects of waste interventions and promotes the development of integrated waste management systems in emerging and developing countries in the long-term.

2 Participants

In total the event attracted an audience of more than 50 people from a variety of institutions active in the field of waste management. Several professionals from the private sector participated, representing consulting firms such as Adelphi, GOPA Worldwide Consulting, Perspectives Climate Group and Green Partners. Even more pronounced was the attendance from public sector institutions such as the German Environment Agency (UBA), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the UNEP DTU Partnership and various universities.

The event engaged several experts on NAMAs and waste management who gave dedicated input in form of presentations, a panel discussion, a Q&A session and a final workshop at the end. Table 1 highlights the background of the key speakers who contributed to the side event.

Table 1: Overview on speakers

Name	Organization	Background
Andreas Jaron	BMUB	Andreas Jaron is head of BMUB's division "Principal and International Matters of Waste Management". For more 10 years he was a member of the Bureau of the Basel Convention of the United Nations Environment Programme (UNEP) and since 2014 he is Co-Chair of the OECD Working Group on Waste Prevention and Recycling and Co-Chair of the Working Group "Environmentally Sound Management of Waste".
Sören David	Nama Facility	Sören David is the head of the Technical Support Unit of the NAMA Facility. He holds a PhD in law, started his professional careers as an investment banker and gained extensive international experience in

[2] Vogt et. al. (2015): The Climate Change Mitigation Potential of the Waste Sector – Illustration of the potential for mitigation of greenhouse gas emissions from the waste sector in OECD countries and selected emerging economies; Utilisation of the findings in waste technology transfer". TEXTE 56/2015, German Environment Agency: https://www.umweltbundesamt.de/publikationen/the-climate-change-mitigation-potential-of-the

Name	Organization	Background
		GIZ Programmes in the area of clean energy.
Volker Weiss	UBA	Volker Weiss is head of UBA's section "Waste Technology, Waste Technology Transfer" and joined the agency in 1989. His professional experiences range from the assessment of environmental impacts of waste treatment technologies to analysing impacts of waste management on climate change.
Wolfgang Pfaff-Simoneit	KfW Entwicklungsbank	Wolfgang Pfaff-Simoneit is Senior Technical Expert at KfW Development Bank in the division "Water Resources and Solid Waste Management" with large professional experience in national and international solid waste management projects.
Karsten Karschunke	UBA	Karsten Karschunke works since 2006 at UBA's "German Emissions Trading Authority (DEHSt) in the section which is the "Designated National Authority" for CDM and JI in Germany. He is a Member of the German Delegation to the UNFCCC Climate Change Conferences as an Expert for Global Carbon Markets and emission reduction projects.
Anja Schwetje	UBA	Anja Schwetje is a senior research staff member at UBA's section "Waste Technology, Waste Technology Transfer" working on waste and climate protection since 2014. By profession a process engineer, she has more than 20 years of international experience in waste management.
Kamna Swami	GIZ India	Kamna Swami is a technical expert for the waste sector at GIZ India responsible for the development and management of a NAMA, which is sponsored by the international climate initiative of BMUB. She has over 10 years of professional experience as urban planner in the waste sector.
Axel Michaelowa	PCG	Axel Michaelowa works on international climate policy instruments and the UNFCCC process since 1994. He is managing director of the consultancy Perspectives and part-time researcher at the Institute of Political Science of the University of Zurich. He contributed to the development of several NAMA guidebooks and has been involved in NAMA development projects.
Jan Janssen	PCG	Jan Janssen has 17 years of professional experience in Latin America, Asia, Eastern Europe and Africa in Financial and Technical Cooperation projects for large international development institutions such as GIZ and KfW. His focus areas cover GHG mitigation in the waste sector and solid waste management.

3 Agenda

The side event "Climate-friendly Waste Management through NAMAs in Emerging Economies and Developing Countries" took place on 2 June 2016 at the IFAT in Munich, the "World's Leading Fair for Water, Sewage, Waste and Raw Materials Management". The 5 hours event was structured in three parts:

1. Presentations by experts on NAMA development and funding
2. Panel Discussion with 6 NAMA and waste management experts

3. Workshop for the exchange of experiences on selected NAMA cases

Figure 1 shows the detailed agenda of the side event.

Figure 1: Side Event Agenda

Source: Workshop Flyer (see Annex II)

4 Side Event

The event was then moderated by Anja Schwetje from the German Environment Agency (UBA).

With his speech on NAMAs and the importance of the waste sector for climate change mitigation Volker Weiss, the head of section "Waste Technology, Waste Technology Transfer" of the German Environment Agency (UBA), officially opened the event.

He commented on the history of UNFCCC climate negotiations and the emerging of the NAMA concept in the Bali Action Plan 2007and pointed out that NAMAs are GHG mitigation activities that can range from individual projects or actions to sector-wide mitigation programs, which are defined by each country to fit their individual needs in line with national policies and strategies. Some countries prepare NAMAs with additional international assistance while others go without foreign support assistance, meaning they are full-financed by own resources. In this context he also highlighted the importance of funding vehicles such as the NAMA Facility, which was established during the climate negotiations 2012 in Doha, Qatar, in collaboration of BMUB and the Department of Energy and Climate Change of the United Kingdom. Today the NAMA Facility is a leading institution in field of NAMA funding.

Volker Weiss emphasized the relevance of the waste projects for greenhouse gas (GHG) mitigation in DCs. Worldwide and especially in the developing world, waste amounts are still growing, while landfill of waste remains the prevailing method in municipal waste management. These landfills are large emitters of methane - a potent driver for global warming. Landfill gas collection and utilization can only be the first step. However, gas collection and utilization needs to be complemented by integrated waste management, because at best only 50% of the gas can actually be collected throughout the entire life span of a landfill. Waste management is therefore considered a key area for future NAMA development, particularly because until today not many Waste-NAMAs have been developed or imple-

mented. In the long-term, well-implemented NAMAs in the waste sector offer great opportunities for waste technology transfer and innovation for developing countries.

4.1 Presentations[3]

Waste Management-NAMAs in India and Latin America - Experiences from design of MRV and policy instruments (Axel Michaelowa and Jan Janssen)

In the first presentation Axel Michaelowa and Jan Janssen, Perspectives Climate Group, provided climate policy background information on the concept of NAMAs, described the concept itself in greater detail and shed light on potential waste management technologies for integration into NAMA concepts.

The climate policy regime was established over 20 years ago at the Rio summit in 1992. The Kyoto Protocol being the first milestone that put "flesh to the bones" of the UNFCCC in 1997. The Marrakesh Accords in 2001 provided the modalities and procedures that were necessary for an effective design of the system. In this climate policy framework mechanisms such as the Clean Development Mechanism (CDM) and instruments such as NAMAs evolved over time.

The Kyoto Protocol divided the world into the two categories of developed and developing countries, of which developed countries were expected to take on emissions reduction targets. That fundamental division and the 'top down' approach with its international rules, procedures and oversight lead to the United States leaving the Kyoto Process. At Copenhagen in 2009 a pledge and review process emerged that resulted in December 2015 in the Paris Agreement - the new global treaty combining top-down elements of Kyoto Protocol and bottom-up processes as every participating country determines and declares its own emission reduction goals with the submission of Nationally Determined Contributions (NDCs).

The concept of NAMAs was established as Parties wanted another option for mitigation activities beyond the CDM. The concept is quite open as there is no specific set of rules and funding mechanisms behind it. Many NAMAs differ in terms of reduction potential, complexity, scope, etc[4]. Thus, NAMAs can take many shapes. The NAMA funding landscape is slowly starting to gain momentum, with already established actors such as the NAMA Facility but also actors which more recently became operational, such as the Green Climate Fund (GCF). Important to note is that ultimately NAMAs will constitute the implementing pillars of the NDCs and will thus have major importance in the future fight against climate change.

Jan Janssen highlighted the relevance of the short term climate pollutant methane and demonstrated the potential mitigation technologies include landfill gas capture, composting, biomethanization, mechanical-biological treatment, recycling and 'waste-to-energy'. By now there are 17 different solid Waste-NAMAs in development that promote a number of different technologies.

On the example of a Waste-NAMA in Peru the challenges in establishing a MRV system were demonstrated. With no mandatory international rules in place that could provide guidance for project developers, the establishment of the MRV system was pioneering work. In the case of Peru reliable baseline information was missing, leading to intensive data gathering exercises, stakeholder consultations and site visits, with the extrapolation of the data gained as a particular difficulty. At the same time the monitoring costs needed to be taken into account, balancing feasibility and robustness of the system. The assignment of monitoring tasks to existing institutions, the establishment of a long-term capacity building and training strategy and the monitoring of co-benefits turned out to be challenging.

[3] The presentations of Perspectives Climate Group and the NAMA Facility can be found in Annex I.

[4] For more information on existing NAMAs visit the UNFCCC NAMA Registry.

Challenges in designing and implementing NAMAs in the waste sector - experiences from the NAMA Facility portfolio (Sören David)

Sören David from the Technical Support Unit of the NAMA Facility presented the NAMA Facility as a funding institution highlighting its project portfolio and selection criteria. He discussed the potential for projects from the waste sector and the challenges in the design of NAMA Support Projects (NSPs).

NSPs of the NAMA Facility focus on channeling public and private investment to implement projects across different locations and interventions and to achieve transformational change by showcasing a NSP that can be replicated. The NAMA Facility strives to support projects that bring about transformational change, which can be described as 'abrupt', 'radical' and 'permanent'.

Sören David explained the design of the first Waste-NAMA, which was included in the portfolio of the NAMA Facility. It is targeting integrated waste management in China with a funding volume of EUR 8 million. For this Chinese Waste-NAMA the NAMA Facility supports only the technical component, which includes capacity building measures, policy advice and analysis of GHG mitigation effects amongst others. The establishment of the waste management system including the investment components of the NAMA is provided by the Chinese government that ear-marked sufficient public funds for that purpose.

The typical shortcomings of NAMA proposals were explained by Sören David. The mitigation potential might not be substantiated or is overestimated. The barrier analysis is often incomplete, e.g. targeted sector or country context is insufficiently analyzed. The rationale for a specific technology is often missing or the business model lacking, and/or the institutional set-up is not defined. Similarly the rationale for a specific financing mechanism is missing or the phase-out concept is insufficient.

4.2 Panel Discussion

The moderator of the panel discussion Jan Janssen asked the panelists to provide the audience with an insight on the perspective of their institutions regarding NAMA development and implementation process. The discussion started with brief 5-minute keynote speeches by each of the participants, followed by a Q&A-session with the audience.

Figure 2: Panel in Discussion (Photo by Anja Schwetje/UBA)

An overview of the opening statements of each participant is provided in the following.

Andreas Jaron (BMUB)

- The best waste management systems show a high recycling rate and a low landfill rate since landfill is the environmentally harmful solution. Germany closed almost 50.000 landfill sites about 40 years ago and built approximately 15.600 modern waste management plants.

- The goal of the Environment Ministry is to assist other countries on their path to modernize their waste management system. However, there are 3 distinct challenges to be faced when using the German "blueprint" for other countries, which are that separated collection systems are often missing in DCs, financing for the waste system is difficult to mobilize and the legislative frame is missing.
- For the setting and enforcing the legislative frame, NAMAs can play a role.

Karsten Karschunke (UBA)

- Comparing CDM on the one hand and NAMAs on the other hand, the big difference is the role of the government. While NAMAs are government driven on side of the implementing as well as financing country, the CDM is completely private sector driven. This is why CDM projects experienced a much faster growth than NAMAs in their initial phase.
- NAMAs will increase the transparency for mitigation actions, which is integral part of the Paris Agreement.

Kamna Swami (GIZ India)

- The Indian Government tries to work towards the goals set out in its NDC by implementing a NAMA in the waste sector. The waste sector was selected as one of the priority sectors within the NDC.
- A feasibility study was conducted before that involved extensive stakeholder consultations. The result showed a huge potential of waste management interventions in India, where only 19% of the waste is treated at the moment.
- A very important factor that lead to selection the waste sector as a focus for NAMA development were the co-benefits that are related to interventions in the field of waste management.

Pfaff-Simoneit (KfW Development Bank)

- At the beginning it was only possible to finance landfills as this was the only economically sensible solution for DCs. However, today we understand very well that these landfills generate environmentally-harmful emissions. The challenge today is not so much to mobilize the necessary funds for the initial investment, but the financing of the running costs thereafter. 70-90% of the total costs are running costs (operating expenditure).
- Because of the upstream and the downstream effects advanced solid waste management systems can reduce developing countries' GHG emissions by up to 15%. The establishment of a link to the world of climate finance would be desirable but at the moment the instruments that climate experts have fit not really to the challenges that waste projects face. It would be great if we would find solutions together with the climate community in the future.

Sören David (NAMA Facility)

- The question is how to implement the technical know-how from countries like Germany and make it compatible with the procedures of the climate institutions such as the NAMA Facility. Many national line ministries have limited knowledge on the concept of NAMAs and need to be integrated in the process to a larger extent. Typically, either the national ownership of NAMA proposals is very high but the technical complexity is rather low, or the other way around.
- NAMAs are a very ambitious concept and often the governmental framework is weak when it comes to the implementation of NAMAs. The chosen technology might be very suitable but if for instance the municipal structures are dysfunctional it can become very difficult to implement a Waste-NAMA. That is why government ownership and the alignment of the NAMA with national priorities and plans is crucial.

Axel Michaelowa (Perspectives Climate Group)

- NAMAs have the best chance of successful implementation if it is supported by relevant government entities on all levels. Barriers need to be identified at an early level and addressed sustainably. The incentive structure of the financing agencies should reward those consultants who actually do the work with the relevant ministries, which is very often not the case.
- The revenue generated from the sale of emission credits can be used to bear the high operating costs of waste management systems. Thus, the operating cost burden can be reduced if functional market mechanisms are created in the upcoming years.

In the following, key aspects are highlighted to provide an impression of the subsequent debate that was moderated by Jan Janssen.

On the lessons learned for NAMAs and the experience with carbon markets Karsten Karschunke stated that every NAMA needs to be integrated into the national policy context in the same way CDM projects were always integrated. Moreover, it is crucial for successful NAMA implementation to secure not only short-term upfront finance but also long-term finance. This stands in contrast to the CDM, which always had the opposite problem of receiving the short-term upfront finance as in the long-term revenues were generated through the sales of CERs.

Regarding the main constraints for Waste-NAMAs to receive funding, Sören David explained that NAMA proposals received for the waste sector are often not sufficiently elaborated or lack scalability, which is a crucial aspect for the selection of a project by the NAMA Facility. In general the waste sector is equivalent to other sectors when it comes to developing of eligible NAMAs. Only the aspect of scalability might be the one criteria which is more difficult to fulfill for the waste sector. So smaller countries or projects, which present a limited possibility for replication on national level, are not favorable for the NAMA Facility.

Regarding the challenges in financing waste management projects in DCs, Wolfgang Pfaff-Simoneit emphasized that waste management is not as expensive as often assumed. The price of an efficient waste management system that generates similar GHG emissions as the one from Germany would cost 10 EUR per year and 50% of it could be covered by GHG revenues. The main problem is that political decision makers are reluctant to spend money on the waste sector. It is important to convey this message to decision makers of developing countries.

Regarding the possibility of a guarantee fund to leverage private sector investment in Waste-NAMAs, Axel Michaelowa remarked that this depends on country specifics. A guarantee fund can be a very useful instrument if there are private actors in the waste sector who are willing to engage with such an instrument. We also considered this instrument when designing the Waste-NAMA for India. If there is sufficient equity in the country a guarantee fund is a great tool to mobilize the private sector. He highlighted the importance of political commitment of the host country. Many developing countries had unrealistic expectations in the past that the very act of handing in NAMA proposal would entail funding. It is, however, crucial to have a long-term perspective, the willingness to overcome barriers and well-ingrained behaviors in ministries, and the willingness to engage the private sector. The private sector was the important success factor of the CDM. In the context of NAMAs it is necessary to ensure that the private sector is either driven by a “stick” or even better encouraged to engage by a “carrot”.

Regarding the governmental decision making on technology for the Indian Waste-NAMA, Kamna Swami explained that despite the large potential for transformation in India it is not possible to implement all the possible technologies but important to agree on specific technologies to achieve results within the sector. For the Indian Waste-NAMA a feasibility study was conducted that identified 14 potential mitigation options. These options were extensively discussed in collaboration with the private sector, NGOs and governmental bodies and evaluated according to international standards (e.g. CDM

and Gold Standard). Five options were shortlisted, 2 of which being policy-based support programmes and three being technology options (composting, refuse derived fuel and biomethanization). The final decision on the option for the Waste-NAMA will be taken by the Ministry of Environment, Forest and Climate Change on the secretary level.

With regard to the mistakes that DCs should avoid in waste management, Andreas Jaron remarked that it is important to know with which kind of waste you are dealing and how the local waste system is set up before you decide on the right technology. Developing Countries sometimes tend to prefer waste-to-energy, a technology successfully established in Germany, although a simple technology "copying" does not work in most of the cases. Only by careful analysis of the local conditions one can make a sensible choice on the technology. Germany's experiences can be used to help others in finding intelligent solutions for their problems, but it is not a blue print.

Wolfgang Pfaff-Simoneit stated that one should not think in terms of individual technologies when it comes to solid waste management because the waste sector consists of different elements that need to fit together. The system as a whole has to be taken into account when technology choices are made. Technical and administrative capacities of the local government and the existence of markets need to be considered when decisions are made. Actors from the "climate sphere" often do not consider the whole picture but solely focus on individual technologies with the goal to reduce GHG emissions.

Axel Michaelowa explained the rational and the functioning of the pilot auction facility as a "safety net" for project developers to stir carbon market activity. He further encouraged the German Government to increase the ambition and translate it into the development of policy instruments. He expressed his hope to see coalitions of countries in buying credits from the carbon markets soon. If market related activities fail to materialize there is the danger of the markets being lost without any possibility of re-vitalization. The time for generating demand for the market mechanisms is now and Germany should seriously consider initiatives to promote them. This could involve pilot activities for the mechanism set out in the Paris Agreement.

Summary

Anja Schwetje concluded the event with a summary of the key issues conveyed during the side event:

- NAMAs are around and will stay, also as an element in the formulation and achievement of a country's NDCs.
- Building sustainable MRV systems for Waste-NAMAs and defining international standards for MRV remains a challenge that needs to be addressed in the near future. CDM experiences could provide experiences, but have to be adapted to NAMA conditions.
- Establishing waste sector specific NAMAs seems no more difficult than for other sectors. However, scalability could be a problem, which is more common to Waste-NAMAs than to NAMAs in other sectors. Most of the current proposals for Waste-NAMAs could not satisfy the criteria set by the NAMA-Facility, so there seems to be a demand to improve the proposal quality.
- Landfills are large emitters of methane, a potent GHG, and the current practice of landfill of untreated waste strongly contributes to global climate change. However, the introduction of integrated waste management systems is seen as an important though still underestimated measure to achieve the goals set by the Paris climate agreement.
- Projects in waste management are often less appealing to local decision-makers than measures in other sectors, so that the mitigation potential of the waste sector is exploited insufficiently despite its high potential for GHG reduction and the achievable co-benefits. So it seems important to raise the profile of Waste-NAMAs.

- The importance of a participatory process across all levels, from national to local, is a success factor for Waste-NAMAs, and increasing the ownership and the readiness of the host country and supports a coherent government approach. It has to be considered that a quality proposal for a Waste-NAMA often may require external consulting input and support that match to the these complex and time-consuming processes. This should be considered by the donors.
- Private sector engagement is important. It was a success factor in CDM, and it remains a challenge to integrate it into the more government-driven NAMA processes.
- A solid financing and financial framework is key for a successful Waste-NAMA. Costs in general should not be so much of an issue, but affordability for some shares of the population can be a problem. Especially the sustainable financing of the operation and maintenance is crucial and was discussed controversially. Should these costs be paid by the polluters/waste generators via fees, covered by taxes or should climate finance contribute to operation costs for a certain period especially in case of the least developed countries (in addition to supporting infrastructure investments).
- The waste sector is a complex sector with interconnected elements and simple choices based on individual technologies are unrewarding. The challenges are organizational and technical likewise.

4.3 Networking Workshop

In the subsequent workshop session a networking space for the participants was provided. Lively discussions were initiated on a variety of NAMA-related topics such as policy instruments, stakeholder engagement, co-benefits, MRV and the existence and access to funding and experiences on NAMA design were exchanged using examples from the Waste-NAMA development process in India supported by panelist Kamna Swami and in the Dominican Republic supported by the participant Judith Wolf from GIZ.

5 Follow-up

The side event for the first time brought together international experts for climate policy and finance and waste management specialists. The event received a very positive feed-back from the participants and the panelists. The high attendance rate and lively discussions showed the pronounced interest in NAMAs as an instrument to promote sustainable waste management projects in emerging economies and developing countries.

In many ways this event side event was perceived as a starting point to intensify the exchange between experts and decision-makers in climate policy and in waste management. Many important aspects have been addressed but there is also a need to continue and deepen this discussion in the specific fields.

Apart from what has been mentioned and concluded from the presentations and the panel discussion, many experts expressed their wish to follow-up on the development in this field with another meeting in a year, when the first Waste-NAMAs are implemented.

With climate finance vehicles like the Pilot Auction Facility and GCF starting to operate, there is a window of opportunity for the waste sector to get the much needed funding to put its potential into effect. Countries could be encouraged to include waste management in their NDCs and establish NAMAs to support the achievement of the NDCs.
More attention for the GHG mitigation potential of the waste sector could be raised by a strengthening

the cooperation between relevant actors such as NAMA Facility, GIZ and UBA through special events and activities.

Some participants also mentioned the need to deepen the discussion on a standardization of MRV systems. The case of the MRV system for the Waste-NAMA in Peru demonstrated the challenges and difficulties to establish a MRV system and the according baseline in such projects in DCs. During the networking workshop a demand for more information exchange regarding MRV standards were discussed, particularly as more Waste-NAMAs will be developed and encountering the same challenges as the Peruvian Waste-NAMA. It could be beneficial if this side event is followed-up with an expert meeting tailored to the quantification of GHG emissions in the waste sector, e.g. for the establishment of baselines as a references for future reduction, verification and monitoring of emission reduction delivered through waste projects.

6 List of Annexes

- Annex I: Presentations of Perspectives Climate Group and NAMA Facility
- Annex II: Workshop Flyer

ANNEX 1

Waste Management-NAMAs in India and Latin America - Experiences from design of MRV and policy instruments

Dr. Axel Michaelowa
Managing Director, Perspectives GmbH

Dipl.-Ing. Jan Janssen, M.S.P.H.
Associated Consultant

Munich, IFAT Side Event
2 June 2016

Agenda

- **International climate negotiations**
  - Key milestones
  - Paris Agreement & Bonn
  - NAMA policy instruments
- **NAMA Background**
  - Political framework
  - NAMA Financing
- **Waste NAMAs**
  - Mitigation potential
  - Technologies
  - Example Peru
  - MRV & Challenges

Perspectives‘ profile

Dr. Axel Michaelowa

- PhD in Economics
- Managing Director

– Works on international climate policy instruments & UNFCCC process since 1994
– Lead Author of IPCC 4th and 5th Assessment Reports
– Experience in over 30 developing countries

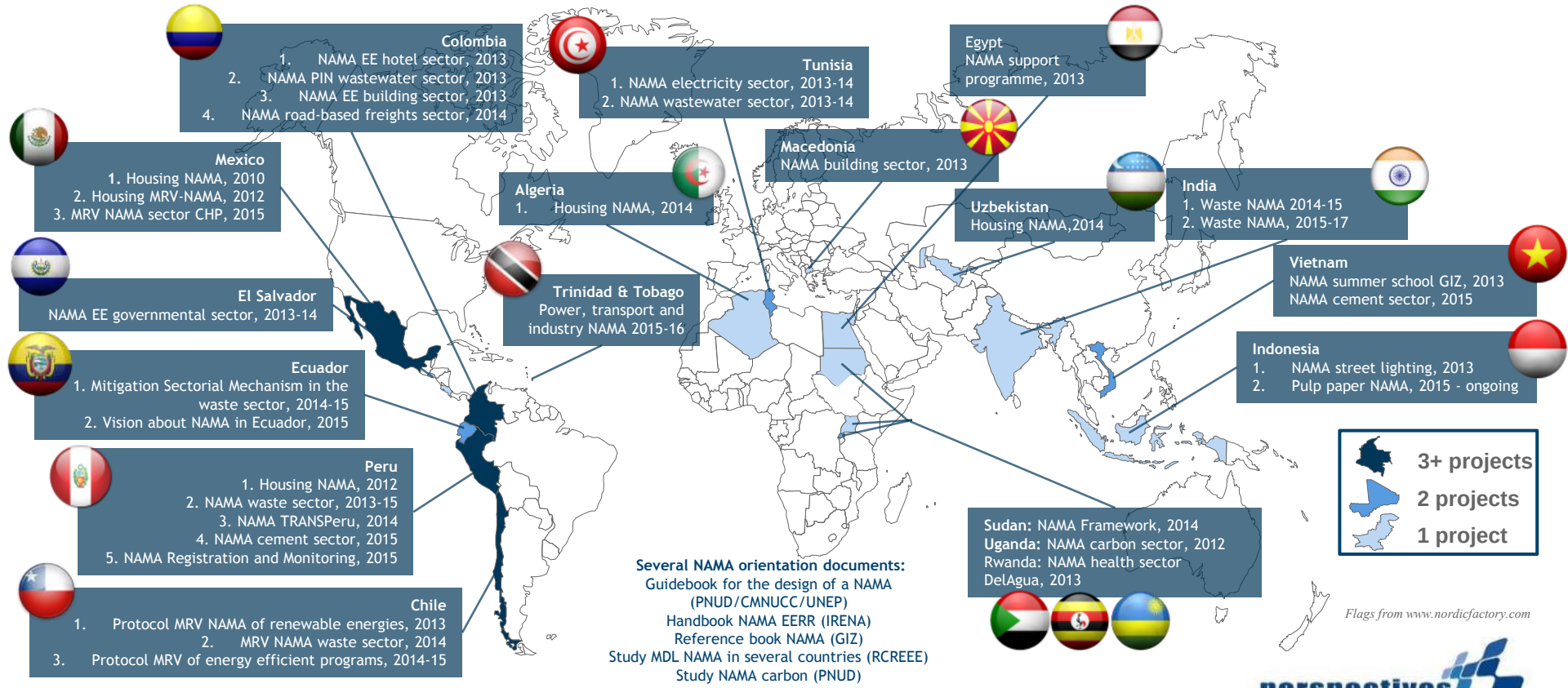
Dipl.-Ing. Jan Janssen

- Environmental Engineer
- Associated consultant

– Experience with solid waste NAMAs in Peru, Costa Rica, India
– Experience in over 20 developing countries

- Leading expertise in international climate policy, market mechanisms like Clean Development Mechanism (CDM), NAMAs and other climate policy instruments
- High-quality, tailor-made consultancy services
  - NAMA design
  - Negotiation support
  - Climate finance proposals (GCF)
  - Conceptual studies on policy instruments
- More than 100 clients and projects in over 60 countries
- Offices in Freiburg, Zurich and Alicante

Our references in working with NAMAs



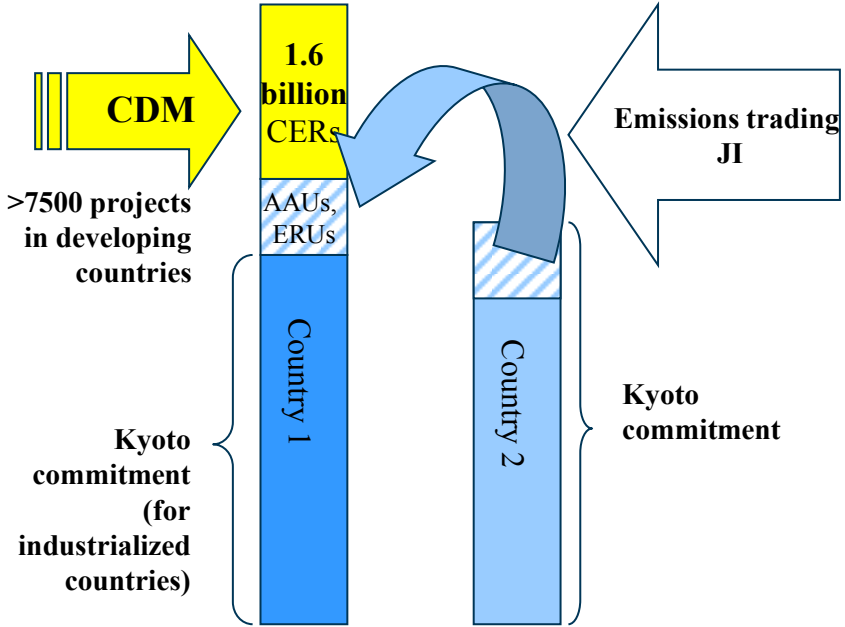
International Climate Negotiations

Creating the framework to achieve low-carbon economies

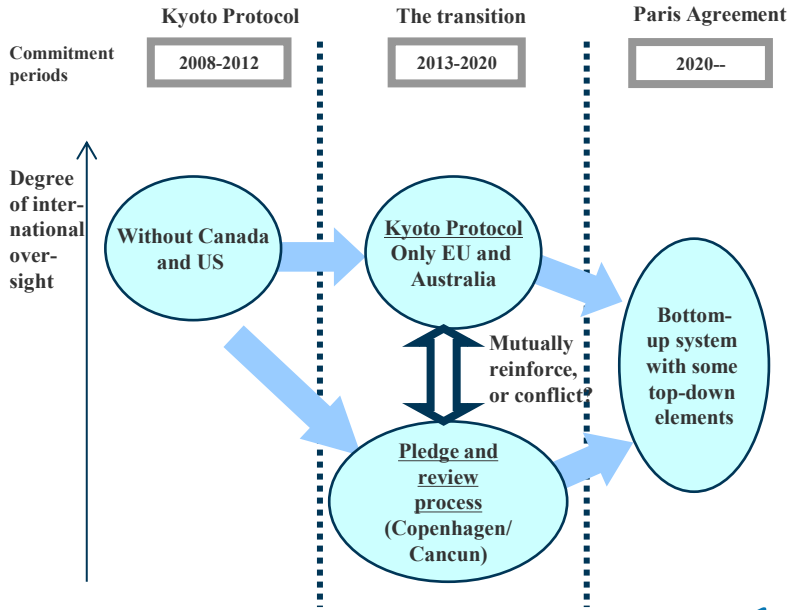
Key milestones of the international climate regime

From top down to bottom up greenhouse gas mitigation

The Kyoto Mechanisms



From Kyoto to Paris and beyond

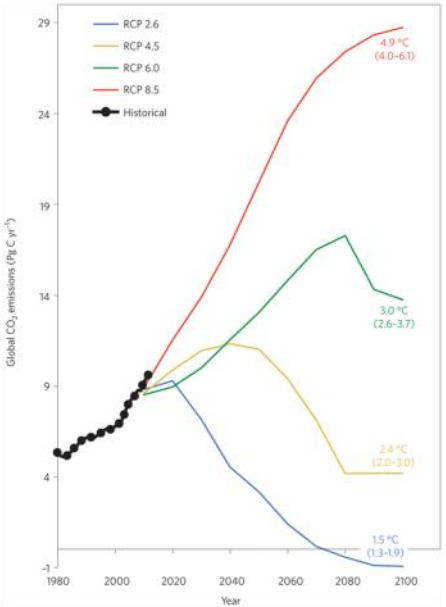


The Paris Agreement

- is a **break-through** in international mitigation policy covering **all countries**
- combines **bottom-up emissions pledges** with an **international regulatory architecture**
- reinstates **market mechanisms** as key instrument
- requires a **huge amount of work** in the next **3-5 years** to put “flesh to the bones” of the agreement

The Paris Agreement: Ambition and mitigation

- Global goal of keeping warming **“well below” 2° and aim at 1.5° C**
- Achieve **balance of emissions** and **sinks** by **second half of century**
- Global stocktake on progress every 5 years from **2023** onwards
- **All countries** participate in **mitigation** (and adaptation) through **Nationally Determined Contributions (NDCs)**
- NDCs **ratcheted upwards** every 5 years
- **Centralized and decentralized market mechanisms** available
  - Sustainable Development Mechanism (SDM), Art. 6.4
  - Cooperative Approaches (CAs), Art. 6.2



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Highlights Bonn Climate Negotiations (16 – 27 May 2016)

- Backdrop: First 4 months of 2016 beat **1.5°C temperature increase** from preindustrial level. In **just three years**, global average temperature has increased by **0.5°C**
- **Nevertheless, no real sense of urgency**
- Pre-Paris conflict lines **partially reopened**
  - **What should be the name of the market mechanisms?**
  - **What should be the level of international oversight regarding Sustainable Development?**
- **Submissions on market mechanisms** due by 30 September
- **No interim meeting** planned before Marrakech conference in November

Status of (I)NDCs

- Cover **189** (96% of) Parties and **> 87%** of global GHG emissions
- INDCs can be transformed into NDCs **without additional effort**
  - **17 NDCs** to date, of which **only one changed significantly** compared to the INDC
- Most are **high-level political targets** without specifying measures
- 149 (**79%** of) INDCs have expectations for **international support**
  - **Annual financing needs ~USD 350 billion**
  - **3.5 times** the promised level of **"mobilized" North-South climate finance flows**
- 91 (**48%**) indicate they would at least consider using **market mechanisms**
  - **Pre-Paris market mechanisms status was unclear: more countries might use them** now they are part of the agreement

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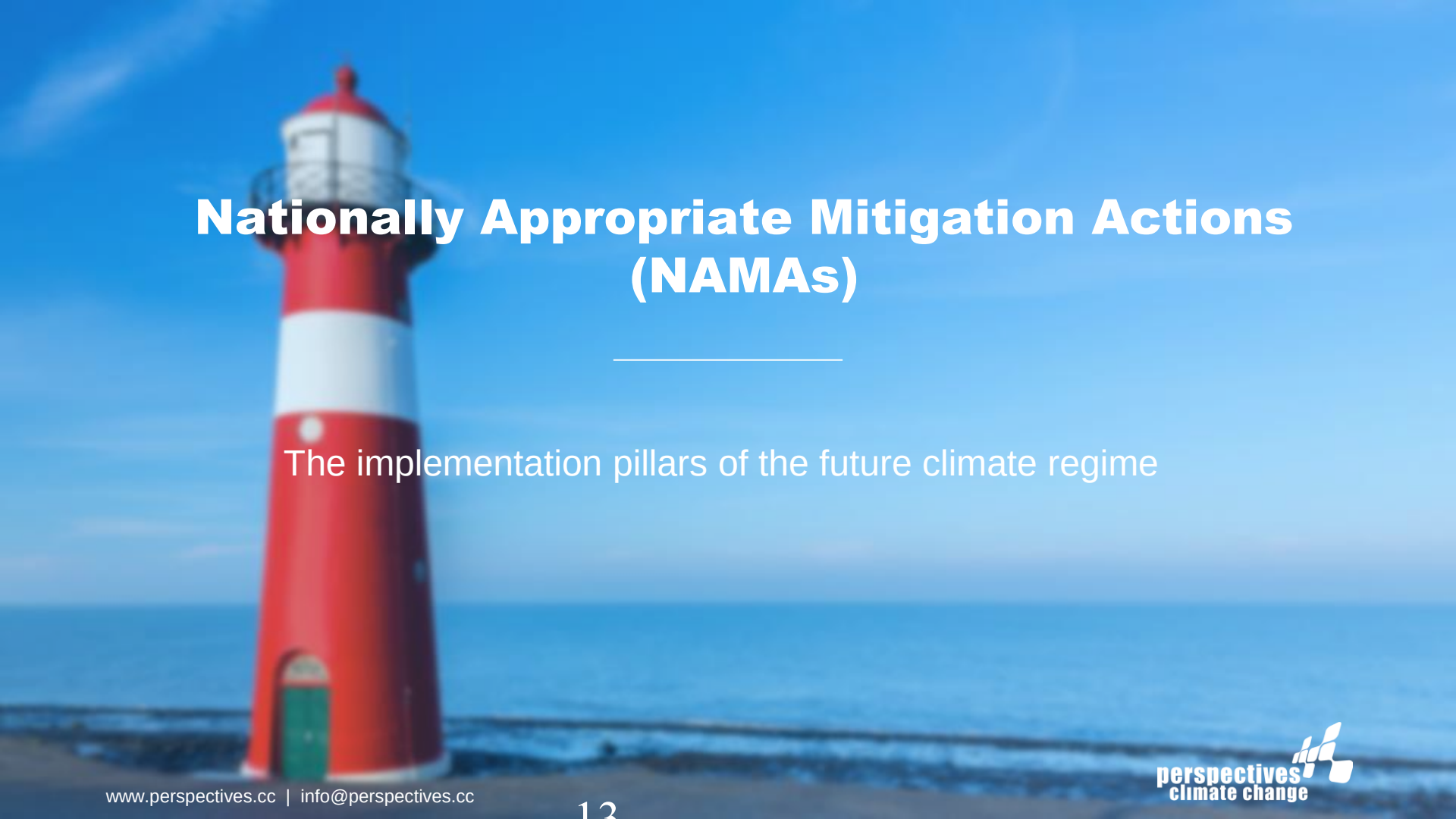


Nationally Appropriate Mitigation Actions (NAMAs)

The implementation pillars of the future climate regime

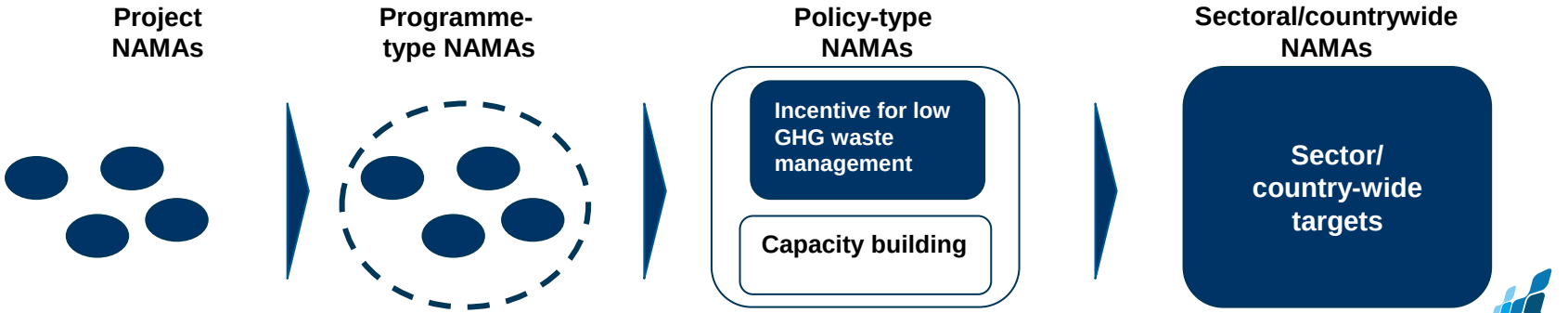
Nationally Appropriate Mitigation Actions (NAMAs)

- Concept created in the Bali Action Plan (2007) to describe [voluntary] mitigation actions by developing countries after 2012
- "**Nationally appropriate** mitigation actions' by developing country Parties in the context of sustainable development, **supported** and enabled by technology, financing and capacity building, in a **measurable, reportable and verifiable** manner."
- **No** binding international rules, but also **no dedicated financing concept**
- Since 2013, a **voluntary NAMA registry** is administered by the UNFCCC Secretariat
- **Over 150 NAMA concepts** developed around the world
  - **Less than a dozen** have actually been financed

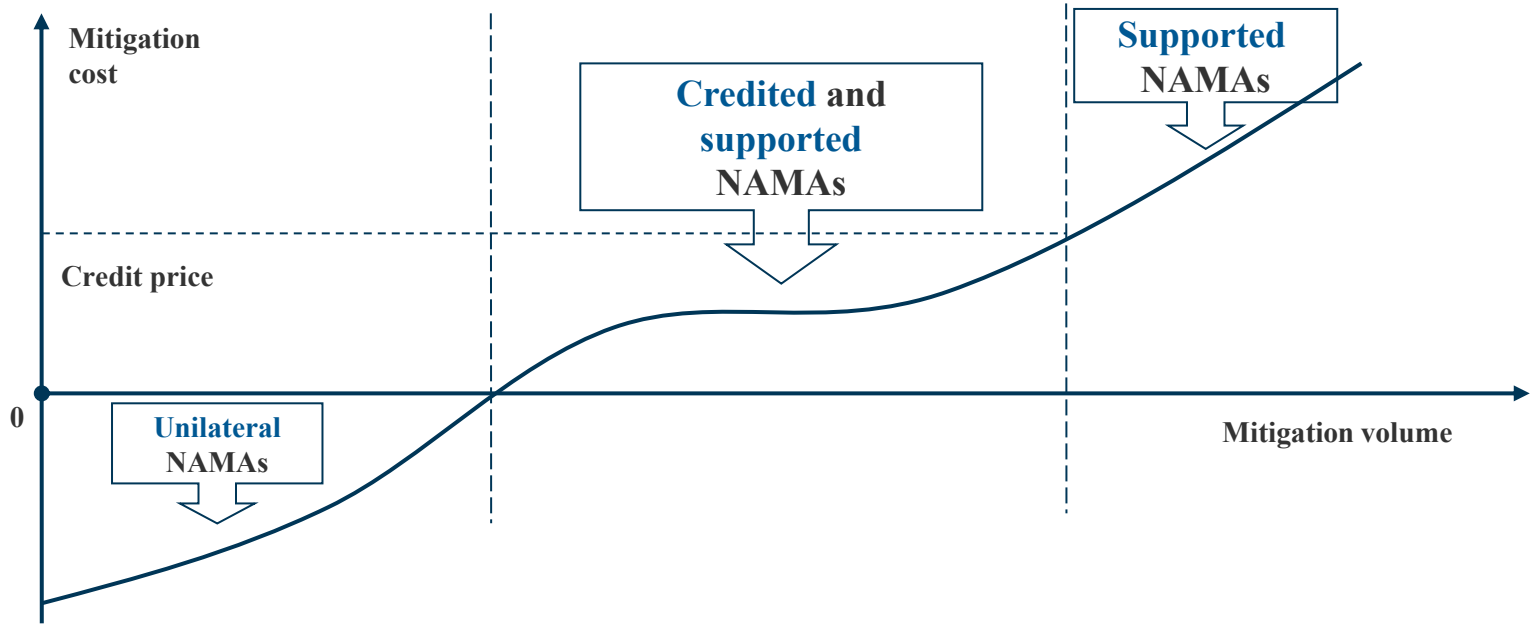
UN Climate Change Conference 2007
Bali - Indonesia

The concept of NAMAs…

- …requires **prioritization** of policy instruments using agreed **sustainable development criteria** and indicators, building upon **existing policies**
- …requires ability to **monitor, report and verify** outcomes
- …**is not a replication of CDM** – NAMAs are **organized by government** and normally do **not aim at specific projects**
- MRV can be **less cumbersome than for CDM** if NAMA does **not generate credits**



NAMA types

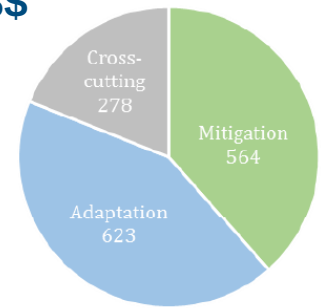

Mitigation cost
Credited and supported NAMAs
Supported NAMAs
Credit price
0
Unilateral NAMAs
Mitigation volume

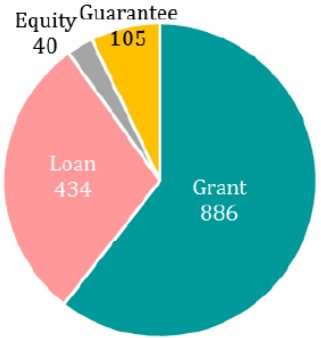
NAMA funding vehicles

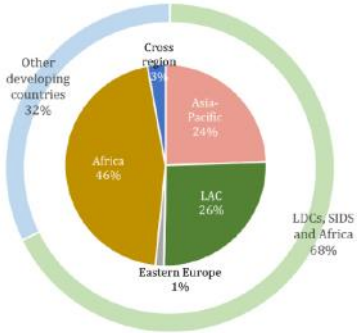
- **Unilateral** NAMAs: actions **independently funded** and carried out by DCs
- **Internationally** supported NAMAs: **technical assistance** and/or **direct funding** provided by industrialized countries
  - **Green Climate Fund** (total 9.6 billion US$ for 2015-2018)
    - Grants and loans, procedures under development, 8 projects financed
  - Multilateral grants (e.g. through **NAMA Facility**, total 205 million € in 2013-2015)
    - Operational, 3 rounds held
  - **Bilateral** grants, **loan** financing (Japan)
  - **Market mechanism** revenues (through CDM, SDM, CAs, voluntary market)
  - and combinations of the above

Status of the Green Climate Fund

- GCF started project selection at Board meeting November 2015
- Received **37 proposals** asking for **1.5 billion US$**
- **Selected 8 proposals (0.17 billion US$)**
- Disbursement of **2.5 billion US$** planned per year

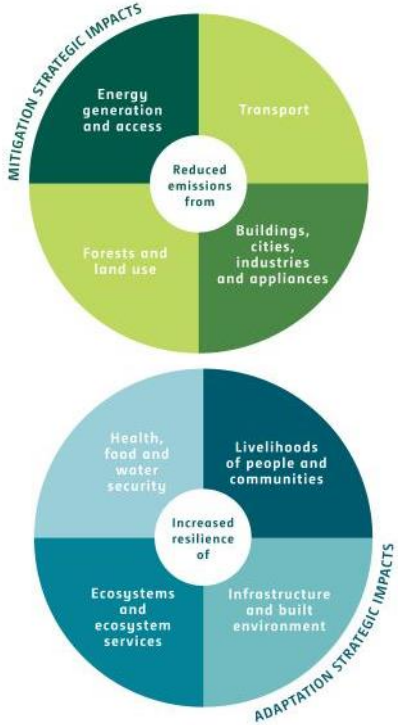






GCF Investment Criteria

- **Impact** potential – mitigation/adaptation impact
- **Paradigm shift** potential – policy change, scale-up and replication
- **Sustainable development** potential – social, environm. & economic
- **Needs** of the recipient – vulnerability, development level, availability of other finance
- **Country ownership** –existing policies, stakeholder engagemement
- **Efficiency and effectiveness** – cost-effectiveness, amount of co-financing, use of best practices



NAMAs as the pillars of NDC implementation

- Often, INDCs were developed **“top down”**
  - Theoretically based on an **economically ideal** mitigation path
- Practically, NDC implementation should be built on the **sum of NAMAs**
  - **Barriers** are known
  - **Baselines** have been assessed
  - **Financing needs** been discussed

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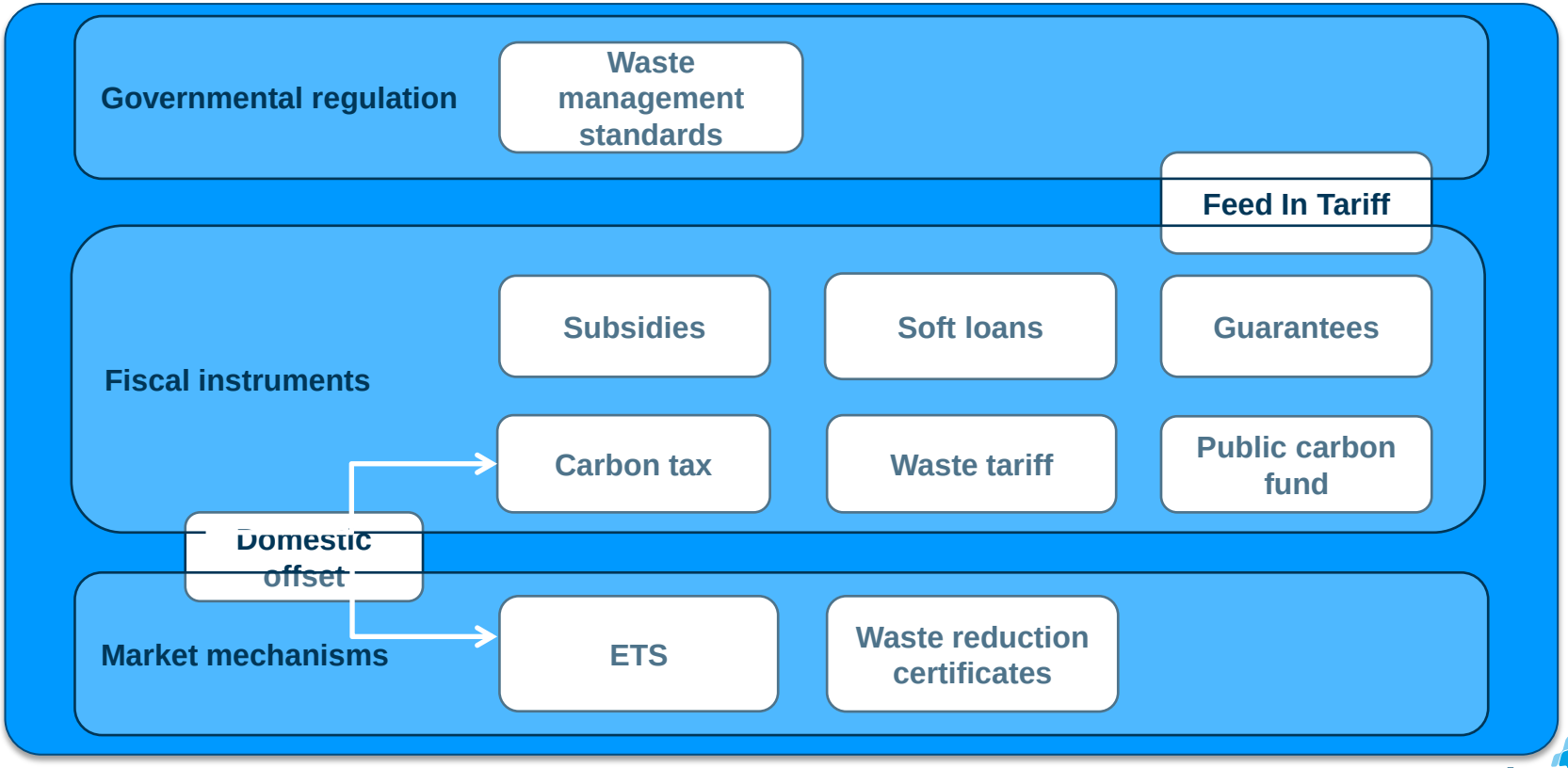
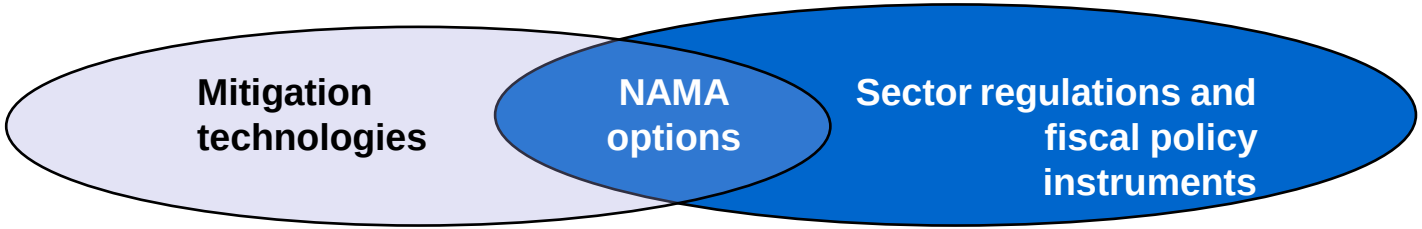
Waste NAMAs

Transforming the waste sectors of developing countries

NAMA policy instruments



Two different NAMA forms



a) **Prioritized mitigation option** (e.g. recycling) → Set of **regulatory and fiscal policy instruments** best suited to mobilize this option, supported by capacity building

b) **Prioritized policy instrument(s)** (e.g. waste tax) → **Various mitigation options**

Solid Waste Management technologies and GHG reduction

Solid waste management technologies and GHG reduction

- **Key greenhouse gas:**
  Methane (CH_4):
  - 25 times stronger than CO_2 (over 100 years)
  - Short-term climate pollutant
  - **72 times stronger than CO_2 over 20 years**

Principal mitigation technologies

Landfill Gas capture

Composting

Biomethanization (anaerobic treatment)

Waste-to-Energy and RDF

Recycling

Mechanical-biological treatment

Increase of CH_4 emissions due to improved MSW management:

Increase of collection coverage

More MSW disposed of on new or existing disposal sites

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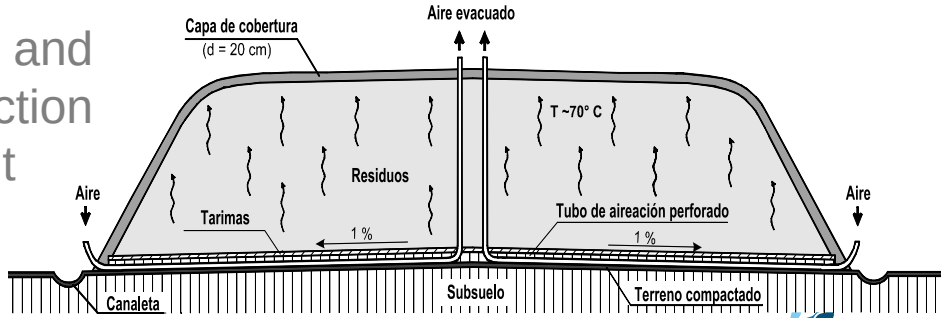
LFG capture in sanitary landfills

- Only **flaring**, or with electricity generation, or supply of gas to third parties
- Due to the volume of current emissions from disposal sites this strategy is of **high relevance for GHG mitigation in short and medium term**, until disposal of organic material is phased out
- Disadvantage: Only captures a part of the generated methane

- Advantage: Potential of **renewable electricity generation** (depending on feed-in tariffs), leading to additional GHG mitigation by replacing fossil fuels

Mechanical-biological Treatment (MBT)

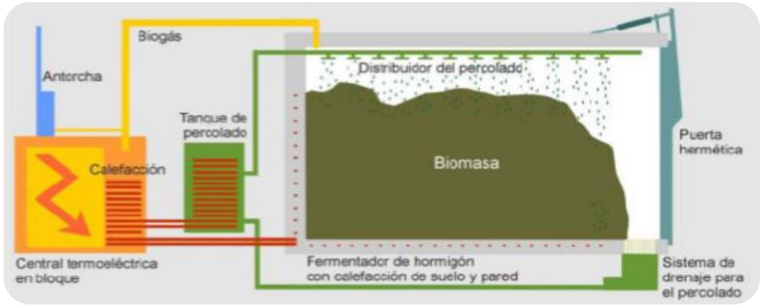
- **Pretreatment** of MSW and similar waste types by **classifying, shreddering, biological stabilization** (similar to composting)
- **Reduces volume** of the waste to be disposed **to around 50%,** increasing landfill lifetime to the double
- Reduces (almost eliminates) generation of **leachate** and GHG (**methane**), reduces risks and odors at landfill sites
- Easily **separation of recyclables** and **refuse-derived fuel (RDF)** production can be added, compost-like output (**CLO**) possible



Composting

- Requires **separately collected** organic wastes (e.g. from households, markets, parks, agriculture etc.)
- **Improves soil quality**, partly replaces synthetic fertilizer
- **Reduces** landfill space requirements
- Centralized, decentralized and/or at household level

Anaerobic digestion (biomethanization)



Anaerobic digestion: example of dry fermentization

- Requires **separately collected** organic waste
- **Controlled decomposition** of the waste coupled with **generation of biogas** (methane)
- Generation of **energy** (electrical and/or thermal)
- **Many** technical alternatives and sizes: e.g. **wet** or **dry** fermentation **wide range** of sizes (kW to MW)

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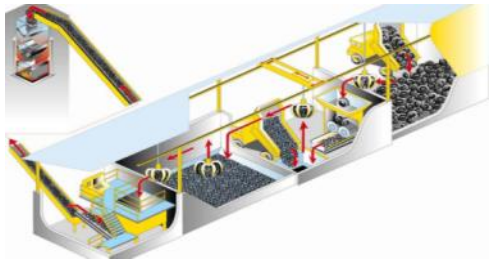
Recycling of dry materials

- Plastics, paper/cardboard, glass and metals
- Replaces primary materials by **secondary materials**
- **Significant energy saving** per unit produced, thus high GHG mitigation
- **Major co-benefits**:
  employment, business opportunities,
  integration of NGOs and neighbourhood initiatives

Waste-to-Energy



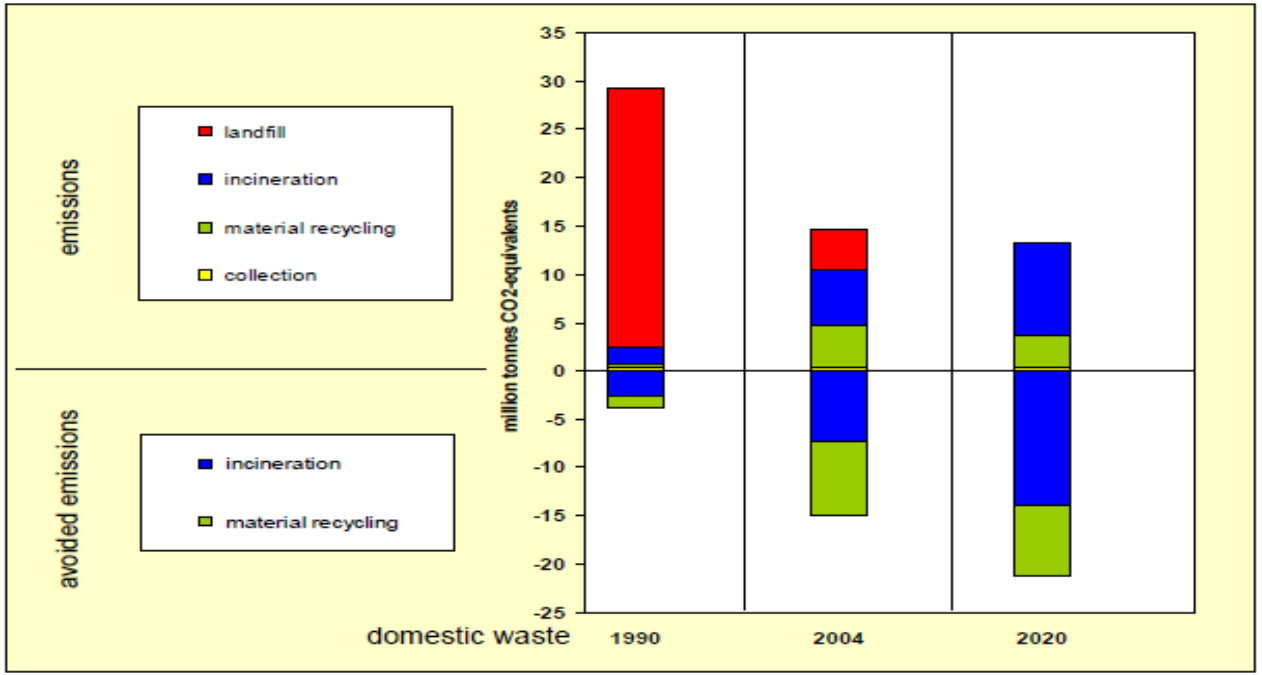
- Utilization **of energy content** of solid waste through combustion
- GHG mitigation by **replacing fossil fuel**
  e.g. use of RDF in **cement plants (co-processing)**: high demand, high temperatures, complete destruction of contaminants
- Refuse-derived-fuel (**RDF**): separated, shreddered and/or dried (stabilized) MSW fractions, e.g. from MBT

Solid Waste sector in Germany: Negative GHG emissions

Potential of an integrated approach using efficient strategies and technologies:

- Separate collection, recycling
- Advanced mechanical-biological treatment
- Utilizing a part of the MSW and industrial waste for energy generation
- Disposal on landfills is only allowed for inert wastes
- Sensibilization of population and economic sectors

GHG emisions and mitigation in Germany 1990 - 2020



MSW = Municipal Solid Waste = domestic waste

Source: Giegrich, J. Et.al., IFEU

Examples for Solid Waste NAMAs

Solid Waste NAMAs – examples – none yet in implementation:

- Peru: MSW NAMA
- India: MSW NAMA
- Indonesia: Vertically integrated NAMA
- Colombia: MSW NAMA
- Mexico: Sustainable use of biomass
- Philippines: Revolving fund for W-t-E projects
- Costa Rica: MSW NAMA
- Chile: NAMA Treatment of organic solid waste
- Jordan: NAMA for domestic waste management
- Pakistan: MSW for generating energy
- Uganda: SW in Kampala City
- Dominican Republic : Tourism and waste NAMA
- Vietnam, Rwanda, Mozambique, Sierra Leone, Zimbabwe ...

Technologies proposed for SW NAMAs
(17 evaluated NAMAs):
Composting: 6
Landfill gas: 5
RDF: 5
Anaerobic digestion: 4
Recycling: 4
Mech.-biol. Treatment: 3
Incineration w/ power generation: 2
Waste reduction: 1
Semi-aerobic landfill: 1
Methane oxidation layer: 1

Measuring, Reporting and Verifying (MRV) for NAMAs

- Paris Agreement (12/2015): All countries will have the same **transparency requirements for GHG emissions reporting** from 2020 onwards:
  → increased accountability on implementing the emission reduction goals set in Intended Nationally Determined Contributions (**INDCs**)
  → need for **nation-wide, sector-specific monitoring systems**
- **MRV** = Measuring, Reporting and Verifying of
  - **emission reductions**,
  - **co-benefits** (sustainable development indicators) and
  - **financial flows** (international support, private sector contributions etc.)
- Design of a MRV system is basically all about **information flows**:
  - **what** information (parameters) is measured and collected, and **who** collects it
  - how is it **reported** and **who reports** it
  - how is it **verified** and **who verifies** it

Measuring, Reporting and Verifying (MRV) for NAMAs

- There are **no mandatory international rules** on how to design MRV for NAMAs: can presently be largely determined by the **host countries** and its **key sector players**, while taking into account the **requirements from donors** supporting the NAMA
- However, it is agreed that MRV should be based on the **best international practices** and the **specific conditions of the country**
  - a conservative approach is the application of CDM methodologies
  - application of default factors for key parameters of baseline and NAMA emissions
  - to be balanced with the **implementation and operating costs** of the MRV system

United Nations
Framework Convention on
Climate Change

The Gold Standard
Premium quality carbon credits

Measuring, Reporting and Verifying (MRV) for NAMAs

- The MRV system should be **robust, credible, transparent** and **rigorous**
- Protecting the **reputation and interests of international donors**:
  → sufficiently robust to reassure donors that the supported NAMA contributes positively to the sustainable development of the host country; assure environmental integrity of the NAMA
  → assure credibility of the NAMA's capacity to deliver real, measurable **emission reductions**
  → especially **results-based payments** require a high level of confidence that the emission reductions have actually occurred – this generally requires an independent third-party to verify monitoring results
- MRV must reliably quantify the NAMA's emission reductions as their **contributions to the INDC**

MRV and baseline for NAMAs

- Emission reductions = **difference between baseline and actual emissions**
- Baseline = **most plausible scenario** that would be realized **in absence of NAMA,** typically understood as a **business-as-usual** (BAU) **scenario** from which a policy-driven improvement is desired
- **Absolute baselines**: overall (absolute) emissions of the relevant sector
- **Intensity baselines:** e.g. GHG emissions per ton of production
- Baselines for NAMAs and INDCs should be **conservative** to enhance credibility

Group of municipalities	1960	1970	1980	1990	2000	2010	2011	2012
Coast <10,000 inhab.	0.38	0.40	0.42	0.44	0.47	0.52	0.52	0.52
Coast 10,001-50,000 inhab.	0.53	0.55	0.58	0.60	0.65	0.71	0.72	0.72
Coast > 50,000 inhab.	0.56	0.59	0.62	0.65	0.69	0.76	0.77	0.77
Highlands <10,000 inhab.	0.51	0.54	0.56	0.59	0.63	0.69	0.70	0.70
Highlands 10,001-50,000 inhab.	0.65	0.68	0.72	0.75	0.80	0.88	0.89	0.90
Highlands > 50,000 inhab.	0.73	0.76	0.80	0.83	0.89	0.98	0.99	1.00
Jungle < 10,000 inhab.	0.46	0.48	0.50	0.52	0.56	0.61	0.62	0.62
Jungle 10,001-50,000 inhab.	0.65	0.68	0.72	0.75	0.80	0.88	0.89	0.90
Jungle > 50,000 inhab.	0.64	0.67	0.70	0.73	0.78	0.86	0.87	0.87
Metropolitan Lima/Callao	0.69	0.73	0.76	0.80	0.85	0.94	0.94	0.95
Peru	0.62	0.65	0.68	0.71	0.76	0.83	0.84	0.85

Generation of MSW (kg/inhab./day) by municipality group 1960 - 2012

Group of municipalities	Urban Population 2012	% of disposed urban MSW			
		2012	2000-2012	1980- 2000	1960- 1980
Coast <10,000 inhab.	646,247	86.7%	86.7%	73.7%	62.7%
Coast 10,001-50,000 inhab.	2,238,070	87.0%	87.0%	74.0%	62.9%
Coast > 50,000 inhab.	2,869,814	90.6%	90.6%	77.0%	65.5%
Highlands <10,000 inhab.	2,587,178	86.2%	86.2%	73.3%	62.3%
Highlands 10,001-50,000 inhab.	1,604,838	90.0%	90.0%	76.5%	65.0%
Highlands > 50,000 inhab.	1,270,058	87.7%	87.7%	74.6%	63.4%
Jungle < 10,000 inhab.	804,776	88.5%	88.5%	75.2%	63.9%
Jungle 10,001-50,000 inhab.	1,072,783	81.6%	81.6%	69.3%	58.9%
Jungle > 50,000 inhab.	544,865	76.5%	76.5%	65.0%	55.3%
Metropolitan Lima/Callao	9,280,473	94.1%	94.1%	80.0%	68.0%
Peru	22,919,102	90.0%	90.0%	76.5%	65.1%

Urban population and percentage of MSW disposed in final disposal sites by municipality group 1960 – 2012

Baseline development - example Peru

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Challenges and barriers in MRV design – lessons learned

- **Lack of reliable information and data**:
  → Data collection can be time consuming, but gathered knowledge is transferable to other sectors
  → Intensive consultations with stakeholders as well as with institutions with relevant knowledge about economic and sector history are required
  → Extensive site visits, surveys, interviews and training are needed
- **Monitoring costs - feasibility vs. robustness of the system**
  → Overall transaction costs of the MRV system need to be minimized
  → As far as possible building on existing infrastructure, information systems and business practices

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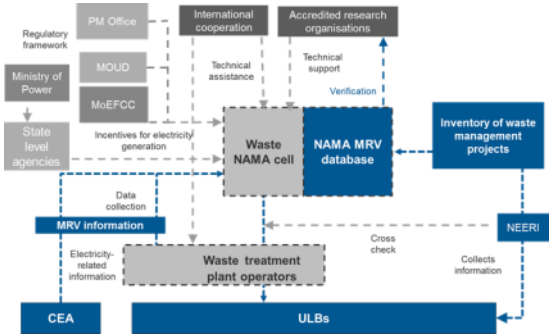
Challenges and barriers in MRV design

- Assigning MRV tasks to **institutions** and defining information flow
  → Need of coordination between different NAMAs within the country and with INDC monitoring
  → Need of institutional sustainability and stability
- Key success factor for MRV implementation is a long-term **capacity building** and **training** strategy
- Monitoring of **co-benefits** (social, environmental, economic – *local or national impacts*):
  → diffuse impact chains – achievements are sometimes difficult to be attributed to the NAMA



Institutional set-up – example India

Challenges and barriers in MRV design

- MRV needs to cope with different stakeholders with **multiple interests and levels of NAMA activity**: beneficiaries, financing institutions (donors), national climate policy coordination bodies, local population, national financial sector, etc.
  → e.g. high relevance for host countries and sectors: **co-benefits** and domestic environmental and **development benefits**
  → high relevance for donors: GHG **emission reductions** and **avoid reputation damage**
  → confidentiality of private sector data
- Thorough sustainability assessments are frequently required that consider **environmental and social concerns of stakeholder groups**

Specific problems in baseline definition – example Peru

Baseline required a **comprehensive national solid waste inventory**

- Peru's waste sector already had a monitoring and reporting system (**SIGERSOL**) → with a usage rate of only 62%, the main reason being lack of training of key staff and staff rotation
  → use of results had severe limitations
- **Current disposal practices** represent
  → high risks for population, waste collectors on the sites and the environment
  → GHG mitigation not taken into account
- **Inventory activities**:
  → 156 interviews with municipalities
  → visits to the regions and the country´s main disposal sites and other facilities
  → 3 extensive MSW characterization studies in different climatic areas
  → stakeholder workshops, interviews with authorities and private sectors

Burning disposal site near Trujillo, Northern Peru

Baseline definition – example Peru

- **Inventory activities**:
  → analysis of 98 MSW characterization studies, 45 MSW Management Plans, 34 Integrated Plans for Solid Waste Environmental Management, 148 Public Investment Projects, numerous technical studies of SWM projects etc.; 81% of Peru´s urban population covered
- **Municipality groups** according to **disposal practices, city size and climate**; only **urban sectors** because rural sectors have little waste collection service and disperse final disposal
- **Matrix with Peru's 1838 districts**, interpolated / weighted complex statistical processing
  → reliable figures for all districts by 2012

Component	2010	2012	2020	2030
Organic Waste (food)	53,5%	52,6%	46,7%	40,6%
Inerts and others, including plastic, glass and metals	33,1%	33,3%	38,4%	43,9%
Paper and cardboard	6,9%	6,7%	6,3%	5,2%
Diapers	3,7%	4,5%	5,9%	7,6%
Gardens and parks	1,4%	1,4%	1,4%	1,2%
Textiles	1,3%	1,3%	1,3%	1,4%
Wood	0,1%	0,1%	0,1%	0,1%
Total	**100,0%**	**100,0%**	**100,0%**	**100,0%**

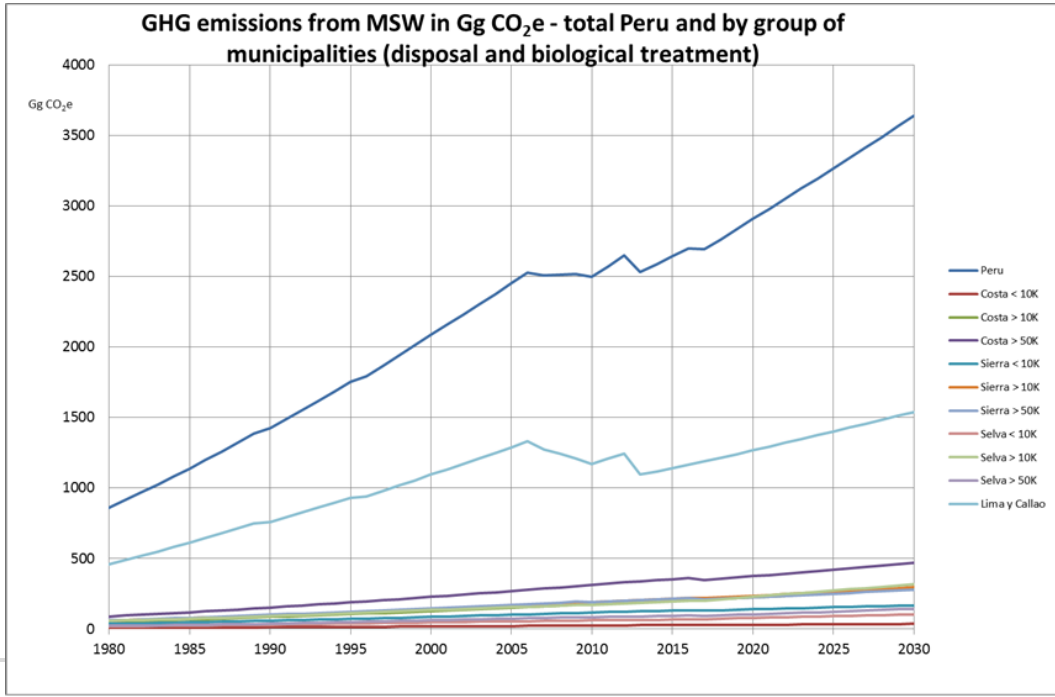
- Estimation of **baseline GHG emissions**:
  Bottom-up approach, IPCC 2006 Tier 2 Inventory guidelines with use of some default values
- **Underlying data**:
  population and migration data, GDP (per capita), consume patterns, waste policies and legislation, current / expected projects, etc.

Baseline definition – example Peru

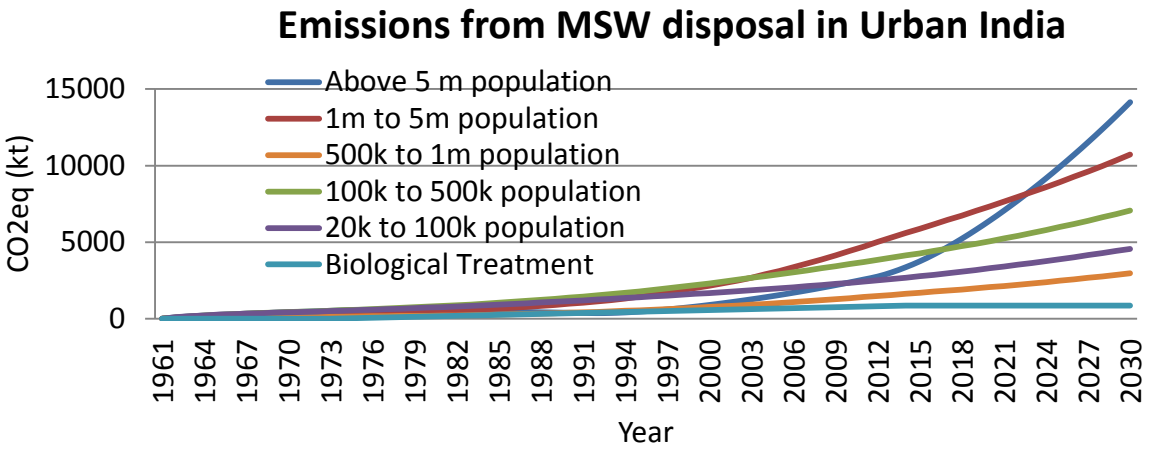
Baseline (BAU scenario): Conclusions and results

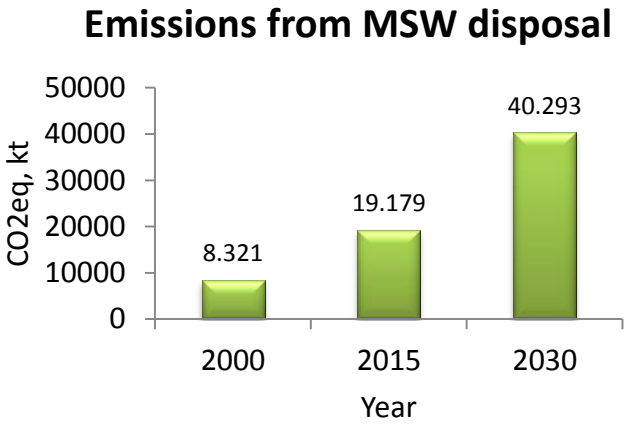
- Many **already approved SWM projects**: they will determine SWM for an important part of the country over **the next 20 years**
- GHG emissions will steeply increase due to **replacement of dumps by sanitary landfills**
- Mitigation considerations (low-emission technologies) to be mainstreamed in project planning;
  → **Critical moment** with opportunity for **NAMA supported mitigation projects**
- Sector emissions over-estimated in previous GHG inventories due to extrapolations based on wrong assumptions, default factors and TIER 1 approach

GHG emissions of MSW sector: History and BAU scenario until 2030



Baseline definition – example India





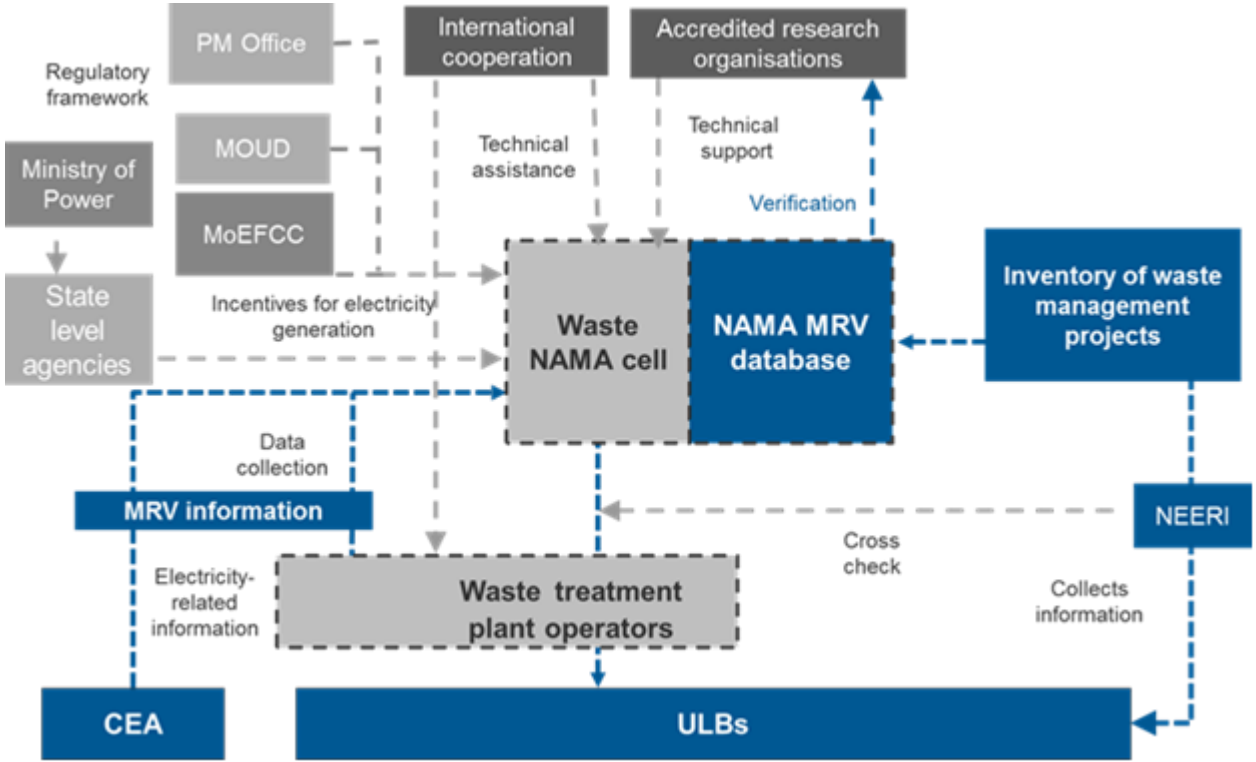
Baseline (BAU scenario): Conclusions and results

- GHG emissions from solid waste disposal to be doubled by 2030
- Cities with >1 million population will contribute >50% of total emission by 2030
- There will be 68 such cities by 2030; hence these cities should be targeted first under SWM NAMA

MRV for SW NAMAs: Parameters and institutions - India

Field of Monitoring	Method	Parameters to be monitored	Institutions involved
Mitigation options: **RDF and/or Composing**	CDM methodologies for mitigation option, adapted if necessary System rigidness will depend on support mechanisms; e.g. higher for mitigation options fostered by "result-based financing" and / or for internationally supported mitigation options	Parameters indicated by respective CDM methodologies, adapted if necessary Sustainability indicators - Direct impact: subset of indicators, e.g. no. of employments created through new composting plants e.g. generated renewable energy (MWh/a) Indirect impact: difficult to measure	Monitoring and reporting: ULBs and plant operators Data compilation: SPCB Verification: NEERI and accredited institutions Coordination: Waste NAMA cell
Prioritized policies: Output-based incentives, viability gap funding	Causal impact chain model	Inputs / activities: e.g. technical assistance for adapted legislation Outputs: e.g. proposal of adapted legislation Use of outputs: e.g. by political decision makers within legislative process Direct impact: e.g. adapted legislation in force Indirect impact, sustainability indicators	Monitoring and reporting: Coordination: Waste NAMA cell Verification: to be defined
NAMA support	Causal impact chain model	Inputs / activities, outputs, direct impact, indirect impact	Monitoring and reporting: Supporting organizations and Waste NAMA cell Data compilation: Waste NAMA cell Verification: to be defined

MRV for SW NAMAs: MRV and management structure – India



perspectives climate change

Thank you

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NAMA Facility

Challenges in designing NAMAs in the waste sector

Experiences from the NAMA Facility portfolio

Dr. Sören David, Head of the Technical Support Unit to the NAMA Facility

Presentation at the occasion of the IFAT 2016
Munich, 2 June 2016

NAMA Facility

On behalf of
Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety

Department of Energy & Climate Change

DANISH MINISTRY OF ENERGY, UTILITIES AND CLIMATE

European Commission

Overview

I Introduction to the NAMA Facility

II Portfolio overview

III Potential for projects from the waste sector

IV Challenges in designing NAMA Support Projects (NSPs)

Introduction - the NAMA Facility

Background

The Bali action plan passed in 2007 established the concept of NAMAs. The term refers to a set of policies and actions aimed at transformational change which countries undertake to reduce greenhouse gas emissions.

Aim

Supporting countries implementing ambitious NAMAs aiming at transformational change

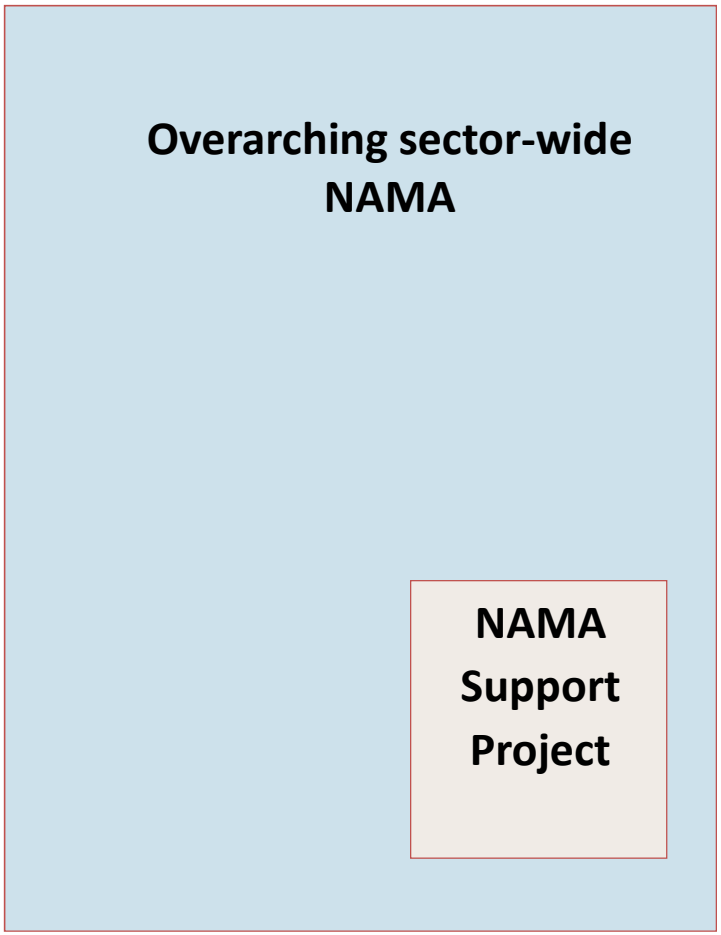
Who we are

- A multi-donor fund
- Jointly established by Germany (BMUB) and Great Britain (DECC) in 2013
- Denmark and the European Union joined in 2015 as additional donors
- Secretariat (Technical Support Unit) based in Berlin
- Total funding made available through the Facility since its inception: EUR 202 m.

What we do

- We provide funding for a combination of financial and technical measures
- We hold annual competitive bidding rounds (Calls) to select projects for funding
- The 4th Call is currently under preparation to be launched in 2016

NAMA Support Project within the NAMA



Example: Colombia – Transit-Oriented Development

The NAMA aims at:

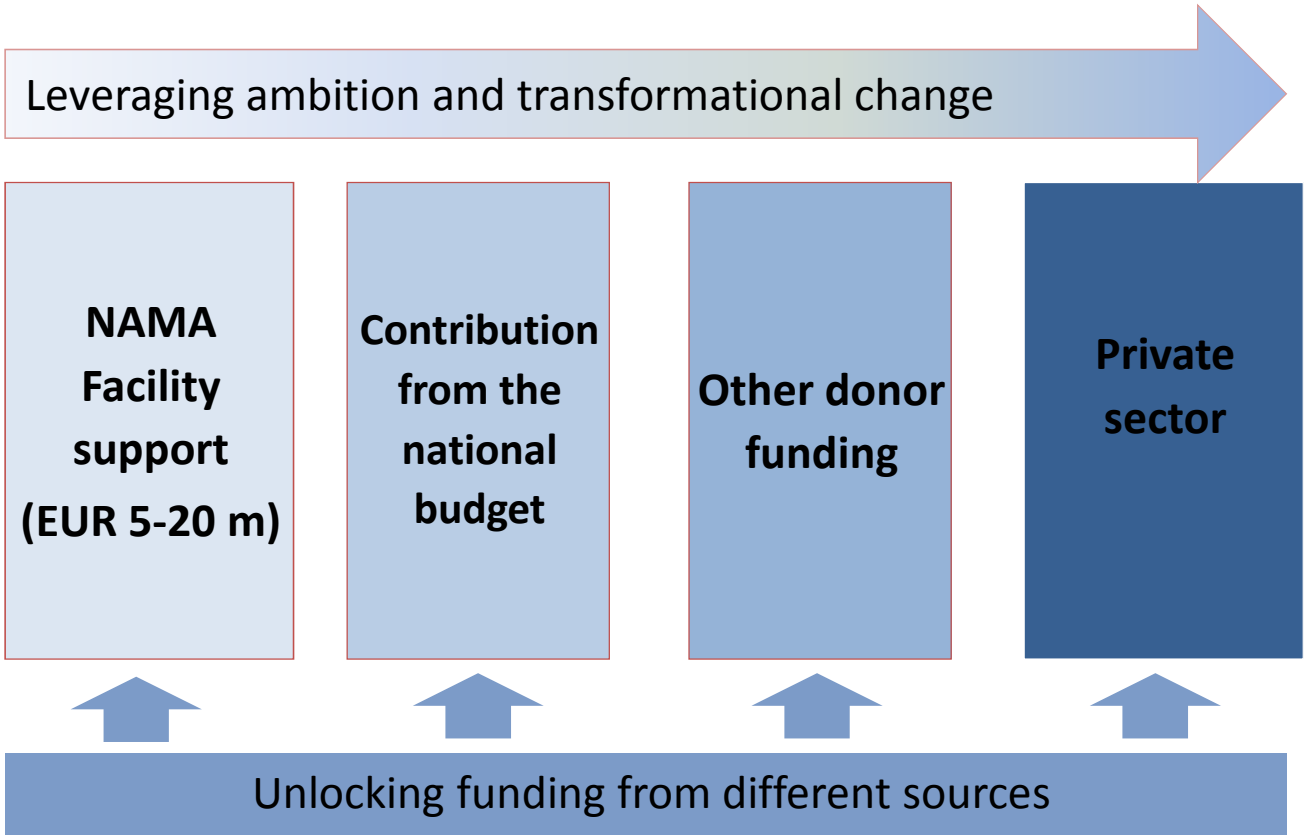
- transforming urban development
- shifting public and private investment in mass transit and social housing to increase its contribution to sustainable urbanization (environment, economic and social return) on a national scale

The NSP focuses on:

- Channelling public and private investment to implement projects across a range of locations and intervention types
- Showcasing better-designed, walkable, transit-oriented neighborhoods

Showcases from NSP to be replicated nationally within NAMA (→ transformational change)

Financing concept for a sector-wide NAMA



Means of support

Outcome of NAMA Support Project

e.g. GHG mitigation investments

Outputs

Financial Cooperation
e.g.:
- Investment grants
- Concessional loans
- Guarantee funds

Technical Cooperation
e.g.:
- Training and capacity building
- Feasibility studies
- Development of bankable project
- Knowledge exchange

Project example: Mexico

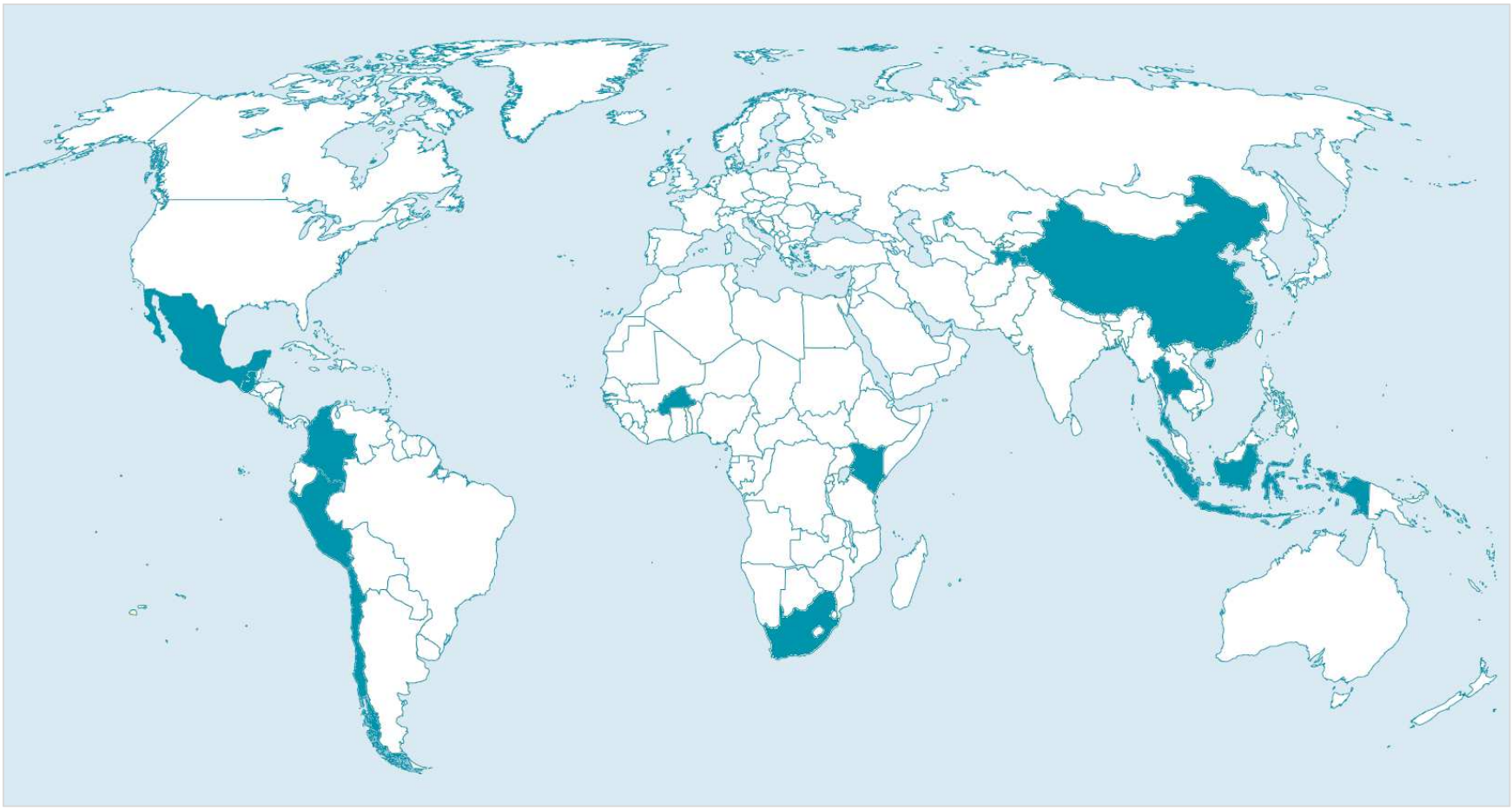
- Promotion of energy efficiency standards in the entire Mexican market on new built houses
- Emission reduction: 0.2 Mt CO2e in 2020, up to 2.7 Mt CO2e after 20 years of life span
- Co-benefits: better quality of life at lower costs, reduced energy consumption, job creation in the construction sector, creation of new markets for energy efficient system components

Photos: GIZ Mexico

Financial cooperation component:

- Guarantees for financial intermediaries at attractive premiums to facilitate developers' access to commercial financing
- Grants to small and medium-sized project developers to partially offset the investment costs of energy efficient technologies and specific advisory services to identify and prepare suitable projects and obtain further funding

NAMA Facility portfolio



Africa: Burkina Faso, Kenya, South Africa
Americas: Chile, Colombia, Costa Rica, Guatemala, Mexico, Peru
Asia: China, Indonesia, Tajikistan, Thailand

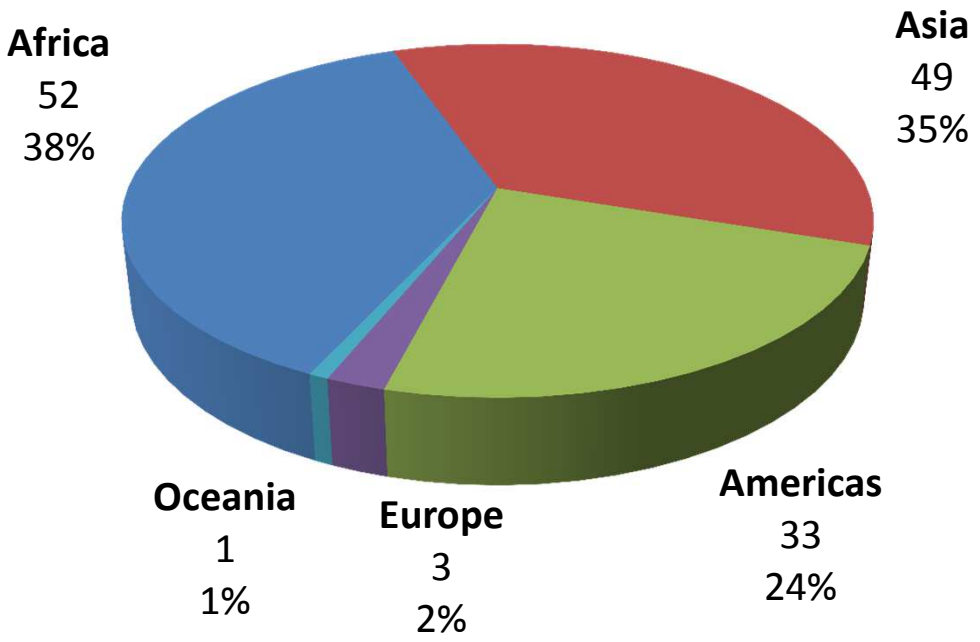
NAMA Facility - portfolio overview

Sector	Country	NAMA Support Project (NSPs)	Funding volume (Mio €)
Energy efficiency	Mexico	sustainable housing	14
	Thailand	industrial refrigeration and air conditioning	15
	Colombia	domestic refrigeration	9
	Guatemala	efficient use of fuel and alternative fuels in individual households and rural communities	11
	South Africa	energy efficiency in public buildings	19
Agriculture	Costa Rica	low-carbon coffee production	7
Transport	Indonesia	sustainable urban transport	14
	Colombia	Transit Oriented Development (TOD) NAMA	15
	Peru	sustainable urban transport	9
	Kenya	mass rapid transport system for Nairobi	20
Renewable energy	Chile	self-supply with renewable energy	15
	Burkina Faso	biomass energy	14
Forestry	Tajikistan	Sustainable public forestry	13
Waste	China	integrated waste management	8

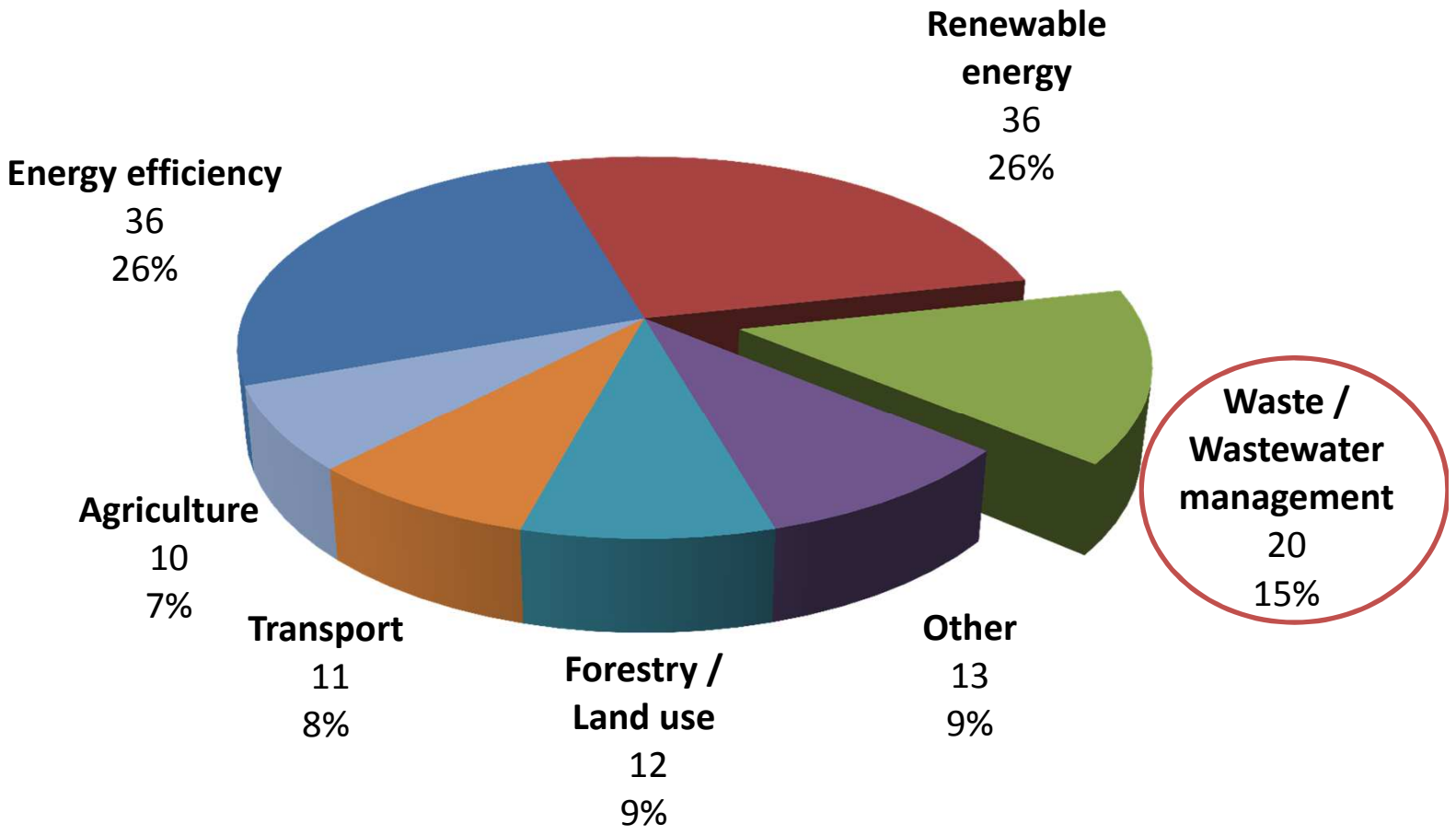
NAMA Facility portfolio – proposals received by region

Total Outlines: 138

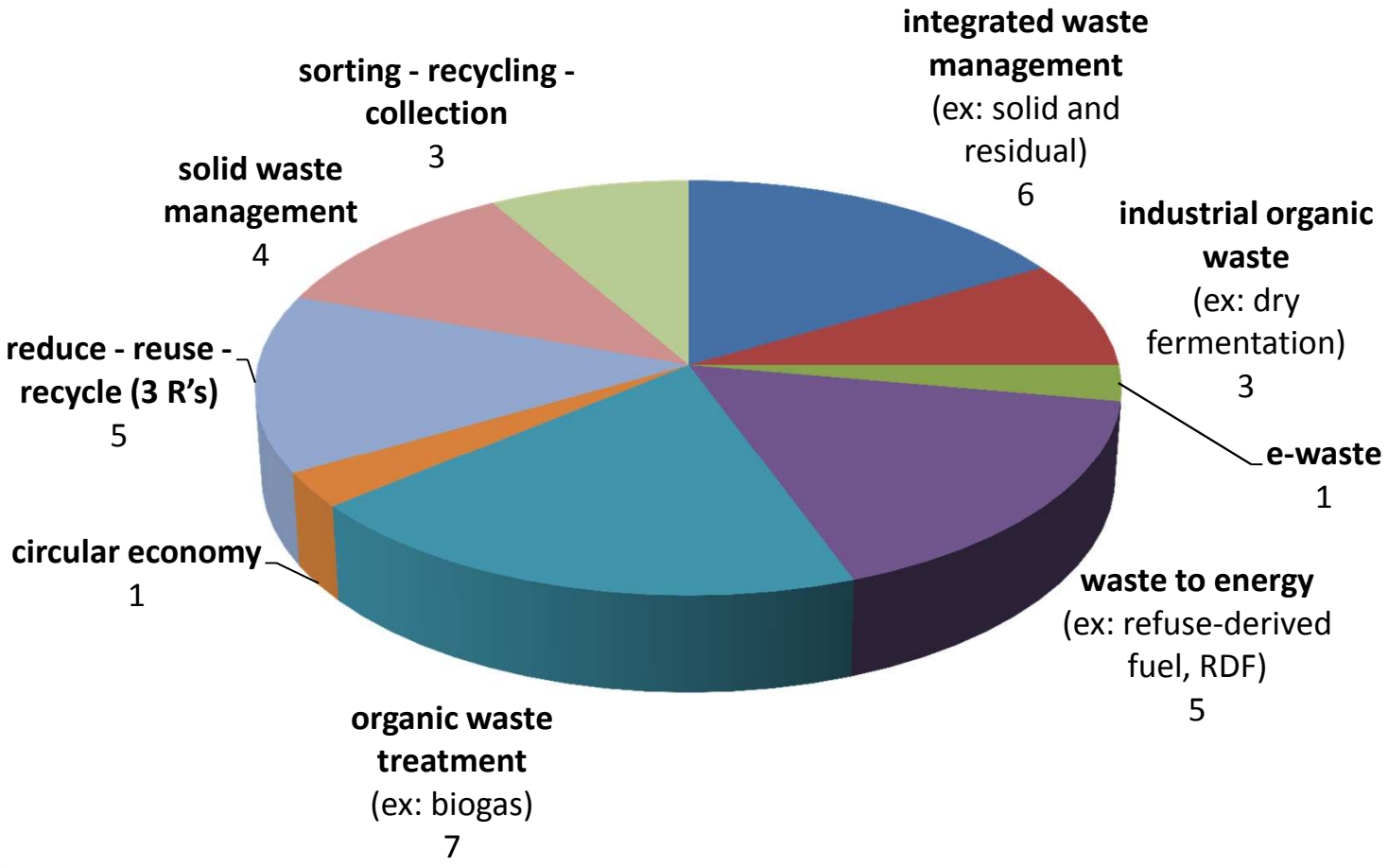
1st Call: 47
2nd Call: 49
3rd Call: 42



NAMA Facility portfolio - proposals received per sector



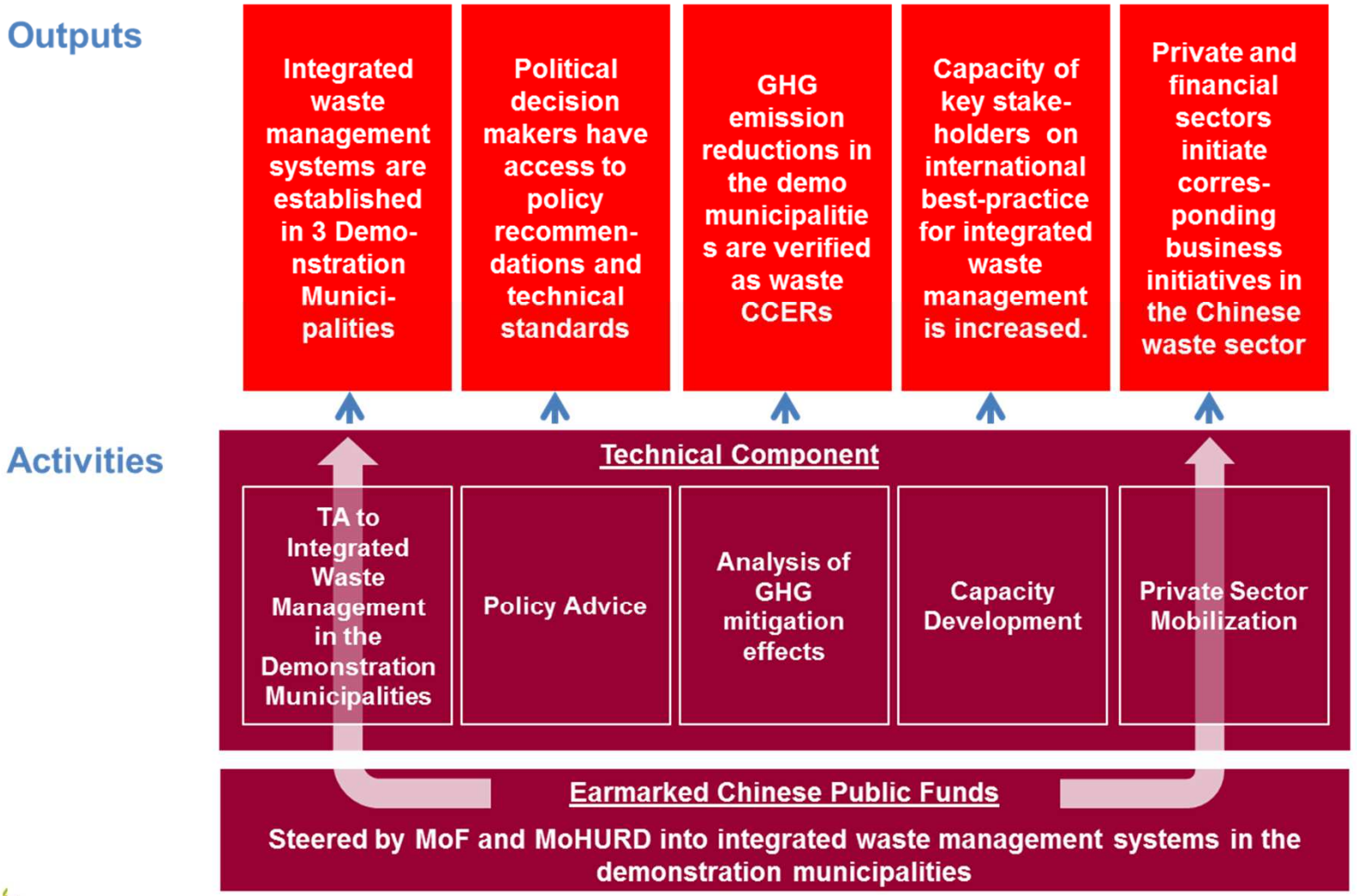
Potential for projects from the waste sector – Elements in the 12 proposals from the waste sector



Potential for projects from the waste sector – Project example China

- Demonstrate in 3 municipalities how **integrated waste management** and **waste-to-energy systems** can be operated profitably
- Direct emission reductions: 210,000 - 400,000 tCO2e/year depending on waste composition and technologies applied
- Co-benefits:
  - reduced leakage-induced groundwater pollution
  - better food safety due to the improved hygienic quality of waste fed to livestock
  - employment of “waste pickers” as qualified waste sector workers through appropriate training approaches

Potential for projects from the waste sector – Project example China cont.



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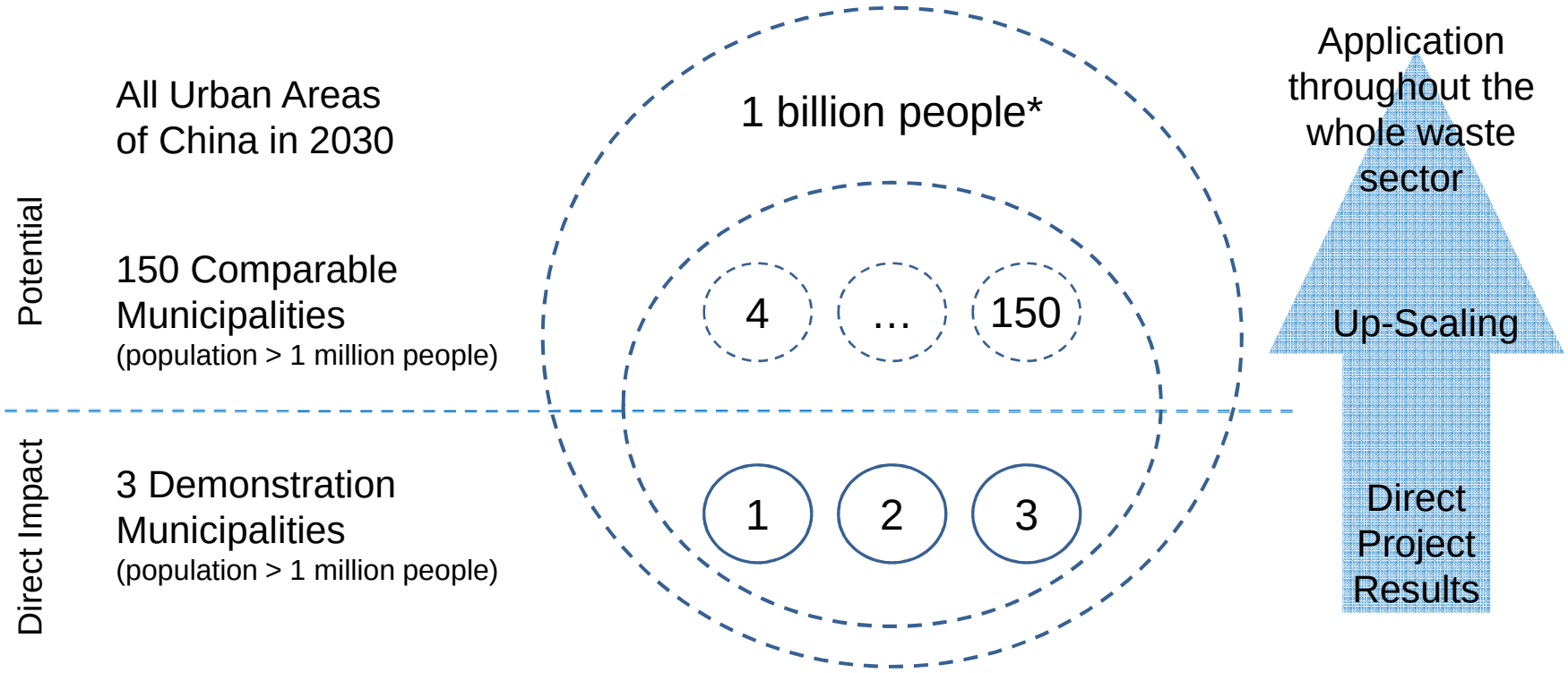
Potential for projects from the waste sector – Project example China cont.

Up-Scaling Potential in China



*Source: * World Bank : Urban China, Toward Efficient, Inclusive and Sustainable Urbanization; 2014*

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Challenges for designing NSPs – reasons for non-eligibility of outlines

Formal requirements

- Requested funding not within the required EUR 5-20 m.
- Project duration (maximum is 5 years)
- Lack of support letters
- Outline document handed in incomplete

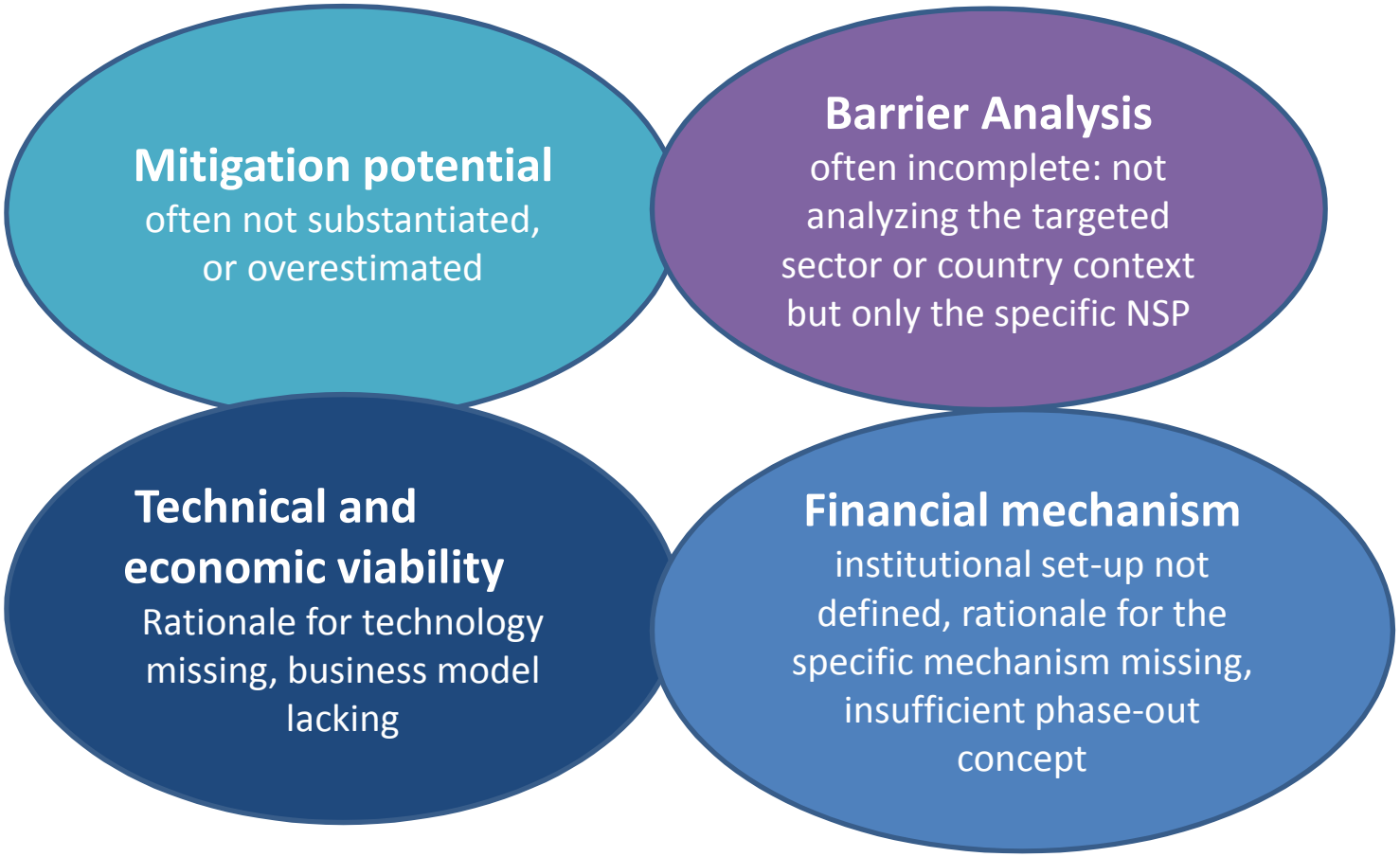
NAMA Support Organization

- Outlines handed in by organizations with insufficient FC know-how

Implementation readiness

- Research projects, technological pilots and unsound financial mechanisms – all do not qualify

Challenges for designing NSPs – reasons for insufficient ambition and feasibility



Key elements of a strong NAMA: transformational change

- Transformational change is 'abrupt'.
- Transformational change is 'radical'.
- Transformational change is 'permanent'.

Key elements of a strong NAMA: abrupt change

Since its inception the NAMA Facility has insisted on supporting implementation. Implementation means actual mitigation action (which is permanent and at scale). This has been the hardest objective to pursue, particularly implementing a significant deviation from business as usual scenarios in the short term. It means that initial finance (the NAMA Facility and beyond) has to be deployed through a financing mechanism from the beginning, not at the end, of NAMA Facility involvement.

Example of insufficient abruptness:

Today, there are almost 12 million units and the expected outcome is financing contracts for at least 60,000 units **signed between partnering banks and consumers and fleet operators by 2022** (approximately 60% purchased by fleet operators and 40% by consumers).

Key elements of a strong NAMA: permanent change

The NAMA Facility's financial participation is temporary, whereas a permanent change normally requires a permanent financial structure to keep things from falling back to where they came from. How will the funding from NAMA Facility phase out and **what phases in at its place**?

Example of insufficient phase in:

The firewood sub-sector is a priority for mitigation of climate. It also complements the National REDD+Strategy **which has financing for a Forest Investment Program line of work focused on sustainable management of firewood.** The participation of the private sector, consolidation within the framework of policies and the institutionalization of the proposed instruments, **will allow the flow of resources and political support to secure the long-term sustainability.**

Key elements of a strong NAMA: radical change

The NAMA Facility's financial strength is limited and rarely enough to institute a transformation on its own. We use 'scale up' and 'replicability' to signal this, but even in the time window where the Facility is active significant co-financing is commonly necessary. In most cases the national budget needs to be activated.

Example of insufficient scale:

Today, **there are almost 12 million units** and the expected outcome is **financing contracts for at least 60,000 units** signed between partnering banks and consumers and fleet operators by 2022 (approximately 60% purchased by fleet operators and 40% by consumers).

Thank you for your attention!

- Further information on www.nama-facility.org
- or contact the Technical Support Unit at contact@nama-facility.org

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Department of Energy & Climate Change

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European Commission

ANNEX 2

Climate-friendly Waste Management through NAMAs in Emerging Economies and Developing Countries

IFAT/ Side Event, 2 June 2016, 10:00 – 14:00

Exhibition Hall A3, Room A31/A32 – IFAT Fair Munich

Modern waste management technologies can lead to significant GHG reduction. In the context of international climate policy the concept of Nationally Appropriate Mitigation Actions (NAMAs) allows to design waste management strategies that lead to such reductions.

NAMAs focussing on waste management are rare and confronted with substantial challenges in implementation. This side event will bring together international experts from climate policy and waste management to exchange experiences on Waste-NAMAs.

9:30 – Registration

10:00 – Welcome
Volker Weiss (German Environment Agency)

10:05 – Presentation: Waste Management-NAMAs in India and Latin America - Experiences from design of MRV and policy instruments
Axel Michaelowa (Perspectives Climate Group) & Jan Janssen (assoc. consultant, Perspectives)

10:45 – Presentation: Challenges in designing and implementing NAMAs in the waste sector - experiences from the NAMA Facility portfolio
Sören David (NAMA Facility)

11:15 – Break

11:30 – Panel Discussion
Andreas Jaron (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety), Karsten Karschunke (German Environment Agency), Sören David (NAMA Facility), Wolfgang Pfaff-Simoneit (KfW Development Bank), Kamna Swami (GIZ India), Axel Michaelowa (Perspectives Climate Group),
Moderator: Jan Janssen

12:45 – Conclusions
Anja Schwetje (German Environment Agency), Axel Michaelowa, Jan Janssen

13:00 – Workshops on selected NAMA case studies
Round Tables with experts for in-depth discussion of Waste-NAMA Design

Umwelt Bundesamt

Registration and Participation is free of charge. Please provide your name and organization by 30 May 2016 to friedmann@perspectives.cc

perspectives climate group