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Joint ICTP-IAEA College on Identification and Assessment of Nationally Appropriate Mitigation Actions (NAMAs) in Energy System Development to Help Combat Climate Change

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National Appropriate Mitigation Actions

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Under the first funding round opened in 2013, 47 projects applied, with 14 million euros awarded to Mexico to cut energy use in homes by introducing efficiency standards across all new housing stock.

Other projects earmarked to receive cash are plans to help roll-out renewable power subsidies in Chile, to better integrate public transport in Colombia and Indonesia and to introduce less carbon-intensive ways of growing coffee in Costa Rica.

The funds form part of the climate aid plans for Britain and Germany.

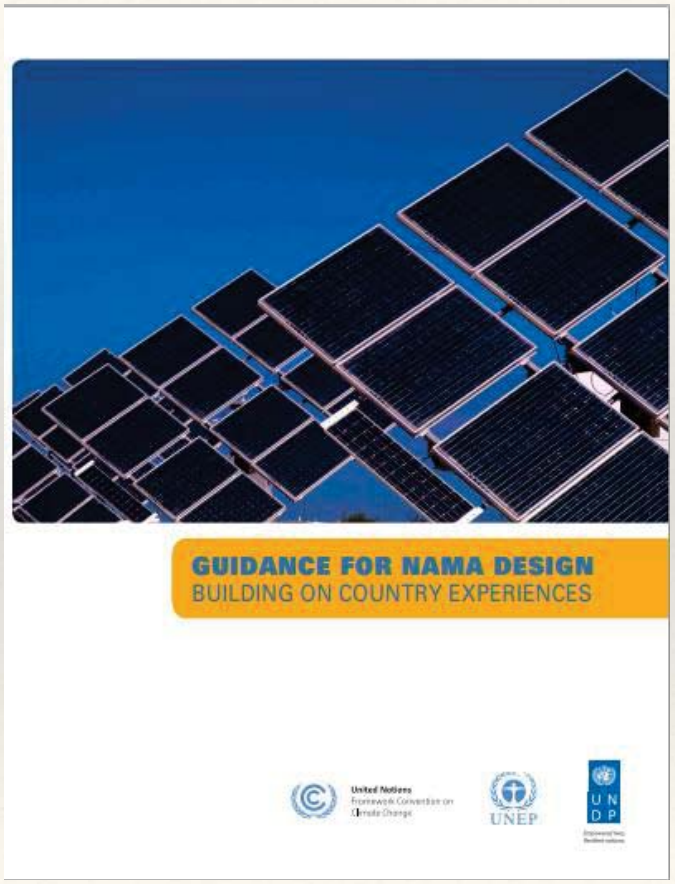
All nations have pledged to provide up to $100 billion a year in climate aid by 2020 to help the world's poorest countries to cut emissions and adapt to climate change.

Under a U.N. agreement in 2010, all developing nations agreed to produce NAMAs. Some 95 have been outlined in 35 countries, according to a database maintained by Dutch consultancy Ecofys.

http://www.trust.org/item/20140409094406-pywab/

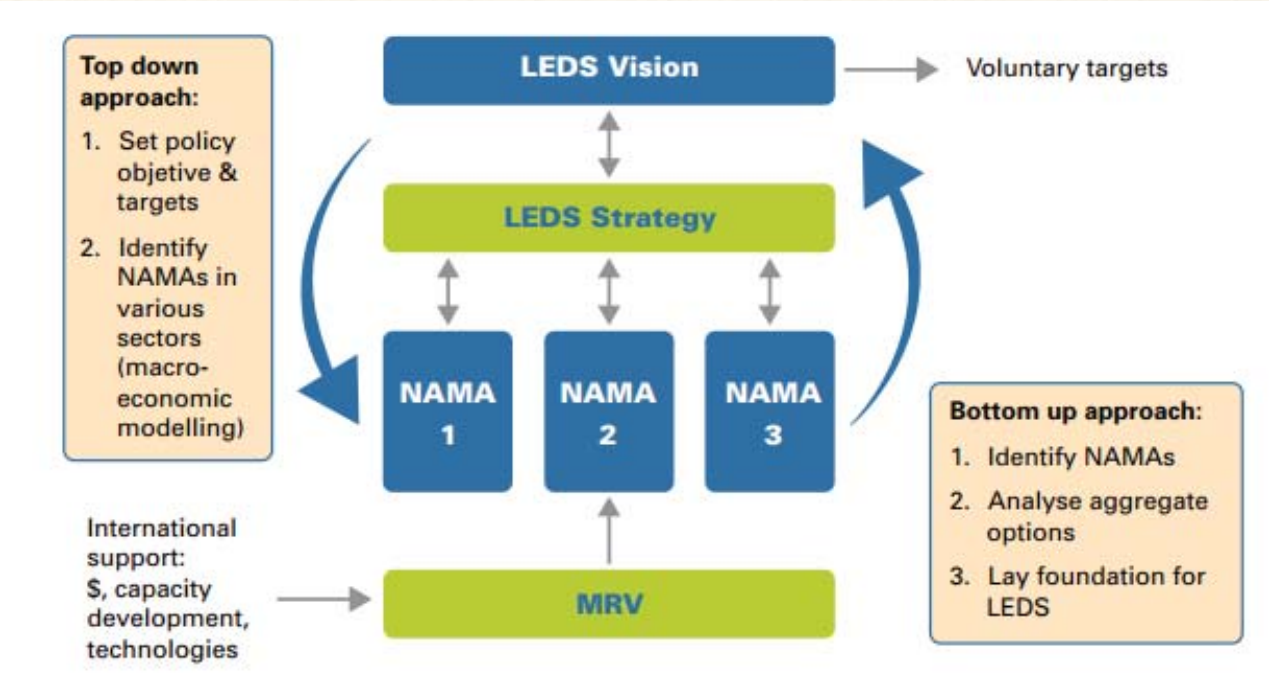
Contents

- Introduction to NAMAs
- Identification and prioritization of NAMAs
- How to structure NAMA financing
- The NAMA development process
- Measurement, reporting and verification (MRV) of NAMAs
- Quantifying the impact of NAMAs



Introduction to NAMAs

- Nationally Appropriate
- **Policy** versus **project** level
- **Unilateral** and **supported** NAMAs
- Low Emission Development Strategies (**LEDS**)
  - National commitments and voluntary targets
  - Determine NAMA's
  - NAMA's aggregated into LEDs
- MRV needed for applications



CDM versus NAMAs

	CDM	NAMA
Definition	One of the flexible mechanisms of the Kyoto Protocol. It provides locational flexibility of emissions reduction, hence allowing emissions reduction undertaken in a developing country to offset emissions in a developed country, typically through a trading agreement.	Voluntary activities for GHG emissions mitigation in developing countries that are led by local governments and are not subject to mitigation commitments under the UNFCCC.
Objective	Assist developing countries in achieving sustainable development, and also assist developed countries comply with their mitigation commitments under the Kyoto protocol.	In the context of sustainable development, achieve deviation from business as usual emissions
Actions	Projects and programmes of activities	Policies, programmes and projects
Initiator	Private sector or public sector	Typically public sector
Investment driver	Normal returns from the market that the project activity addresses, with the addition of returns from Certified Emission Reductions (CERs). CERs are issued by the CDM Executive Board based on project verification reports. CERs can be traded on carbon markets.	The sustainable development priorities of the host country, with possible added benefits from including emissions reduction in policy planning. The NAMA may attract international financial participation and it may include the generation of business opportunities for the private sector, who will invest for profit motives.
Requirement	Reductions in emissions must be in addition to any that would occur in the absence of the certified project activity. CDM also assists developing countries in achieving sustainable development.	A NAMA, framed in the context of sustainable development, aims at achieving a reduction in emissions relative to BAU, by 2020.
Financing	Upfront financing, generally from the private sector. Certificates are issued ex post facto, based on regular verification reports. CERs can be sold on a carbon market.	Domestic resources and/or international support (e.g., through biliateral/multilateral agreements, development banks) for the preparation and implementation of NAMAs.
Rulebook	Marrakesh Accords and subsequent body of CDM Executive Board decisions.	Limited guidance currently being developed under the Convention.

Information and status

- **UNFCCC NAMA Registry**: UNFCCC's registry of NAMA proposals for the purpose of seeking international support, facilitating matching financing, seeking technology and capacity-building support and sharing knowledge about NAMAs.
- **UNFCCC Secretariat**: A compilation of information on NAMAs to be implemented by developing countries.
- The NAMAs communicated after the UNFCCC Conference of the Parties (COP 15) in Copenhagen have been compiled into an **information document**. The original submission of these NAMAs as well as recent developments can be found on the UNFCCC **mitigation page**. Other developing countries have subsequently communicated their intentions to implement NAMAs, and these have been compiled into a **miscellaneous document** and one addendum. Three other countries (Burkina Faso, Gambia and Guinea) have also communicated NAMAs to the Secretariat.
- **NAMA database by Ecofys**: The NAMA wiki contains a database of NAMAs and related activities around the world. The aim is to share information on these activities, so that countries and other participants are able to learn from these experiences and gain insights into how to undertake mitigation activities within the NAMA framework.
- **UNEP Risø Centre NAMA Pipeline Analysis and Database**: This database contains all submissions of NAMAs to the UNFCCC. The site is not a registry, but rather a less formal overview of NAMAs submitted to the registry. It includes submissions that preceded the establishment of the NAMA Registry. These consist mainly of the aforementioned communications subsequent to COP 15 in Copenhagen.

Criteria for prioritizing NAMAs

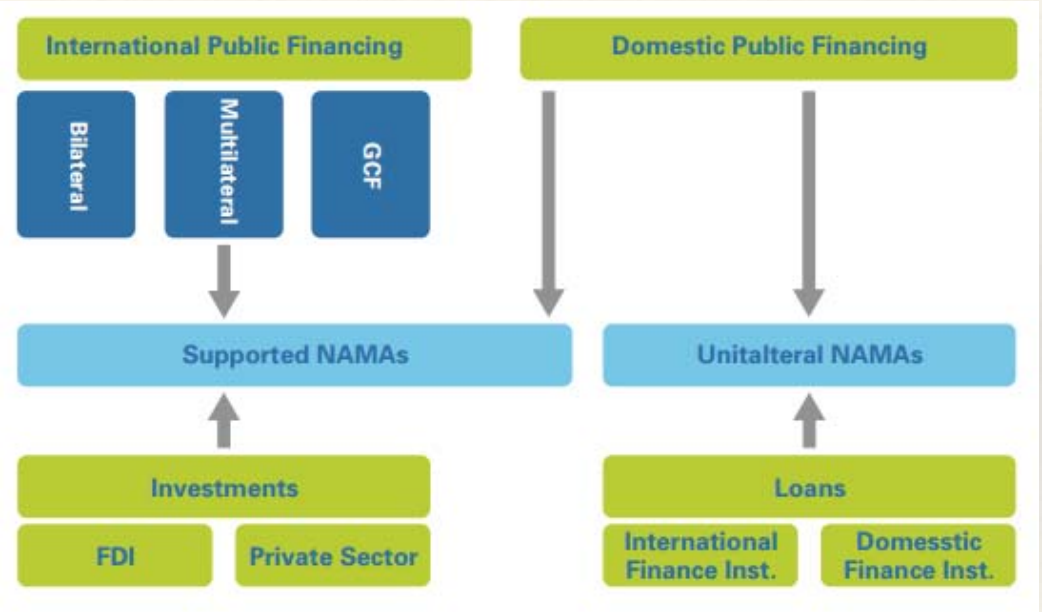
Sustainable Development Benefits	Materiality of benefits for the host country, such as: • savings in household energy bills • general public-health improvements • jobs creation • reduction of congestion • reduced air/water/soil pollution • improved training and education options
Relation to national strategy and national climate policies as well as existing programmes and initiatives	NAMAs related to national climate policies have better chances of success. Consider: • national capacity to implement the NAMA • compatibility with priority sectors of national development plans • probability for broad political consensus • potential for widespread implementation/replication • stakeholder level of support and opinions • positive impacts on other sector policies
Potential GHG mitigation	GHG emission reduction potential
Financing	The financing model of the NAMA may determine its attractiveness: • flexibility of the financing model • options for leveraging financing from budgets outside the national finance bill • compatibility with acceptable modes of implementation • attraction for international financiers • possibility of generating additional income from the initiative, or reducing costs in other sectors • bankability/financial sustainability

Criteria for prioritizing NAMAs

Transformation	The long-term emissions reduction effect may be influenced by the: • permanence due to the nature of the proposed change • chance of influencing behaviour of central stakeholders • degree to which cash flows are altered
National economy considerations	The NAMA: • promotes national industry • benefits existing national suppliers or enables the development of new national industry • shifts technology to substitute imports • supports national technology development • offers capacity building and training • is easy to implement
Others	• access to data in support of MRV • social acceptability • access to required technologies • risks associated with the NAMA • businesses co-benefits such as competitive edge, securing future market shares, liability management, etc.

Financing

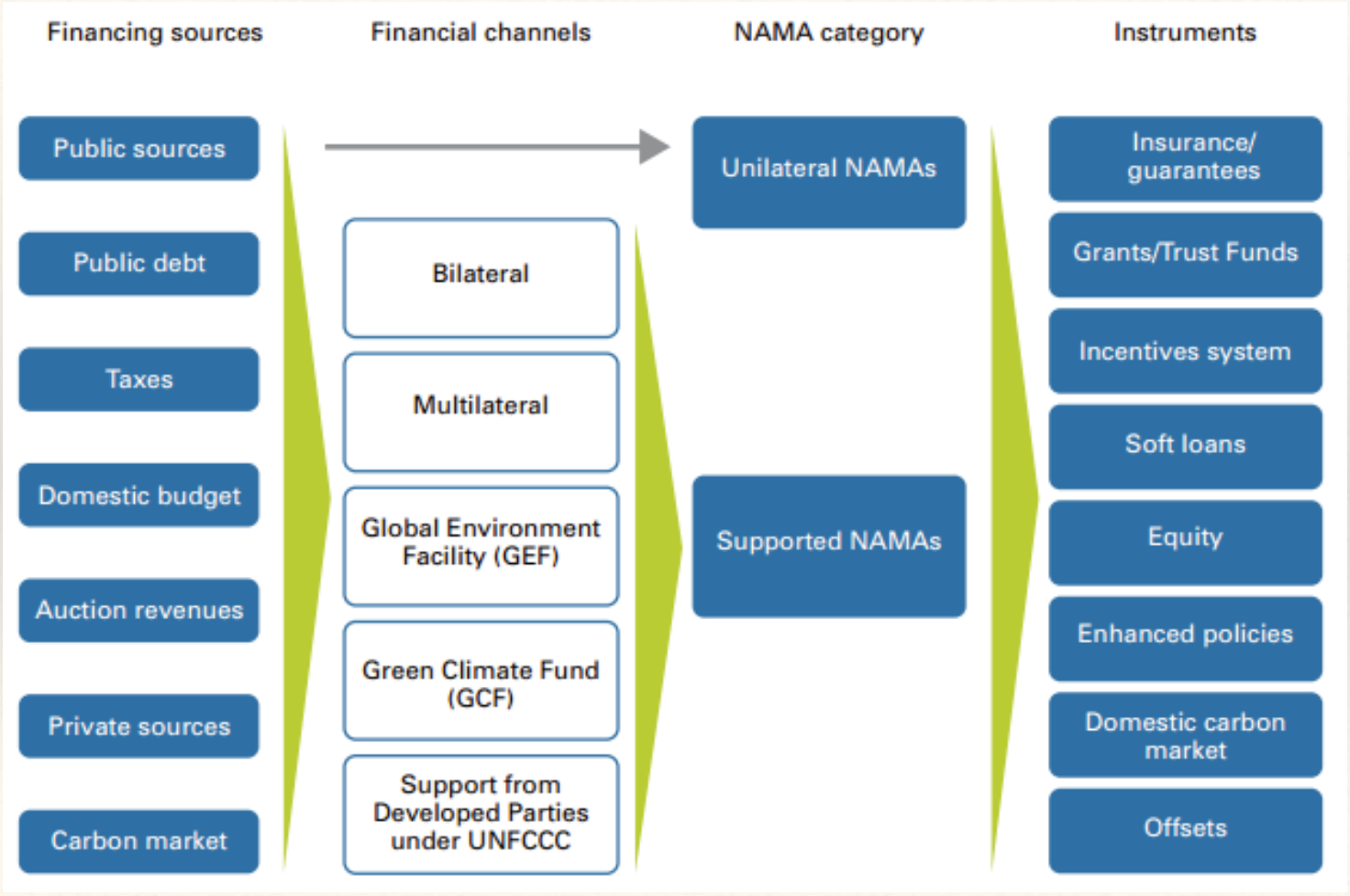
- The financial point of departure: The current budget
- The NAMA financing proposal
- Involving the private sector
- Key issues when approaching the first financier



The NAMA financing proposal

- **Cost-benefit overview: The total costs of implementation - by illustrating alternative scenarios - of the planned measure(s) and indication of the direct benefits of the measure(s), including emissions-reduction benefits as well as other kinds.**
- Financial instruments: Information on potential financial instruments to be employed and the conditions that must be met in order to use each. This includes financing of other NAMA elements.
- Governance: Identification of a domestic authority that serves as the communications partner. If there is a financial aggregator, this should also be identified. These are the stakeholders involved in structuring the NAMA financing and who may also be capable of facilitating the implementation process.
- Major risks and barriers: Identification of likely obstacles that may threaten cash flows and delay or hinder the implementation and successful operation of the NAMA.
- MRV system: This is necessary documentation that helps to justify involvement in climate financing
- Domestic and international support: Financing that is provided through the national budget should be highlighted. Additional financial instruments sought from other sources should be described, if possible, providing alternative approaches.

Potential financing streams

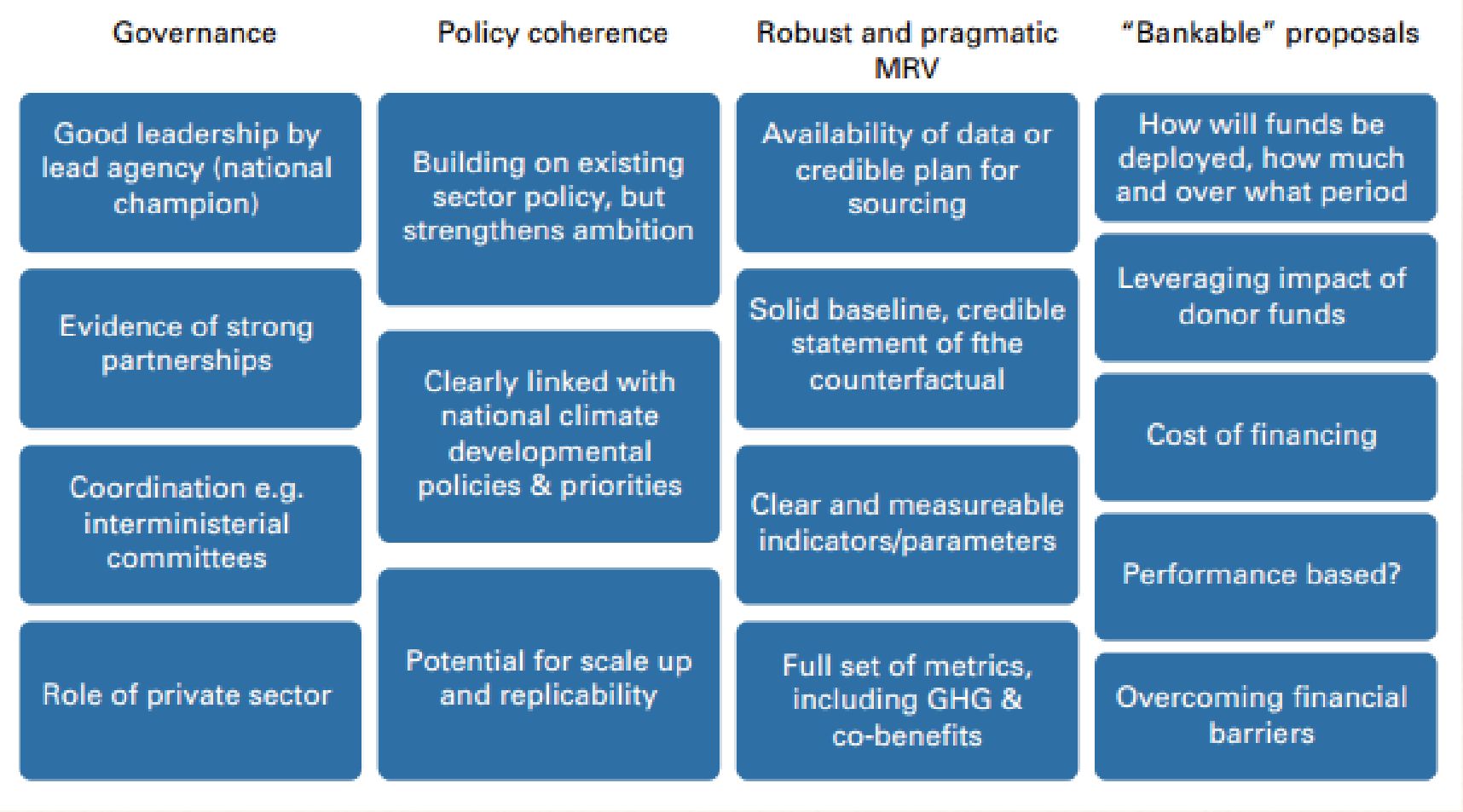


For reference only
–Instruments on offer

Instrument	Characteristics	Typical providers
Equity	Investments made directly in projects or operating assets by investors who assume a portion of ownership relative to their provision of capital.	Private companies, individuals, venture funds, publicly funded venture funds (hybrids), pension funds
First-loss	A tranche of finance that, in the event of a default, takes the first loss, before other tranches. Also called "mezzanine financing" or sometimes "junior debt". May be regarded as a hybrid of debt and equity.	Private companies, venture funds, publicly funded venture funds (hybrids)
Loans	Traditional debt financing on standard terms (market rate and tenor), commonly provided by banks, including development banks.	Banks, development banks, publicly funded venture funds (hybrids), pension funds
Soft loans	Loans on favourable terms (below market price) with low interest rates, long maturities and possible grace periods. A subset of soft loans are mixed credits which, according to OECD rules, must contain at least a 35% grant element.	Bilateral donors (through commercial banks), multilateral development banks
Bonds	A debt investment in which an investor loans money to an entity (corporate or governmental) that borrows the funds for a defined period of time at a fixed interest rate. The bond (i.e., the debt) may be traded at an exchange and bought by anyone.	Financial arrangers such as banks and credit institutions, large corporations, governments
Dedicated credit lines	Lines of credit (debt finance) for investing in projects that meet specified criteria, e.g. related to climate change. Credit lines are typically established by development banks or less commonly by public entities (government agencies) and channelled through a private sector bank or financial institution for the financing of (most often) private sector initiatives.	Multilateral and bilateral development banks
Risk cover instruments, guarantees	Several instruments provided by either the public or the private sector, most often in the form of insurance against certain events. Governments will typically provide political (policy) guarantees and government agencies may insure such guarantees; private sector entities may provide technical (technology) risk cover. Guarantees (except government guarantees) are paid for much like an insurance policy.	Export Credit Agencies, insurance companies, banks, governments, technology suppliers
Project Finance	Financing structured around a project's own operating cash flows and assets, without requiring additional financial guarantees by the project sponsors. Loans in a project finance structure are also called "non-recourse" lending. Project finance depends essentially on the structuring of the risk through risk-cover instruments.	All of the above
Grant	Provision of funds without expectation of repayment, using government budget allocations, and/or international financial institution/donor funds. An example would be funds provided to pay up-front costs of measures/projects.	Bilateral donors, philanthropic funds
Blending mechanisms	Blending facilities use grant funds to create a blend of debt and guarantee instruments from a number of financial institutions in order to provide a package of finance with attractive terms to meet project finance needs.	Both the Green Climate Fund (GCF)[21] and the NAMA Facility[22] have signalled their intent to provide a wide variety of financial instruments

Structuring NAMA financing

- Criteria for attracting Nordic Environmental Financing Cooperation (NEFCO) as a potential NAMA



NAMA Development Process (1): The '**Concept**' phase

- **identify and prioritise areas of national or sectorial development plans or policies in which GHG emissions reduction is feasible and desirable;**
- **visualise implementation modalities;**
- **describe possible policy instruments or measures required to make the emissions reduction happen;**
- **conduct initial cost estimates;**
- consider aspects of budgets and means of diverting existing funding or obtaining new funding;
- identify probable stakeholders, including possible financiers, and ways of engaging them;
- **establish baseline and mitigation emissions scenarios;**
- **describe the NAMA's prime benefits and co-benefits; and**
- **outline an MRV system.**

NAMA Development Process (2): The '**Development**' phase

- **defining the status quo of GHG emissions and making projections at BAU and mitigation levels;**
- formalising MRV mechanisms and other **evaluation tools**;
- fleshing out the details of the NAMA;
- continuing to engage financial and other stakeholders;
- defining the responsibilities of the actors involved; and
- formalising and submitting all necessary documentation.

NAMA Development Process (2): The '**Implementation**' phase

- the NAMA activity is launched;
- initial feedback is recorded;
- stakeholder engagement continues;
- the legal/institutional framework, system(s) or project(s) of the NAMA are set into motion; and
- **the NAMA is adapted, if necessary, based on feedback from all areas involve.** .

Stakeholder Outreach

- **Government:** Typically, any and all ministries responsible for regulation or funding of the proposed olicies and/or measures; e.g., ministries of environment, economy, finance, energy, resources, transport or industry. Depending on whether the NAMA is a policy or a project NAMA, and also depending on what types of implementation modalities it will involve, regional and local governments need to be involved as well, as do other relevant governmental institutions, such as an Environmental Protection Agency or an energy regulator. Political parties might also need to be included.
- **Public sector**: This includes representatives from state utilities, relevant municipalities or chambers of commerce as well as public banks or investment promotion agencies.
- **Private sector**: These stakeholders might be industry associations, pertinent companies (domestic and international branches), private utilities, private banks and other businesses with relevant interests in the NAMA measures.
- **Non-governmental organisations and civil society**: These include NGOs from various areas such as the environment or national development, labour organisations, human and gender rights organisations, indigenous or religious groups and other civil society representatives.
- **Institutions providing domestic or international support**: Of course, institutions providing financial, technical or capacity-building support need to be integrated into the process early on. These include domestic or multilateral development banks, international development agencies and bilateral agencies. Observers from regional institutions or partner countries may be involved as well.
- **The academic community**: Research institutions, universities and think tanks as well as technical experts and advisers will provide know-how as well as data.

Barriers and Risks

Barrier/risks	Potential risk management measures
Flagging sense of programme ownership and commitment among stakeholders	• A focal point or coordinating entity takes and maintains ownership of the NAMA • Regular communication and updates on the progress of the NAMA development • Requests for knowledge sharing • Offer capacity building • Publicise successes of other national NAMAs or NAMAs in other countries
Lack of awareness • Limited awareness of options • Lack of knowledge/access to knowledge	• Capacity building for public institutions and private sector • Training of trainers: advisers, planners and developers of measures under the NAMA • Measures/actions and demonstrating their practicability and benefits • Marketing and outreach
Capacity barriers • Lack of skilled labour • High transaction costs	• Capacity building for public institutions and private sector • Training of trainers: advisers, planners and developers of measures under the NAMA

Barriers and Risks

Barrier/risks	Potential risk management measures
Technical barriers • High transaction costs	• Capacity building • Training of advisors, planners and developers of measures under the NAMA • Encouragement and support for domestic and regional manufacturers and companies
Regulatory and institutional barriers • Limited access to capital • Monopolies/ Limited access to markets	• Analyse/strengthen sector regulation and permitting procedures • Training for local authorities and other local stakeholders • Capacity building for monitoring and auditing authorities • Design, establishment and operation of a NAMA office / institution
Financial barriers • Limited access to capital • High upfront costs; small project sizes • Split incentives (e.g., between owners and users) • Conflicting allocation of resources for investments (e.g., subsidies for conventional technologies) • Financially stable support	• Provision of promotional financing, including grants and subsidised loans • Attract donors for up-front finance to start NAMA process • Reduction of incremental investment costs by economics of scale • Publicise national commitments in addition to international cooperation and support for NAMA identification, formulation and development process

Measurement, reporting and verification (MRV) of NAMAs

- **Accuracy**: Measurement should be as accurate as the NAMA budget will allow and aligned with the use of measurement results in evaluating outcomes/impacts. Accuracy trade-offs should be accompanied by increased conservativeness in estimates and judgements. Further, accuracy should be determined taking into account the significance of the outcomes/impacts.
- **Completeness**: Measurement methodology should cover information related to all effects of activities included in a NAMA. Some of the outcomes/impacts, such as reduction in GHG emissions, will be estimated, based on measurement data for the estimates. In such cases, the documented methodology should clearly outline the process and procedures for estimating the outcomes/impacts (emission factors of electricity production, for example) as well as other measured data used for estimates.
- **Conservativeness**: Estimates and measurements should be made so as to err on the side of conservative reporting of outcomes/impacts. The principle of conservativeness should be applied to situations in which either measurement or estimating have a high level of uncertainty or in which a high level of accuracy of measurement or estimating is not cost-effective. The measurement methodology should expressly identify the uncertainty in measurements and include procedures for choosing conservative values.
- **Consistency:** Reporting of information should be consistent between different types of projects/programmes and different periods of time for the same project/programme.
- **Comparability:** The information or estimates, especially of GHG emissions reduction, should be comparable across NAMAs. To enable comparability, the NAMA implementer should use standardised formats for reporting.

Measurement, reporting and verification (MRV) of NAMAs

Type of NAMA	Measuring Parameters
Project oriented NAMA	RE-based power generation capacity installed Carbon emission factor of grid (Type of fuel, fuel consumption, carbon emission factor etc.) Employment created, income generated, access to power provided Emissions of local pollutants (SOx, NOx, particulate matter, etc.)
Policy oriented NAMA	Enactment of regulation and legislation (e.g. FiT) Number of RE projects applying for FiT Electricity generated by RE projects claiming FiT Reduction in cost of RE generation Employment created, income generated, access to power provided Emissions of local pollutants (SOx, NOx, particulate matter, etc.)

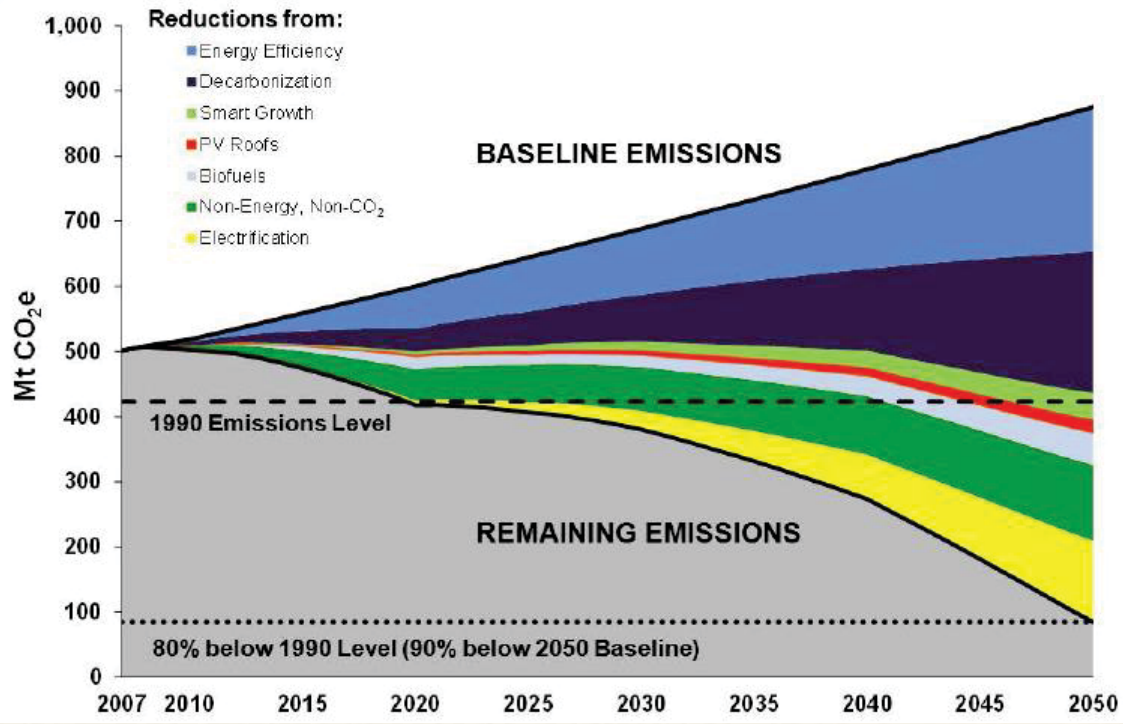
Measurement, reporting and verification (MRV) of NAMAs

What the UNFCCC needs to see

NAMA type	Expected MRV requirements
Domestically supported (unilateral) mitigation actions	Domestic MRV in accordance with guidelines for domestic MRV developed by the COP Requirements to be elaborated by the Subsidiary Body for Scientific and Technological Advice (SBSTA) of the UNFCCC Reflection of national circumstances and priorities expected
Internationally supported mitigation actions	Domestic MRV with international oversight subject to international MRV procedures conducted with the ICA process International MRV can be required by donors/investors Tracking of financial and technical support

Quantifying the Impact of NAMAs

- Establishing the NAMA baseline scenario
- Challenges to establishing baseline emissions projections
- Emission estimates under the NAMA Scenario
- Evaluation of co-benefits



Quantifying the impact of NAMAs

- **Estimating a baseline**
- GHG emissions = fn (*energy use, energy system, emission factors*)
  - Energy use = fn (*activity * energy intensity*)
    - Activity = fn (*population, income, economic growth*)
- **Estimating reduction**
  - **Any changes in:** *energy system, emission factors, activity , energy intensity, population, income, economic growth*
- **Estimating cost**

Quantifying the impact of NAMAs

- Energy models are often needed:
  - Intermittency
  - Fuel switching
    - Supply
    - Demand
  - Indirect changes (e.g. energy efficiency)
  - These are dynamic and not additive
  - Need experts
  - Tools: MESSAGE, MARKAL/TIMES, LEAP, OSeMOSYS etc.

Quantifying the impact of NAMAs

Baseline documentation example

Sector	Power
Scope	Power sector (National / Regional / State / District)
Boundary	Country / Region / State / District
NAMA indicator	GHG emissions per unit of power produced (CO_2 / kWh)
NAMA indicator reporting level	CO_2 / kWh
Historical data	• GHG inventories in National Communications to UNFCCC • National data, especially from the energy sector, including relevant social and economic data • IEA data
Local default values	GHG emission factors for fossil fuels (if available)
Other sources for estimating GHG emissions	IPCC / ISO 14064 / GHG Protocol / CDM / GEF etc.
Parameters influencing BAU emissions projection	• GHG target • Regulatory environment • Policies promoting renewable energy and energy efficiency • Technology development and diffusion • Finance access – Green Climate Fund, World Bank, ADB, IADB, GEF, etc.

Quantifying the impact of NAMAs
Nationally appropriate

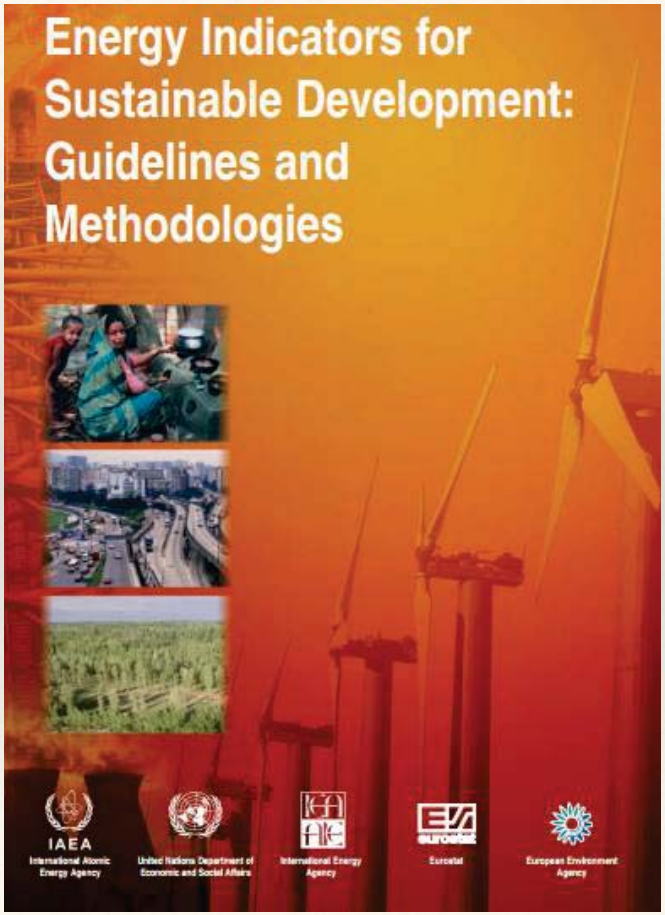
Criteria	Indicator
Economic	
Job creation	Created employment Availability of qualified, highly efficient, productive national manpower
Energy security	Diversification and conservation of energy sources • More efficient use of fossil fuels • RE utilisation rate Rural electrification
Social	
Improvement of quality of life	Health improvements Direct or indirect increase in availability of resources to local population • Distribution of costs and benefits • Income distribution • Local participation Enhancement of health conditions and safety standards Contribution to gender equality

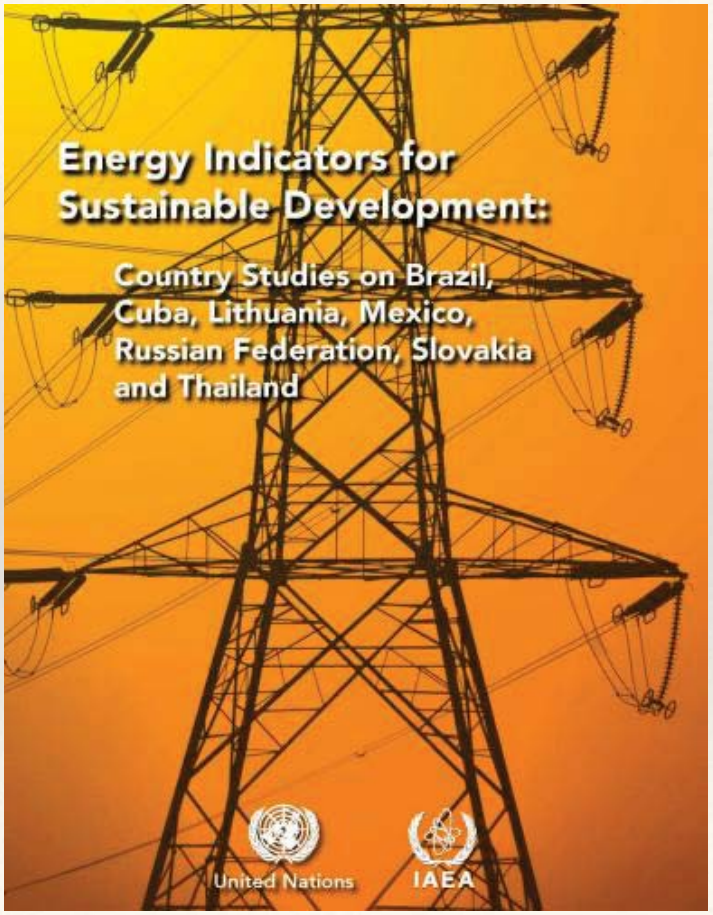
Quantifying the impact of NAMAs
Nationally appropriate

Criteria	Indicator
Environment	
Conservation of natural resources and land use	Water supply and demand Direct or indirect increase in water availability Net impact on biosphere/biodiversity Contribution to avoid further desertification/deforestation Conservation and/or expansion of agricultural land or increased availability of agricultural inputs
Reduction of local/ regional environmental impacts	Air quality: local air pollution, particulates Water quality and quantity: irrigation, drinking water, sea water Soil: exposure of soil to pollutants Waste: solid waste generation and disposal Other pollutants

Quantifying the impact of NAMAs *Nationally appropriate*

- Linking to energy models / scenarios
- See the IAEA's ISED
- See also IAEA case studies
- CLEWs and the nexus





Conclusion

- **Templates are available**

- Identification and prioritization of NAMAs
- How to structure NAMA financing
- The NAMA development process
- Measurement, reporting and verification (MRV) of NAMAs
- Quantifying the impact of NAMAs

NAMA Design Template — **Ver. 01.00 Jan2013**

A. NAMA SUMMARY

A.1 Summary		
Title of NAMA		
Purpose of NAMA		
Sector	❑ Energy ❑ Industry ❑ Buildings ❑ Transport	❑ Forestry (AR / REDD not applicable for pilots) ❑ Agriculture ❑ Waste
Category of NAMA	Domestic / Support / Mixed / Crediting / Others	
Type of NAMA	Policy / Project	
NAMA Geographical Coverage	• National / Regional / State / District / Village (select or add as appropriate) • State multiple countries if any	
Estimated GHG Emission Reductions	• Estimated Annual Average (MtCO2 / year)	
Programme Duration	• XX years	
Brief description of NAMA / programme and proposed activities	• Provide brief account of target policy, measures, relevant Ministries & Government Departments, NAMA activities (project features – technology, capacity building measures- workshops, financing – model etc.,) etc.,	
NAMA / Programme proponents	• Provide specific details of NAMA proponents and their responsibilities in implementation • Provide details of agencies involved in design, development, implementation, management and financing of the NAMA	

http://namapipeline.org/Publications/Guidance_for_NAMA_Design_2013_.pdf

Many thanks

References:

UNEP Guidance for NAMA development
http://namapipeline.org/Publications/Guidance_for_NAMA_Design_2013_.pdf
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IAEA Indicators for Sustainable Energy Development
http://www-pub.iaea.org/MTCD/publications/PDF/Pub1222_web.pdf