Introduction to Nationally Appropriate Mitigation Actions (NAMAs)

in a measureable, reportable and verifiable (MRV) manner

Makoto Kato, Principal Researcher
Overseas Environmental Cooperation Center, Japan (OECC)

Contents

1. NAMAs in the climate negotiation context
2. NAMAs Response by Developing Countries
3. Steps to be taken for the development of NAMAs in a MRV manner – an example
4. Technology Aspect of NAMAs- opportunity for developing country stakeholders

1. NAMAs in the climate negotiation context

1. NAMAs in the climate negotiation context

BALI ACTION PLAN (1/CP.13)

I.b.(ii) **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**;

COPENHAGEN ACCORD(2/CP.15 ANNEX)

5. Mitigation actions(..)including national inventory reports, shall be communicated through national communications(..)**every two years** (..). **Mitigation actions taken by Non-Annex** I Parties will be subject to their **domestic measurement, reporting and verification** the result of which will be reported through their national communications(..). **Nationally appropriate mitigation actions seeking international support** will be recorded in a registry along with relevant technology, finance and capacity building support. (...and) will be subject to international **MRV measurement, reporting and verification**(...)

1. NAMAs in the climate negotiation context

COPENHAGEN ACCORD(2/CP.15 ANNEX) ….CONTINUED

8. **Scaled up, new and additional, predictable and adequate funding as well as improved access shall be provided to developing countries,** ..... The collective commitment by developed countries is to provide new and additional resources, including forestry and investments through international institutions, approaching **USD 30 billion for the period 2010–2012** with balanced allocation between adaptation and mitigation. ..... [D]eveloped countries commit to a goal of mobilizing jointly **USD 100 billion dollars a year by 2020** to adress the needs of developing countries.....A significant portion of such funding should flow through the Copenhagen Green Climate Fund.

1. NAMAs in the climate negotiation context

CANCUN AGREEMENT(1/CP.16)

48. Agrees that developing country Parties will take **NAMAs** (..), aimed **at achieving a deviation in emissions relative to 'business as usual' emissions in 2020**;

50. Invites developing countries (..)**to voluntarily inform** the COP of their intention to implement **NAMAs** (..)**to the secretariat**;

61. Decides that **internationally supported NAMAs** will be MRV-ed, and will be subject to **international MRV** accordance with **guidelines** to be developed under the Convention;

62. Decides that **domestically supported mitigation actions** will be **MRV-ed domestically** in accordance **with general guidelines** to be developed under the Convention;

64. Decides that **information** (in BUR..) should include the national GHG inventory report, **information on mitigation actions**, including a description, analysis of the impacts and associated methodologies and assumptions, progress in implementation and information on domestic MRV, (…);

65. Encourages developing countries **to develop low-carbon development strategies or plans i**n the context of sustainable development;

1. NAMAs in the climate negotiation context

DURBAN OUTCOME(1/CP.17)

32. **Encourages** developing country Parties who are yet to **submit information on NAMAs** to do so**;**

34. **Invites** developing country Parties(..)to submit(..)**more information relating to NAMAs** , including underlying assumptions and methodologies, sectors and gases covered, global warming potential values used, support needs for implementation of NAMAs outcomes;

35. **Invites** developing country Parties **to submit this information** (..) **by 5 March 2012**(...);

38. **Encourages** developing country Parties **to develop low-emission development strategie**s, recognizing the need for financial and technical support (..) for the formulation of these strategies, (..);

1. NAMAs in the climate negotiation context

DURBAN OUTCOME(1/CP.17) CONTINUED…

Biannual Updated Report (BUR)

39. Adopts the guidelines,(..), for the preparation of biennial update reports by non-Annex I Parties(..),

40. Affirms that **the Guidelines shall respect the diversity of mitigation actions** and provide flexibility for non-Annex I Parties to report information, while providing an understanding of actions taken;

41. Decides:

(a)That non-Annex I Parties, (..)**should submit their first biennial update report by December 2014**; (..);

(f) That non-Annex I Parties shall **submit a biennial update report every two years**, either as a summary of parts of their national communication in the year when national communication is submitted or as a stand-alone update report; (..);

2. NAMAs Response by Developing Countries

2. NAMAs response by developing countries

To date, 51 parties send submission to UNFCCC:

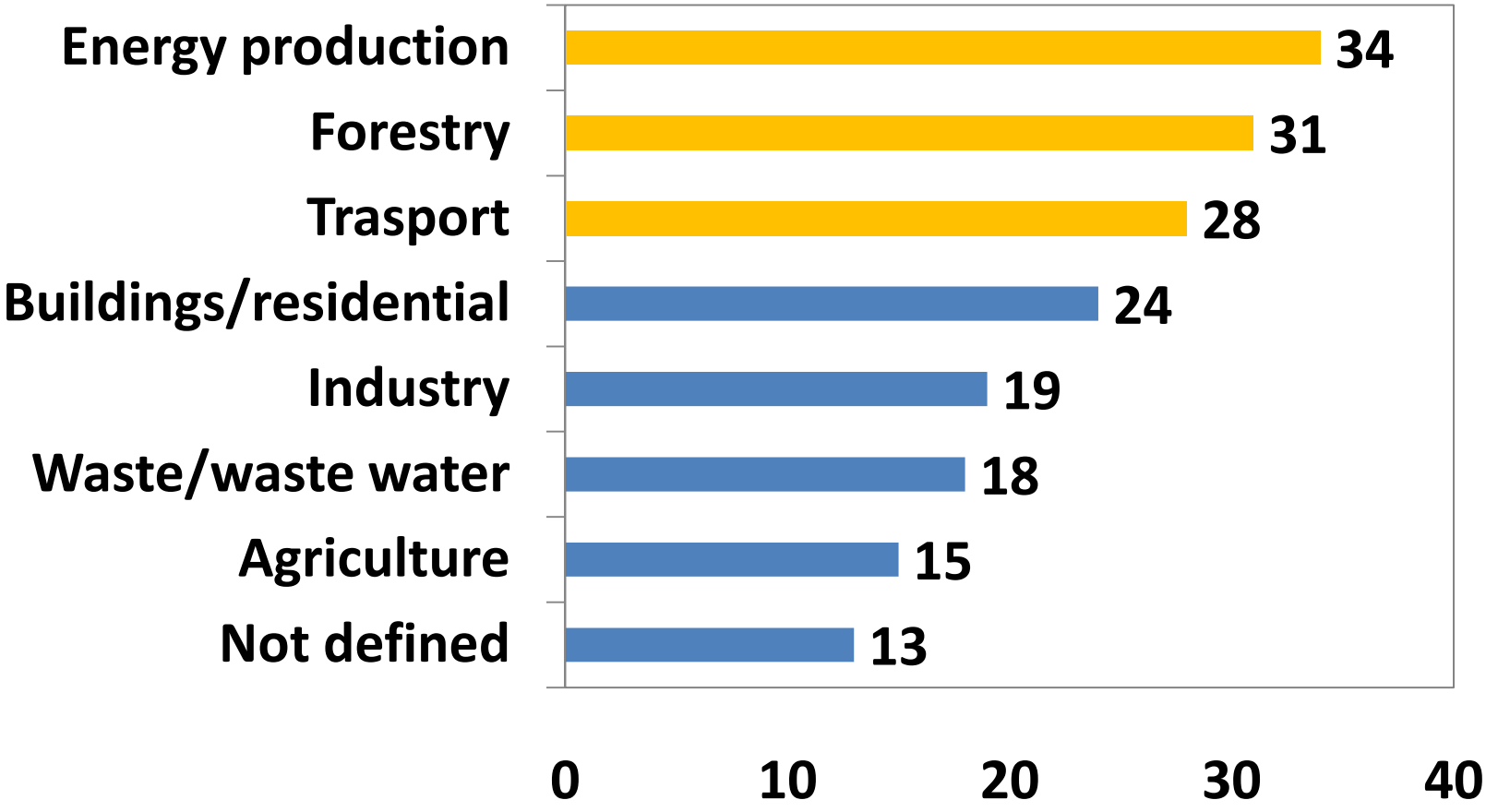
1.Wide Sector coverage: energy supply, industry, transport, buildings, waste, agriculture and forestry

2.Various emission targets: climate neutrality, below base year, below BAU (business as usual) and undefined target

3.Broad range of type of action: from projects to policies as well as strategies

2. NAMAs response by developing countries

1. Wide sector coverage (No. of countries) :

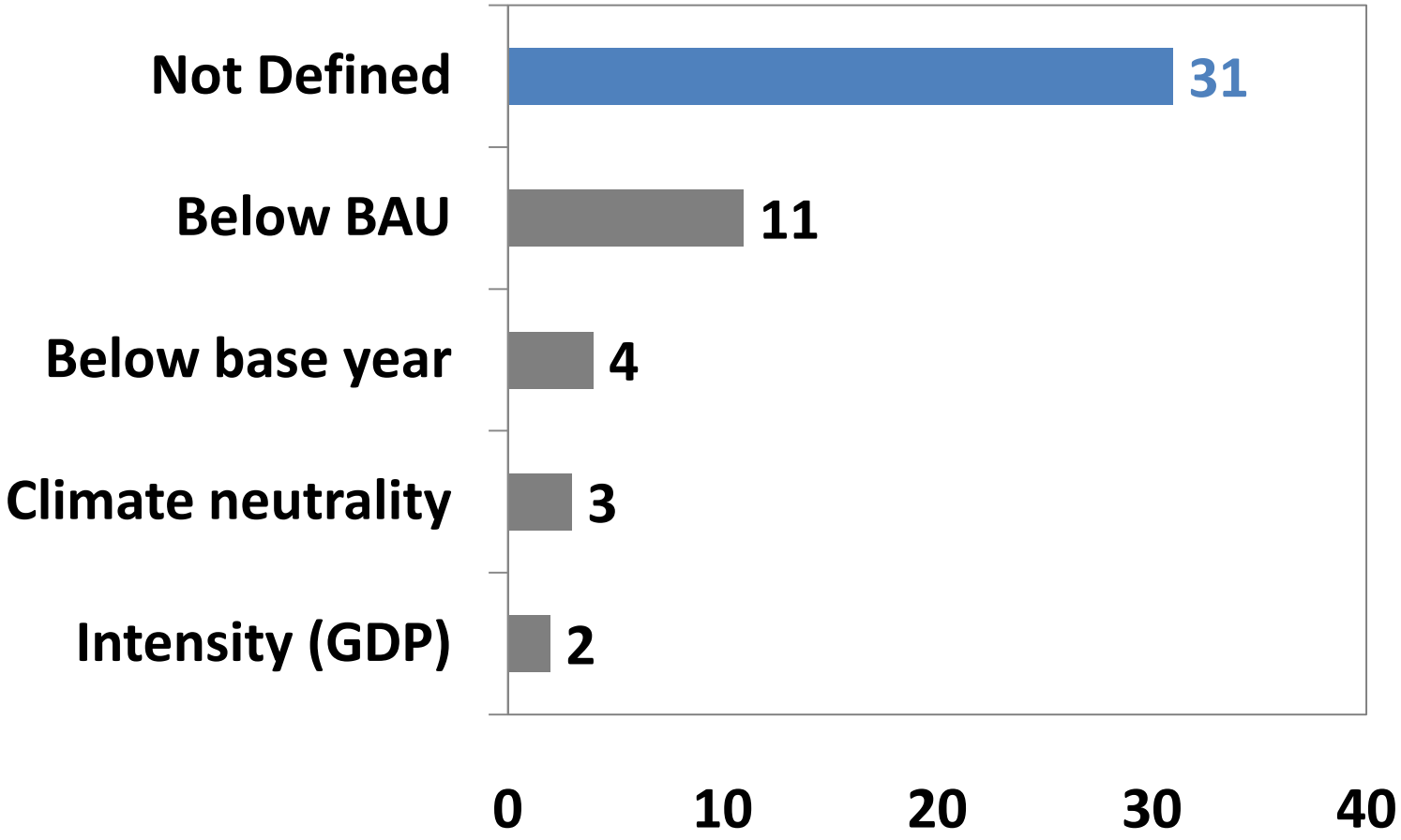


*Data might be slightly different to other studies due to vague expressions in Submissions.
**For the same reason graphs might not reflect exactly the current position of the Parties.

Source: : Compilation of information on NAMAs (FCCC/AWGLCA/2011/INF.1)

2. NAMAs response by developing countries

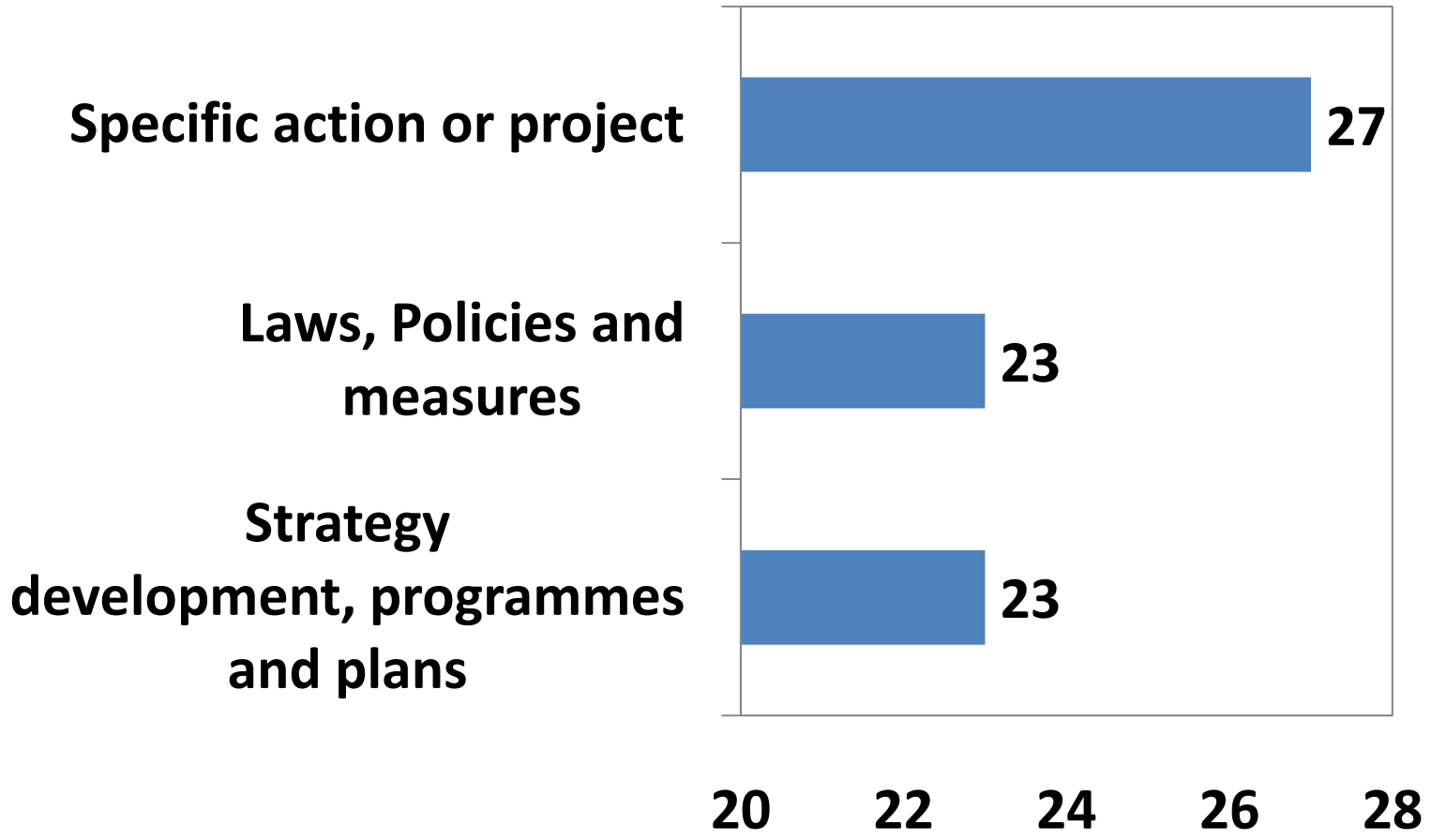
2. Various emission targets (No. of countries) :



Source: : Compilation of information on NAMAs (FCCC/AWGLCA/2011/INF.1)

1-2. NAMAs response by developing countries

3. Broad range of type of action (No. of countries) :



Source: : Compilation of information on NAMAs (FCCC/AWGLCA/2011/INF.1)

1-2. NAMAs response by developing countries

Country	Target	Sectors for NAMAs	Reference Level	Relevant Plan/ Strategy
Bhutan	Carbon Neutral (with Sink)	N/A	N/A	-
China	40-50% /GDP	• 15% for the share of non-fossil fuel • Forest Coverage 40,000,000 ha	2005	China Climate Change Program
Indonesia	26-41% (26% reduction thru unsupported NAMAs)	• Sustainable Peat land • Deforestation • Forestry, Agriculture • Renewable Energy • Waste • Transport	BAU	National Climate Change Action Plan and other development/ sectoral plans
Mongolia	N/A	• Renewable Energy • Construction, Industry • Transport • Agriculture, forestry	N/A	-

Source: : Compilation of information on NAMAs (FCCC/AWGLCA/2011/INF.1)

				National Plan on Climate Change (if any)	Other relevant information
				N/A	original text
Togo	N/A	Togo proposes the following NAMAs: ● Increase in forest cover from 7% in 2005 to 30% in 2050 ● Energy efficiency in urban and rural areas ● Conservation of traditional energy sources ● Increased use of renewable energy sources	N/A	N/A	original text (fr)
Tunisia	N/A	Tunisia envisages the following NAMAs: ● Development of renewable energy sources ● Development of alternative energy sources ● Promotion of energy efficiency and sound use of energy ● Development and implementation of environmental standards for industries ● Reforestation/afforestation and prevention of deforestation and land degradation	N/A	N/A	original r/ar)

Website Platform that contains information on NAMAs submitted to UNFCCC

http://www.mmechanisms.org/e/namainfo/index.html

2 . Our finding: Keys to developing NAMAs

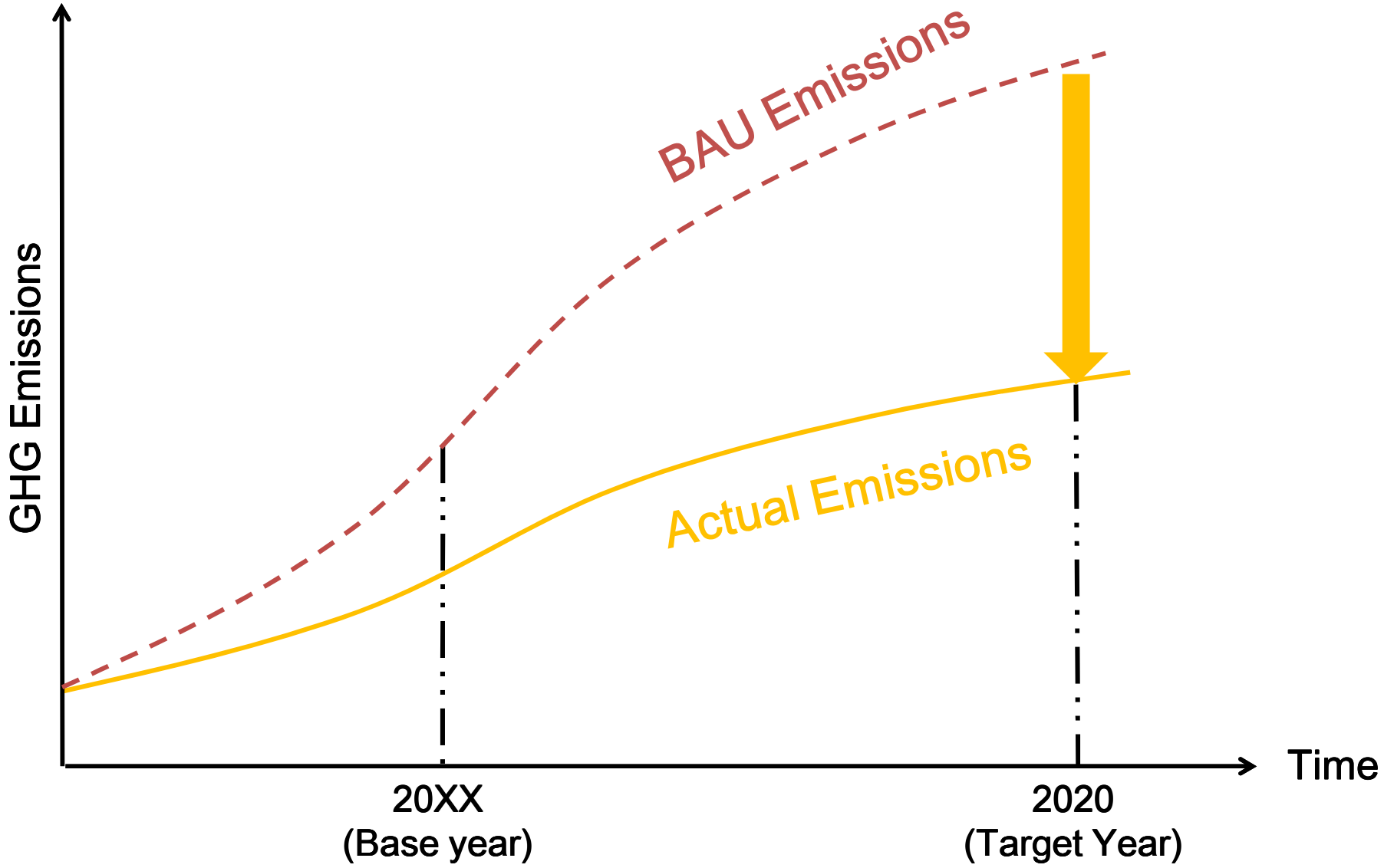
1. Wide Sector coverage:
   >> Prioritize mitigation measures aligned with national development policy

2. Various emission targets:
   >> Quantify GHG emissions reduction, identifying reference level (BAU) and mitigation potential

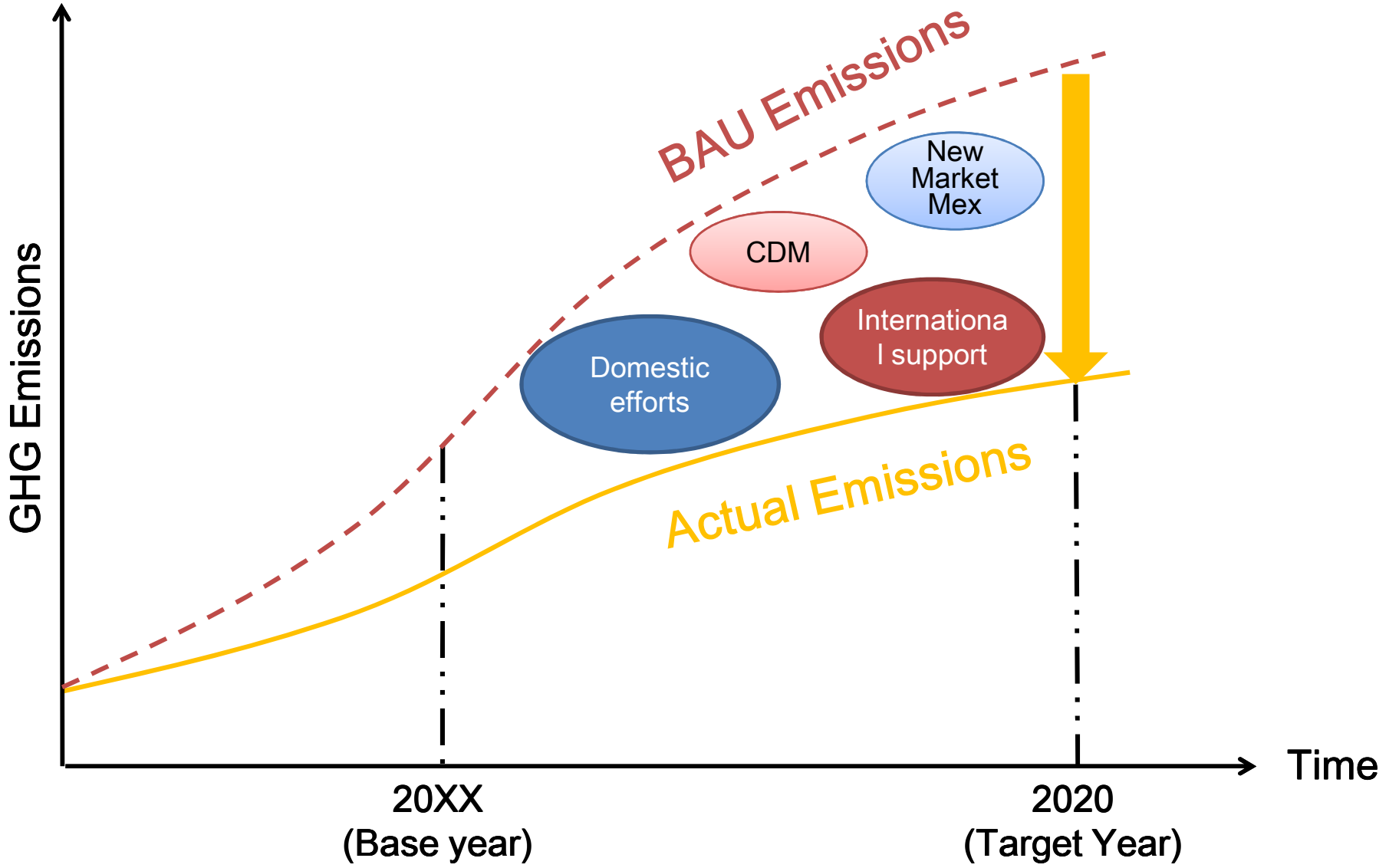
3. Broad range of type of action:
   >> Set up MRV system, clarifying stakeholders' roles and responsibilities for implementing actions (ministries, provinces, etc.)

3. Steps to be taken for the development of NAMAs in a MRV manner– an example

An Illustration of NAMAs



Alternative Illustration of NAMAs



Further Activity on Quantifying GHG Emissions Reduction

Climate Change Sectoral Strategy

Cambodia Energy Sector Strategy

Others

*Extract data and make fact sheets

Activity1:
Data and Info. collection (MOEC)

Fig 1. Energy Development Plan in BAU and NAMAs

	2012	2020
BAU	XXX MWh	X,XXX MWh
NAMAs	-	X,XXX MWh

Activity2:
GHG Emissions Calculation (OECC)

Fig 2. GHG Emissions in BAU and NAMAs

	2012	2020
BAU	XXX t/CO2	X,XXX t/CO2
NAMAs	-	X,XXX t/CO2

Activity3:
Identify Mitigation Action
- XX MW Solar
- XX units Boilers
(MOEC, OECC)

2012年10月11日　OECC

Steps for NAMAs Design

(1) Collection of Info on relevant policies and strategies

Collect and analyze relevant policy documents of development, climate change and related sector

(2) Collection data for BAU in the sector

Collect data for calculating BAU emission with bottom-up approach (eg. List all individual landfills, and collect respective waste volumes)

(3) Quantification GHG emissions of BAU

Quantify GHG emissions based on (2) data, and
a) Identify the calculation formulas
b) Calculate respective emission in BAU
c) Aggregate respective emissions

(4) Examination and selection of NAMAs options

Select possible NAMAs options and technologies based on (1) policies and mitigation strategies and additional consideration.

(5) Quantification GHG emission reduction by NAMAs

Quantify GHG emissions with (4)NAMAs assumptions
a) Set the calculation formulas
b) Calculation
c) Aggregate potential with reduction by NAMAs

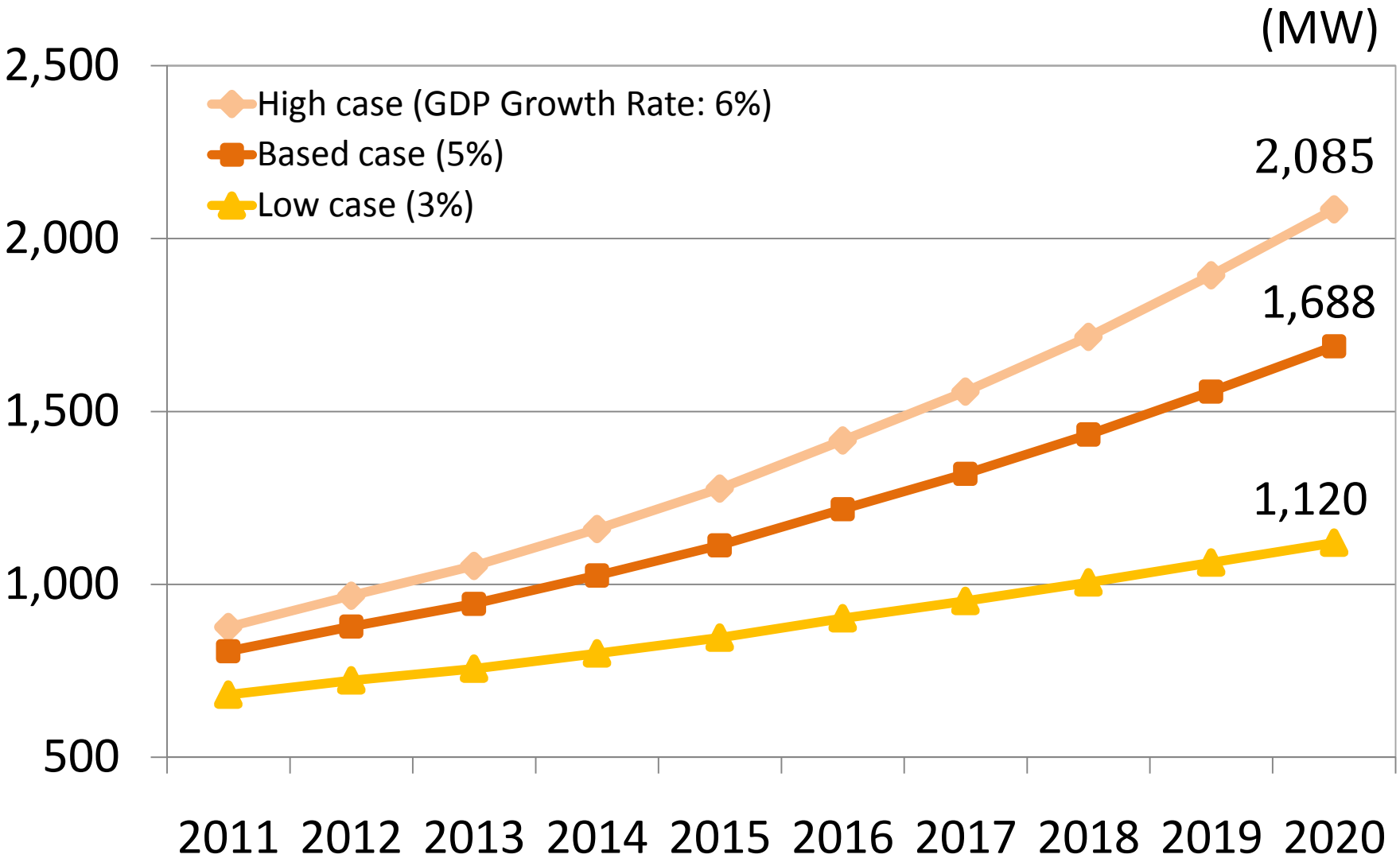
Low-carbon technology survey

Examination MRV methods

Capacity-buildings in Vietnam for NAMAs implication

Source: OECC 2012

BAU: Energy Demand Projection in County A



Source: OECC (Overseas Environemtnal Cooperation Center, Japan) 2012

BAU: Power Development Plan in Country A

*Need to consider projects which may be developed in BAU out of the present plan.

No.	Project Name	Type	Capacity (MW)	Year	Condition as of Dec. 2011
1	XXXX	Heavy Fuel Oil	340	-	Operating
2	YYYY	Coal	13	-	
3	ZZZZ	Hydro	13	-	
4	AAAA	Wood, Biomass	6	-	
5	Kamchay	Hydro	194	2012	Under Construction
6	Kirirom III	Hydro	18	2012	
7	Stung Atay	Hydro	120	2012	
8	Stung Tatay	Hydro	246	2013	
9	Lower Stung Russei Churum	Hydro	338	2013	
10	100 MW Coal Fired Power Plant	Coal	100	2013	
11	270 MW Phase 1 of the 700MW Coal Fired Power Plant	Coal	270	2014 ~2015	PPA singed
12	100 MW Coal Fired Power Plant	Coal	100	2016	PPA singed
13	430 MW Phase 2 of the 700MW Coal Fired Power Plant	Coal	430	2017	FS completed
…	…	Coal	α*	20XX	May be developed*
	Total		2188+α		

Source: OECC 2012

Power Development Plan with mitigation options

No.	Project Name	Type	Capacity (MW)	Year
1	XXXX	Heavy Fuel Oil	340	
2	YYYY	Coal	13	-
3	ZZZZ	Hydro	13	-
4	AAAA	Wood, Biomass	6	-
5	Kamchay	Hydro	194	2012
6	Kirirom III	Hydro	18	2012
7	Stung Atay	Hydro	120	2012
8	Stung Tatay	Hydro	246	2013
9	Lower Stung Russei Churum	Hydro	338	2013
10	100 MW Coal Fired Power Plant	Coal	100	2013
11	270 MW Phase 1 of the 700MW Coal Fired Power Plant	Coal	270	2014 ~2015
12	100 MW Coal Fired Power Plant	Coal	100	20
13	430 MW Phase 2 of the 700MW Coal Fired Power Plant	Coal	430	2017
…	…	Coal	α*	20XX
	Total		2188+α	

Introduction of high-performance boiler

Promotion of renewable energy (hydro, solar, biomass

Source: OECC 2012

GHG Emissions Reduction with mitigation measure

***All values are calculated on the assumption.**

Mitigation measure	Calculation method	Emissions reduction
Introduction of high-performance boiler	Amount of energy conserved by high-performance boilers (50 kl oil-equivalent/unit) × Cumulative numbers of boilers introduced in target year 2020 (100 units) × Emission factor (2.62 tCO2/kl)	**13,100 t-CO2**
Promotion of renewable energy	The use of renewable energy in 2020 (1,000,000 MWh) ×Grid emission factor (0.6257 t-CO2/MWh)	**625,700 t-CO2**

Source: OECC 2012

4. Technology Aspect of NAMAs in a MRV manner

Background of Collecting Technology information

Rationale to choose the scope of Collecting Technology Information
- NAMAs Mongolia, submission Copenhagen Accord, Appendix II, 2

Copenhagen Accord

APPENDIX II

Mongolia: Nationally appropriate mitigation actions of developing country Parties

Non-Annex I	*Actions*
Mongolia	1. **Energy supply: Increase renewable options**
	a. PV and solar heating Mongolia is located in a region with abundant sunshine, typically between 2,250 to 3,300 hours per year. The PV systems have been shown to be the less expensive option compared to small gasoline generators. At present, small-

Source: NAMAs Mongolia, submission Copenhagen Accord, Appendix II, 2
http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/mongoliacphaccord_app2.pdf

Background of Collecting Technology information

(2) Reason to choose the scope of Collecting Technology Information

- NAMAs Mongolia, submission Copenhagen Accord, Appendix II, 2

5. Energy Supply - Improve CHP plants

Improve efficiency and Reduce internal use

At present, 6 CHP are operating in Mongolia with total installed electrical capacity of 824 MW, steam production capacity of 7100 tonne/h and annual load factor of 71.4 %. Station own use for electricity is 22.3% and for heat production is around 15%. Total CO_2 emissions by the CHP sector amounted to 6,372 Gg. Therefore, CHPs contribute an important part to total national GHG emissions. Especially efficiency improvement including reduction of own use should be seriously considered for greenhouse gas mitigation.

Implementation of this options will give 185,000 tons CO_2 reductions per year.

6. Energy Supply - Increase use of electricity for local heating in cities

Use of electricity from grid for individual households in cities

The main purpose of this option is to reduce air pollution and GHG emissions

Source: NAMAs Mongolia, submission Copenhagen Accord, Appendix II, 2
http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/mongoliacphaccord_app2.pdf

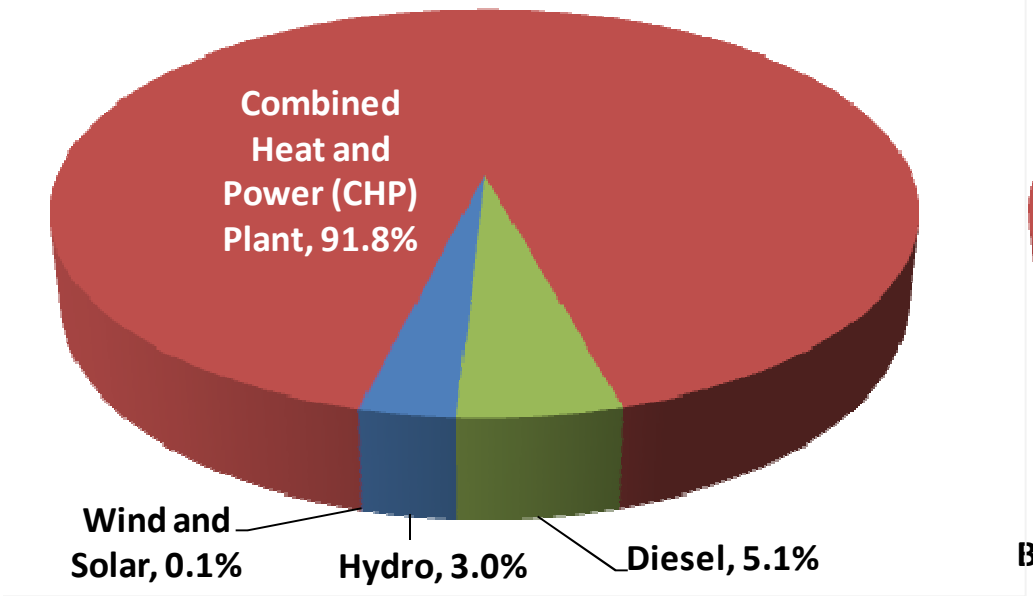
Background of Collecting Technology information

Rationale to choose the scope of Collecting Technology Information

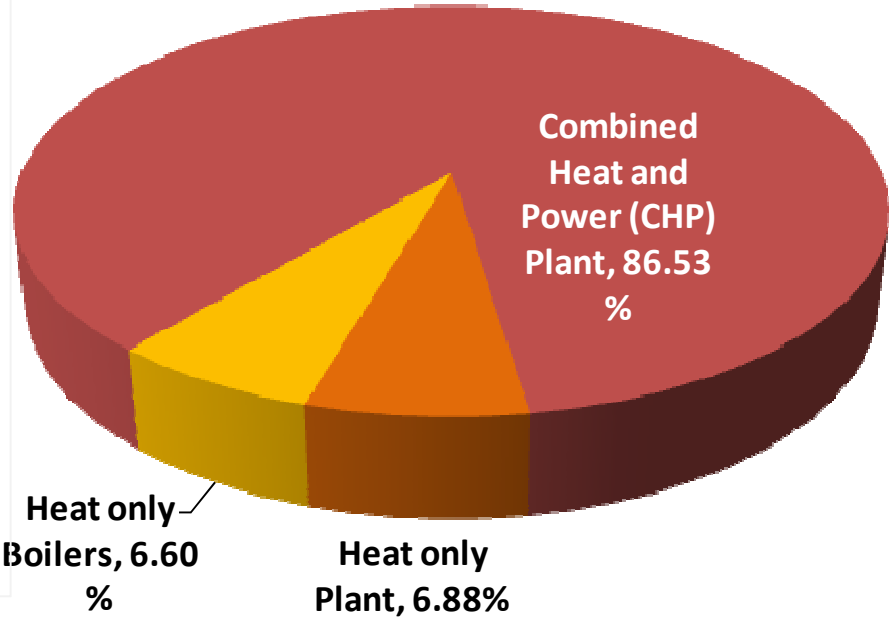
- **Emission ratio of the energy supply sector**
- **Discussion on Inception Workshop and 1st Advisory Committee of NAMAs**

Power Industries

Installed Capacity for **Electricity Generation**
Total- **897MW**



Installed Capacity for **Heat Generation**
Total-**6018MW$_{th}$**



Source: Energy supply, development trends, PUREVBAYAR.D, Ministry of Energy, Mongolia Inception Workshop for NAMA)in a MRV manner <September 19, 2012>

Background of Collecting Technology information

Rationale to choose the scope of Collecting Technology Information

- **Emission ratio of the energy supply sector**
- **Discussion on Inception Workshop and first Advisory Committee of NAMAs**

ELECTRICITY GENERATION :

To reduce GHG emissions from energy supply sector

First, to use renewable energy sources as widely as possible,

Secondly, to use coal in environmentally friendly and high efficient manner – when coal combustion power stations are essential

Hydro Power, Wind Power and Solar Power Systems will generate 350-400 MW out of planned 2200 MW. Remaining 1800 MW is to be generated by CHPs.

•To introduce either one of below two technologies into high-capacity CHPs to be built by 2030:

•TPP of IGGC ;

•TPP of high efficiency supercritical and ultra-supercritical coal-fired technologies

(With air condenser of steam turbine, fluidized bed combustion of coal)

Source: Introduction of NAMAs In Mongolia and in the Energy supply sector, Prof. NAMKHAINYAM, B. Inception Workshop for NAMA)in a MRV manner <September 19, 2012>

Process of the survey to find the appropriate technologies

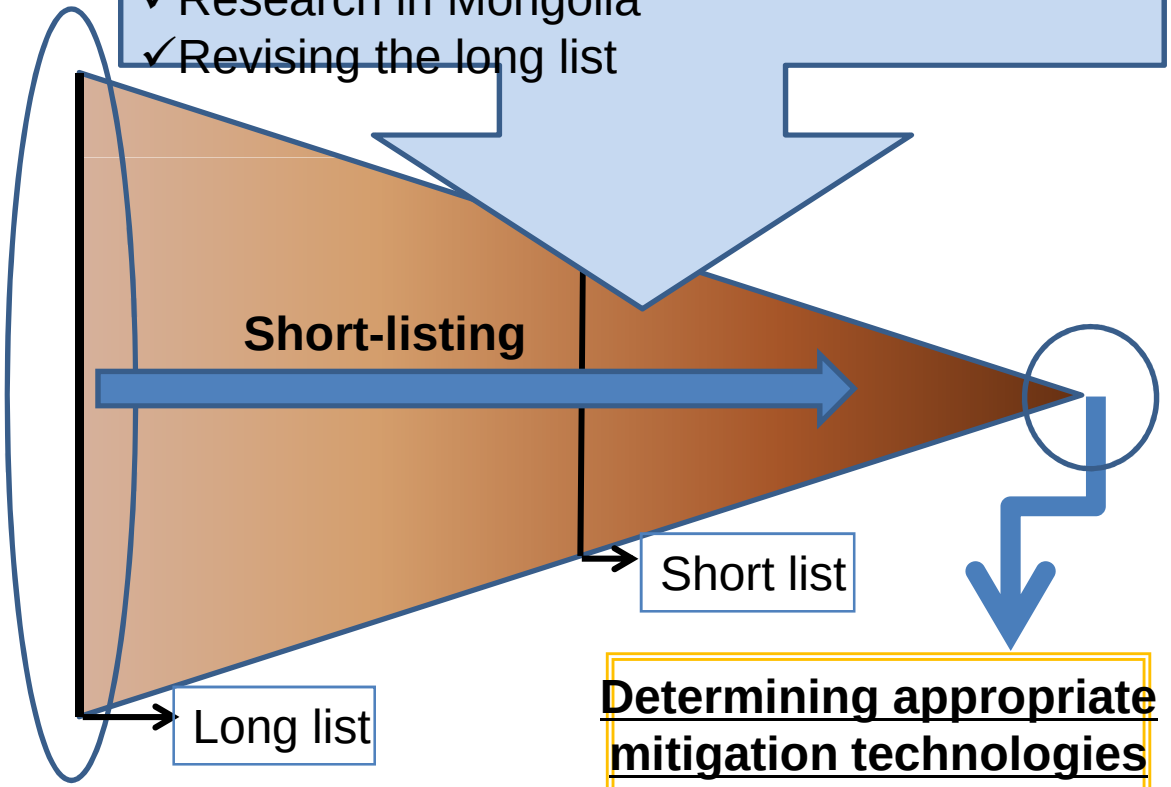
<1> Picking-up appropriate technologies from long-list and other source
<2> Short-listing
Long list → Short list

finding out the appropriate technology

Selecting the appropriate technologies

Information collection through
trade fair, Interview/meeting with stakeholders, utilization of database, etc.

Short-listing process
✓Surveying on needs and potentials of GHG mitigation technologies in Mongolia
✓Interview with certain stakeholders and collecting technology information. Create a "long list".
✓Research in Mongolia
✓Revising the long list



Thank you very much