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Introduction to Japan's Experiences in Mitigation Actions & Application for NAMAs in a MRV manner

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Outline

Part I :
Japan's Experiences in Mitigation Actions and Quantifying GHG Emissions mitigation

Part II:
Step Towards NAMAs Development in other Asian countries

Part I:
Japan's Experiences in Mitigation Actions and Quantifying GHG Emissions mitigation

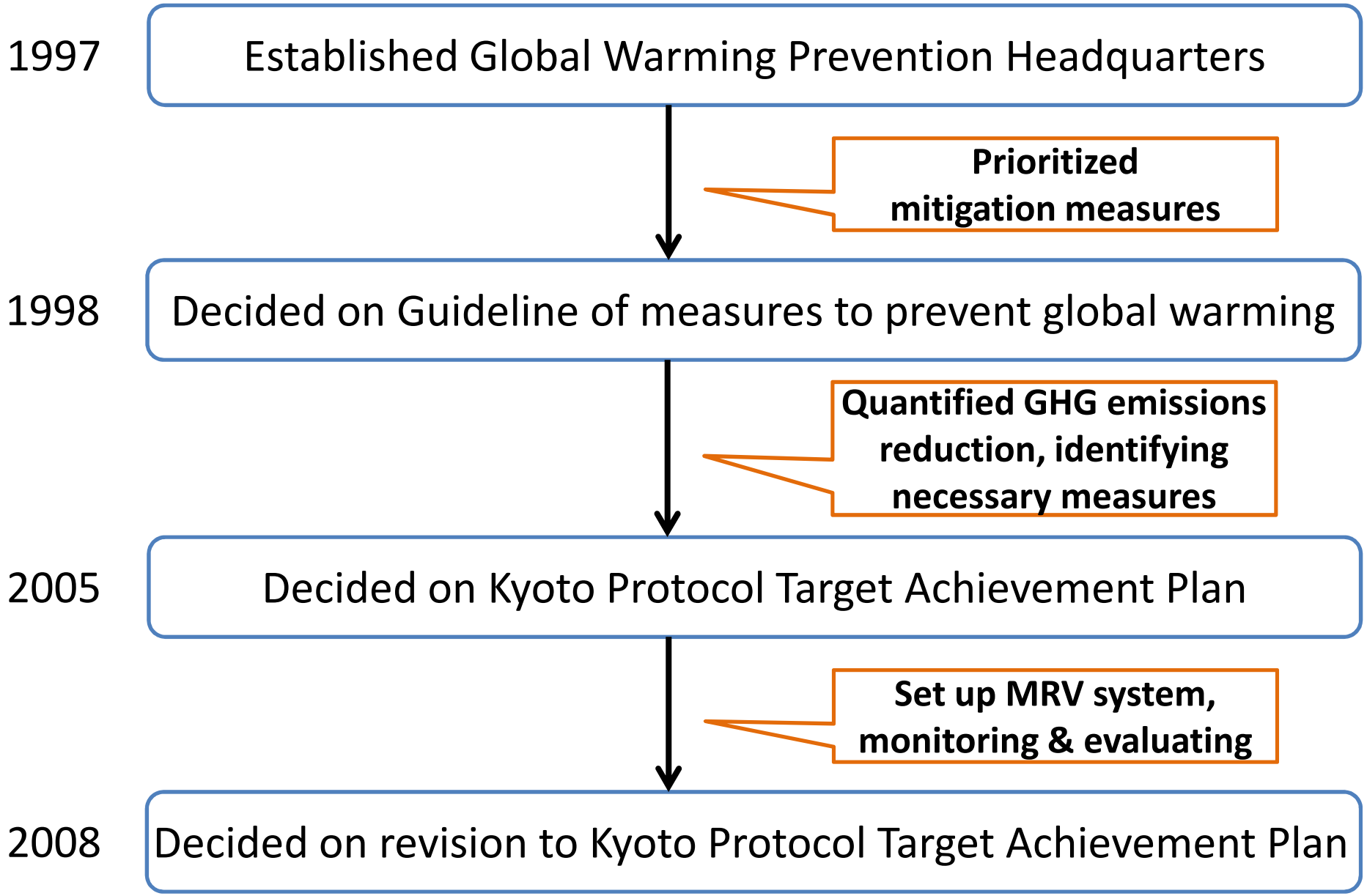
1-1. Our finding: Keys to developing NAMAs

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

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

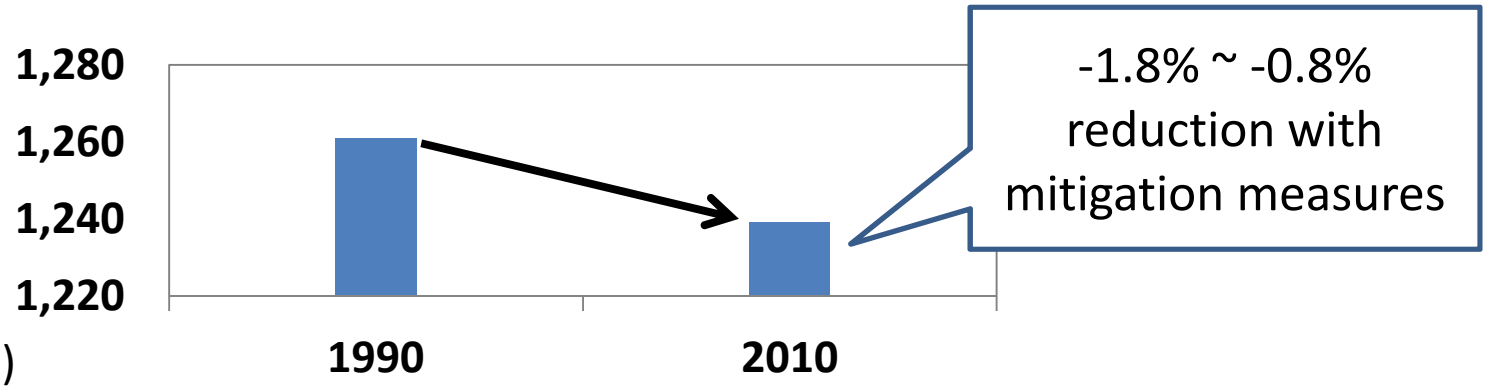
3. Broad range of type of action:
   >> Set up MRV system, clarifying stakeholders' roles and responsibilities for implementing actions (ministries, provinces, etc.)

1-2. Japan's Experience in Mitigation Actions



Source: Global Warming Prevention Headquarters. 2008: *Kyoto Protocol Target Achievement Plan.*

1-2. Japan's Experience: Quantify GHG Emissions reduction



	1990 (Base year)	2010 (Target year)	Emissions reduction
Energy-originated CO2	**1,059**	**1,076~1,089**	**+1.3%~+2.3%**
Energy conversion	68	66	-0.1%
Industry	482	424 ~ 428	-4.6%~-4.3%
Residential	127	138 ~ 141	+0.9%~+1.1%
Others (Incl. office)	164	208 ~ 210	+3.4%~+3.6%
Transport	217	240 ~ 243	+1.8%~+2.0%
Non energy-originated CO2, CH4, N2O	**151**	**132**	**-1.5%**
3 Fluorinated Gases	**51**	**31**	**-1.6%**
Total	**1,261**	**1,239~1,252**	**-1.8%~-0.8%**

Source: Global Warming Prevention Headquarters. 2008: *Kyoto Protocol Target Achievement Plan.*

1-2. Japan's Experience: Quantify GHG Emissions reduction

Example: Mitigation Measure

Sector	Mitigation measure
Energy	● Promotion of measures for new energy sources ● Promotion of biomass use
Industry	● Dissemination of high-performance boilers ● Promotion of introduction of co-generation
Transport	● Promotion of the use of public Transportation ● Promotion of environmentally-friendly use of automobiles
Waste	● Promotion of measures to reduce CO2 emissions deriving from waste incineration

Source: Global Warming Prevention Headquarters. 2008: *Kyoto Protocol Target Achievement Plan.*

1-2. Japan's Experience: Quantify GHG Emissions reduction

Example: Calculation methods

Mitigation measure	Calculation method	Emissions reduction
Promotion of renewable energy	Use of renewable energy in target year 2010 (Expand use of solar, wind, biomass power) (36 million MWh) ×Grid emission factor (0.425 t-CO2 /MWh)	15.3 million t-CO2
Dissemination of high-performance boiler	Amount of energy conserved by high-performance boilers (45 kl oil-equivalent/unit) × Cumulative numbers of boilers introduced in 2010 (11,000 units) × Emission factor (2.62 tCO2/kl)	1.3 million t-CO2

Source: Global Warming Prevention Headquarters. 2008: *Kyoto Protocol Target Achievement Plan.*

1-2. Japan's Experience: Quantify GHG Emissions reduction

Example: Calculation methods

Mitigation measure	Calculation method	Emissions reduction
Promotion of the use of public transportation	Reduced car-kilometers per day in 2010 (0.5 car-km/day) × CO2 emission per 10,000 car-km (15,900 t-CO2/car-km) × 365 days	2.9 million t-CO2
Promotion of measures to reduce CO2 emissions deriving from waste incineration	Amount of waste incinerated by type to be degraded in 2010 (General: 822,000 t, Industrial: 1,280,000 t) ×Emission factor by type (approx. 2,600 kg-CO2/t)	5.5 million t-CO2

Source: Global Warming Prevention Headquarters. 2008: *Kyoto Protocol Target Achievement Plan.*

1-2. Japan's Experience: Quantify GHG Emissions reduction

What can be applied to NAMAs Development?

Bottom-up quantification approach

>> Estimate GHG emissions reduction with each mitigation measure based on;

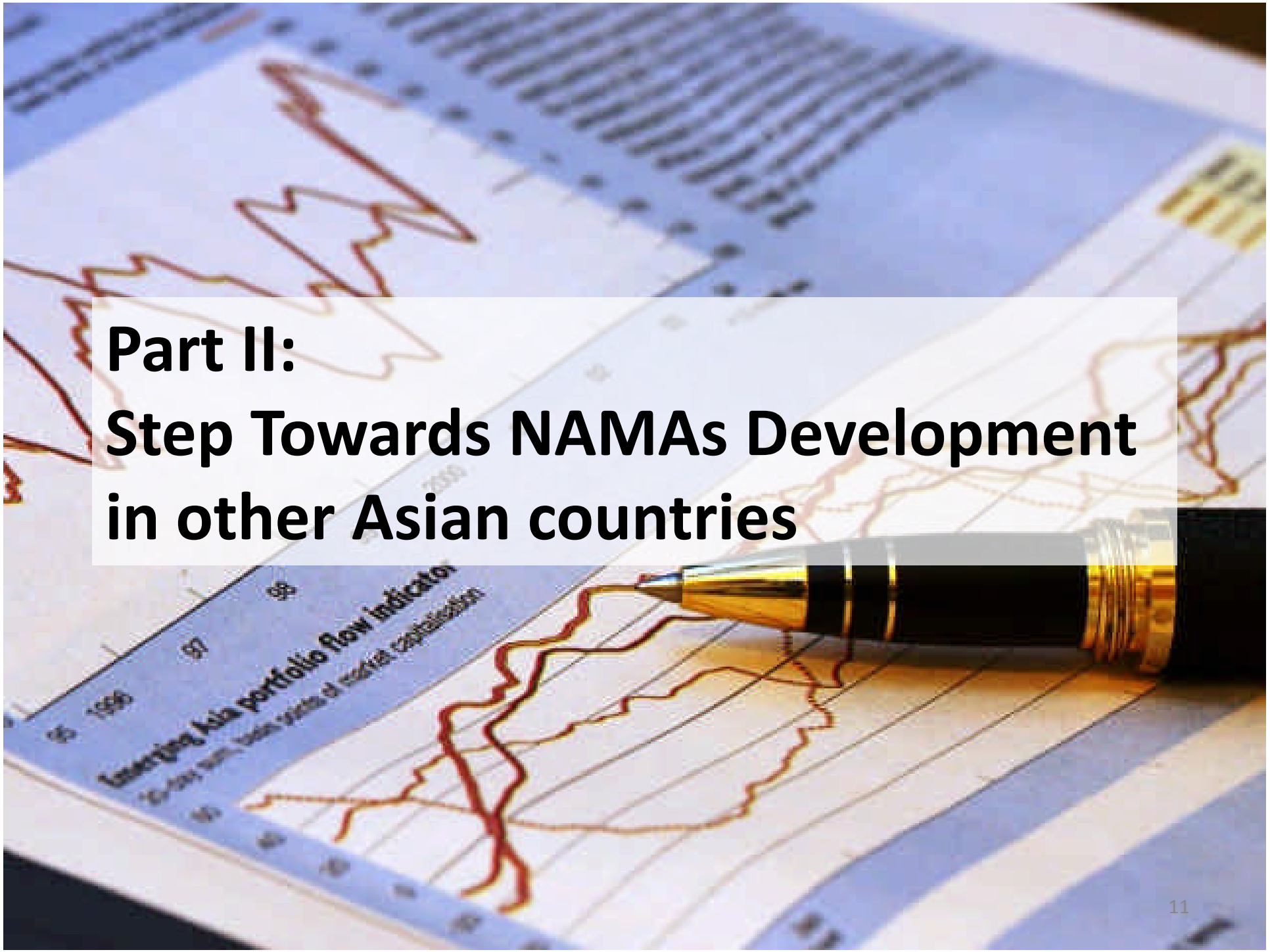
- Use of renewable energy,
- No. of updated equipment,
- Reduced car-kilometer, etc.

Advantages

1. Simple calculations
2. Identifiable actor
3. MRV friendly

e.g. IPCC approach (adopted to GHG inventory)

>> Estimate GHG emissions at the macro level based on energy consumption, etc.



Part II:
Step Towards NAMAs Development in other Asian countries

2-1. Step for NAMA 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 for NAMAs implication

Source: OECC 2012

2-2. Priority sector for NAMAs Development for each countries

Sector	Priority Sector
Mongolia	● Energy Supply Sector Sub-sector: CHP(Combined Heat and Power)
Cambodia	● Energy Sector Sub-sector: Bio digester, Solar power generation
Laos	● Transport Sector Sub-sector: Low Emission Cars, Public Transportation
Vietnam	● Waste Management Sector

2-3. Example of GHG mitigation action in Laos

Sector	GHG mitigation action
Energy	• Hydro • Energy Efficiency Measures
Industry	• Efficient Production System
Transport	• Introduction of Electric Vehicles • Promotion of Public transport Use
Waste	• Composting Organic Waste
Agriculture	• Reduce Methane Emission from Rice field/Cows
Forestry	• Reforestation • Reduce Slash-and-burn • Reduce Wildfire

Source: National Strategy on Climate Change Laos, 2010

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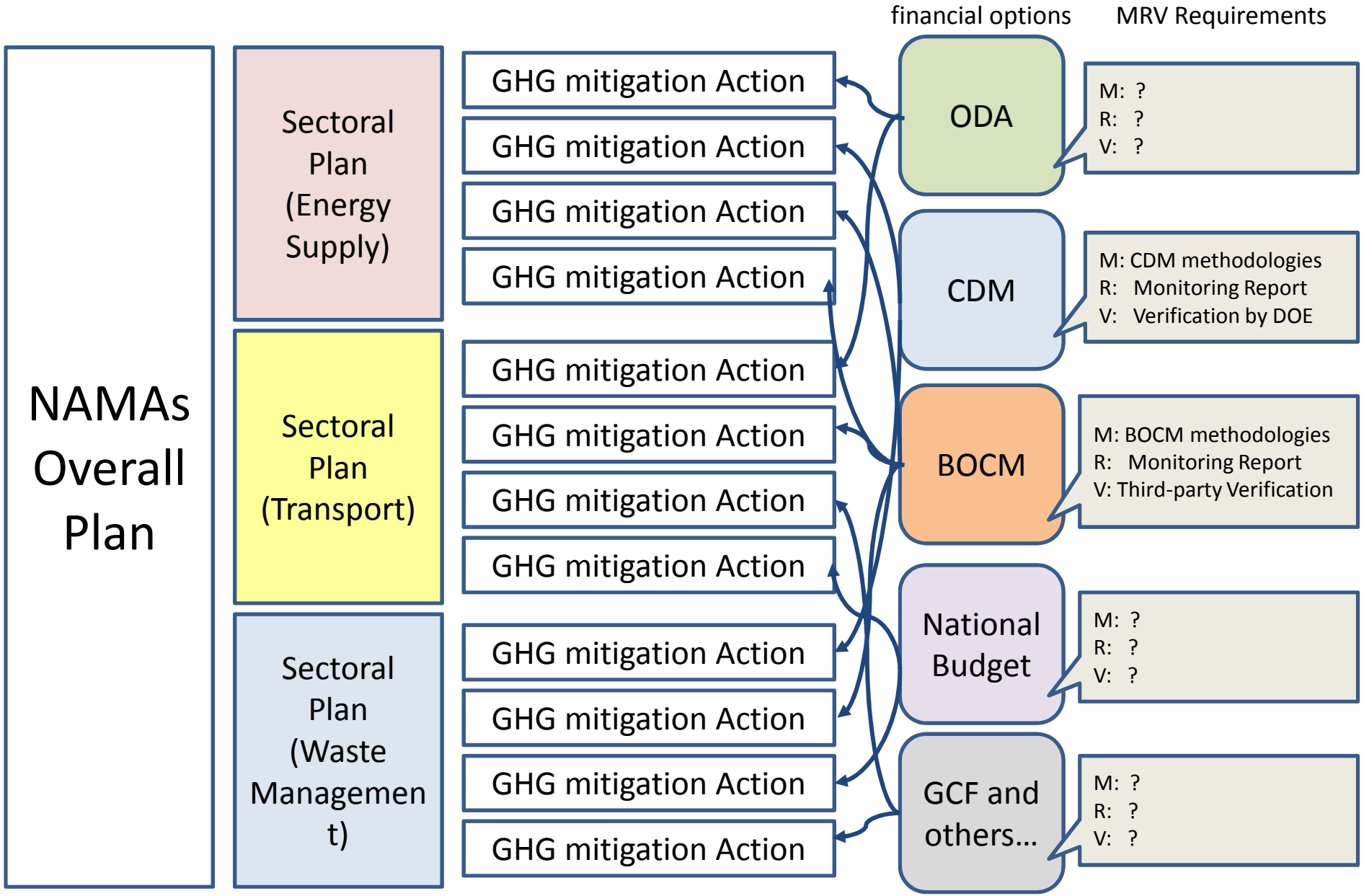
Source: National Strategy on Climate Change Laos, 2010

2-4. Emission Calculations by selected GHG mitigation action in Laos

*All values are calculated on the assumption.

Mitigation measure	Calculation method (BAU – NAMA scenario)	Emissions reduction (year)
Development of Public Transport Service (Bus)	***Private Car*** {Transport amount (60000 passenger-km) ×Emission Factor (25.7 kg/passenger-km)} ×365days ***Bus*** {Transport amount (60000 passenger-km) ×Emission Factor (22.7 kg/passenger-km)}×365days	***Private car - Bus*** **66,000 t-CO2**
Promotion of electric vehicle for government use	***Private Car*** No. of car (5000) ×Traveling Distance (5 km) ×Emission Factor (25.7 kg/km) ×365days ***Electric Vehicle*** No. of electric vehicle (5000) ×Traveling Distance (5 km) ×Emission Factor (1.7 kg/km) }×365days Private Car－Electric Vehicle	***Private Car -EV*** **7,939 t-CO2**
……More Mitigation Measures		**α t-CO2**
Total		**82,855 +α t-CO2**

2-5. Relations between NAMA Overall Plan and respective NAMAs with different finances and associated MRV requirements



Conclusion

1. Keys to developing NAMAs:
   >> Prioritize GHG mitigation action
   >> Quantify GHG emissions reduction
   >> Set up MRV system

2. Japan's experience:
   >> Bottom-up quantification approach

3. Step towards in Host countries
   >> Information/data collection and analysis,
   identifying potential NAMAs,
   quantifying GHG emissions reduction

Thank you for listening!

Feel free to make comments and questions.

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