United Nations Framework Convention on Climate Change

CGE TRAINING MATERIALS- MITIGATION ASSESSMENT

MODULE C

Mitigation Assessment: Concepts, Structure and Steps

Module Objectives and Expectations

1. **Objective:** Provide participants with an overview of the purpose, key steps and key design considerations involved in conducting a Greenhouse Gas (GHG) mitigation assessment, and the issues involved in building upon these assessments to create more detailed national climate action plans.
2. **Expectations:** Participants will have a broad but sound understanding of how to conduct GHG mitigation assessments and how to create detailed national climate action plans.

Module Outline

1. Purpose and Objectives
2. Steps for Conducting a Mitigation Assessment
3. Translating Mitigation Assessments into National Climate Plans

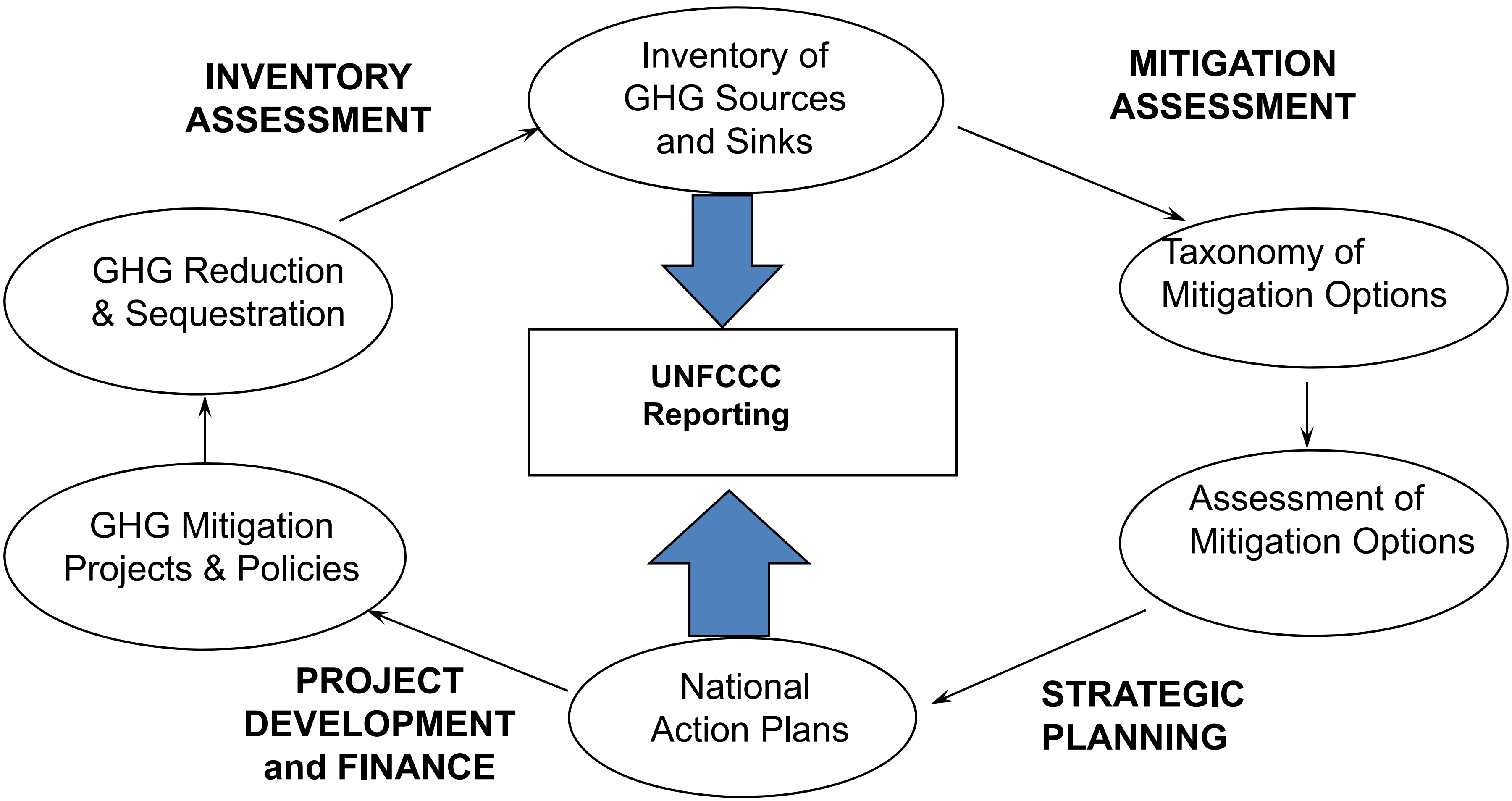
MODULE C1

Purpose and Objectives

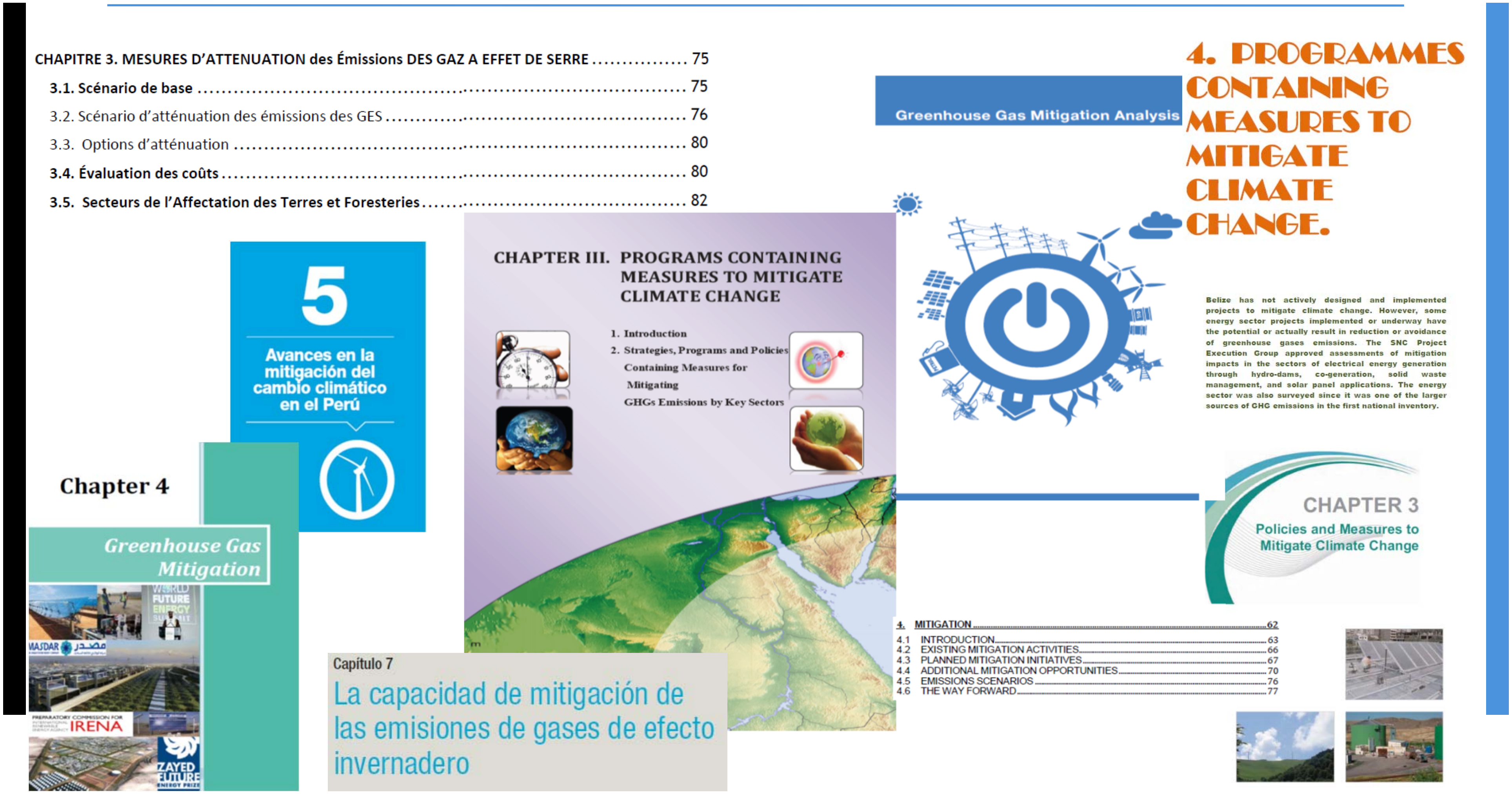
Why do a Mitigation Assessment?

- Meet the principles and objectives of the UNFCCC:
  - Under Article 4, all Parties are required to assess programs and measures that will mitigate climate change
- Provide policy makers with an evaluation of technologies and practices that can mitigate climate change and contribute to national development objectives
- Better understand the scale of emission reductions possible and their associated costs and benefits
- Identify and evaluate potential new programs and projects, including nationally appropriate mitigation actions (NAMAs)
- Put existing initiatives in context.

GHG Inventory and Mitigation Assessment and Reporting

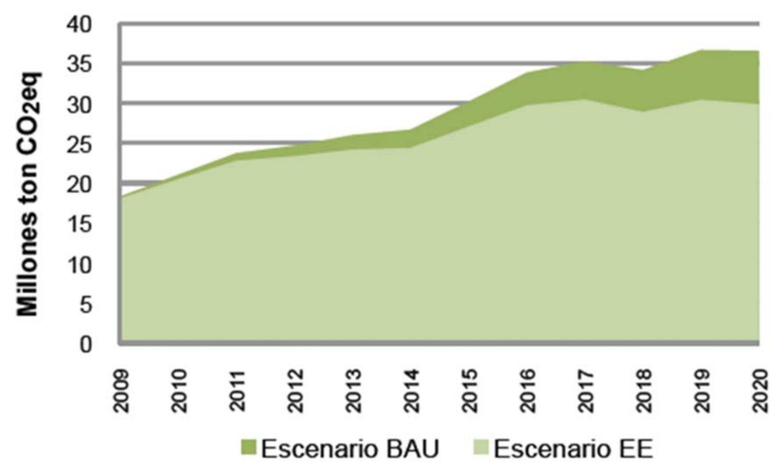


Examples of Mitigation Assessment (National Reporting)

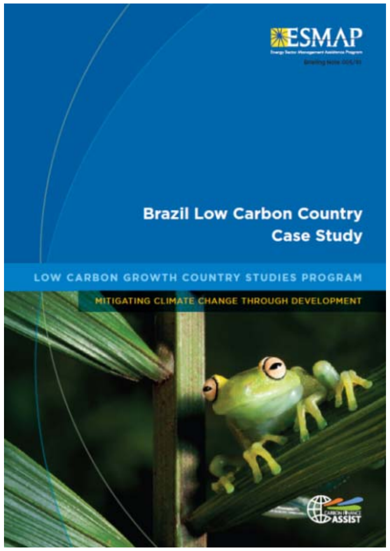


Examples of Mitigation Actions Described in Latin America and Caribbean (LAC) countries' National Communications

- Barbados' 1st Nat. Comm.
  - Presented broad abatement options (e.g., energy efficiency in industry and buildings)
  - Highlighted the need to target entities providing a unique service to the country (e.g., sole electricity generator and only cement production plant in the country).
  - Noted an opportunity to introduce electric vehicles since impediments facing other countries (e.g., oil companies discouraging use of alternative fuels) don't yet exist.
- Belize's 2nd Nat. Comm.
  - Included examples of particular projects, along with GHG savings compared to likely alternatives:
    - Solar panels in villages (vs. adding a diesel generator or connecting to the power grid miles away)
    - Installation of compact fluorescent lights across the country (replacing incandescent bulbs).
- Chile's 2nd Nat. Comm.
  - Calculated scenarios of GHG emission impacts from energy efficiency measures in the copper mining sector business as usual (BAU) and mitigation scenarios).



Other Examples of Mitigation Assessment



Abundant academic and grey literature is available on national mitigation analyses

MODULE C2

Steps for Conducting a Mitigation Assessment

Steps of a Mitigation Assessment

- Exact procedure will depends on context, e.g. goals, scope and integration with national planning:

- Once complete, review and communicate findings and integrate into national reports and plans.

1. Assess situation & organize process → 2. Define scope → 3. Design methodology → 4. Collect & calibrate data → 5. Develop baseline scenario(s) → 6. Identify & screen mitigation options → 7. Develop & assess mitigation scenario(s)

Step 1. Assess situation and organize process

- Determine and prioritize objectives of assessment:
  - Contribution to other national objectives (e.g. sustainable development, rural development, reduced local pollution), effectiveness in reducing GHG emissions, etc.
- Assess existing studies, current capacities and data availability:
  - Review available national mitigation studies, identify strengths and gaps.
- Define key participants and stakeholders:
  - Which organizations will have institutional responsibility for the analysis and for implementing results
  - Possible stakeholders include: policy makers, scientific community, NGOs.

Key Participants

- The development of mitigation assessments will require close cooperation among a wide range of stakeholders
- Energy, agriculture, environment, planning and finance ministries will all likely need to be involved
- Some tasks may be undertaken by outside consultants or the academic community
- Sectoral policy analysts, modellers, and technical writers are typically needed to prepare assessment
- Broader set of participants often useful to ensure mitigation options are consistent with national development priorities and other considerations.

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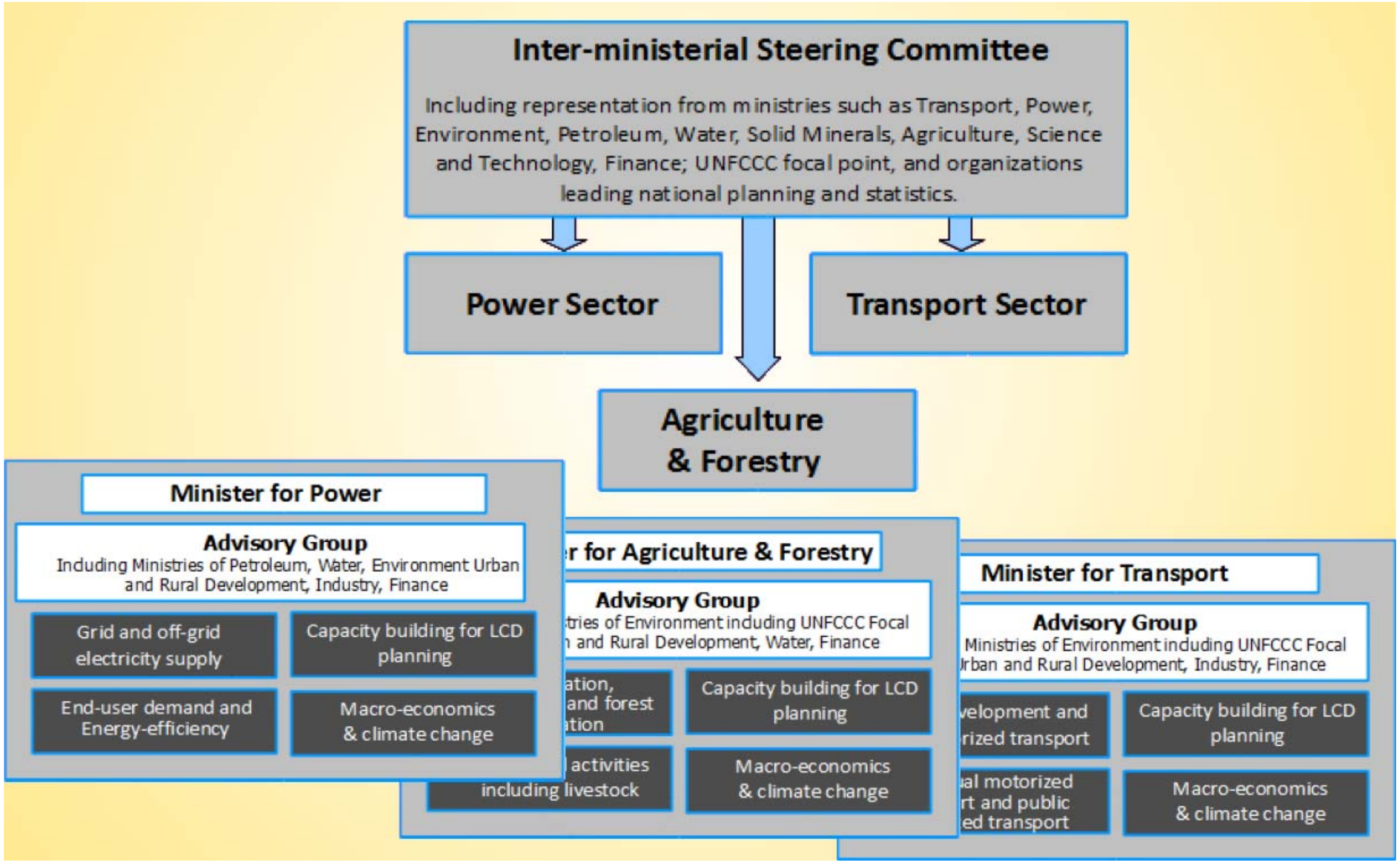
Schematic Example of Breadth of Government Involvement



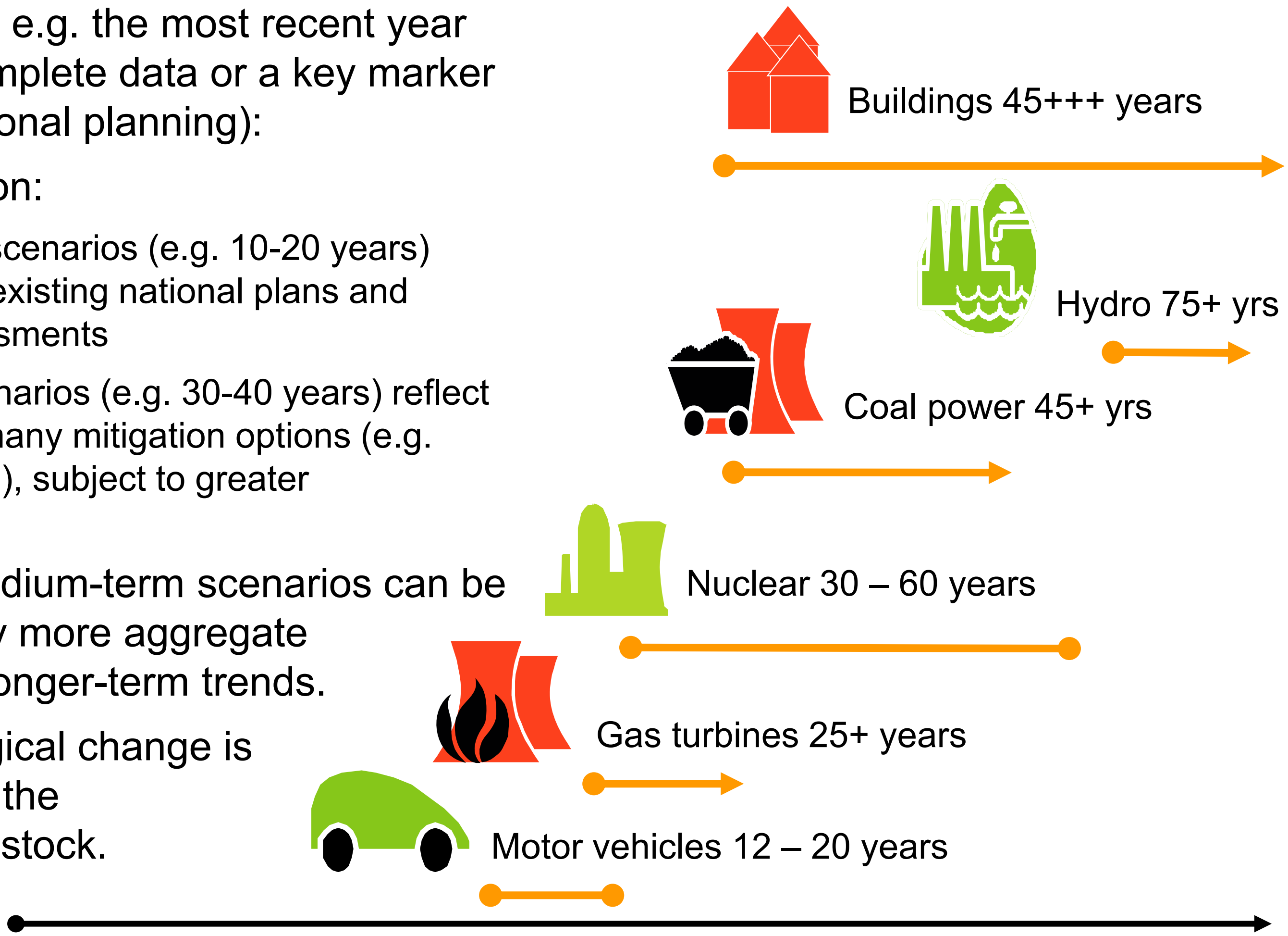
Source: Rogers (2011) "Building consensus to prioritize low carbon mitigation actions"

Step 2. Define scope of assessment

- Sectoral scope: energy supply, transport, buildings, industry, agriculture, land-use, forestry, solid waste:
  - Include all sectors and sources or only those with significant emissions benefit (see templates).
- Technological scope of mitigation options:
  - Limit based on cost, availability, conflict with other objectives?
- Inclusion of cross-sectoral issues and options, e.g. market mechanisms.

Time Frame of Mitigation Assessment

- Select base year: e.g. the most recent year with relatively complete data or a key marker year (e.g. for national planning):
- Select time horizon:
  - Medium-term scenarios (e.g. 10-20 years) integrate with existing national plans and sectoral assessments
  - Long-term scenarios (e.g. 30-40 years) reflect time scale of many mitigation options (e.g. urban planning), subject to greater uncertainties.
- More detailed medium-term scenarios can be complemented by more aggregate assessments of longer-term trends.
- Rate of technological change is closely related to the lifetime of capital stock.



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Step 3. Design assessment methodology

- Select methodologies consistent with study objectives, desired outputs, available data and resources:
  - Economic outputs: cost and benefits (bottom-up approaches), macroeconomic impacts (top-down models)
  - Integrated and/or sector-specific analysis (e.g. power supply or transportation modeling)?
  - Modelling options discussed in Module E.
- Other criteria for methodology selection may include:
  - Consistency with other assessments (inventory and vulnerability and adaptation assessment (V&A) and established models and methods
  - Transparency to facilitate consensus building and decision-making across sectors
  - Familiarity and open access to enhance credibility with stakeholders.

Approaches to cost/economic analysis

- **Mitigation (Abatement) cost analysis:**
  - Often estimated at the policy or measure level, but can done for scenarios
  - Reflects the incremental cost relative to a baseline
  - Generally relies bottom-up approaches and simple cost analyses, using direct costs (capital, operation, maintenance, fuel, material, and transaction costs)
  - Often represented in marginal abatement cost (MAC) curves, and in cost per unit of GHG reduction
  - Useful in comparing relative costs of options
  - Captures direct economic costs, not impacts on GDP growth, employment, industrial structure, etc.
- **Macroeconomic analysis:**
  - Enables estimation of impacts on GDP, prices, employment, other macro-economic variables
  - Captures price, income, and other interactions unlike typical bottom-up methods
  - Generally requires use of more complex, and less transparent, macroeconomic models (e.g. equilibrium, input-output models)
  - Often limited ability to represent specific mitigation policies and measures.

Modelling in a Mitigation Assessment

- Consider who will undertake it: consultants provide ready source of expertise, but this does little to build capabilities within a country.
- Continuity and experience: NCs are sometimes hampered by the need to set up a new team for each assessment.
- Spreadsheet tools may be suitable for simpler studies. Success depends less on the sophistication of the model: more on quality of data and expertise of analysts.
- Lack of data: simple assessments can help focus and prioritize future data collection efforts.
- Even the simplest formal models require many months and a good level of expertise; don't expect this task to be done by just a few analysts: it requires ongoing training and strong guidance from experienced experts (economists, modellers, energy experts).
- Don't leave mitigation modelling to the last few months of an analysis.
- Consider setting up a permanent team responsible for mitigation modelling to ensure continuity of expertise.
- Strong and coordinated team needed: economists, engineers, energy and industrial engineers, Agriculture and LULUCF experts as appropriate
- Close coordination with and involvement of team working on inventories is crucial.

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Step 4: Collect and calibrate data and assumptions

- Data requirements and level of disaggregation depend on scope and objectives of study:
  - Sufficient detail to meet needs of analysis, and for which data is available.
  - Avoid being “data driven”.
- Helpful sources of data and assumptions can include:
  - GHG inventories and prior national communications
  - Energy statistics and energy balances
  - National economic and demographic statistics and surveys
  - Planning reports from utilities
  - Relevant studies (e.g. low carbon scenarios, renewable energy assessments).
- International data and studies can help fill data gaps.
- Develop consistent accounts of energy use and emissions for base year (and, if relevant, other historical years).

Step 5. Develop baseline scenarios

- A baseline scenario provides a plausible and consistent description of future developments in the absence of explicit new GHG mitigation policies:
  - Not a forecast of what will happen: future is inherently unpredictable.
- Development of the baseline scenario(s) can be a critically important analytical and policy task:
  - Influences the magnitude of emissions benefits and relative cost of mitigation strategies.
- Not simply an extrapolation of past trends, a baseline scenario requires data and assumptions regarding:
  - Macroeconomic and demographic projections (e.g. population and GDP growth)
  - Structural shifts in the economy (e.g. relative growth of agricultural, industrial and services sectors)
  - Planned investments and existing policies in individual sectors (e.g. power supply plans)
  - Evolution of technologies and practices, including saturation effects, fuel switching, and adoption rates of new technologies (e.g. share of household with refrigerators; use of combined heat and power in the steel industry).

Defining Baseline Scenarios

- Baseline scenarios are often termed "business-as-usual (BAU)" scenarios:
  - BAU needs to be carefully defined
  - Does it include anticipated future changes? Does it include policies recently enacted? Recently announced? Does it include only policies not specifically directed at reducing emissions?
  - There is no single commonly accepted definition.
- It can be useful to have multiple baseline scenarios, for example:
  - With and without existing policies (to reveal their emission benefits)
  - With efficiencies and other parameters "frozen" at current values (static) and with anticipated technological and other changes (dynamic).

Baseline Scenario Definitions: Examples from the Literature

- International Energy Agency's widely cited *World Energy Outlook 2011* presents two:
  - Current Policies Scenario ("show how the future might look on the basis of the perpetuation, without change, of the government policies and measures that had been enacted or adopted by mid-2011")
    - From a national communications perspective this might be one "baseline" scenario; another baseline scenario might look at emissions levels were these policies not in place to enable estimation of their emissions benefits.
  - New Policies Scenario ("recent government policy commitments are assumed to be implemented in a cautious manner – even if they are not yet backed up by firm measures")
    - From a national communications perspective this might be one of several "mitigation" scenarios.

Baseline Scenario Definitions: Examples from Nat. Comms

- Scenario descriptions drawn from communications of various NAI Parties:
  - "presupposes…economy will continue its current development course, with similar growth mechanisms and a similar level of government intervention"
  - "…a 'business as usual' projection of…GHG emissions between 2008 and 2020. It is assumed that recent trends in population and economic growth will continue and that no GHG abatement measures will be implemented."
  - "…business-as-usual (BAU) baseline projections from 2000 until 2020, taking into account national economic and social policies, development trends and projections
  - "The baseline scenario is constructed based on trends, plans and policies prevailing…"
  - "development of this scenario required a projection of current levels to future levels of each type of activity for the time period of 2000-2033
  - "…draws on assumptions made about population growth, GDP, and other macro variables, which were obtained from official institutions"

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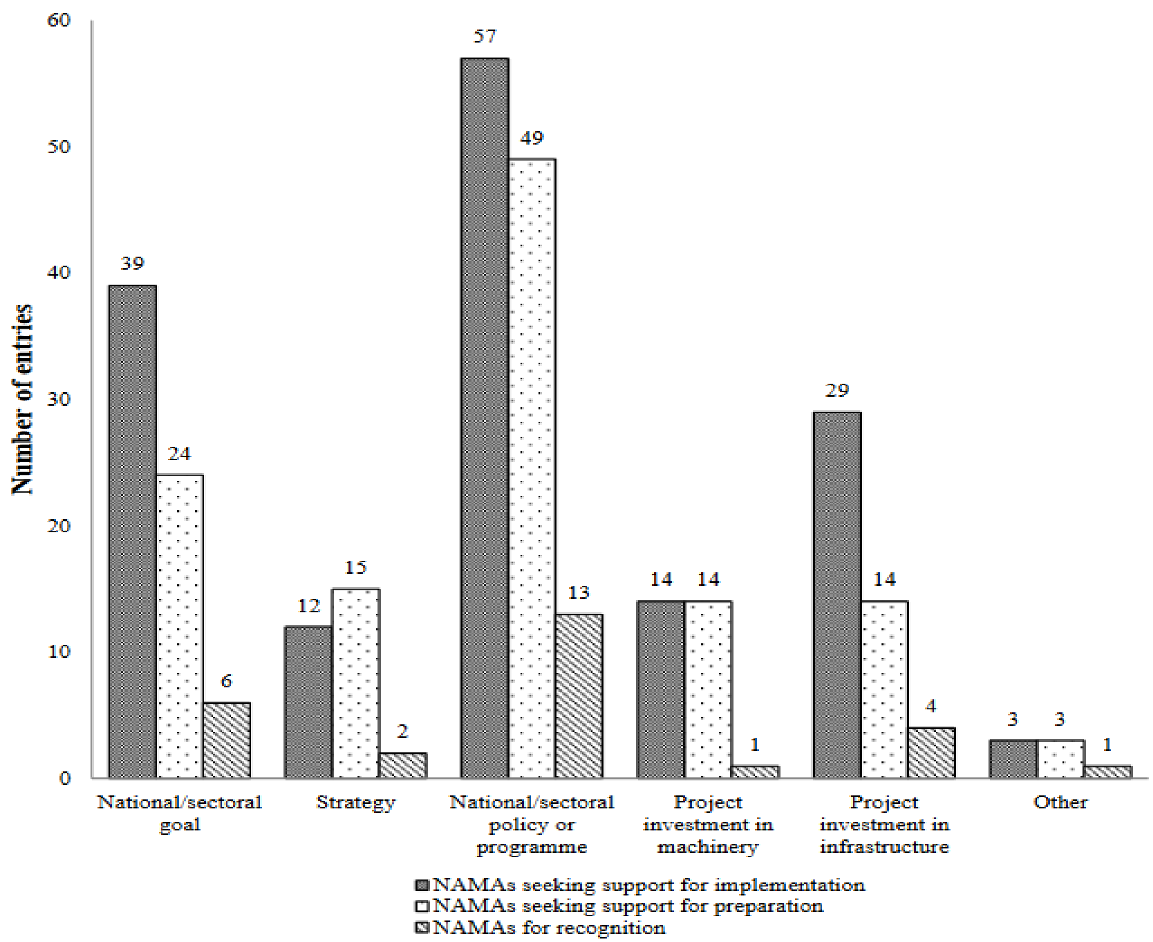
Baseline Scenarios are Referred to in Several NAMAs

Figure 7

Number of nationally appropriate mitigation action entries in the registry by type of action as at 30 September 2020



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Step 6: Identify and screen mitigation options

- A systematic screening process can be used to determine which mitigation options to include in mitigation scenarios:
  - Establish criteria and indicators consistent with objectives of mitigation assessment
  - Identify potential mitigation options in each sector
  - Apply criteria and assess indicators for each option
  - Determine which options to include/ evaluate further.
- Process can involve many participants, from technical analysts to policy makers; can help to ensure consistent perspective across sectors and participants
- Particularly important when using bottom-up approach in which a wide range of technologies and policies need to be considered.
- May include a quantitative assessment of the mitigation potential (tCO_2) and cost of saved carbon ($/TC) of each option. May also include qualitative factors.
- Provides opportunity to explicitly consider a comprehensive set of options while reducing the level of effort required in the later more in-depth mitigation analysis.
- Reduces likelihood of overlooking important options.

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Identify Potential Mitigation Options

- Review prior assessments and mitigation literature (in-country and international), including NAMA and low-carbon studies
- Consult with sectoral experts and relevant government agencies
- Develop lists of strategies – technologies, policies, and measures – by sector and across sectors
- Include both hard (quantifiable) and soft (enabling) options.

Establish Screening Criteria

- Potential criteria/indicators include:
  - Significance of emissions impact (tCO2e)
  - Cost-effectiveness (e.g. marginal abatement cost)
  - Feasibility, including institutional capacity (data collection, monitoring, enforcement, permitting, etc.) and political acceptability
  - Consistency with national development plans and goals
  - Social and macro-economic impact (employment, forex, trade)
  - Equity (differential impacts on income groups)
  - Environmental impact (e.g. local air quality, biodiversity, soil conservation, indoor air quality, etc.)
  - Replicability (adaptability to different geographical, socio-economic-cultural, legal, and regulatory settings)
  - Technology transfer.

Screening Example: Mexico Low-Carbon Development Study

In **Mexico,** 40 near-term priority mitigation measures have been identified using 3 principal criteria to rank options to 2030:

1. *CO_2 emission reduction potential.* An intervention must generate 5 million tons of CO_2 equivalent (CO_2e) emission reductions from 2009 to 2030.
2. *Low cost per ton of CO_2e reduced.* Only interventions with positive economic and social rates of return (at a given discount rate or cost of capital) and an abatement cost of US$25 per ton CO_2e reduced or less were considered. Interventions with positive net benefits are "no-regrets" measures since the financial and economic benefits more than cover the costs.
3. *Feasibility of implementation.* Determined by sector experts who considered technical potential, market development, and institutional needs; and by government officials who considered the political and institutional feasibility of scaling up interventions across the economy. Before adopting an intervention, public discussion with sector experts, government officials, the private sector, and civil society will take place. All selected interventions have already been implemented, at least on a pilot level, in Mexico or in other countries in similar conditions. Some interventions face barriers in the short term (next five years) but it is considered that these barriers can be removed in the medium term.

Source: ESMAP, "Low-Carbon Development for Mexico"

Screening Matrix (exercise to follow)

Examples of Criteria	Criteria Weight (Sum to 100 across all criteria)	Mitigation Option 1	Option 2	Option 3
Criteria Taken from Cost Curve				
Mitigation Potential (Million Tons CO2e)				
- Mitigation Potential Score (0=lowest, 10=highest)				
Direct Unit Costs ($/Ton CO2e)				
Direct Total Costs (Million $)				
- Direct Total Cost Score (0=highest, 10=lowest)				
Other Criteria (add your own)				
- Reliance on Local Technologies (0=bad-10=good)				
- Reliance on Domestic Energy Sources (0=bad-10=good)				
- Potential for poverty alleviation (0=bad-10=good)				
- Potential for improving air quality (0=bad-10=good)				
- Technical Feasibility (0=bad-10=good)				
- Political/Social Popularity (0=bad-10=good)				
- add your own….				
-				
-				
-				
Totals	-			
Overall Rank (1=best to 10=worst)				

Example of Ranking in Paraguay's 2nd Nat. Comm.

Priority mitigation measures

The **index of political compatibility** takes into account sectoral plans, international agreements, and national legislation

The **index of barriers** considers technical, institutional, financial, and social barriers

Medidas	Índice compatibilidad (Icp)	Índice barreras (IpB)
Biocombustibles	1.15	-1.92 (severa)
Sistemas fotovoltaicos rurales	0.5	-1.96 (severa)
Fogones mejorados	0.90	-0.83 (irrelevante)
Biogás	1.25	-2.2 (muy severa)
Energía eólica	0.64	-1.13 (moderada)

Improved cooking stoves:

- Compatible with political instruments and has small barriers
- Obstacles to implementation can be overcome with little investment
- Also a big impact on human health, particularly for women.
- Helps reduce impacts on primary forest and ecosystems, and increase carbon sinks.

Multi-Criteria Analysis (MCA) Example from Mauritius' 2nd Nat. Comm.

- Scale 1 to 5, where 5 represents the most probable level of adoption.
- MCA ex. for…

OPTION	DESCRIPTION	Mitigation potential	Sustainability	Social considerations	Cost considerations	Other considerations	OVERALL
		MULTI-CRITERIA ANALYSYS SCORE					
1	Reduce field burning of Agricultural Residues	4.00	4.25	3.19	3.50	2.46	3.45
2	Abandonment of cultivated land	3.00	5.00	3.42	2.33	2.65	3.14
3	Electricity generation from farm manure	1.00	3.94	2.25	3.00	2.80	2.75

Agriculture:

- Reducing field burning of agricultural residues is most attractive
- Anaerobic digestion of manure from farm animals received the lowest score due to high investment costs and logistical constraints.

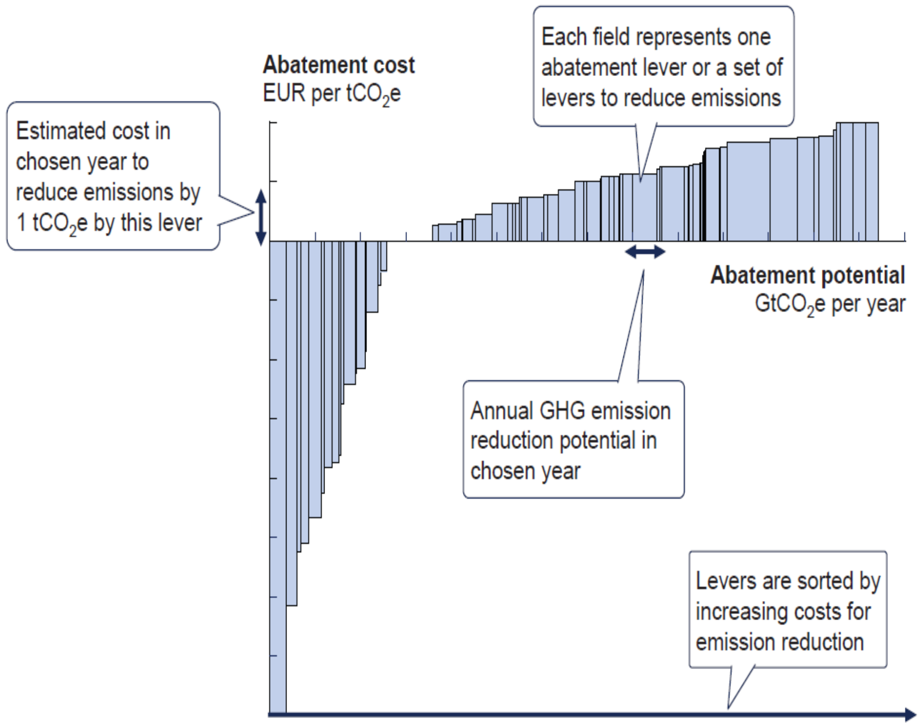
OPTION	DESCRIPTION	Mitigation potential	Sustainability	Social considerations	Cost considerations	Other considerations	OVERALL
		MULTI-CRITERIA ANALYSYS SCORE					
1	Improvement in transmission efficiency	1.00	4.05	2.74	3.48	3.17	3.04
2	Waste-to-Energy	2.00	2.80	2.38	2.65	2.77	2.55
3	Solar	3.00	4.75	3.32	3.13	2.85	3.39
4	Geothermal	4.00	4.45	3.86	2.95	3.57	3.74
5	Wind	5.00	4.55	2.96	3.20	2.77	3.39

Electricity generation:

- Geothermal with highest score, followed by solar and wind
- Waste-to-energy is last due to risk aversion and health concerns.

Cost-Effectiveness and Marginal Abatement Cost (MAC) Curves

- A technique for screening and ranking GHG mitigation options:
  - Plot cumulative GHG reduction from successive mitigation options (e.g. tonnes of CO_2 avoided) against cost per unit of GHG reduction (e.g. USD/tonne)
  - Area under curve yields total cost of avoided emissions
  - Care should be taken to consider interdependencies among options (e.g. benefits such as fuel switching in electric sector may be reduced by end-use efficiency programs), for example through use of integrated models.



Source: *Pathways to a Low-Carbon Economy,* McKinsey & Company, 2009

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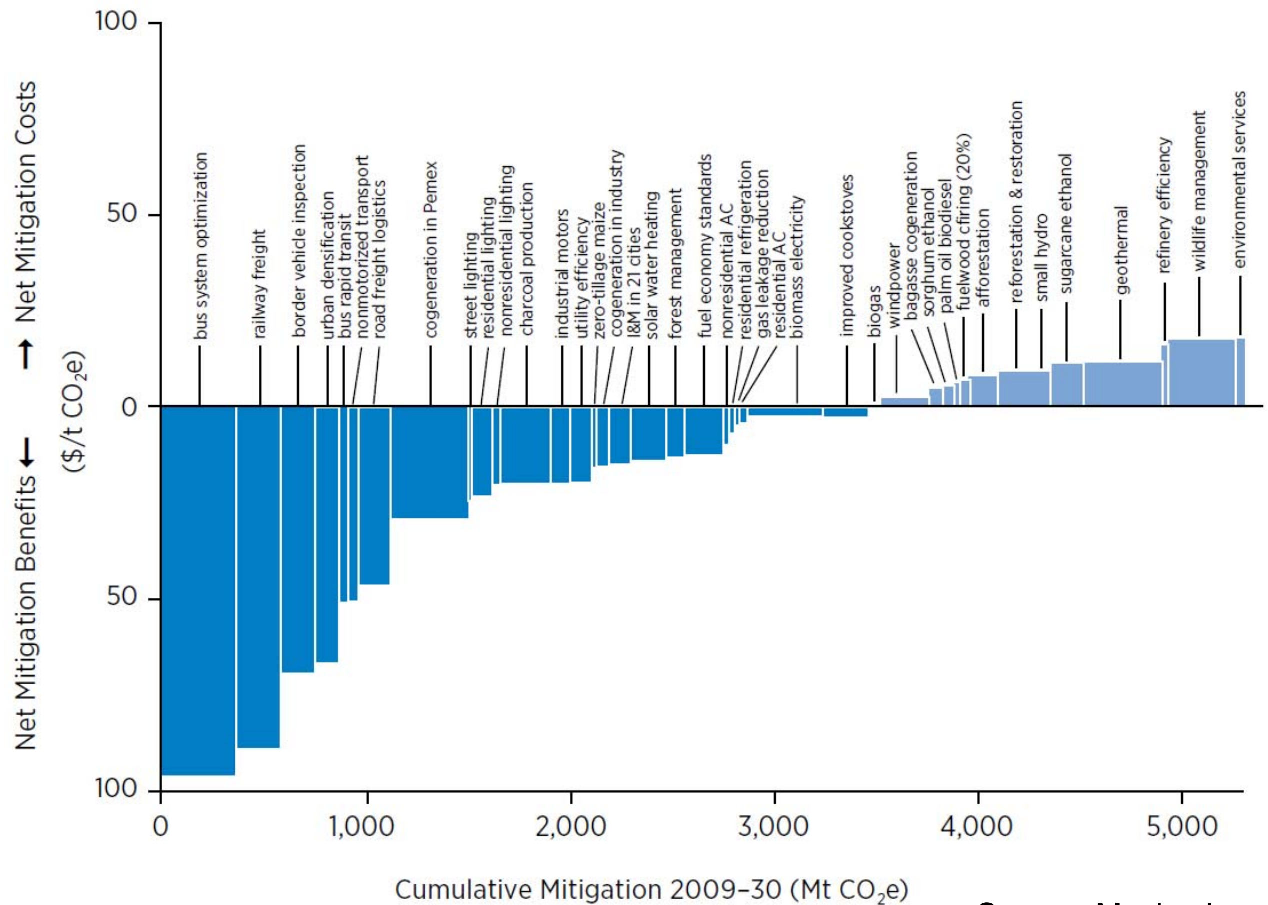
Example of MAC Curve: Mexico



Source: Mexico Low Carbon Country Case Study, World Bank ESMAP

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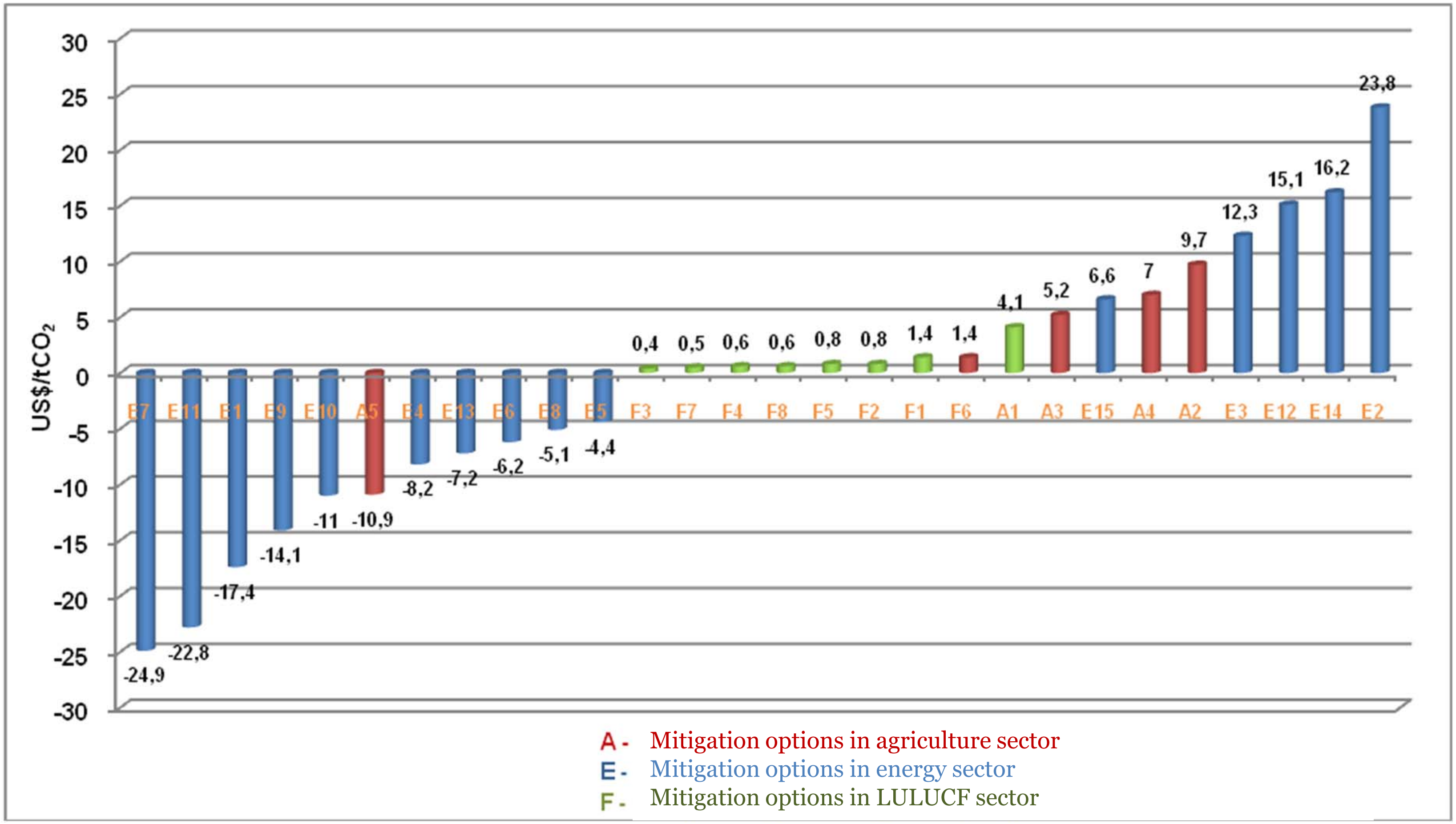
Example of MAC Curve: Vietnam



Source: Dr. Tran Thuc, “National GHG Inventory and Assumption Baselines for GHG Emissions Projections”

Marginal Abatement Cost (MAC)

$$MAC_{option} = \frac{\Delta Cost(\$, other\_unit)}{\Delta Emissions}$$

- MAC is always relative:
  - Δ = difference between mitigation and baseline option
  - Baseline should be consistent across options
- Cost = the net present value of direct costs over option lifetime at discount rate:
  - What discount rate to use? Which costs to include? What option lifetime?
- Emissions = GHG emissions over option lifetime
  - Discount emissions too? (generally not done).

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Step 7. Develop Mitigation Scenarios

- Mitigation scenarios reflect a future in which explicit policies and measures are adopted to reduce the sources (or enhance the sinks) of GHGs.
- Mitigation scenarios should take into account:
  - Specific national and regional development priorities, objectives and circumstances
  - The common but differentiated responsibilities of the Parties.
- Mitigation scenarios should not simply reflect current plans. Instead they should assess what would be hypothetically achievable based on the goals of the scenario.

Steps in Constructing Mitigation Scenarios

- Establish framing
- Create option portfolios (identify synergistic and/or mutually exclusive options and double counting), estimate penetration rates
- Construct integrated scenarios using chosen modeling methodology
- Calculate overall costs, benefits and GHG mitigation potential.

Framing Mitigation Scenarios

- A mitigation scenario can be framed as:
  - An emission reduction target
    - Relative to the baseline
    - Relative to emissions in some historical year, or
    - Relative to some indicator such as CO_2/capita or CO_2/USD
  - All options up to a certain cost per unit of emissions reduction
  - "No regrets" (cost-effective options only)
  - With or without specific options or technologies.
- Parties may wish to assess more than one mitigation scenario.

Examples of Mitigation Scenario Definitions

- IEA 2011 World Energy Outlook (WEO):
  - 450 Scenario: "works back from the international goal of limiting the long-term increase in the global mean temperature to two degrees Celsius (2°C) above pre-industrial levels"
- Scenario description drawn from communications of NAI Party:
  - "The mitigation scenarios are proposed plans and projects that have a potential for sectoral emission reduction or sink enhancing. Mitigation options are selected and analyzed according to their direct and indirect economic impact, consistency with national development goals, economical feasibility, and compatibility with implementation policies, sustainability and other specific criteria. Various methods and tools are used to evaluate each mitigation option in terms of technological and economical implications. It should be noted that due to major lack in data, most of the values used in the analysis are based on international applications and studies."

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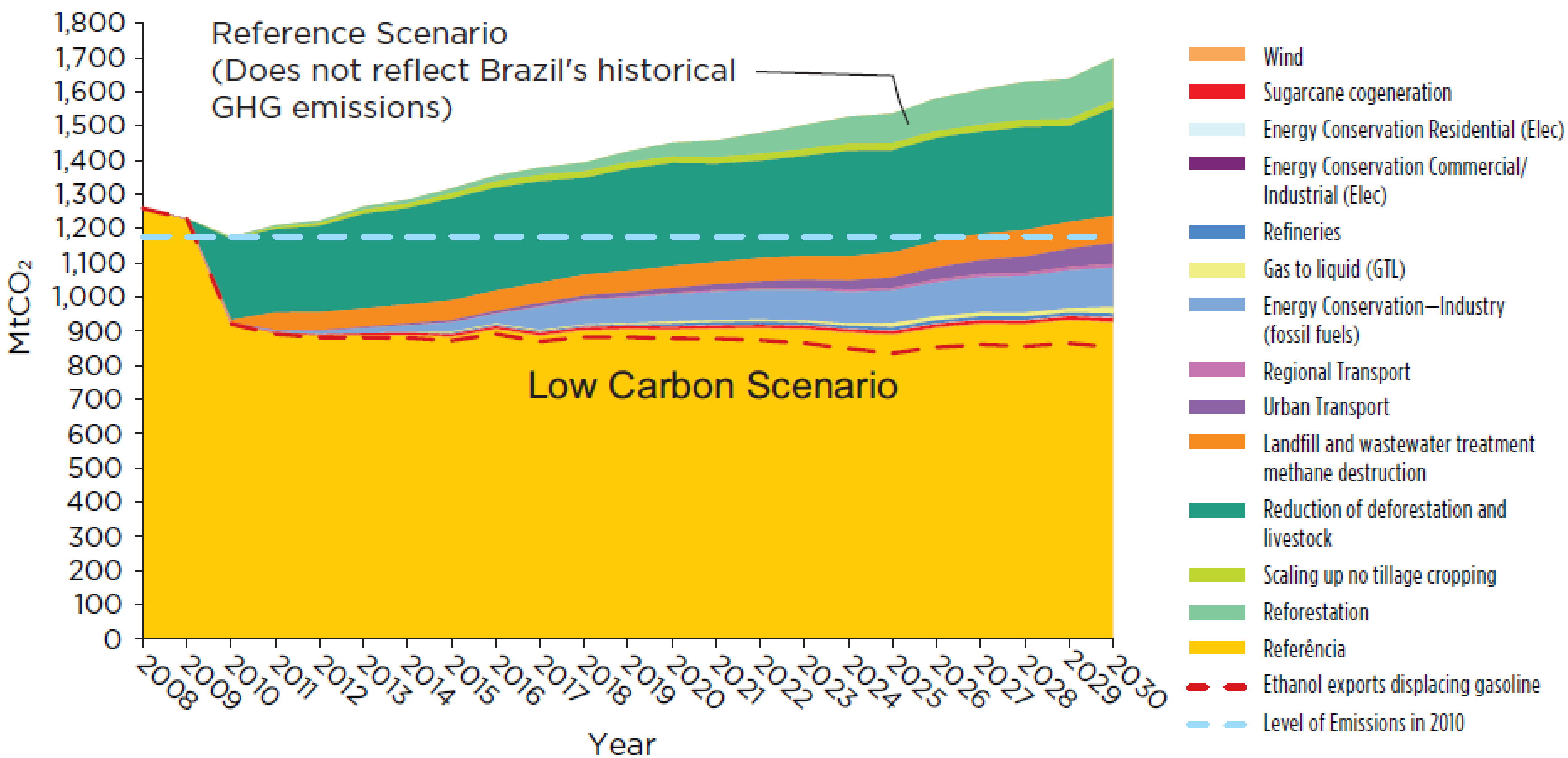
Brazil: Low carbon scenario



Source: ESMAP, "Brazil Low Carbon Country Case Study"

Assessing Mitigation Scenarios

- Scenarios can be assessed in terms of:
  - GHG emissions savings
  - Other co-benefits (e.g. reduced local air pollution)
  - Impacts on energy security
  - Social impacts (e.g. development benefits or drawbacks)
  - Costs (e.g. saved fuel costs or increased capital investment requirements, impacts on foreign exchange, etc.)
  - Technical feasibility of options
  - Political plausibility, etc.

Mitigation Action Plans and Scenarios (MAPS)

- Collaboration between developing countries
- Aims to establish the evidence base for transitions to carbon efficient, robust economies
- Contributes to ambitious climate change mitigation; aligns with poverty alleviation and economic development
- Mitigation action case studies were conducted for five countries, including South Africa (see next slide)

MAPS South Africa Case Study

- Four examples of mitigation activities assessed:
  - Bus Rapid Transport (BRT) in Cape Town: reduced CO_2 emissions from improved public transport (energy efficiency, modal shift from SOV)
  - South African Renewables Initiative (SARi): secure financial and institutional arrangements for renewable energy development
  - Carbon tax: Explore economic policy as mitigation option (proxy tax on fossil fuels proposed)
  - National Sustainable Settlements Facility (NSSF): solar water heaters and thermal efficiency measures in new low income houses.

Risks to implementation

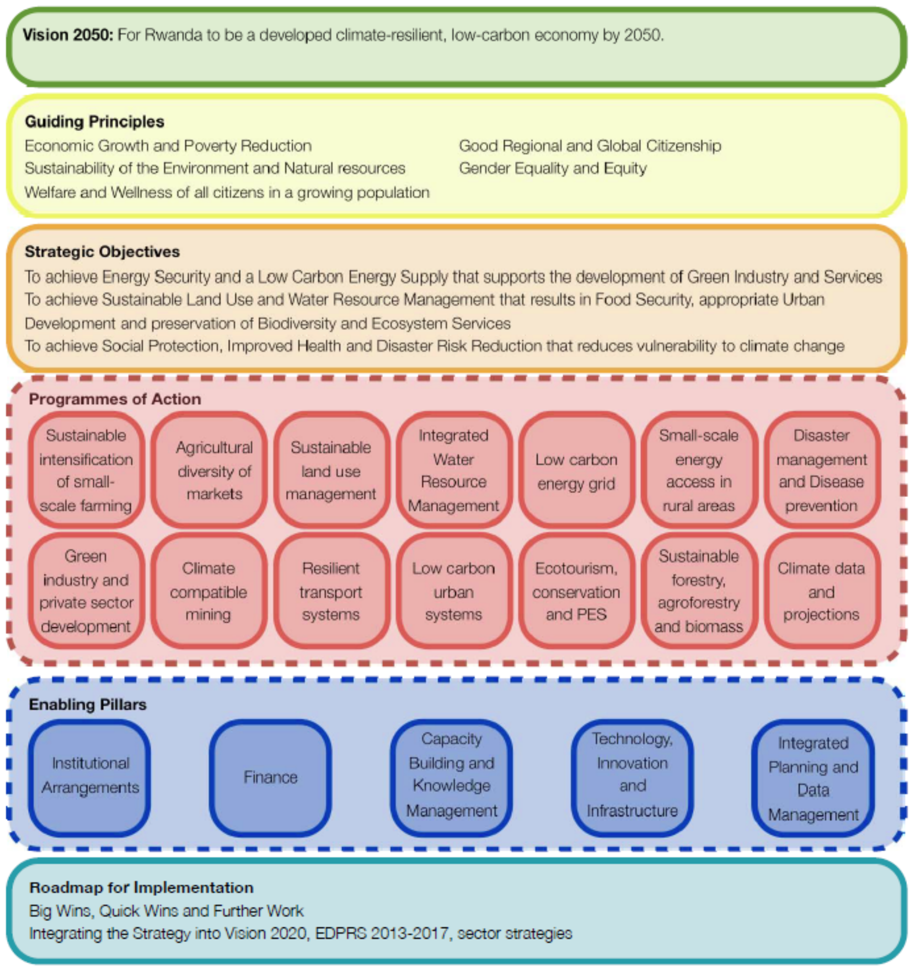
Red = high risk
Amber = medium risk
Green = low risk

Description Criteria	Is there a problem with mandate?	Is there relevant existing institutional capacity to implement?	Is there a supportive planning, policy and regulatory context for the MA?	Is it aligned with national priorities?	Has a financial structure for the MA been developed?	Is there local technical capacity to design the MA?	Capacity to technically operationalise MA	Other, not-yet-captured risks to implementation
Tax	Green	Green	Green	Green	Green	Amber	Green	Red
NSSF	Amber	Amber	Red	Green	Amber	Green	Amber	Red
SARi	Amber	Amber	Amber	Green	Green	Green	Amber	Red
BRT	Green	Amber	Green	Green	Green	Amber	Amber	Red

Source: “MAPS. Mitigation Actions in Developing Countries: Country Study for South Africa”

Rwanda's National Strategy for Climate Change and Low Carbon Development

Strategic framework for the strategy



- Vision of climate-resilient, low carbon economy by 2050
- Guiding principles (e.g. economic growth, good regional and global citizenship)
- Strategic objectives (e.g. low carbon energy supply, sustainable land use)
- Programmes of action (e.g. agricultural diversity of markets, climate compatible mining, ecotourism)
- Enabling pillars (e.g.f inance, capacity building, integrated planning and data management)
- Roadmap for implementation

Source: "Green Growth and Climate Resilience: National Strategy for Climate Change and Low Carbon Development"

Rwanda's National Strategy for Climate Change and Low Carbon Development (2)30

- A few "big wins" were identified from the actions recommended in the national strategy that will have a large impact on mitigation, adaptation and low carbon economic development.
- Likely to produce the greatest return on investment since these actions impact the economy in the long-term.
- Three largest GHG sources (energy, agriculture, and transport) are all addressed in mitigation "big wins" to enable low carbon development, increased food and energy security, and reduced vulnerability to oil prices:
  - Geothermal power generation
  - Integrated soil fertility management
  - High density walkable cities.

Source: "Green Growth and Climate Resilience: National Strategy for Climate Change and Low Carbon Development"

Reporting Mitigation Assessments

- Mitigation assessments form an important part of communications on climate change.
- They are read both by the international scientific community and by national and international policy makers, so need both a high level of scientific rigour and a high level of clarity and comprehensibility.
- Raw modelling results need to be reinterpreted in a form more familiar to policy makers.
- Should describe:
  - What methodologies were adopted and why (not just software chosen, but how it was used)
  - How structure of national energy system is reflected in the model.
  - What data structure was used and why.

MODULE C3

Translating Mitigation Assessments into National Climate Plans

From Mitigation Assessments to National Action Plans…

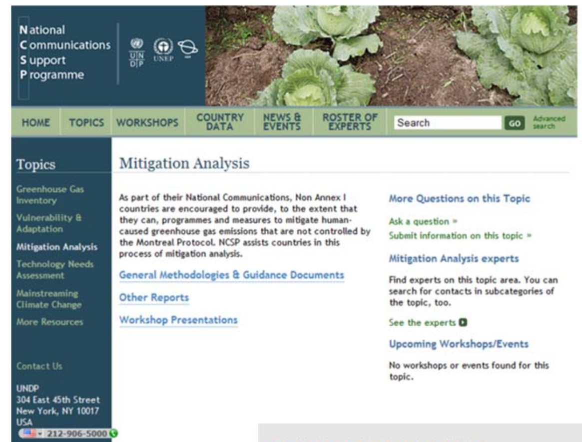
- Developing a national action plan goes well beyond the scope of a mitigation assessment:
- Key issues include:
  - Plan development must involve a diverse group of government agencies
  - Requires participation of non-governmental stakeholders
  - Must focus on well-defined objectives
  - Should emphasize implementation and have a practical focus
  - Should have local control and ownership
  - Should include aspects that aim to increase public awareness of climate change
  - Should be living documents and viewed as part of an ongoing process to address climate change.

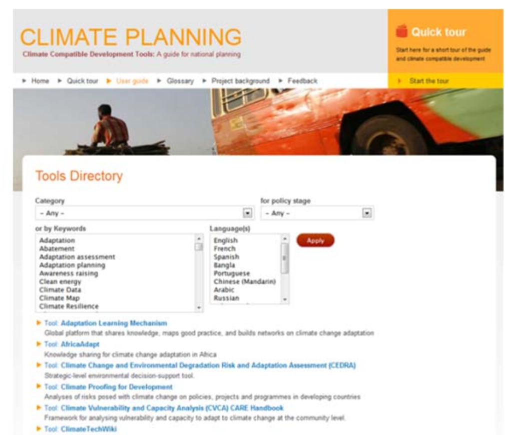
Integrating with GHG Inventories and Vulnerability and Adaptation (V&A) Assessments

- Mitigation assessments should be closely linked to the other national communications: GHG inventories and V&A assessments.
- Should be consistent with data and assumptions used in those assessments (e.g. demographic and economic assumptions).
- Reporting on the 3 elements should be harmonized and closely coordinated.
- GHG Inventories:
  - Will identify major sources and sinks of GHGs, helping to determine the scope and emphasis in the mitigation assessment
  - Mitigation assessment accounts should use inventories accounting procedures and emission factors wherever possible.
- V&A Assessments:
  - Will identify possible changes in natural resource conditions and management practices, which could effect baseline resource conditions as well as the applicability of mitigation options
  - For example: climate change might affect hydro potential, irrigation energy requirements, and biomass productivity, and alter the effectiveness of mitigation strategies such as afforestation or the reduction of agricultural emissions.

Resources for Planning a Mitigation Assessment

- Institutions that support mitigation assessments include:
  - UN Global Support Programme
    - http://un-gsp.org/
  - Global Environment Facility
    - http://www.thegef.org/gef/climate_change
  - Technical University of Denmark working to implement UN Environment's Climate Change Strategy and Energy Programme (UNEP DTU)
    - https://unepdtu.org/
  - Climate & Development Knowledge Network (CDKN) toolkit
    - https://cdkn.org/ar5-toolkit/?loclang=en_gb
    - OpenEI, LEDS gateway
    - http://en.openei.org/wiki/Gateway:Low_Emission_Development_Strategies





Topics for Discussion

- What lessons have you learned from past mitigation assessments?
- What are the most challenging and resource intensive steps, and how can they be addressed?
- What are the biggest challenges in defining a baseline?
- What criteria have you used for mitigation and other planning efforts?