

Introduction to Measurement, Reporting and Verification (MRV)

Overview

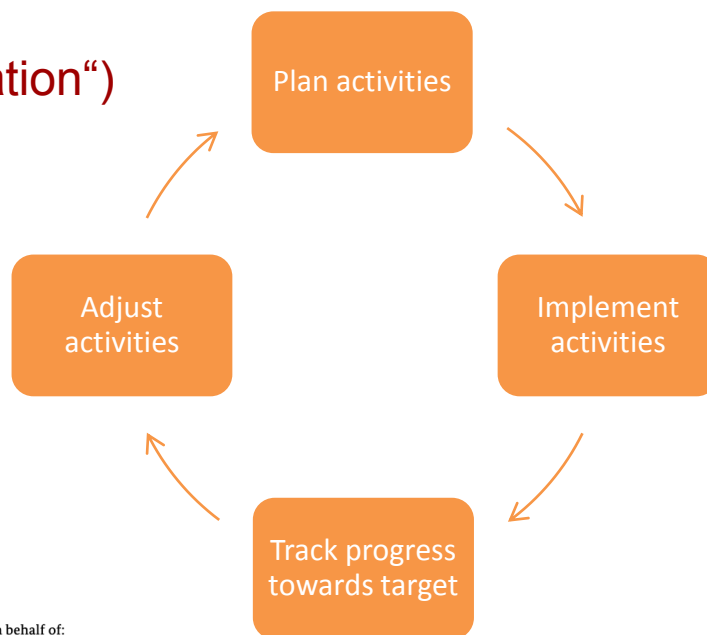
- National MRV Systems
- National GHG Inventories
- Mitigation action MRV
- MRV of Support
- Institutional Structures



What is MRV?

- MRV refers to activities allowing to track progress and steer towards climate change related targets
- It includes
 - data collection and assessment („measurement / monitoring“)
 - Reporting of results
 - QA/QC of all steps and results („verification“)

MRV is a terminology used under the UNFCCC. It is NOT a definition!



The M, R and V



Important: The rigour of an MRV system has to be balanced with its function – input to policy decision making, reporting to the UNFCCC, carbon markets?

Measurement	Reporting	Verification
<ul style="list-style-type: none"> Data collection related to the relevant indicators, e.g. GHG emissions, fuel consumption, electric vehicles sold Type, level of detail, information collected depends on function of MRV system – e.g. <ul style="list-style-type: none"> national GHG levels mitigation policy impacts, Carbon market 	<ul style="list-style-type: none"> Data reported will generally follow data monitored, but might have different level of detail, e.g. <ul style="list-style-type: none"> Calculation inputs Qualitative/explanatory information Level of details depending e.g. audience, review approach Common reporting templates enhance comparability 	<ul style="list-style-type: none"> Quality assurance step Level of rigour to be aligned with system function, e.g. <ul style="list-style-type: none"> Other department or institution for Biennial Update Report Third party verification for annual report under Emission Trading System



What is an MRV system?

An MRV system is a compound of **institutional structures**, **processes** and **capacities** aiming to track progress toward a target

More specific elements include:

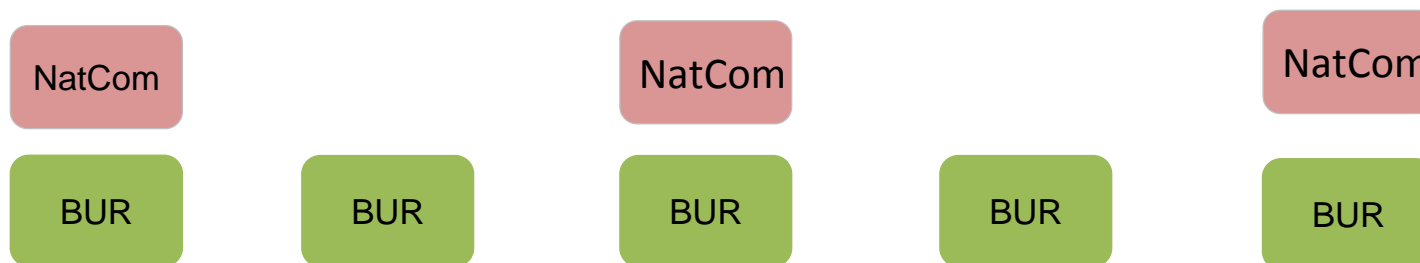
- Indicators
- Data collection
- Quality assurance / quality control
- Data management approaches
- Evaluation of progress towards target
- Documentation/archiving
- Dissemination

A database can be part of an MRV system, but an MRV system is not necessarily a database

A national greenhouse gas inventory is an MRV system

An MRV system can also track qualitative data

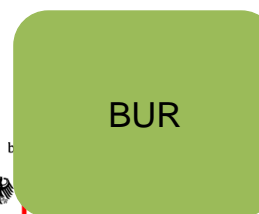
Requirements for national MRV systems: National Communications and Biennial Update Reports



2014 2015 2016 2017 2018 2019 2020 2021 2022



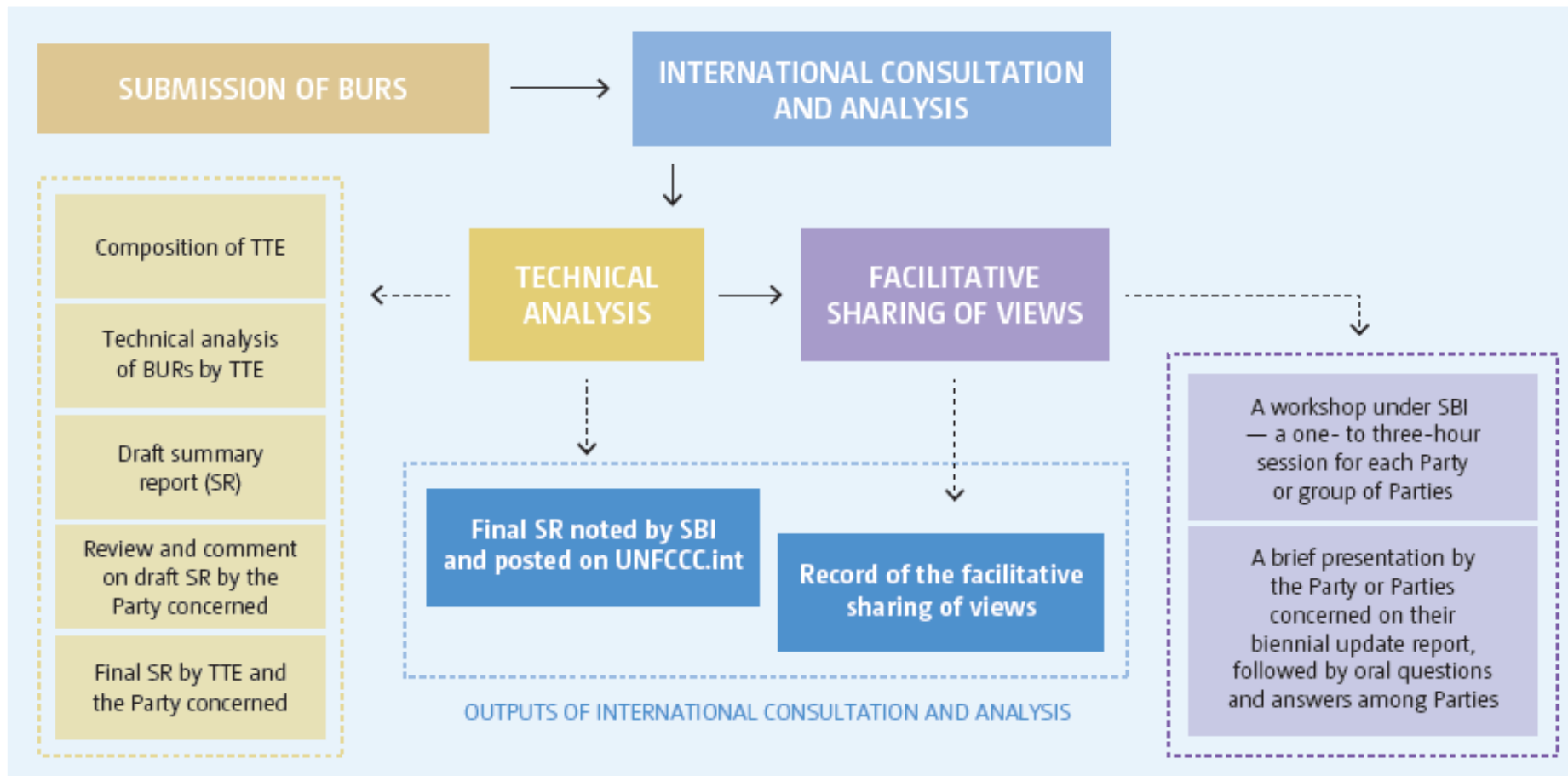
- National circumstances
- National MRV system
- GHG inventory
- Mitigation actions
- Vulnerability and adaptation action
- Support received and required



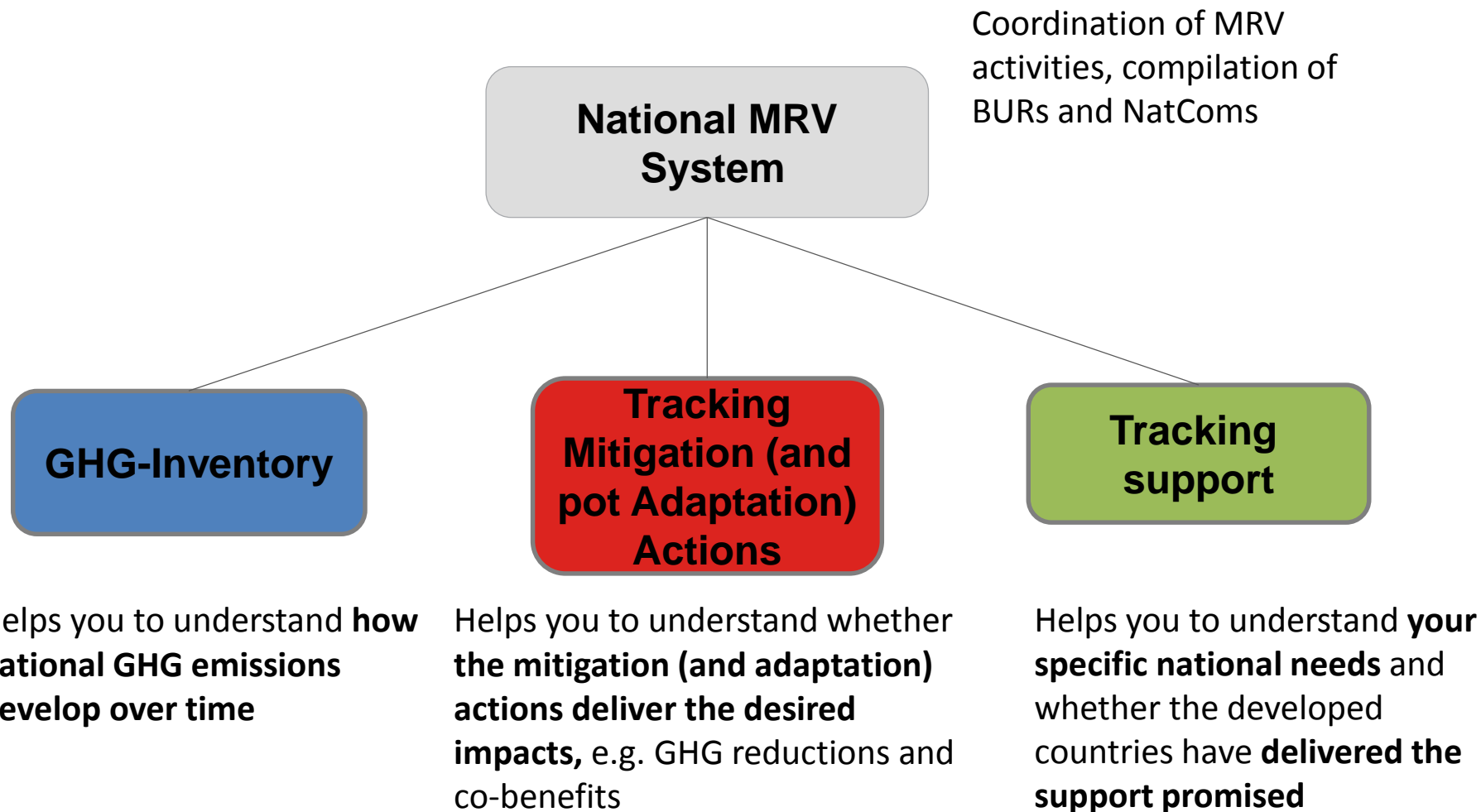
- National circumstances
- National MRV system
- GHG inventory
- Mitigation actions
- Support received and required

Updated information

Requirements for national MRV Systems: International Consultation and Analysis Process



Elements of National MRV Systems



National benefits of MRV Systems

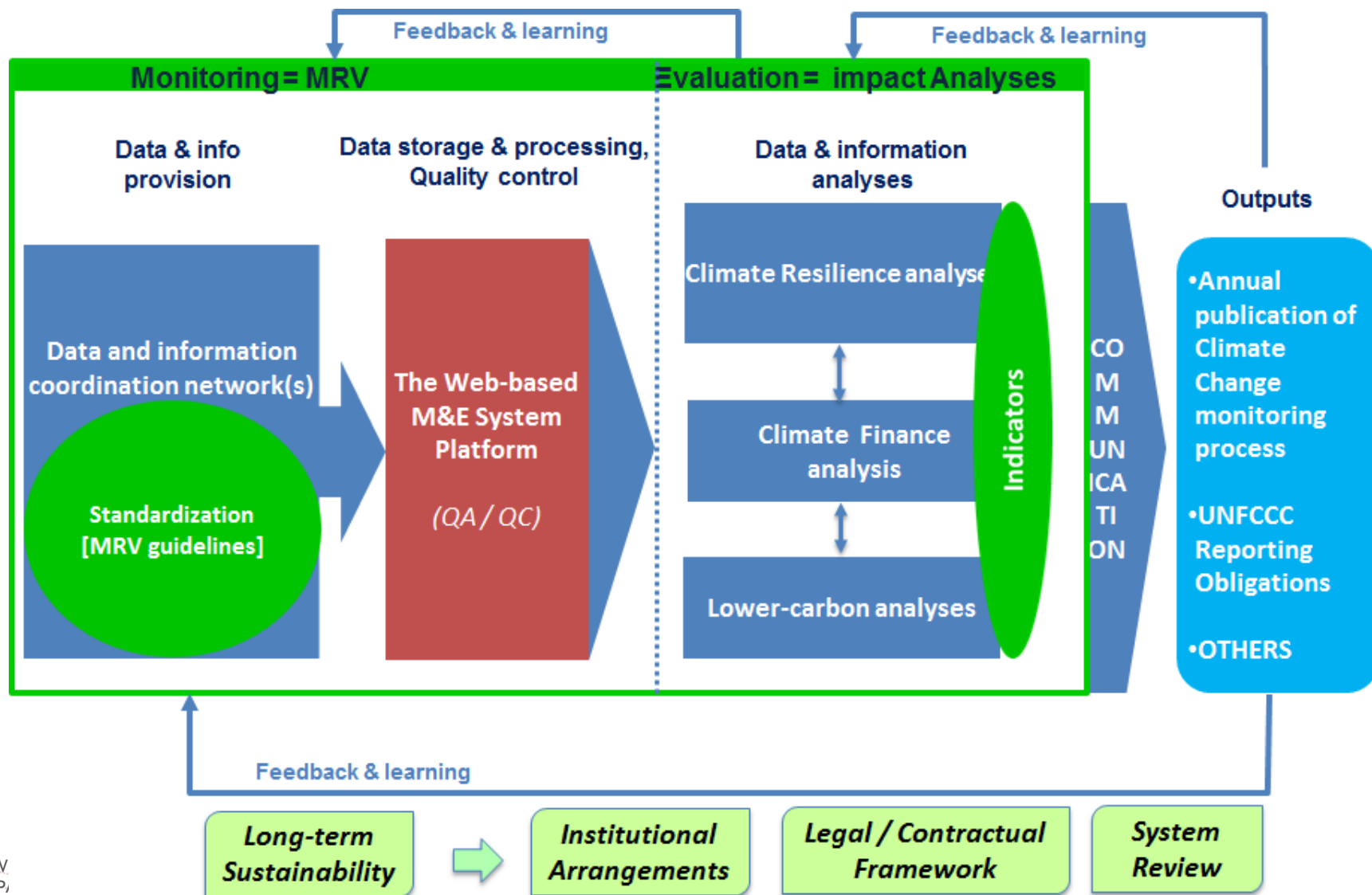
An MRV system allows you to gauge if you are following the right path to reach your fixed objectives

Moreover:

- It facilitates decision making and national planning
- It promotes coordination and communication between emitting sectors
- It generates comparable and transparent information
- It highlights lessons and good practice
- It increases the probability of receiving international support
- It facilitates decision making to use received support in an efficient manner



South Africa – Example of a national MRV system



The M&E SYSTEM

National GHG Inventories

MRV
CAPACITY DEVELOPMENT
PROJECT - TURKEY



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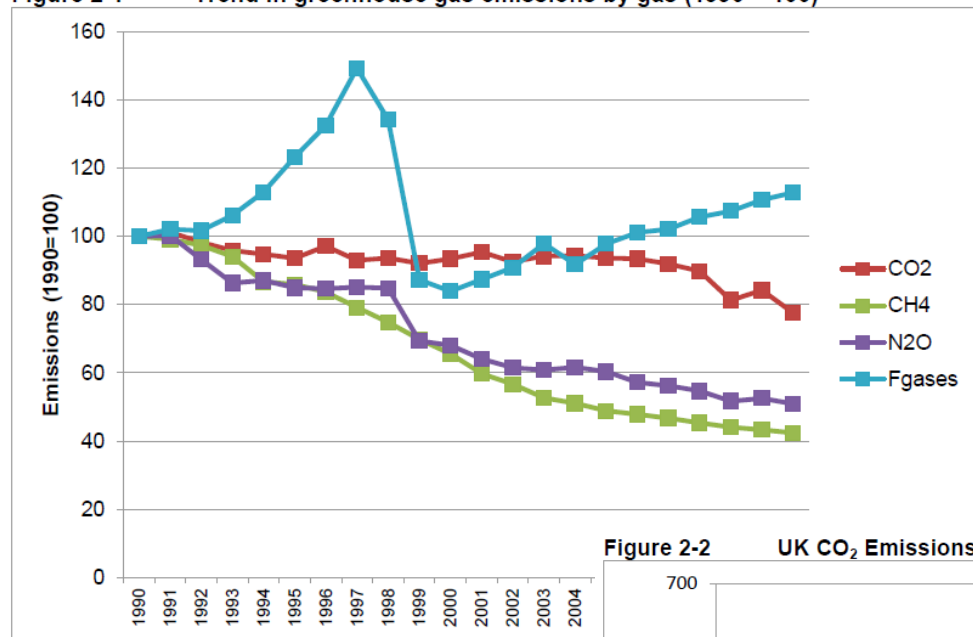
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Purpose of National GHG Inventories

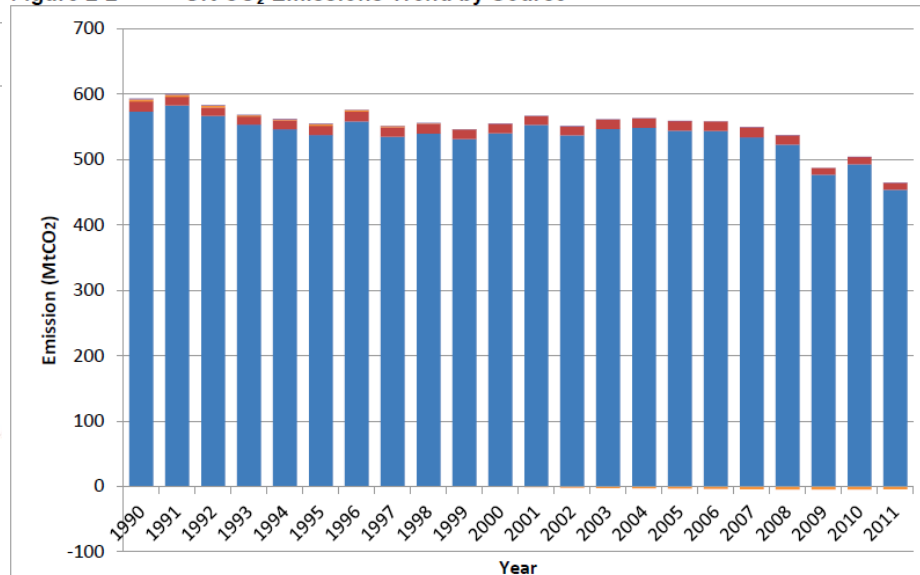
Figure 2-1 Trend in greenhouse gas emissions by gas (1990 = 100)



- Show development of GHG emissions at national level over time
- Allow prioritising of sectors, sources or gases for mitigation action

But there is more.....

Figure 2-2 UK CO₂ Emissions Trend by Source



Health +
environment
impact studies

Wide range of AQ
research

Integrated
assessment
Models

**Academia +
Research**

Informs economic
+ health impact
assessments,
MACCs

Evidence base for
AQ policy
development

Plans to achieve
UK compliance

**Defra AQ
policy
programme**

LA climate change
policy and local air
quality
management

LA transport
planning

LA sustainable
development +
planning

LA energy
efficiency policy

**Local
Authorities**

Statutory reporting
to DA targets

Sector target +
emissions data

Climate change
indicators

Sector data for DA
policy teams

- transport
- waste
- agriculture
- energy efficiency

**Devolved
Administration
governments**

UK government
dept. GHG
reduction targets

Budget reporting

Dept. planning

**DECC carbon
budgets team**



- UK targets
- NECD, UNECE reports



- UK targets
- EU, UN reports

**UK ambient
AQ
assessment**

UK compliance
assessments

Future AQ policy
development

Scenarios

**UK/EU AQ
research +
Policy**

Urban
assessments
(NO_x PM₁₀)

Regional (UK/EU)
assessments
(Ozone, PM)

Deposition studies
(acid, Nitrogen,
metals)

Integrated
assessment

**Department
for Transport**

Vehicle-group-
specific estimates
(GHG/AQ)

Inter-modal
transport studies

National Transport
Model

Regulatory impact
assessments

**DECC energy
statistics
team**

DUKES sector
energy allocations

Sub-national
energy stats.

Energy projections

Sector-specific
energy studies

**DECC
international
team**

Negotiations on
future UK targets

Technical support
on UNFCCC +
IPCC guidance

Capacity building
outreach projects

Use of inventory data and inventory experience in the UK

MRV of Mitigation Actions

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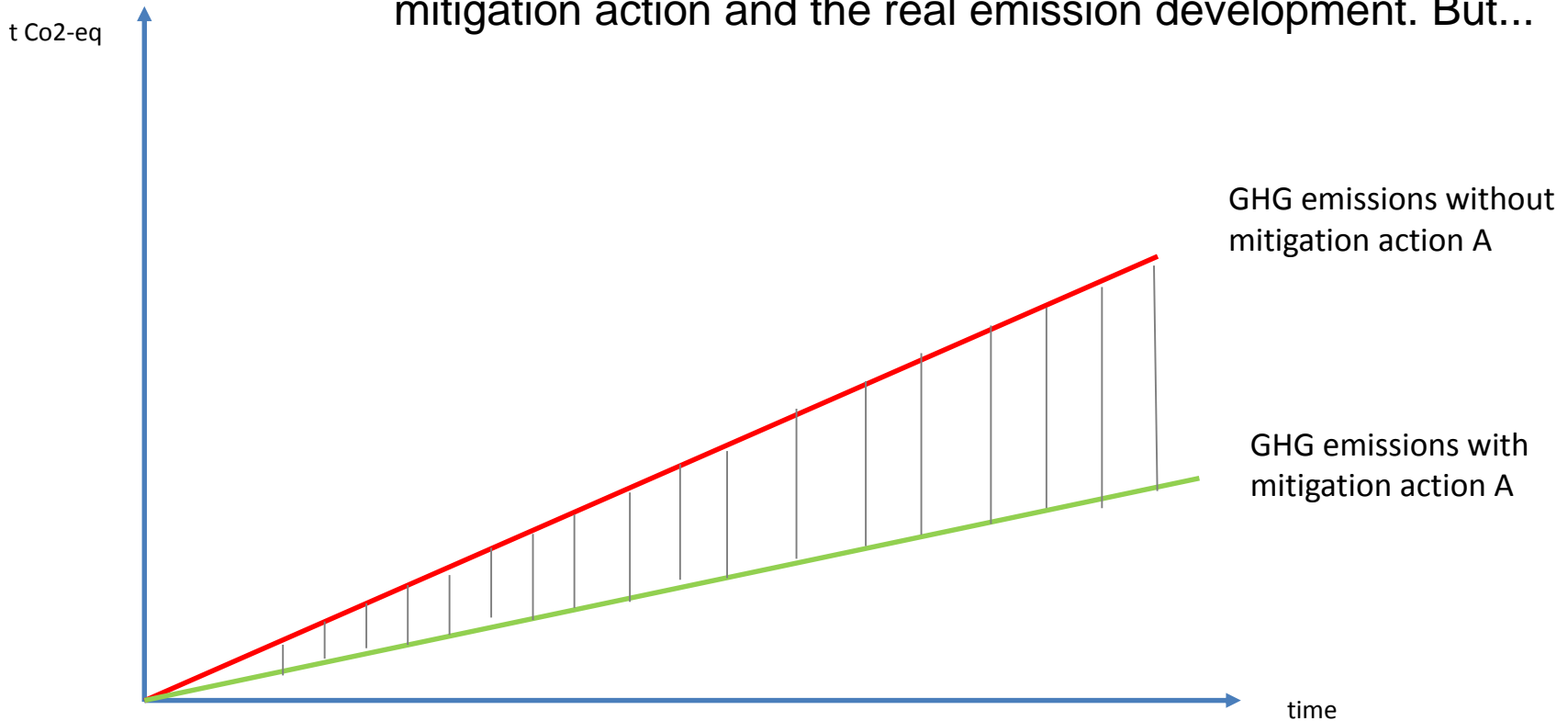
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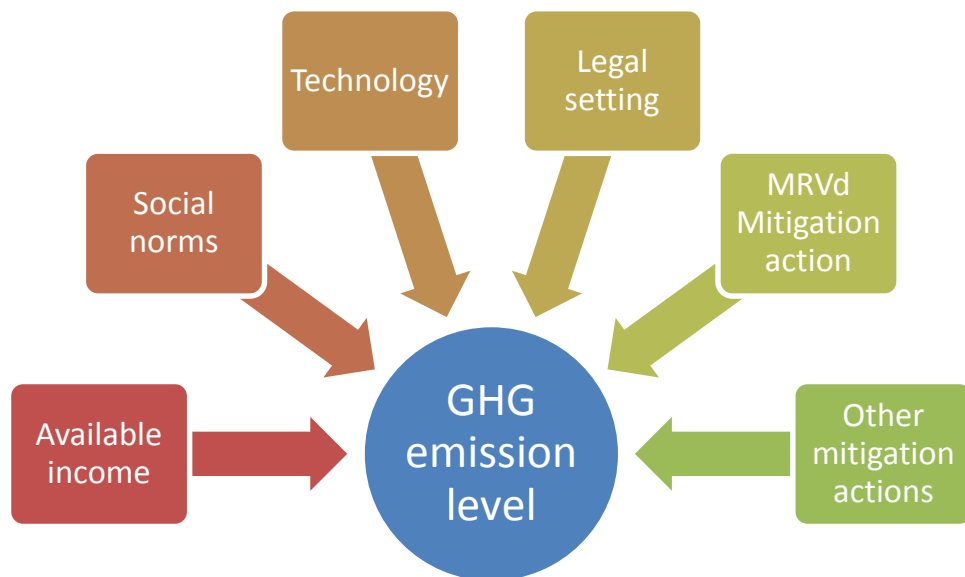
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In theory.....

GHG emission reductions can in theory easily be calculated as the difference of the estimated GHG emission development without a mitigation action and the real emission development. But...



Challenges to the MRV of mitigation actions

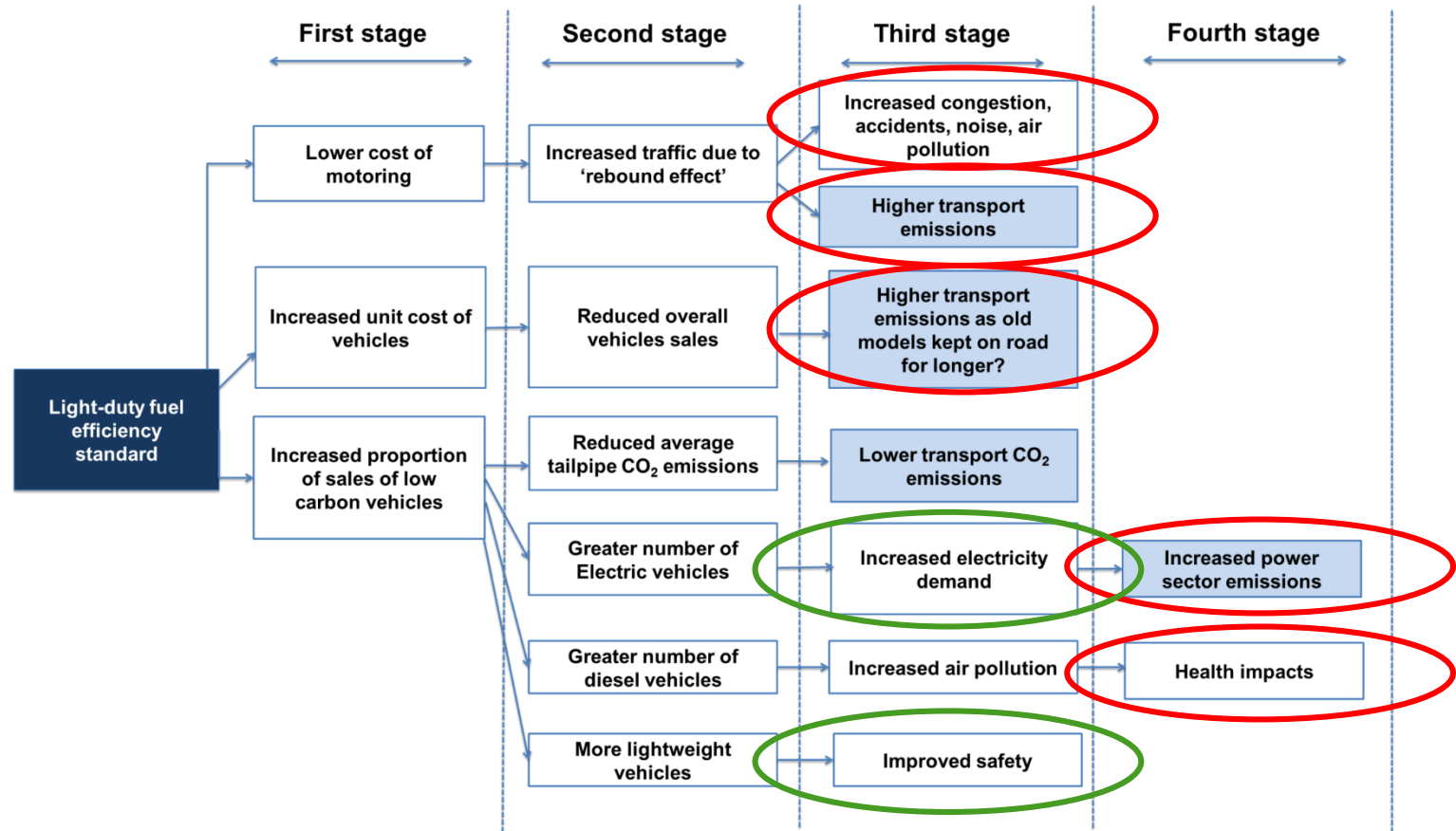


- A mitigation action can have a number of impacts, some reducing, some increasing emissions
- Changes of the GHG emission level of a specific source can have many influencing factors.
- We struggle to understand **whether** a specific mitigation action has caused a change and **to what extent**.

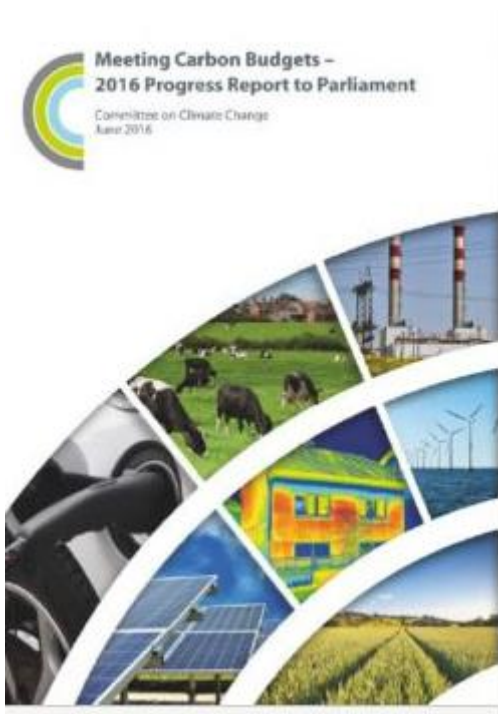
What to do? - Accept these limitations and adjust expectations!

- Move away from a CDM-like MRV focussing on highly accurate emission reduction values
- Assess potential impacts during the design phase of the action
- Realistic expectation: Understanding whether a mitigation action contributes to achieving desired impacts and whether it is more or less relevant than other factors
- Where mitigation actions are likely to overlap, MRV them as a package

Impacts of mitigation actions: An example from the transport sector



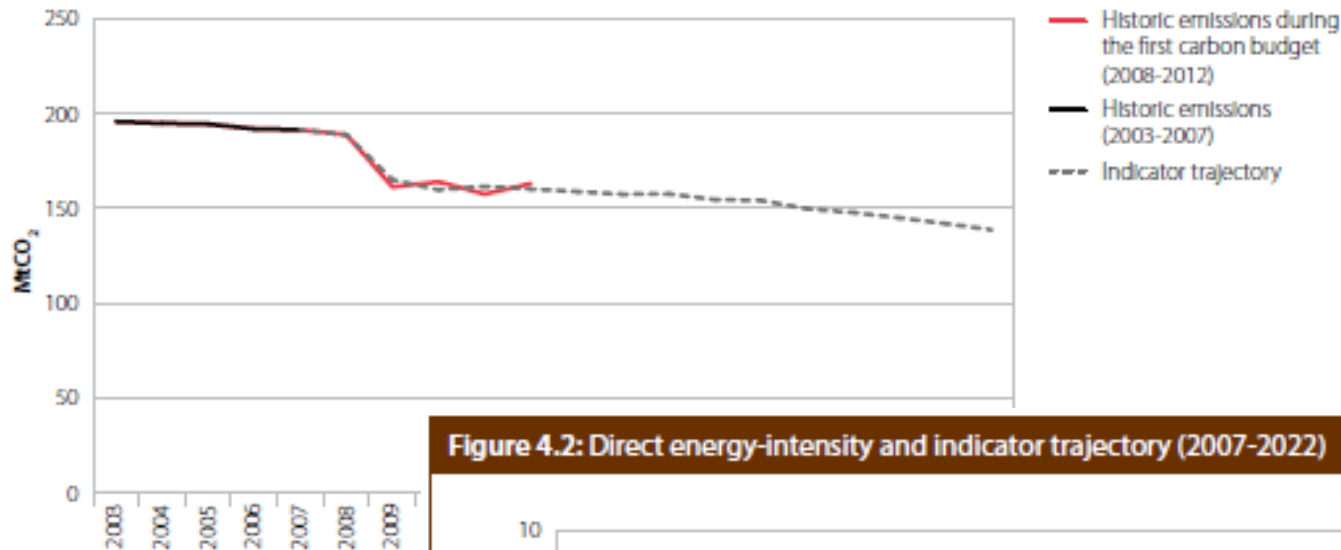
MRV Approach to UK Climate Change Act Targets



- Basic Approach:
 - Define indicators based on relevant effects as well as drivers
 - Develop indicator trajectories based on expected developments
 - Collect indicators values annually
 - Compare collected indicator values with trajectories
- Progress towards target evaluated by independent entity: Climate Change Committee (CCC)
- CCC provides recommendations to keep on track towards targets
- Climate change authorities have to respond indicating action to be taken within 3 months

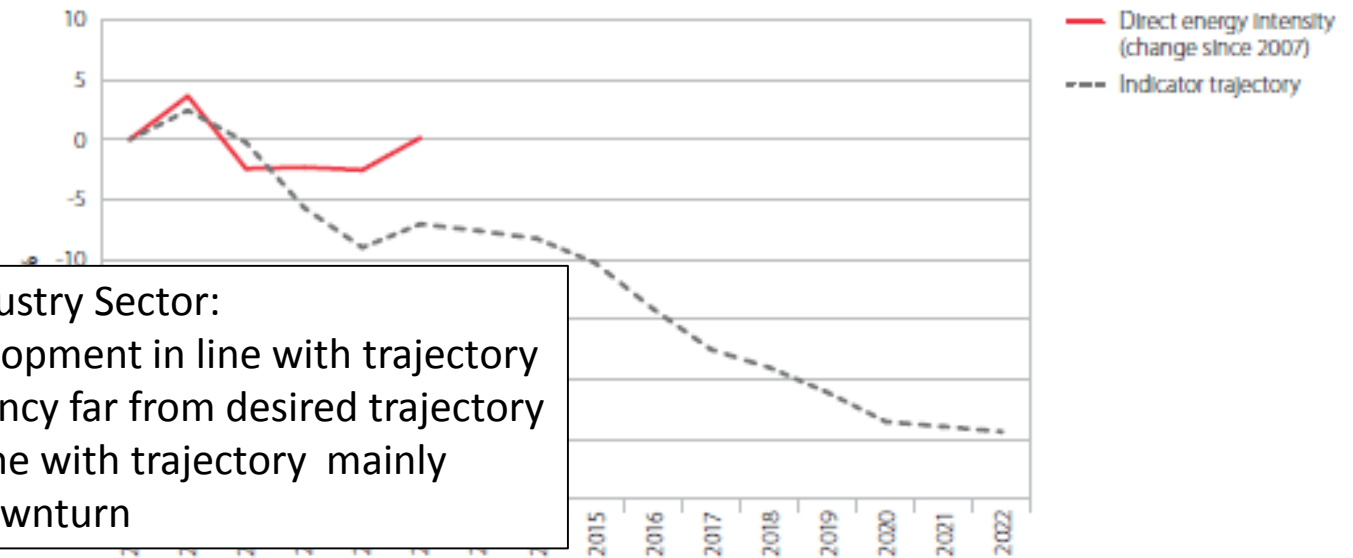


Figure 4.3: Historic emissions vs indicator trajectory (2003-2022)



Source: NAEI (2013); DECC (2013) Energy Trends, March
Notes: 2012 emission estimates are provisional.

Figure 4.2: Direct energy-intensity and indicator trajectory (2007-2022)



Energy Efficiency in the industry Sector:

- Absolute emission development in line with trajectory
- Key driver energy efficiency far from desired trajectory
- Absolute emissions in line with trajectory mainly because of economic downturn

Example: Energy Efficiency in the Industry (UK level)

MRV of Support

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The three main elements of 'support'

Finance Support

Finance for climate activities and related capacity building and technology development and transfer.

Technology Support

Measures taken to promote, facilitate and finance the transfer of, access to and deployment of climate-friendly technologies.

Capacity Building Support

In relation to climate activities and climate-friendly technology development/transfer.



Scope and detail of information on support MRVd

Reported information could include:

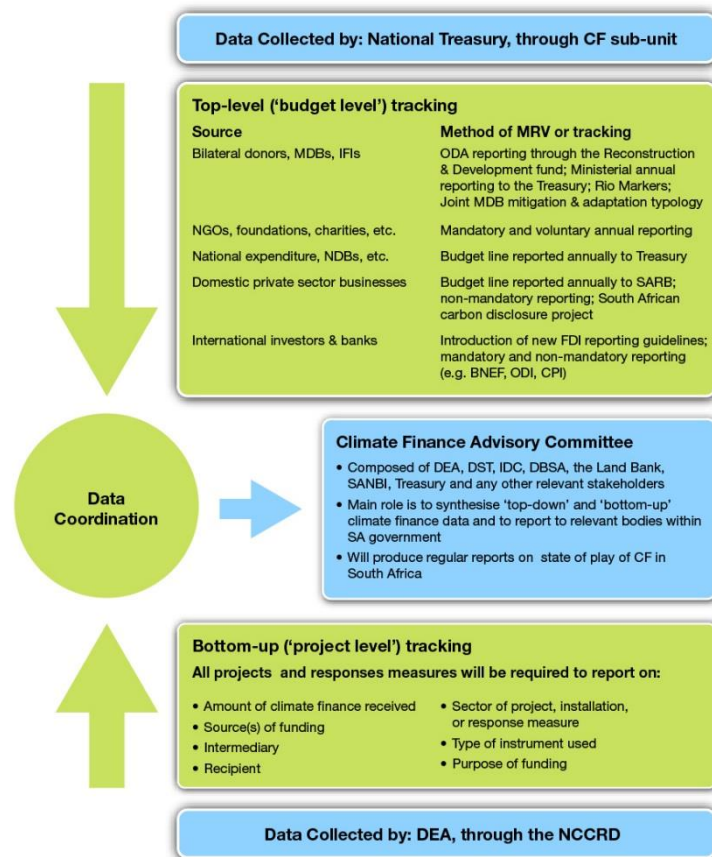
- **Type** (financial, capacity building, technology transfer) of support and **amounts** received
- **Forms of finance** (grants, concessional lendings, equity, guarantees etc.)
- **Sources** of finance (donors)
- **Purpose** of the support (mitigation/adaptation)
- **Distributions** of support across sectors/activities, geographically)
- **Private** finance leveraged
- **Impact** pursued/achieved
- **Comparison with donors' pledged** and actually **disbursed** amount of support

Increased ambition in reporting



Case Study – South Africa's Climate Change Response M&E System

- Climate finance component of the M&E system to track progress in meeting national climate change response targets/policies
- Two-tiered data collection that captures 'support received' at the national level & at the project level
- Coordinated by a Climate Finance Advisory Committee who provide guidance, synthesise & evaluate data, and report



Institutional Structures

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Institutional Structures

- Appropriate roles and responsibilities will differ for each country
- Institutional structures are the backbone of an MRV system, ensuring its sustainability
- Laying structures down in law supports sustainability
- Institutional structure has to enable data sharing – might be supported through Memoranda of Understanding
- Clear, non-overlapping responsibilities will facilitate good cooperation of institutions
- Structures can be built over time
- Institutions' responsibilities have to be supported by adequate budgets



Thank you for your attention!

Any Questions?





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