Regional workshop of the Anglophone Cluster

Overview of approaches to transparency of mitigation

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Outline

1. Section 1 – What is transparency and MRV?
2. Section 2 – what is transparency of mitigation?
3. Section 3 – emissions (GHG inventories)
4. Section 4 – policy impacts
5. Section 5 – GHG projections and scenarios
6. Discussion and Q&A

Recap on transparency

What does it all mean?

National Communication

M&E

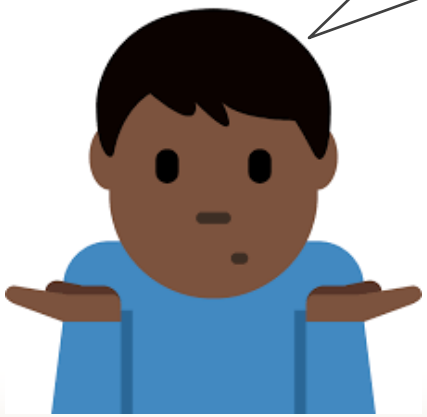
National MRV System

M,E & L

?

Wait....how does it all fit together?

Transparency



MRV

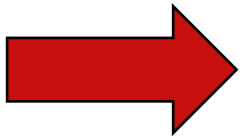
?

Biennial Update Report

?

What is transparency

- Transparency is a FUNCTION – providing information related to climate change activities and/or tracking progress towards a climate target in order to generate trust among Parties
- This means that....



  - MRV is the 'old school' language used under the current reporting requirements
  - Transparency is the 'new' language used under the Paris Agreement

- **MRV = TRANSPARENCY → Reporting on climate-related activities and/or tracking progress towards a target**

MRV vs M&E

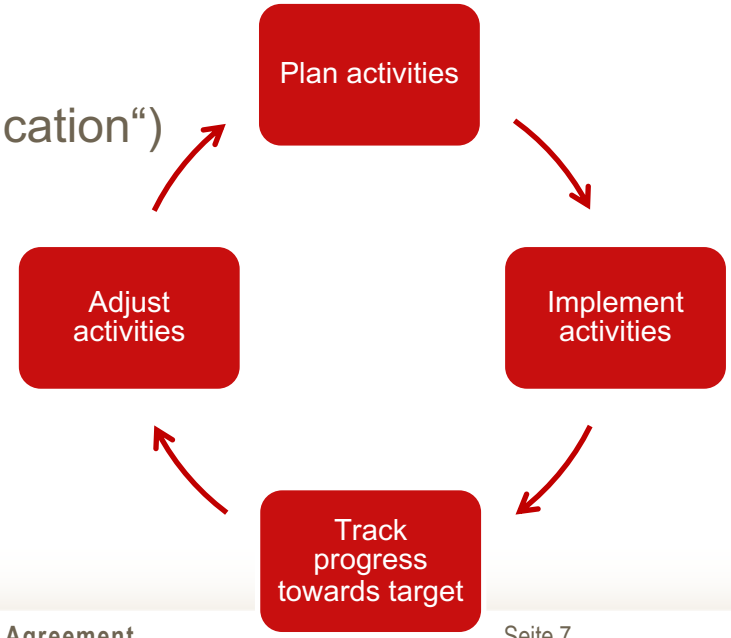
- MRV has tended to refer to emissions – easier to measure, a single uniform metric (CO_2e)
- M&E often used for adaptation – harder to measure, no single uniform metric
- BUT….
- This implies that evaluation (and learning) are less important for mitigation than adaptation. <u>This is not the case!</u>
  - Evaluation has a role in tracking both mitigation <u>and</u> adaptation actions and progress, and should be a key element of transparency for both

<u>NOTE:</u> For the remainder of this workshop, we will use the term transparency, whether referring to the existing framework or the new framework under the Paris Agreement.

So what is transparency?

- **Transparency is a process**. It refers to activities allowing to track progress and steer towards climate change related activities and/or targets
- It includes
  - data collection and assessment („aka measurement / monitoring“)
  - Reporting of results
  - QA/QC of all steps and results („aka verification“)
  - Evaluation and learning

Developing country Parties report under a so called „MRV Framework“ under the UNFCCC at present



Why do we need transparency?

Conceptually

- Transparency is a concept that can be applied to a set of issues
- Key questions: Where are we? Where are we going? How fast are we getting there? Are our responses effective?

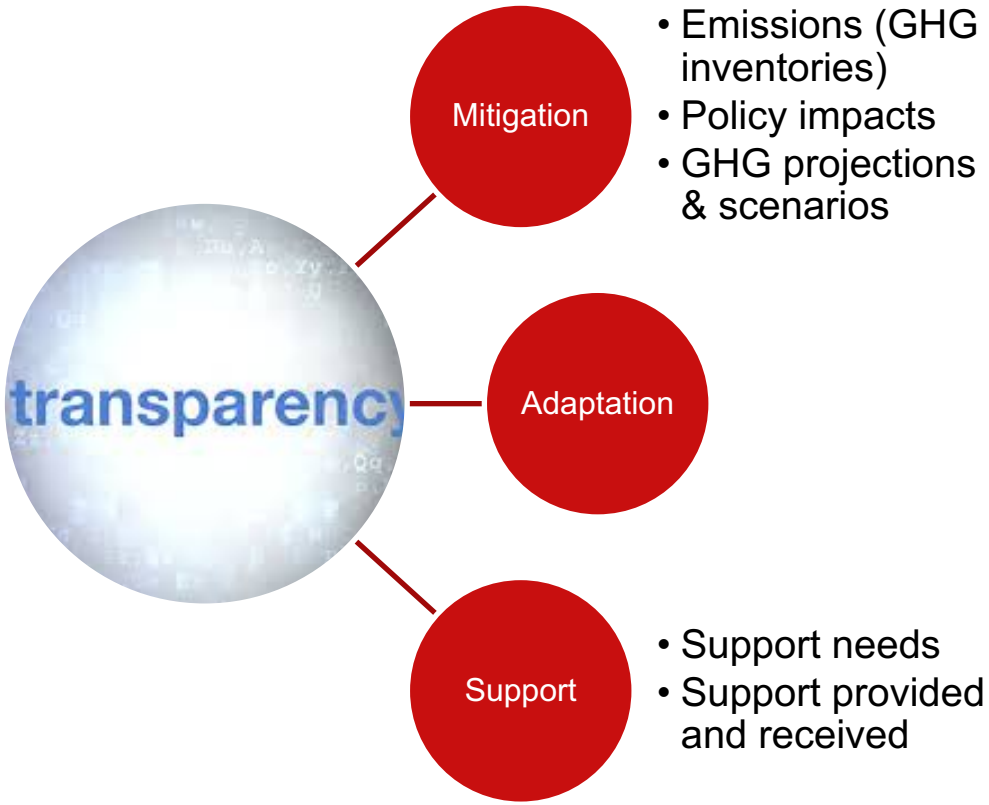
National drivers

- Policy planning and prioritisation
- Improve policy coherence
- Monitoring implementation/effectiveness

International drivers

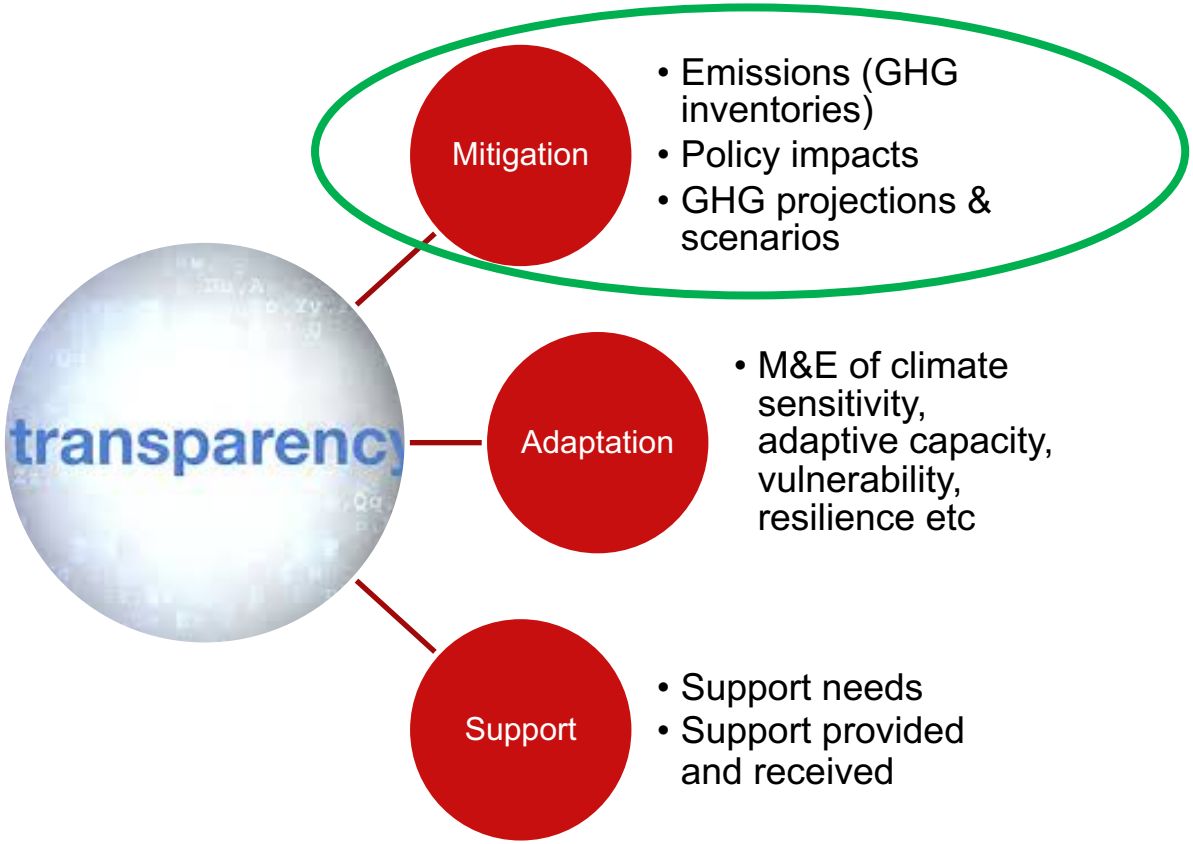
- Improve trust
- International recognition for national performance
- Provide lessons learned, input to 2013-15 review

Transparency isn't just about mitigation



Transparency of mitigation

What is transparency of mitigation?



What would a transparency system for mitigation look like?

- Could include any or all of the three elements - GHG inventories, policy impacts and projections/scenarios
- Each element can offer a different benefit:
  - GHG inventories – understanding how emissions have changed over time, what the key emitting sectors are and (if more detailed) what the drivers for emissions are.
  - Policy impacts – understanding the extent to which policies are delivering the expected emissions reductions and delivering value for money.
  - Projections/scenarios – understanding of how emissions might change into the future under different scenarios
- The nature of the transparency system may depend on the nature of the targets in the NDC…

Types of NDC target…

	Economy-wide coverage	Less than economy-wide coverage (in terms of sectors or gases)
Target quantified in absolute GHG terms ex ante (before implementation)	**Type A**: Economy-wide absolute emission reduction targets (tCO_2-eq) including achievement of carbon neutrality	**Type B**: Non-economy-wide absolute emission reduction targets (tCO_2-eq)
Target can be quantified in absolute GHG terms ex-post (and estimated ex-ante)	**Type D:** Economy-wide goals to reduce emissions relative to a BAU baseline (tCO_2-eq) **Type F**: Emissions intensity goals ($kgCO_2$-eq per unit of GDP); Emissions per capita goals (tCO_2-eq per cap)	**Type E**: Sector-specific goals relative to a BAU baseline (tCO_2-eq)
Target quantified in a non-GHG metric		**Type G**: Various non-GHG goals, including for non-fossil or renewable energy, energy efficiency, forest cover, etc.
Targets that would require other indicators of progress/achievement	**Type C**: Peaking emissions in a given year (limited sectors or gases)	**Type H:** Implementation of qualitative policies and measures, creation of institutions etc.
Non quantified goal	**Type I**: No measurable goals	

Note: The red rectangle denotes the most common NDC types expressed by Parties
Source: Adapted from Briner & Moarif (2016)

…dictate the kind of information needed

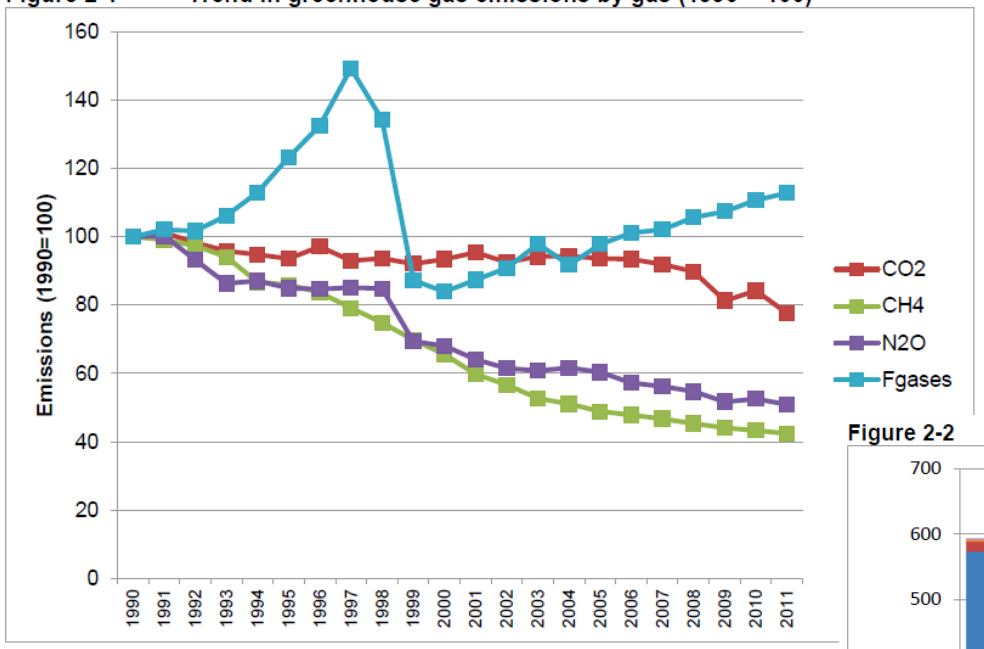
NDC target	GHGI	Mitigation actions	GHG projections
Economy-wide emission reduction targets (tCO2-eq) or achievement of carbon neutrality	✓✓	✓	✓
Peaking emissions in a given year	✓✓	✓	✓✓
Emissions intensity goals (kgCO2-eq per unit of GDP) or Emissions per capita goals (tCO2-eq per cap)	✓✓	✓	✓
Various non-GHG goals, including for non-fossil or renewable energy, energy efficiency, forest cover, etc.	N/A	✓	N/A

Source: OECD, IEA, October 2018
Legend: - Essential information, - Helpful information, N/A - Not applicable

Emissions (GHG inventories)

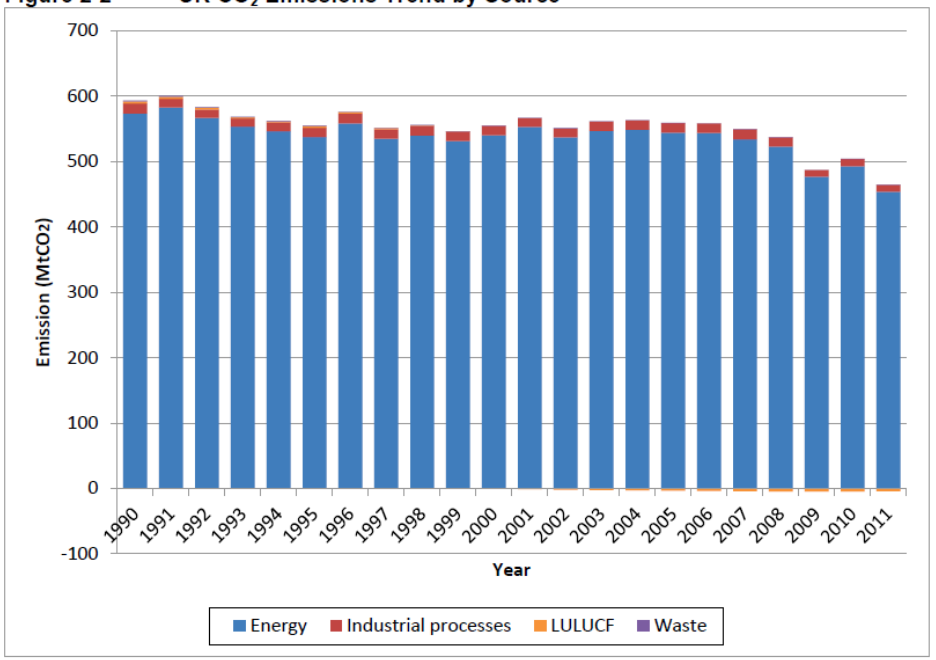
Purpose of National GHG Inventories

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



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

Figure 2-2 UK CO_2 Emissions Trend by Source



GHG inventory ≠ transparency system

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

	GHG inventory	Transparency system
Scope 1	Emissions	Emissions, impacts, cost, outcome
Scope 2	Just mitigation	Mitigation, adaptation, finance
Causality	No	Yes
Implementation	No	Yes
Co benefits	No	Yes

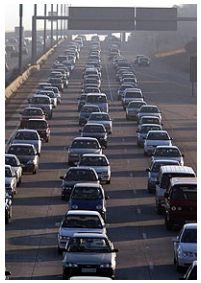
A GHG inventory is not a transparency system – but an essential element of a transparency system!

Further uses of GHG Inventories

The six sectors for reporting GHGs

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

Energy


Agriculture



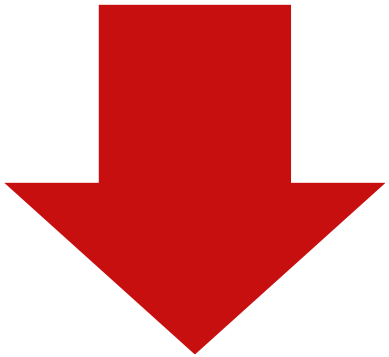
Industrial Processes, Solvents

Waste

Land Use, Land-Use Change and Forestry

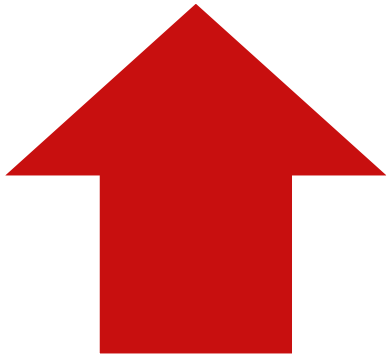

Different approaches

- 'Tiered approach'
- Higher tiers – more robust estimates, e.g. country-specific emissions factors
- Main difference in approach – between top-down and bottom-up
- Both have a role to play



Top-down: e.g. based on fuel sales

Bottom-up: based on activity, e.g. numbers of vehicles, distance travelled etc



Policy impacts

Aim

- To understand the impacts that individual policies (and groups) of policies are having on GHG emissions.
- To better understand the emissions trends seen in the GHG inventory.
- To inform decisions on policies – e.g. whether to amend, scrap etc.
- To understand other impacts from mitigation policies.

- Not just about reporting on policy impacts. Can also report on
  - Policy commitments (e.g. “we said we’d introduce policy X by 2018”) – was this done?
  - Actions (e.g. Environment Ministry to agree MoUs with other ministries by 2019) – are there specific actions in an action plan?

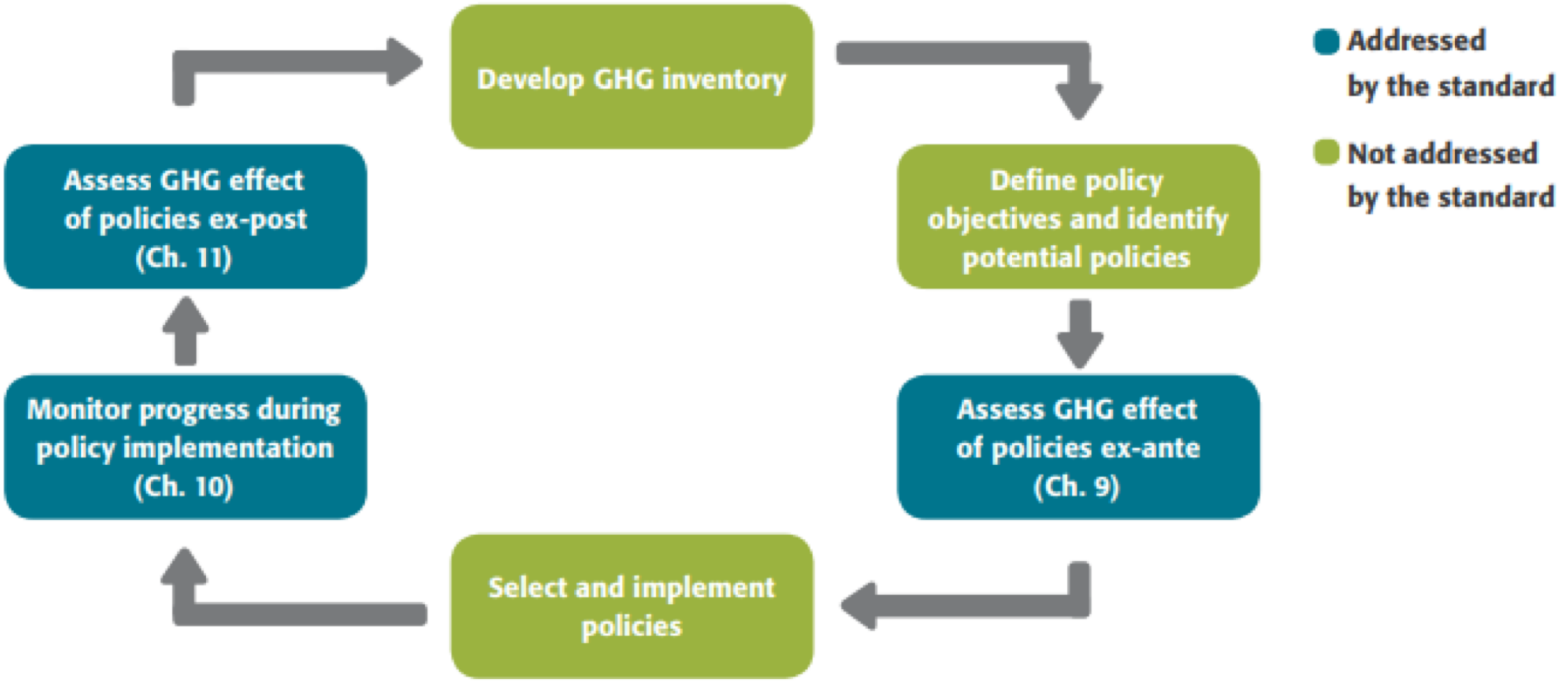
Methodologies to assess GHG impacts of policies

- WRI policy and action standard
- Can be used before, during or after implementation of the policy
- Key steps:
  - Define the policy or action
  - Identify effects and map the causal chain
  - Define the GHG assessment boundary
  - Estimate baseline emissions
  - Estimate GHG effects ex-ante
  - Monitor performance over time
  - Estimate GHG effects ex-post
  - Assess uncertainty
  - Verification
  - Reporting

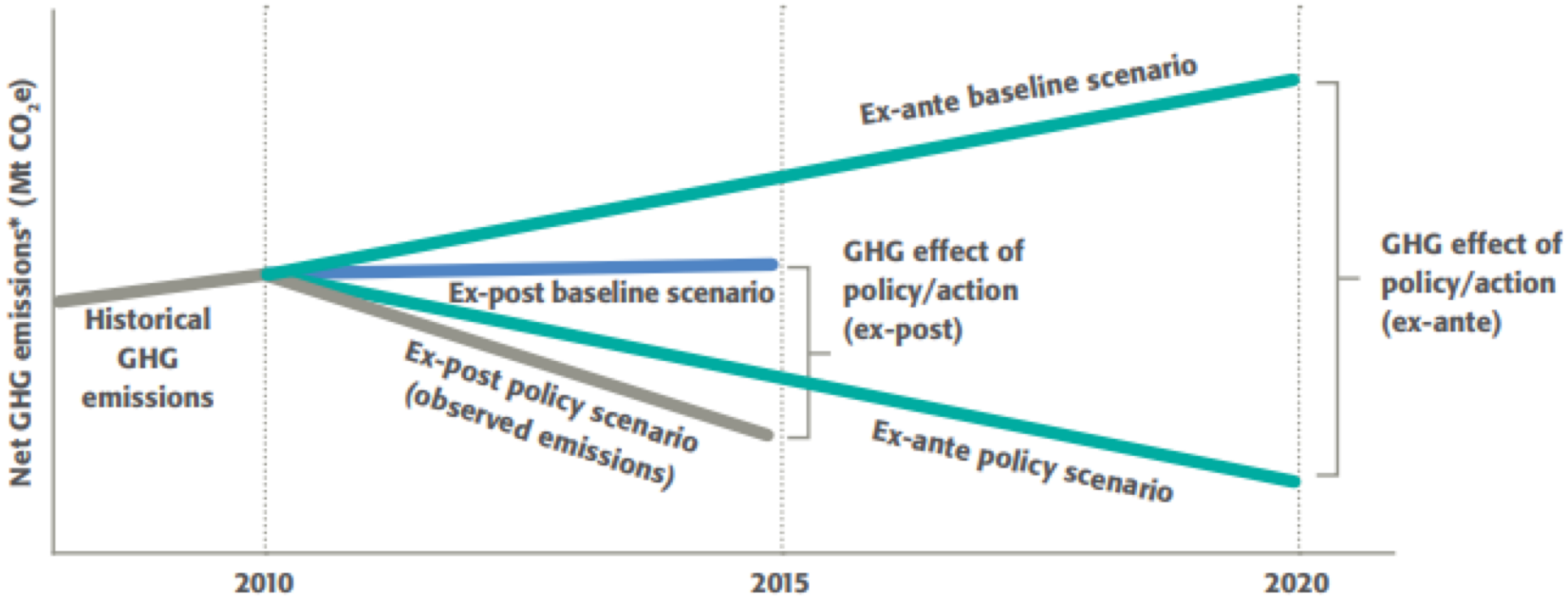
More sector-specific guidance also available…

- For example, transport…

How this links to GHG inventories…



Assessing policy impacts – ex-ante and ex-post



Not just about GHG emissions…

- Mitigation actions are not limited to achieving only mitigation, but can help you achieve all kinds of non-GHG-related objectives:
  - Job creation
  - Increased income
  - Improved air quality
  - Improved health
  - Increased crop production
  - Safeguarding biodiversity
  - Improving livelihoods
  - Improving water availability
  - .....you name it!
- It might bring stakeholders from different „universes“ together – e.g. climate change and development
- Transparency approaches for many of these objectives already exist and can be integrated

GHG projections and scenarios

Definitions

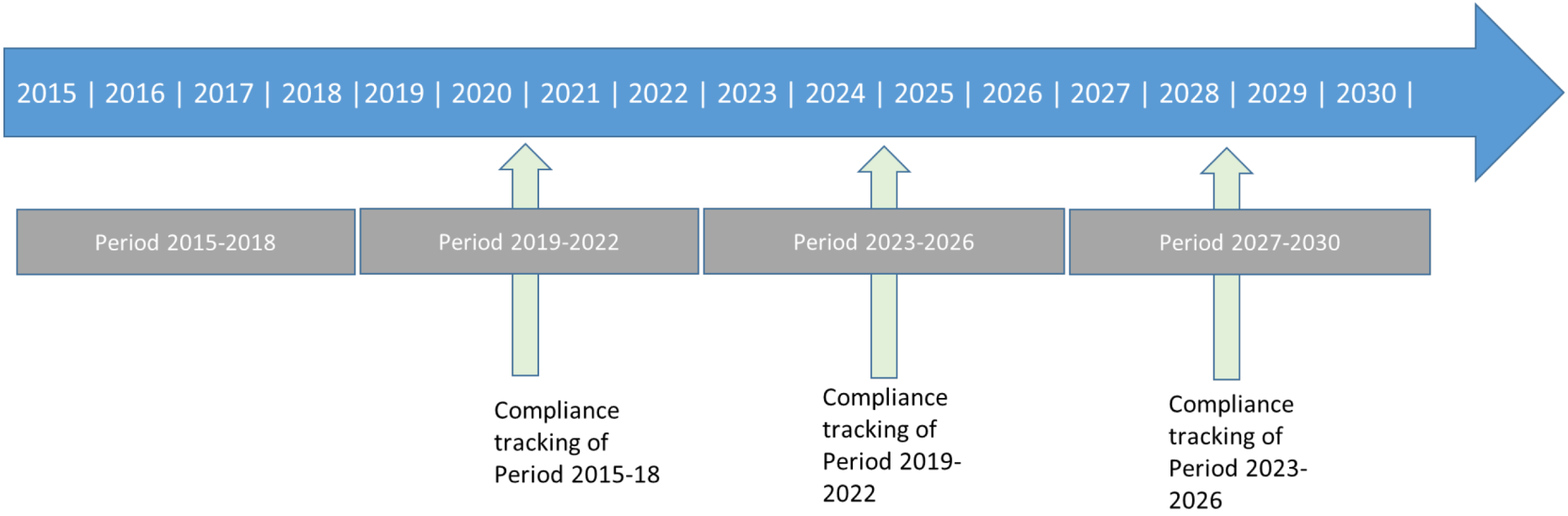
- What do we mean by emissions scenarios?

IPCC – "Scenarios are alternative images of how the future might unfold and are an appropriate tool with which to analyze how driving forces may influence future emission outcomes and to assess the associated uncertainties". ['*Emissions Scenarios', IPCC, 2000*]

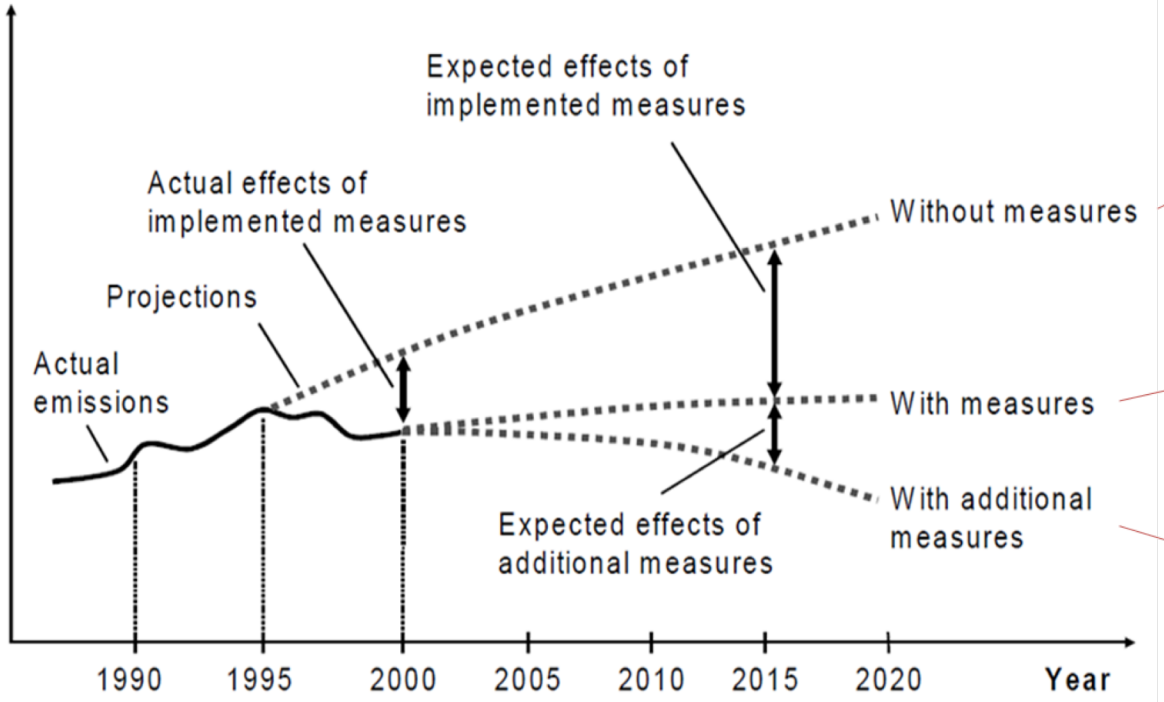
- Emissions scenarios = projections
- Not part of BUR reporting, but an element of LEDS
- Relevance for LEDS
  - Economy-wide, long-term mitigation goals (in the range of 15 to 30 years)
  - An assessment of cost-efficient mitigation options and their prioritisation
  - The stipulation of concrete short- and mid-term mitigation actions

The case for GHG projections / scenarios

- Policy design, implementation and impacts → takes a long time!



UNFCCC guidance on projections



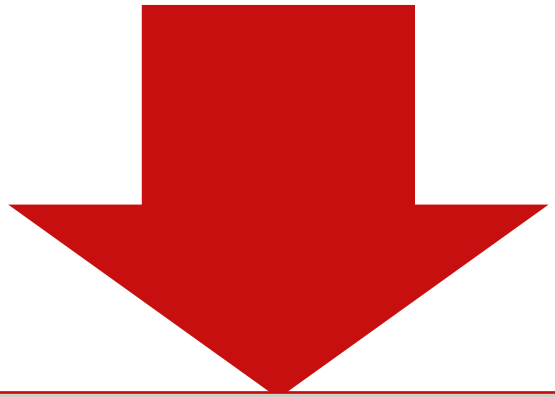
'Without measures' - excludes all policies and measures implemented, adopted or planned after the base year

'With (existing) measures' - encompasses currently implemented and adopted policies and measures.

"With additional measures" - also encompasses planned policies and measures but includes an estimate of the impact of additional mitigation measures

Implemented policies and measures	Adopted policies and measures	Planned policies and measures
• 1 or more of: • National legislation in force • One or more voluntary agreements have been established • Financial resources have been allocated • Human resources have been mobilized	• Official government decision has been made; and • Clear commitment to proceed with implementation	• Under discussion • Have a realistic chance of being adopted and implemented in future

Bottom-up versus top-down



Top-down:

Simple extrapolation model

Economic equilibrium model/CGE (e.g. WorldScan

Econometric models (E.g. E3MG)

Or hybrid (e.g. PRIMES, LEAP, POLES)

Bottom-up:

Dynamic optimisation (e.g. MARKAL)

Accounting (e.g. end-use sector models)

Simulation (elements of POLES, NEMS)

Cement example – simple top-down forecasting

- Calculate current CO_2 emissions (including combustion and process emissions) emitted per tonne produced in various routes.
- Project forward production; base in short term on industry projections of production; in longer-term based on information from IEA report which gives projections of demand on per capita basics combined with projections of population and economic growth.
- Assume exports follow same trend as domestic demand i.e. production follows trend in domestic demand.
- For reference case use industry view about any trends in the relative proportions of production coming from the different production routes, e.g. relative proportion of EAF output increasing in response to growing availability of steel scrap.
- Use industry view about business as usual improvements in energy efficiency pertaining to the future (e.g. incremental improvements and routine plant upgrades).
- From this data calculate total energy related GHG emissions and process related emissions

(Example taken from *IEA, 2009 Energy Technology Transitions for Industry, Strategies for the next Industrial Revolution)*

Baseline scenario

- Scenario against which mitigation options are measured
- Usually the 'with existing measures' scenario…

In report by Danish Energy Agency, OECD and UNEP Riso Centre, baseline scenario defined as "a scenario that describes future greenhouse-gas emissions levels in the absence of future, additional mitigation efforts and policies".

- …but can be 'without measures' (e.g. South Africa)
- Need to consider issue of 'early action' – should this be part of the baseline scenario?
- Choice of base year – may depend on data availability?
- Currently no international guidance on how to develop baseline emissions scenarios

Further ‘additional measures’ scenarios

- Need to decide basis for developing alternative scenarios:
  - Different end points
  - Different pathways to same end-point
- Examples:
  - Ranking plus cut-off (simple extrapolation top-down approaches)
  - Different policy scenarios
  - ‘Thematic’ scenarios
    - E.g. UK Carbon Plan – 3 scenarios (higher renewables/more energy efficiency, higher CCS/more bioenergy, higher nuclear/less energy efficiency)
  - Sensitivity analysis – a form of scenario?

Summary and conclusions

So, a transparency system for mitigation might include the following…

- Robust GHGI
  - Do improvements need to be made? If so, which sectors or sub-sectors? Are they 'material'? Can a sector or sub-sector move to a higher tier of reporting?
  - Does GHGI reporting need to be more frequent to inform policy decisions?
  - Are emissions being reported against a specific target?
- Policy reporting
  - Reporting on policy commitments (e.g. "we said we'd introduce policy X by 2018").
  - Reporting on actions – are there specific actions in an action plan?
  - Reporting on policy impacts, on GHG emissions and other indicators.
- GHG projections
  - In the absence of a fully fledged system of producing GHG projections, can other estimates be made?
  - What can be done now to pave the way for GHG projections in future?

Conclusions

- Transparency of mitigation can take a range of approaches – not just GHG inventory
- The approach to take on the GHG inventory depends on what you want to use the data for
  - Bottom-up is more granular and can give more insights into policy impacts
  - But can be time/resource consuming and in some cases a top-down inventory might be sufficient (and indeed, more accurate)
- Measuring impacts of policies can help improve the policy-making process
- Projections have an important role to play – often a lag with GHG inventories and policies take time to have an impact. So if base decisions purely on GHG inventory, might be too late!
- For all these approaches, possible to start simple and improve over time

Thank you. Any questions?

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