United Nations Framework Convention on Climate Change

Training programme
GHG emission trends and projections

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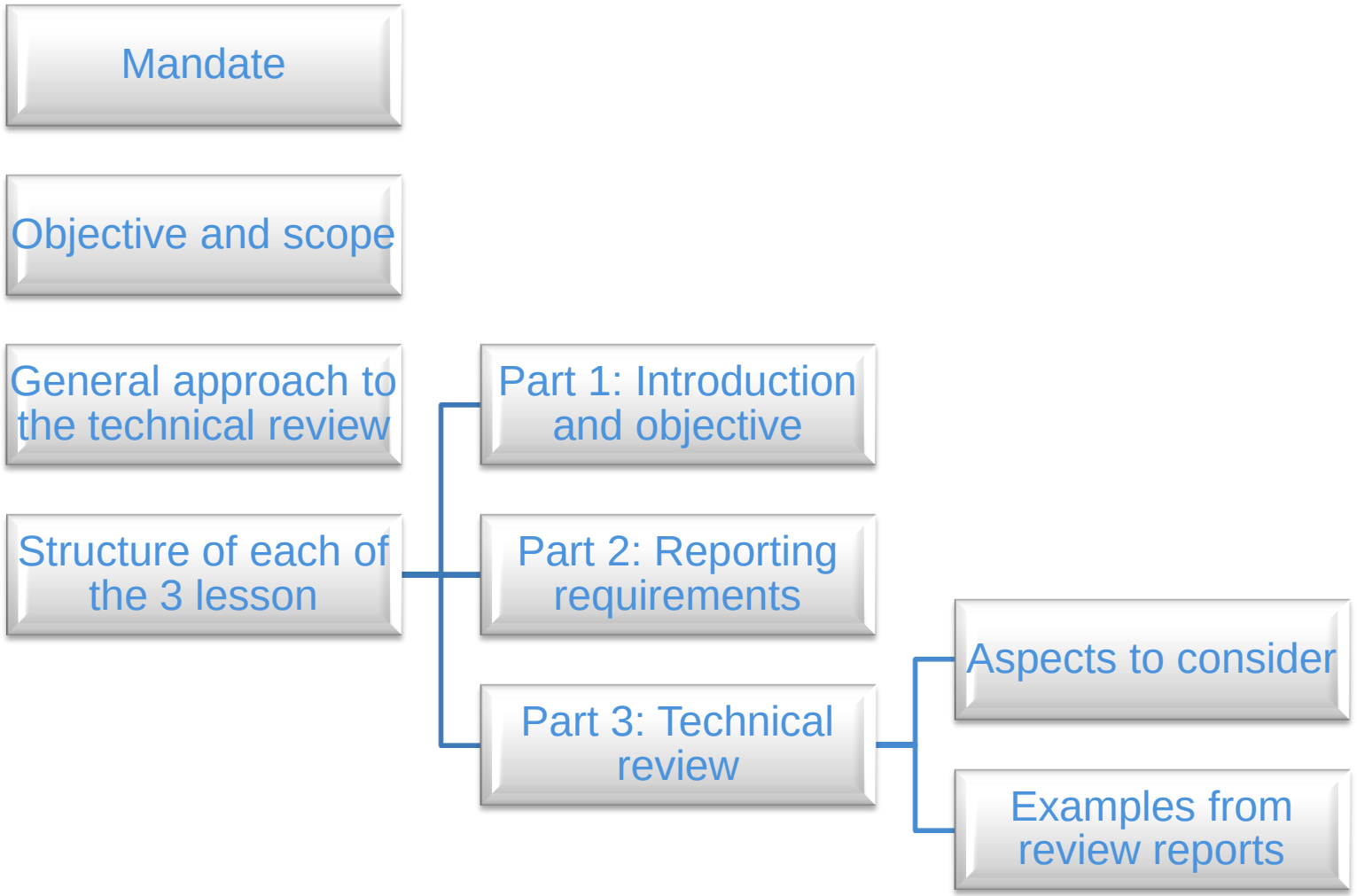
Outline of presentation

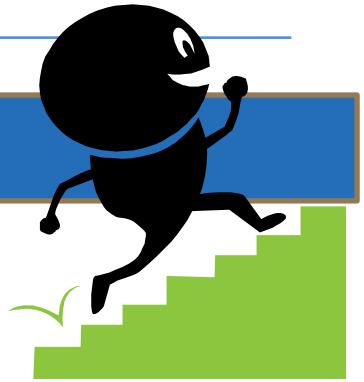
- Overview of the module
- General approach to the technical review
- Lesson 1: GHG emissions and emission trend
- Lesson 2: GHG projections and total effect of PaMs
- Lesson 3: Supplementary relating to flexible mechanisms under the Kyoto Protocol

Overview of the module



General Approach to the review

Key steps in the review



Checking the reported information against the reporting requirements

Performing a technical (qualitative) assessment of the reported information

Identifying issues related to transparency, completeness and adherence to the reporting guidelines

Documenting your findings in the technical review report

Making recommendations and/or encouragements in the technical review report on the basis of your findings

General Approach to the review

Identification of issues

Focus on the most important issues	• Follow-up on previous recommendations • Completeness and transparency of the reported information
Read the previous review report	• Take note of the recommendations
Read the NC / BR	• Check whether the recommendations were implemented
Not satisfied with implementation of a recommendation	• Take note of the areas additional clarification is needed
New information that lacks clarity	
Investigate further	• Ask the Party pertinent questions

LESSON 1:
GHG EMISSIONS AND EMISSION TREND

Lesson 1 - Objectives

Lesson 1 – Reporting requirements

- List of all reporting requirements
  - National communications
  - Biennial reports
- Key requirements (SHALL) NC:
  - Summary information from the national GHG inventory **shall** be provided for the period from 1990 (or other base year) to the last but one year prior to the year of submission of the national communication.
  - For the purpose of the national communication, complete inventory information need not be provided. However, at a minimum, Parties **shall** report the summary, including CO2 equivalent and emission trend tables given in the common reporting format contained in the above-mentioned guidelines.

Lesson 1 – Reporting requirements

- Key requirements (SHALL) BR:
  - Summary information from the national GHG inventory on emissions and emission trends prepared according to the UNFCCC Annex I inventory reporting guidelines **shall** be prepared for the period from 1990 to the latest year in the most recent inventory submission available.
  - Annex I Parties **shall** provide summary information on their national inventory arrangements in accordance with the reporting requirements related to national inventory arrangements contained in the UNFCCC Annex I inventory reporting guidelines, and on the changes to these national inventory arrangements since their last national communication or biennial report.

Aspects to consider

Guidance on specific aspects of the reporting requirements

List of possible questions and follow-up actions

- To be asked to yourself during the review of the reports
- To be asked to the Party, if information is not available in the reports

Guidance on how to describe an issue in the review report

- Identification, description, communication with Party, resolved/not resolved
- When to use a recommendation / encouragement

Aspects to consider

List of possible questions and follow-up actions - examples

- Did the Party provide a summary information on its national inventory arrangements? Have there been any changes to these arrangements since the last NC or BR? If yes, have they been transparently reported?
- Is the reported inventory information consistent with that provided in the most recent annual inventory submission? If not, have the reasons been transparently explained?
- Are emissions increasing or decreasing? Is there a change in the emission trend in particular year(s)? If yes, have the reasons been transparently explained?
- The trend in emissions of which gases and sectors influences the overall emission trend the most?
- What are the main drivers for the overall emission trend? Are these drivers linked with specific national circumstances of the Party? If yes, have these been transparently explained by the Party?

Examples

Short introduction and description of the examples

- Sometimes, during the review, even though you ask relevant questions, the Party might not be in a position to completely describe the underlying factors or drivers of GHG emission trends. You would then encourage the Party to invest more work in the analysis. How an ERT reflected on such a case is shown in the example below

- During that review the ERT identified that the emission trend in the transport sector was quite unusual, as emissions had decreased remarkably since the late 1990s although transport activity had increased and transport emissions showed a general increasing trend in most developed countries.

Examples

Example from IDR NC5

- Emissions from the transport sector accounted for 15.6 per cent of Germany's total GHG emissions in 2008. The trend in transport activity for recent years shows a moderate increase in passenger transport and considerable growth in freight transport. Despite this increase in activity, Germany is one of the few Parties to record decreasing GHG emissions from transport between 1990 and 2008. Within that period, emissions increased up to 1998 and decreased remarkably thereafter. Germany explained that the decrease was driven mainly by rising fuel prices, which are due partly to the ecological tax reform carried out between 1999 and 2003, road pricing for freight trucks, a shift towards international aviation and the increased share of biofuels in transport fuel in recent years. Also, higher fuel prices encouraged people to buy more fuel efficient cars, including a growing number of diesel cars.

Examples

Short description of ERT assessment

- The ERT considered that these explanations did not fully describe the observed trend and identified one factor that might also influence the trend significantly.

Continued - Example from IDR NC5

- However, the ERT noted that higher fuel prices in comparison with many neighbouring countries also led to refuelling outside of Germany and hence to a drop in fuel sales in Germany. The ERT also noted that a further analysis of to what extent these different factors influenced the observed emission trend would be useful, and it encourages the Party to report on such an analysis in its next national communication.

LESSON 2:

GREENHOUSE GAS EMISSION PROJECTIONS AND THE TOTAL EFFECT OF POLICIES AND MEASURES

Lesson 2 - Objectives

Lesson 2 – Reporting requirements

- List of all reporting requirements
  - National communications
  - Biennial reports
- Key requirements (SHALL) NC:
  - At a minimum, Parties **shall** report a ‘with measures’ projection and may report ‘without measures’ and ‘with additional measures’ projections.
  - A ‘with measures’ projection **shall** encompass currently implemented and adopted policies and measures.
  - Emission projections **shall** be presented relative to actual inventory data for the preceding years.
  - Parties may use ‘normalized’ data in making their projections. In this case, Parties **shall** explain the nature of the adjustments.
  - Projections **shall** be presented on a sectoral basis, to the extent possible, using the same sectoral categories used in the policies and measures section.
  - Projections **shall** be presented on a gas-by-gas basis for the following greenhouse gases: CO2, CH4, N2O, PFCs, HFCs and SF6

Lesson 2 – Reporting requirements

- Key requirements (SHALL) NC:
  - In addition, projections **shall** be provided in an aggregated format for each sector as well as for a national total, using GWP values agreed upon by the Conference of the Parties.
  - To ensure consistency with inventory reporting, emissions projections related to fuel sold to ships and aircraft engaged in international transport **shall**, to the extent possible, be reported separately and not included in the totals.
  - Parties **shall** provide an estimate of the total effect of their policies and measures, in accordance with the 'with measures' definition, compared to a situation without such policies and measures. This effect **shall** be presented in terms of greenhouse gas emissions avoided or sequestered, by gas (on a CO2 equivalent basis), in 1995 and 2000.
  - To provide the reader with an understanding of emission trends in the years 1990 to 2020, Parties **shall** present relevant information on factors and activities for each sector.

Lesson 2 – Reporting requirements

- Key requirements (SHALL) BR:
  - Each Annex I Party **shall** report the updated projections for 2020 and 2030 consistent with the UNFCCC Annex I reporting guidelines on national communications.

Lesson 2 – Technical review

Split into 4 parts, each including aspects to consider and examples			
Overview, coverage and presentation of projections	Methodology, key underlying assumptions and information on factors and activities for developing projections	Results of projections and meeting the national emission reduction target	Total effect of policies and measures

Overview, coverage and presentation of projections

Aspects to consider

Guidance on specific aspects of the reporting requirements

List of possible questions and follow-up actions

- To be asked to yourself during the review of the reports
- To be asked to the Party, if information is not available in the reports

Guidance on how to describe an issue in the review report

- Identification, description, communication with Party, resolved/not resolved
- When to use a recommendation / encouragement

Overview, coverage and presentation of projections

Aspects to consider

List of possible questions and follow-up actions

- How are the scenarios defined, including the ‘without measures’, ‘with measures’ and ‘with additional measures’ scenarios? Are the definitions in accordance with those required by the guidelines?
- Which PaMs are included in the ‘with measures’ and ‘with additional measures’ projections?
- What is the coverage of sources and sinks in the projections? Is the sectoral presentation of the projections consistent with that in the PaMs section of the NC or BR? Are projections related to emissions from fuel use for international ships and aircrafts reported separately?
- What is the starting year of the projections (‘with measures’, ‘with additional measures’ and ‘without measures’)?
- How does the starting year relate to the dates of implementation of significant PaMs?

Overview, coverage and presentation of projections

Examples

Short introduction and description of the examples

- Examples below contain findings on transparency. Issues raised include a lack of information on the status of PaMs and which PaMs are included in which scenario. You will note that, although the identified issues all relate to similar findings, the ERTs used both encouragements and recommendations in the review reports. In all cases the reporting was not transparent enough for the ERT to assess whether the reporting requirement was fulfilled. However, in those cases that the ERT identified during the review that the scenario definition was following the guidelines, the ERT opted for using an encouragement, whereas recommendations were used when the ERT identified during the review that the Party did not follow the scenario definitions as provided in the guidelines.

Overview, coverage and presentation of projections

Examples

Examples from IDR NC5

- The ERT noted an inconsistency in the NC5 between the projections chapter, where the regulatory regime for major industrial emission sources was still included as major reduction measure, and the PaMs chapter, where this PaM was not mentioned as it eventually never entered into force. To increase transparency, the ERT recommends that Canada ensures, in its next national communication, that the reported 'with measures' scenario encompasses currently implemented and adopted PaMs.

- The definitions of scenarios provided in the NC5 have not specified which particular PaMs were considered as the existing PaMs and which as the additional PaMs. During the in-country review, France clarified the status of all PaMs. With regard to projections, in order to improve transparency and cross-chapter consistency, the ERT encourages France to provide this information in its next national communication.

Methodology, key underlying assumptions and information on factors

Aspects to consider

Guidance on specific aspects of the reporting requirements

List of examples of assumptions that might be relevant to the technical assessment

List of possible questions and follow-up actions

- To be asked to yourself during the review of the reports
- To be asked to the Party, if information is not available in the reports

Guidance on how to describe an issue in the review report

- Identification, description, communication with Party, resolved/not resolved
- When to use a recommendation / encouragement

Methodology, key underlying assumptions and information on factors

Aspects to consider

Assumptions that might be relevant to the technical assessment

- Key assumptions: population growth, GDP growth, tax levels, international/domestic carbon prices, international fuel prices, etc.
- Assumptions on available energy sources and costs
- Assumptions on the future development of energy markets and its impact on emissions
- Assumptions on technological development, for example energy efficiency improvements
- Assumptions on electricity imports now and in the future
- Assumptions on expansion or closure of industrial activities, technological changes and abatement measures

Methodology, key underlying assumptions and information on factors

Aspects to consider

Assumptions that might be relevant to the technical assessment

- Assumptions on agricultural practices
- Assumptions on waste generation rates, waste management practices, waste recycling, composting and waste treatment;
- Consideration of starting points, for example:
  - Are industries already relatively energy-efficient when compared internationally or is there more to gain from utilizing existing potentials?
  - How advanced are recycling and other waste reduction policies when compared internationally? How big is the potential still?

Methodology, key underlying assumptions and information on factors

Aspects to consider

Possible questions and follow-up actions - examples

- Check the methodology and approaches used for preparing a projection of the different gases and their uncertainties (model-based or ‘handmade’ projection, sectoral or comprehensive projection, relation to economic projections, etc.)
- Has there been any change to the models and/or approaches since the most recent (previous) NC? If yes, is supporting documentation provided by the Party? How did that change affect the results of the projections?
- What are the uncertainty levels of the projections? How sensitive are the projections to key variables? How sensitive are they to various types of PaMs?

Methodology, key underlying assumptions and information on factors

Aspects to consider

Possible questions and follow-up actions - examples

- Is there consistency between projections of key assumptions and past development of these indicators (population growth, GDP growth, etc.)?
- Are the same key assumptions used in the projections for all sectors and gases?
- Are assumptions on factors and activities underlying the emission projections consistent between sectors (e.g. assumptions relating to biofuels in the energy and agriculture/LULUCF sectors)?
- Are the same key assumptions used for the ‘with measures’, ‘without measures’ and ‘with additional measures’ projections? If not, how does this affect the reported total effect of PaMs?

Methodology, key underlying assumptions and information on factors

Examples

Short introduction and description of the examples

- Both the NC and BR reporting guidelines ask Parties to provide information on any changes to the model or methodologies used for the preparation of their projections since the last NC. It might happen that you identify a change during the review, although the Party did not report on it. Also in that case you need to reflect that in the technical review report (see example below).

Examples from IDR NC5

- In the NC4, the reported energy sector projections were based on a different model, namely ENPEP. The ERT notes that in its NC5 Greece has not reported the information on the reasons for this change. During the review, Greece informed the ERT that this change was partly due to the reorganization of the ministries and use of different models by different ministries. After the reorganization, the TIMES/MARKAL model was chosen to be a principal model for energy and emission projections. The ERT was also informed that both models are now used in parallel, showing similar results. The ERT encourages Greece to report the main differences between the methods used for the projections in the NC5 and those used in the NC4.

Methodology, key underlying assumptions and information on factors

Examples

Short introduction and description of the examples

- As previously mentioned, assessing the reasonableness of the projections is done by reviewing the assumptions underlying them. There is a range of findings associated with assumptions. Ideally the ERT can consider that the assumptions are “robust”, “(internally) consistent”, “plausible” and “reasonable”, to provide some language used by ERTs, and reflect that in the technical review report.
- Your findings will most likely relate to the transparency or completeness of the reported information, but they can also directly relate to the reasonableness or consistent application of an assumption.
- In the example below the ERT relates the reasonableness of the assumptions directly to the reasonableness of the projections by highlighting the lack of evidence to underpin the assumptions. As a consequence the ERT also relates the reasonableness of the projections to the likelihood of reaching the domestic target with implemented PaMs.

Methodology, key underlying assumptions and information on factors

Examples

Example from IDR NC5

- The ERT noted that the assumptions used for the transport sector are overly optimistic, a finding that was confirmed by the Party during the review. In particular, an assumption was made that energy efficiency in transport will greatly improve, but no specific study to support such an assumption was presented to the ERT during the review. Another assumption was made that biofuels will represent 14.8 per cent of the liquid fuel consumed for transport (petroleum and biofuels) in 2020, which is far above the European Union target of 10 per cent. The ERT noted that there is no incentive for fuel providers in the Czech Republic to increase the share of biofuels beyond the set European Union target.
- As a result of these assumptions, emissions from the transport sector in the 'with measures' scenario are projected, according to the NC5, to increase by only 11.8 per cent between 2005 and 2020; however, according to the Czech GHG inventory, these emissions already increased by 7.7 per cent within just two years, between 2005 and 2007. As controlling emission levels in this sector might be key to reaching the domestic 2020 emission target, the ERT encourages the Czech Republic to study the impact of planned and potential additional PaMs in the transport sector.

Results of projections and meeting the national emission reduction target

Aspects to consider

Guidance on specific aspects of the reporting requirements

List of possible questions and follow-up actions

- To be asked to yourself during the review of the reports
- To be asked to the Party, if information is not available in the reports

Guidance on how to describe an issue in the review report

- Identification, description, communication with Party, resolved/not resolved
- When to use a recommendation / encouragement

Results of projections and meeting the national emission reduction target

Aspects to consider

Possible questions and follow-up actions - examples

- What is the projected pathway of emissions (e.g. an increase or a decrease)? How does this fit with the historical emission trend?
- What are the main drivers for the overall projected emission trend? How much are the trends influenced by PaMs?
- Given the projections provided, is the Party on track to meet its target? If yes, do you have any findings on the robustness of the projections that might affect this?
- If the projections suggest that the Party may not be on track to meet its target, how is the Party using this information to inform its choice of PaMs?

Results of projections and meeting the national emission reduction target

Examples

Short introduction and description of the examples

- During your analysis you should also assess whether the projected trend is consistent with the historical trend. Inconsistencies that cannot be explained by the Party can give you an indication of the reasonableness of the projections.

Examples from IDR NC5

- On the assessment of the overall emission projections, the ERT acknowledged that the reported results do not show continuation with the trend in the past 10 years (e.g. between 2000 and 2010). Even though the GDP growth rate for 2011–2020 was assumed at around 6.3 per cent annually, which is much lower than the observed GDP growth for the period 2000–2010, around 8 per cent annually, emissions are expected to grow much faster by 2020 than the growth observed in 2000–2010 for all scenarios that assume a different degree of energy efficiency improvement. This suggests that the emissions in 2020 presented in the NC5 could be overestimated.

Results of projections and meeting the national emission reduction target

Examples

Short introduction and description of the examples

- In the next step, you should assess if the Party is on track to meet its emission reduction target(s). Depending on the target and its definition, meeting the target might be achieved by domestic efforts or by the additional use of credits. In the case of a target under the Kyoto Protocol these credits may come from removal units under Article 3, paragraphs 3 and 4, of the Kyoto Protocol or from the flexible mechanisms under the Kyoto Protocol. Often the Party also foresees the implementation of planned measures to meet its target. In any case, it is your task to assess whether the Party is on track in meeting its target on the basis of the provided information and to identify any possible risks or challenges.

Results of projections and meeting the national emission reduction target

Examples

Example from IDR NC5

- Under the ‘with additional measures’ and ‘with measures’ scenarios, total GHG emissions (without LULUCF) in 2010 are projected to be 41.8 and 42.6 per cent above the base year level, respectively . According to the NC5, the gap between the ‘with measures’ scenario emission level and the Kyoto Protocol target level will be closed by the following: the implementation of additional PaMs which were not included in the ‘with additional measures’ scenario (3.60 Mt CO_2 eq per year); the new 2007 revised National Climate Change Programme measures (1.56 Mt CO_2 eq per year; the second national allocation plan under the EU ETS (0.09 Mt CO_2 eq per year).
- The ERT noted that harvesting the estimated mitigation effects from new and additional PaMs might become a challenge during the first commitment period, given the limited time available for implementation of these PaMs.

Total effect of policies and measures

Aspects to consider

Guidance on specific aspects of the reporting requirements

List of possible questions and follow-up actions

- To be asked to yourself during the review of the reports
- To be asked to the Party, if information is not available in the reports

Guidance on how to describe an issue in the review report

- Identification, description, communication with Party, resolved/not resolved
- When to use a recommendation / encouragement

Total effect of policies and measures

Aspects to consider

Possible questions and follow-up actions - examples

- Which approach did the Party use to calculate the aggregate effect of its PaMs?
  - By taking the difference between a ‘with measures’ and ‘without measures’ projection? Are these projections consistent in their underlying key assumptions? If not, how does this affect the total estimated effect?
  - By individually assessing the effect of each significant PaM and aggregating the individual effects to arrive at a total? Were overlaps between effects of PaMs considered? How do overlaps affect the total estimated effect?
  - By using another approach? Is this approach transparently described and robust?
- What is the aggregate effect of PaMs in different scenarios (aggregated at the sectoral or overall level)?
- What are the effects of climate PaMs versus other PaMs that also influence emissions?

Total effect of policies and measures

Examples

Short introduction and description of the examples

- Issues may be associated with the generation of the 'without measures' projections and may identify a potential over- or underestimation of the effect. Also, the consistency between the scenarios, especially the consistency of key assumptions, is essential to ensure an acceptable quantification of the total effect and avoid including other effects in the estimate. You can always compare the sum of the effects of single PaMs (if available) to get an idea of the magnitude of the total effect and ask the Party questions if there is a significant difference.

Example from IDR NC5

- Canada reported that the total estimated effect of adopted and implemented PaMs is 10 Mt CO_2 eq in 2010 and 65 Mt CO_2 eq in 2020. The total effect was calculated as the difference between the 'with measures' and the 'without measures' scenarios. The ERT noted that the 'without measures' scenario includes the effects of PaMs until 2008, therefore, only effects after 2008 are shown and as a result the reported total effect might have been underestimated.

Total effect of policies and measures

Examples

Short introduction and description of the examples

- When the total effect is calculated as the sum of the effects of individual PaMs, incomplete estimates of effects of individual PaMs might lead to a potential underestimation, whereas the consideration of overlaps of the effects of single PaMs usually avoids a potential overestimation.

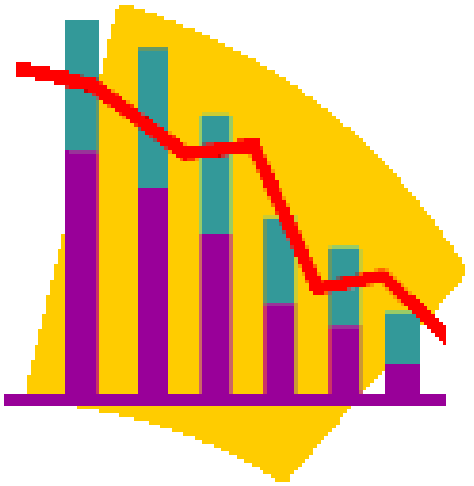
Examples from IDR NC5

- Germany calculated the total effect of its implemented PaMs by adding up the individually assessed effects of individual PaMs. Most of these effects were calculated by taking the difference between the sectoral ‘with measures’ and ‘without measures’ scenarios. Overlaps of effects of PaMs were considered directly in the sectoral models and identified overlaps between the sectors were considered on the basis of expert judgement. The ERT commends Germany for these efforts.

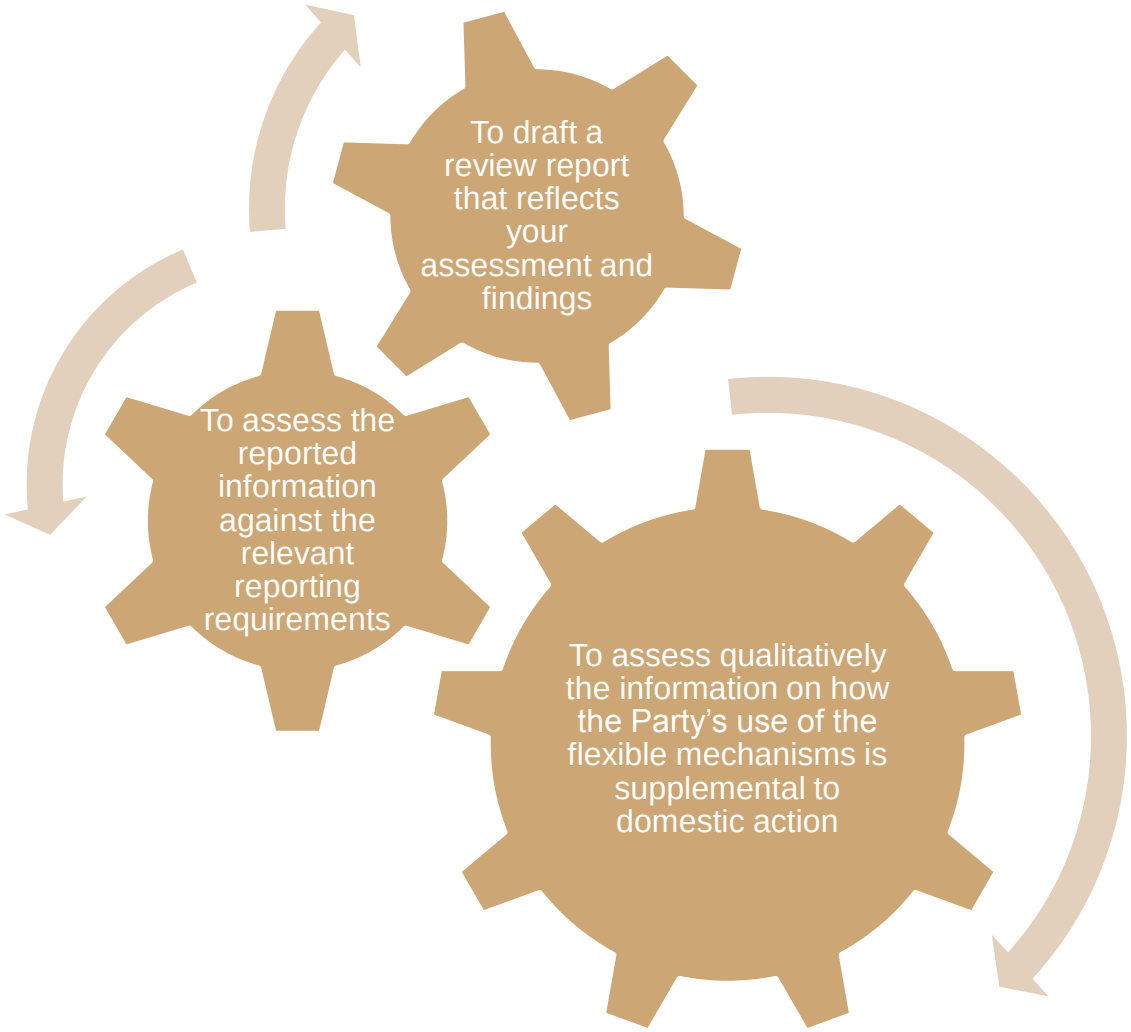
ANNEX

LESSON 3:

SUPPLEMENTARITY RELATING TO THE FLEXIBLE MECHANISMS UNDER THE KYOTO PROTOCOL



Lesson 3 - Objectives



Lesson 3 – Reporting requirement

- One reporting requirement to include supplementary information under Article 7, paragraph 2, of the Kyoto Protocol in the national communication

  - Each Annex I Party **shall** provide information on how its use of the Kyoto Protocol mechanisms is supplemental to domestic action, and how its domestic action thus constitutes a significant element of the effort made to meet its quantified limitation and reduction commitments under Article 3, paragraph 1, in accordance with the provisions of decision 5/CP.6

Aspects to consider

Guidance on specific aspects of the reporting requirements

- No agreed definition of supplementarity
- Most often used definitions by Parties

List of possible questions and follow-up actions

- To be asked to yourself during the review of the reports
- To be asked to the Party, if information is not available in the reports

Guidance on how to describe an issue in the review report

- Identification, description, communication with Party, resolved/not resolved
- When to use a recommendation / encouragement

Aspects to consider

Definitions by Parties

- In quantitative terms, as the possible use of the Kyoto Protocol mechanisms worth up to a certain percentage (in many cases 50 per cent) of the overall effort made to attain the Kyoto Protocol target
- In quantitative terms, as the ratio of domestic efforts to the use of the Kyoto Protocol mechanisms - by comparing the average annual emission reductions due to domestic actions (since 1990 or during the commitment period) with the planned annual use of Kyoto Protocol units to achieve the target
- In qualitative terms, as a statement that the emission reductions as a result of domestic policies and measures (PaMs) are by far greater than those resulting from the intended use of the Kyoto Protocol mechanisms

Aspects to consider

List of possible questions and follow-up actions

- How did the Party define supplementarity?
- Is the definition transparently described in the NC?
- Does the effect of domestic actions used in the supplementarity discussion correspond to the total effect of PaMs?
- Are there any issues that were identified regarding the total effect of PaMs that affect the discussion of supplementarity?
- Regarding the intended use of the Kyoto Protocol mechanisms, did the Party already allocate or approve a budget?

Examples

Examples from IDR NC5

- The European Union in its NC5 provided sufficient information on how its use of the mechanisms under Articles 6, 12 and 17 of the Kyoto Protocol are supplemental to domestic action. The NC5 defined supplementarity as the use of credits from the Kyoto Protocol mechanisms that does not exceed 50 per cent of the European Union wide reductions from sectors currently covered by the European Union emission trading scheme over the period 2008 to 2012, to comply with the supplementarity requirement of the Kyoto Protocol.

  …As a share of the target for the EU-15 of an 8 per cent reduction from base year emissions, the planned use of the Kyoto Protocol mechanisms accounts for approximately 2.5 percentage points of the EU-15 reduction commitment and, hence, the European Union considers that it meets its definition of supplementarity.

Thank you!!

Any questions?