EB39 – Methodologies

EB39 – Annotated agenda item 8

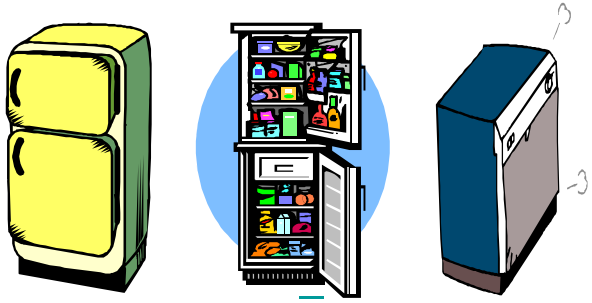
Report of MP32

EB39 – Annotated agenda item 9a

Case NM0235

NM0235: Manufacturing of energy efficient domestic refrigerators

Baseline scenario



Project activity

Applicability:

- **Non-stop operation**
- **No import/export**
- **Manufacturer to claim CERs**
- **No switch from substances with low GWP to substances with high GWP**

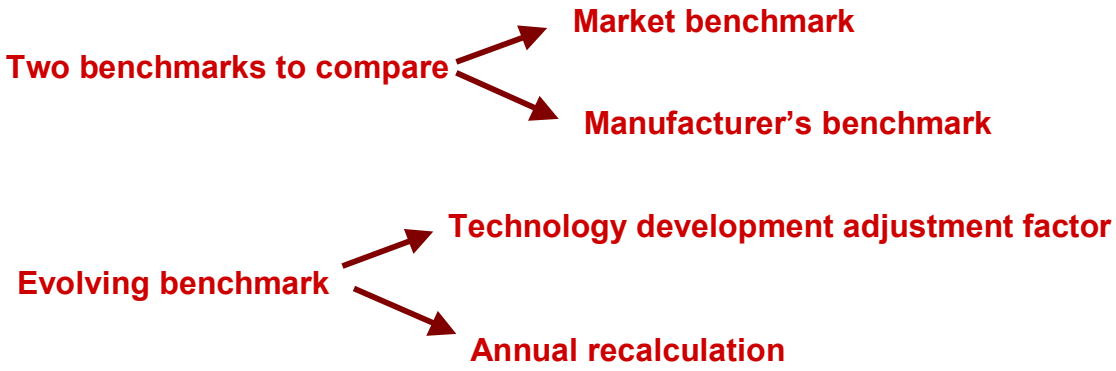
NM0235: Manufacturing of energy efficient domestic refrigerators

Benchmark approach:

-Additionality demonstration

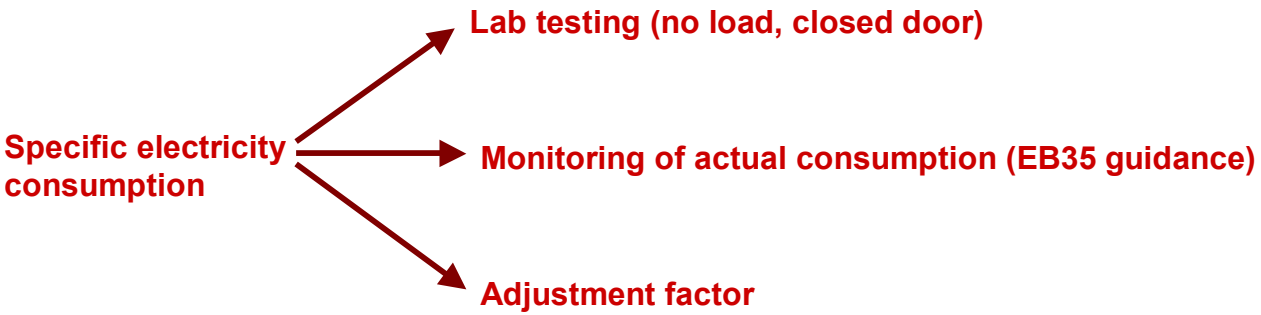
-Baseline scenario selection

-Baseline emissions calculations



NM0235: Manufacturing of energy efficient domestic refrigerators

Emission reductions calculation:



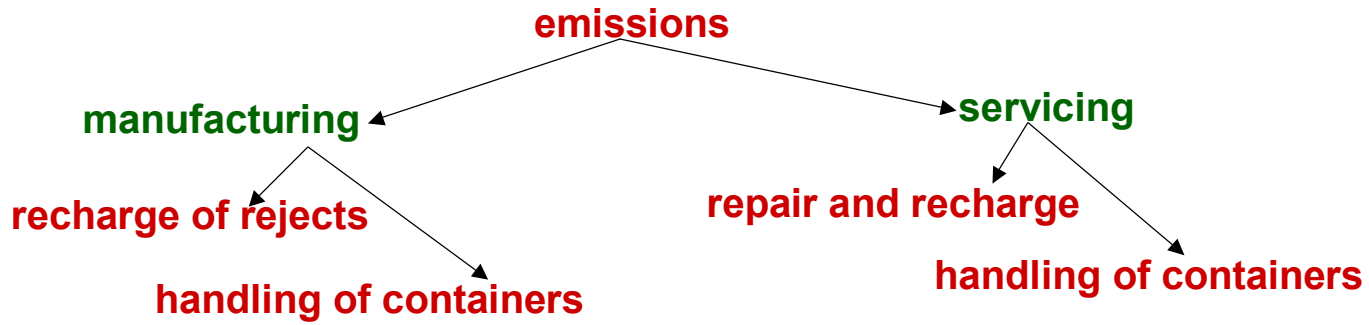
EB39 – Annotated agenda item 9b

Case NM0247

NM0247: Manufacturing and servicing of refrigerators using low GWP refrigerant by M/s Videocon Appliances Ltd

baseline : HFC134a
(GWP 1,300)

project activity : HC
(GWP ~ 20)



NM0247: Manufacturing and servicing of refrigerators using low GWP refrigerant by M/s Videocon Appliances Ltd

Applicability:

-Existing facilities

-Less than 50% of refrigerators at national market use low GWP refrigerant

-No export

Key features:

-Combined tool

-Market share adjustment factor

-DOE to validate common practice of refrigerant handling

EB39 – Annotated agenda item 9c

Case NM0259

NM0259: Methodology for improved energy efficiency by modifying ferroalloy production facility

Applicable to project activities:

(1) Improving energy efficiency by modifying furnaces from submerged electric arc smelting furnace(s) to open slag bath smelting furnace(s);

(2) Improving energy efficiency by modifying rotary kilns from co-current rotary kilns to counter-current rotary kilns.

Applicability conditions:

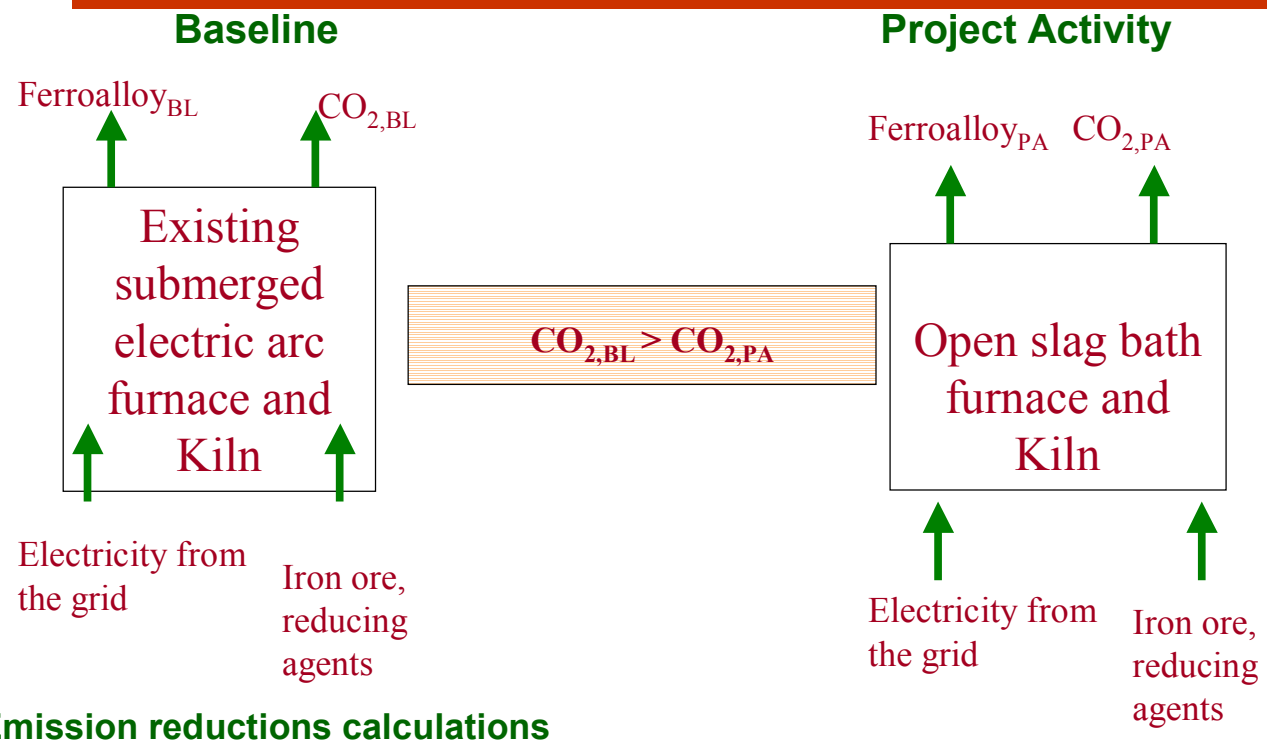
Most of the applicability conditions are in line with AM0038.

- –Type and quality of ferroalloy produced is not affected by the project activity and remains unchanged throughout the crediting period
- –The project activity will not lead to any positive leakage emissions due to changes of down- and upstream processes

Technology:

- Open slag bath furnace can operate at a higher temperature than Submerged Arc Furnace, the chemistry in the furnace is changed and less slag forming material is needed, resulting into saving on energy.
- Counter-current kilns have better energy recovery than in co-current kilns.

NM0259: Methodology for improved energy efficiency by modifying ferroalloy production facility



Emission reductions calculations

based on mass balance of carbon content of raw inputs and (non-) product outputs in baseline and project scenario for the same amount of production.

NM0259: Methodology for improved energy efficiency by modifying ferroalloy production facility

Baseline Scenario and Additionality

- The interdependence of the measures should be established by demonstrating that it is not technically feasible to implement one measure without implementing another.
- In case, it is impossible to demonstrate inter-dependence of measures, the additionality of each measure should be demonstrated separately using combined tool.
- The investment analysis of combined tool option should be used in following cases.
  - In case both the measures are implemented under the project activity.
  - In case, there is increase in production capacity of facility as a result of project activity.

EB39 – Annotated agenda item 10

Requests for clarifications

EB39 – Annotated agenda item 11

Requests for revisions

EB39 – Annotated agenda item 12

Revisions to approved methodologies

EB39 – Annotated agenda item 12a

Revision to AM0018

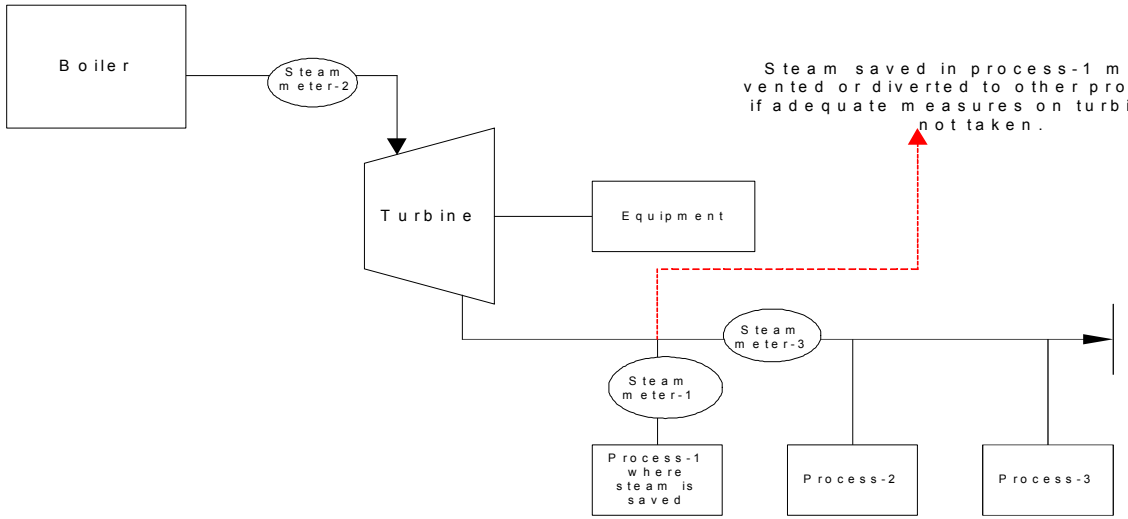
Revision to AM0018

EB requested that deviation received from the project proponents on “new procedures of estimation of conservative emission reduction in case the production values fluctuates beyond normal range of +/-5%” needs to be incorporated in methodology. While revising the methodology, other changes are also included in the methodology, which are inclusive of following.

1. Monitoring tables updated to new format.
2. Applicability conditions are reworded and additional applicability conditions defined when steam saved is an extraction/backpressure steam of cogeneration plant.
3. Procedures added for calculation of baseline and project SSCR when the production is outside the +/-5% of normal range. Baseline estimation procedure advises to use the **minimum SSCR value** for the days when production is outside the normal range. For project emissions the **maximum SSCR value** should be used for the days when production is outside the normal range to ensure conservativeness. For project emissions, the procedure is divided in three options depending upon the nature of change in production process/equipment which causes fluctuations beyond normal range.
4. New approach provided for the project activities where steam is saved in the cogeneration system.
5. Approach of Baseline-load efficiency function is added for boiler efficiency in line with other approved methodologies.

Revision to AM0018

New Approach for projects where steam saved is produced in cogeneration system. Existing methodology does not address the project cases where the steam saved is the extraction steam from a cogeneration turbine, which calls for a different approach to estimate the fuel reduction from the boiler.



Methodology now requires that following projects are necessary along with steam optimisation CDM project to ensure that fuel is saved from the boiler

1) Steam turbine in baseline is converted to an electrical drive. The electricity consumption of the drive should be monitored to determine project emissions.

2) The steam turbine in the baseline is replaced by a more efficient turbine

Revision to AM0018

Brief Analysis of registered CDM projects.

Registered project ref. no. (Total no. of projects registered: 10)	Steam saved is extraction/backpressure steam of turbine (Y/N)	Any project implemented at turbine to ensure the steam is saved from boiler.
0123	Not clear from PDD (LP steam saving at 3.5 Bar of cogen)	No information available
0261	Not clear from PDD (LP steam at 5.65 Bar from cogen in petrochemical complex where HP steam generated at 110 Bar)	No information available
0340	Not clear from PDD (MP steam saved at 17.5 Bar where HP steam is at 110 Bar)	No information available
0677	Not clear from PDD (Petrochemical complex, may have cogen system)	No information available
0679	Not clear from PDD (Refinery)	No information available
1272	Multiple projects in fertilizer plant (LP steam saving)	Yes turbines converted into electrical drives.
0866	Cogen system exists. Mostly MP and LP steam saved.	No information available

EB39 – Annotated agenda item 12b

Revision to AM0029

Revision to AM0029

AM0029: "Baseline Methodology for Grid Connected Electricity Generation Plants using Natural Gas" is applicable to project activities that build and operate a new natural gas power plant that supplies electricity to the grid.

The request sought clarification on two issues:

Which indicator should be used for the identification of the baseline scenario: "*the levelized cost of electricity production in $/kWh*" or "*highest IRR*" ?

The Panel clarifies that either of them can be used and recommends the revision of the methodology to eliminate the inconsistency in the language.

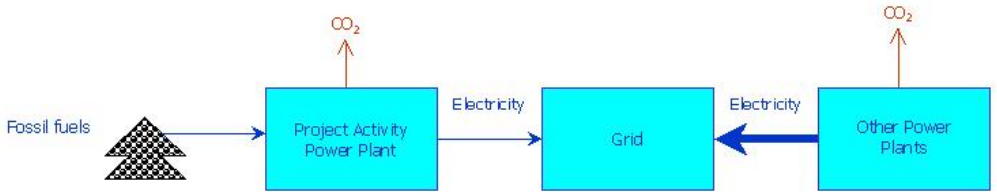
AM0029 allows for the use of up to 1% of fuels other than natural gas. The request seeks clarification on whether 1% refers to percent volume or percent energy.

The Panel clarifies that 1% refers to energy basis and recommends the revision of the methodology to make it clear.

EB39 – Annotated agenda item 12c

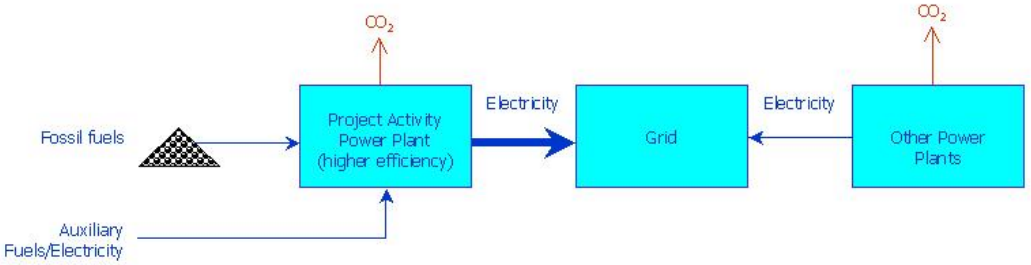
Revision to AM0061

Revision to AM0061



Baseline Scenario

Project Scenario



Revision to AM0061

- AM0061: the project activity is implemented in an existing power plant and does not involve the installation and commissioning of new generating units.

- AM0061: throughout the crediting period the installed capacity of the project activity power plant does not exceed the nameplate capacity existing previously by more than 5%.

- The request is to expand the applicability of the methodology to rehabilitation projects that result in an increase in the nameplate capacity up to 20%, without adding new generating units.

Revision to AM0061

The recommendations by the Panel is to revise AM0061 but with a more conservative approach:

- **The limit for nameplate capacity increase should be set at 15%;**

- **The calculation of the baseline emission factor for the increase in generation should be in line with AM0029.**

EB39 – Annotated agenda item 12d

Revision to ACM0010

Revision to ACM0010

ACM0010 is applicable to manure management on livestock farms where the existing anaerobic manure treatment system, within the project boundary, is replaced by one or a combination of more than one animal waste management systems that result in less GHG emissions.

Existing formula to estimate the Annual Average number of animals (N_{LT})

$$N_{LT} = N_{da} * \left(\frac{N_p}{365} \right)$$

N_{da}: Number of days animal is alive in the farm in the year y, expressed in numbers

N_p: Number of animals produced annually of type LT for the year y, expressed in numbers

Proposed additional formula to estimate the Annual Average number of animals (N_{LT}):

$$N_{LT} = \frac{\sum_{1}^{365} N_{AA}}{365}$$

N_{AA}: Daily stock of animals in the farm, discounting dead and discarded animals

EB39 – Annotated agenda item 12e

Revision to ACM0012

Revision to ACM0012

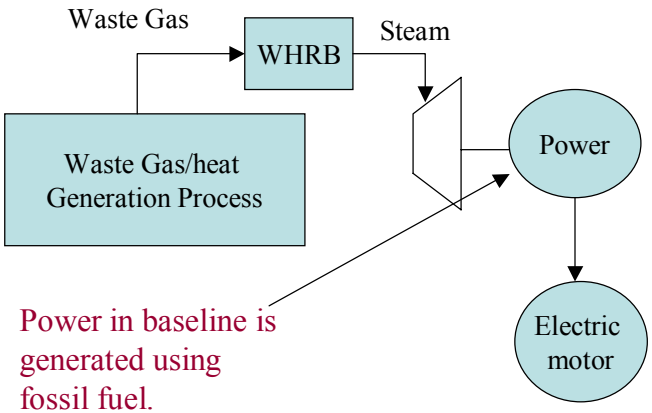
Revision of ACM0012 is carried out based on following.

1. **AM_REV_0073 (approved in MP31): Extend applicability of methodology for displacement of electrical motor/s or mechanical steam turbine/s in baseline by mechanical steam turbine/s driven by steam produced by waste gas heat recovery boiler.**
2. **AM_REV0075 (approved in MP31): : Extend applicability of methodology for the project cases where part of waste gas was used in baseline and project activity intends for improvement in utilisation of waste gas along with improved in energy efficiency of waste gas energy recovery equipment.**
3. **AM_CLA_0071 : Explanation provided for determination of baseline production associated with waste gas generation($Q_{BL,Product}$) when data of 3 years is not available.**
4. **The non-applicability condition that methodology can not be applied for conversion from single to combined power cycle plant is further clarified, by stating that for such projects ACM0007 should be used.**
5. **More consistency provided in use of terms of waste gas, waste heat and waste pressure.**

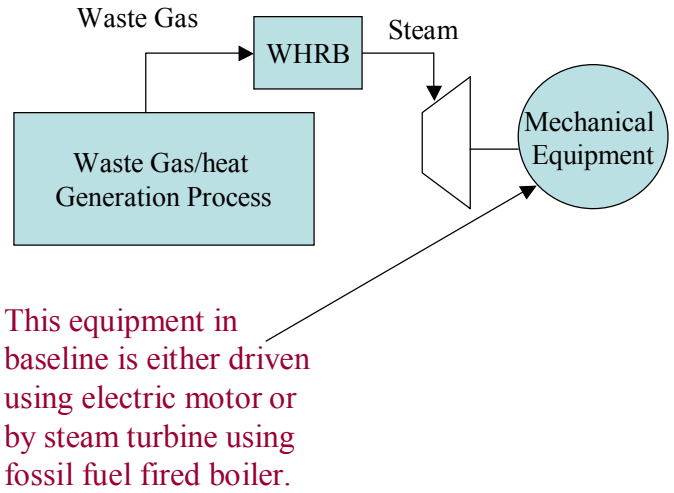
Revision to ACM0012

AM_REV_0073 (approved in MP31)

Existing Methodology



Revised Methodology



Note: 1) New baseline scenarios for Mechanical energy are added.

2) This revision is exclusively for power applications and is not applicable for the project activities where electrical motors/ turbine in baseline are replaced by WHRB based steam turbines and there is extraction of steam to replace fossil fuel fired heat applications .

Revision to ACM0012

AM_REV_0075 (approved in MP31):

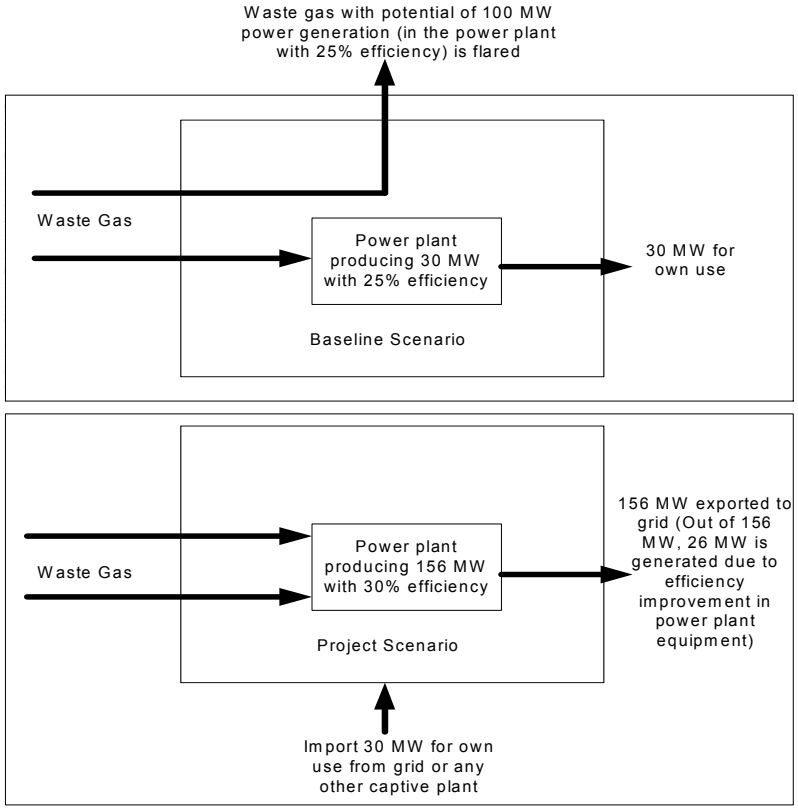
The methodology is extended for type-II project activities implemented to increase the capture and utilization of waste gas for generation of electricity that is flared or vented in the absence of the project activity. The project activity includes replacement/ modification/ expansion of existing generation equipment with more efficient equipment;

Note:

1) **New power generation baseline scenarios added.**
2) **For type-II project activities, the project proponents are required to use economic analysis for identification of most plausible baseline scenario.**
3) **Two project activity scenarios added for which methodology is applicable.**

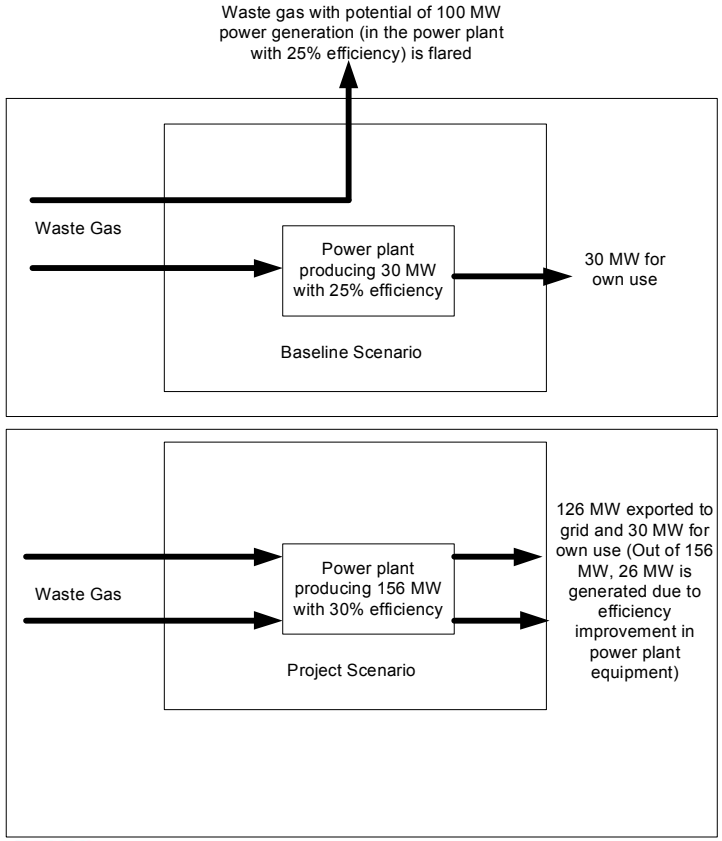
Revision to ACM0012

Scenario-1 under type-II project activities:



Revision to ACM0012

Scenario-2under type-II project activities:



Revision to ACM0012

AM_CLA_0071 : Explanation provided for determination of $Q_{BL,Product}$ when data of 3 years is not available.

Method-2 for estimation of variable fcap (cap on baseline quantity of waste gas for energy generation) based on most relevant baseline production of plant (QBL,Product).In existing methodology, this method is either for waste gas pressure based energy generation or for the facilities, which do not have data available for 3 years prior to implementation of project activity or for new facilities.
Equation 1f-1 requires data of production (QBL,Product) of three years, project proponents seek clarification, how it can be determined for new facilities and for the facilities which do not have three year data of production available.

Revision of methodology now include following approach for determination of QBL,Product.

The minimum of the following two figures should be used: (1) historical production data from start-up (or three years which ever is lower) of the plant or (2) the most relevant manufacture's data for normal operating conditions.
In case of new facilities or where data is not available the manufacture's data for normal operating conditions shall be used.

EB39 – Annotated agenda item 12f

Revision to ACM0013

Revision to ACM0013

Reason for revision

To clarify that the applicability condition requiring the project fossil fuel to be used by at least 50% plants has to be demonstrated using the host country or a region within the host country as the geographical area

EB39 – Annotated agenda item 13

Tool to estimate emissions from electricity consumption

Tool for estimating emissions from electricity consumption

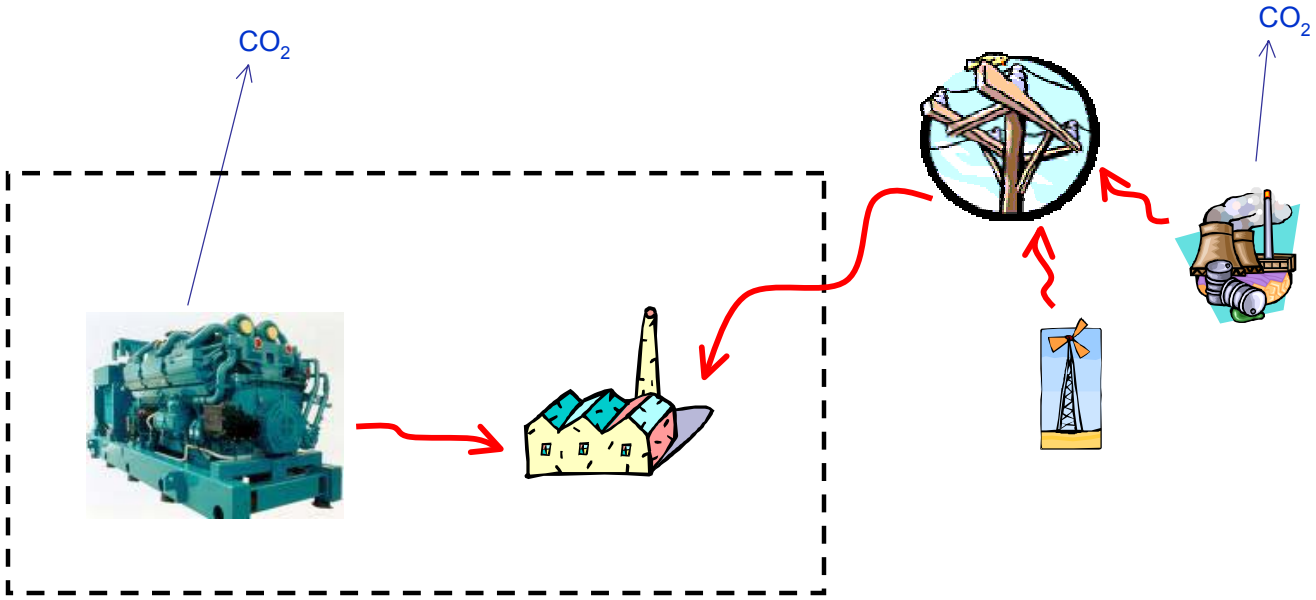
The tool expands the applicability of the “Tool to calculate project emissions from electricity consumption” adding procedures to estimate baseline and leakage emissions associated with the consumption of electricity.

The tool provides several options to project participants aiming at providing flexibility while ensuring conservativeness:

Some of the options provide more rough estimates and rely on conservative default values or conservative simplifications, whereas

Other options provide more accurate estimates but require more accurate project or country specific data.

Tool for estimating emissions from electricity consumption



EB39 – Annotated agenda item 14

Withdrawal of the Tool to estimate project or leakage emissions from electricity consumption

EB39 – Annotated agenda item 15

Guidance on HFC-23 storage

Background

- The Board at its 35th meeting requested the Meth Panel to provide clarification on how to address situations where HFC-23, generated in production of HCFC-22, is stored, when the HFC-23 incineration plant is temporarily not functioning, and subsequently destroyed (in AM0001).
- The Board agreed that the DOEs should ensure, for each issuance request value of "w" shall not exceed the maximum value as registered in the PDD, taking into account the issuances that have occurred in the past one year period (para 90, EB 35 meeting report).

“w” = ratio of HFC-23 to HCFC-22 estimated from historic data and fixed in PDD.

Rationale

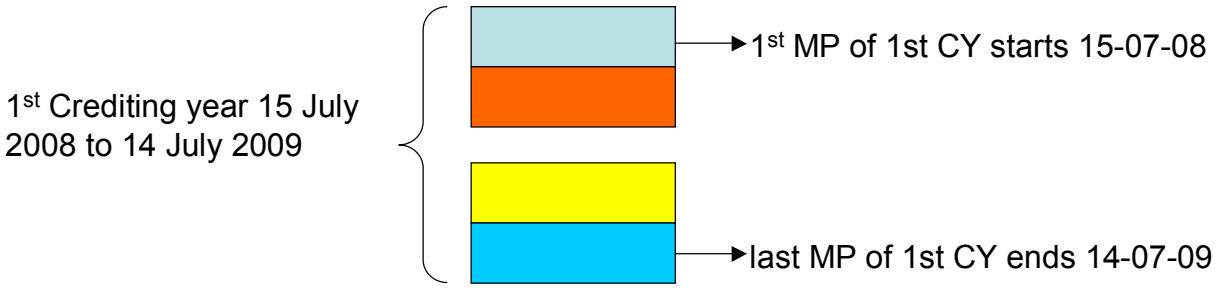
- AM0001 is for project activities that destroy HFC-23 generated in HCFC-22 production
- AM0001 methodology assumes the following:
  - All the HFC-23 generated will be destroyed instantaneously in the destruction facility; and
  - Issuance of CERs will be requested on an annual basis.
- Observed behavior shows:
  - Issuance of CERs are requested for periods less than a year;
  - Though HFC-23 is destroyed instantaneously but disruption in HFC-23 destruction facility can lead to storage

Procedure

Define crediting year (CY) based on start date of crediting period – as accounting year

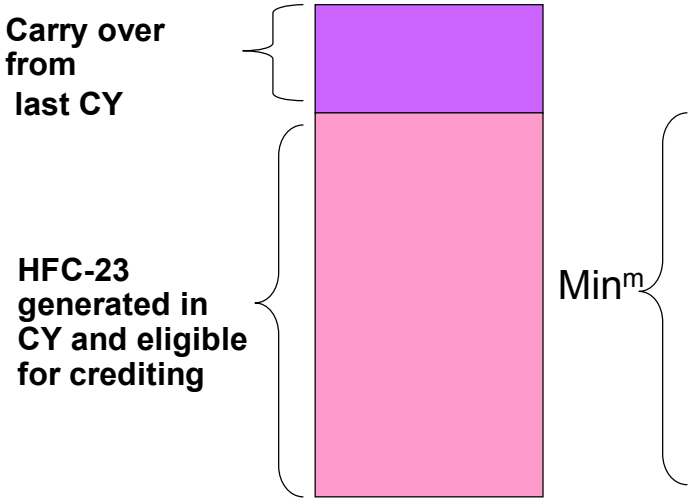
- **Monitoring period (MP) can be less than a year; and**
- **All monitoring period in a crediting year should add to one full year; and**
- **HFC-23 destruction eligible for crediting is established for a crediting period**

HFC-23 stored before start of CP and destroyed <u>not</u> eligible for crediting



Accounting procedure

Eligible HFC-23 for a CY



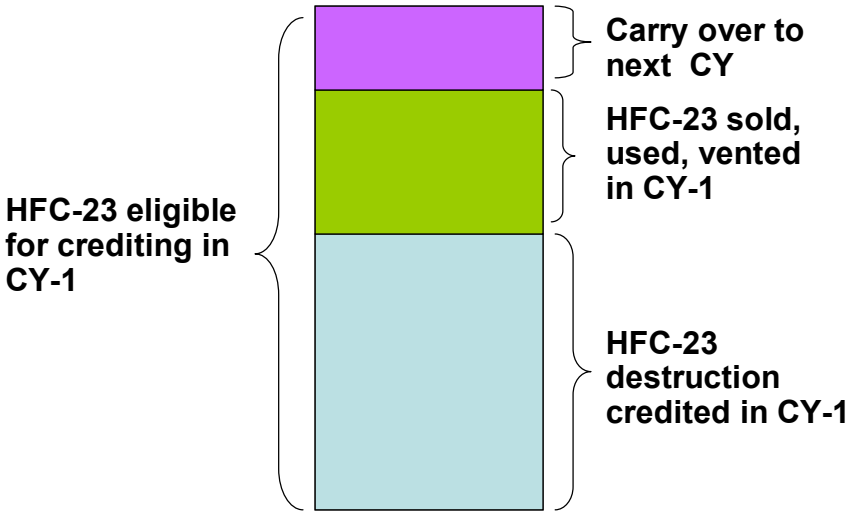
Min^{m}

1. Actual generation;and
2. $Q\_HCFC22_{y}*w$; and
3. $Q\_HCFC22e_{HIST}*w$; and
4. $Q\_HCFC22e_{HIST}*w_{y}$

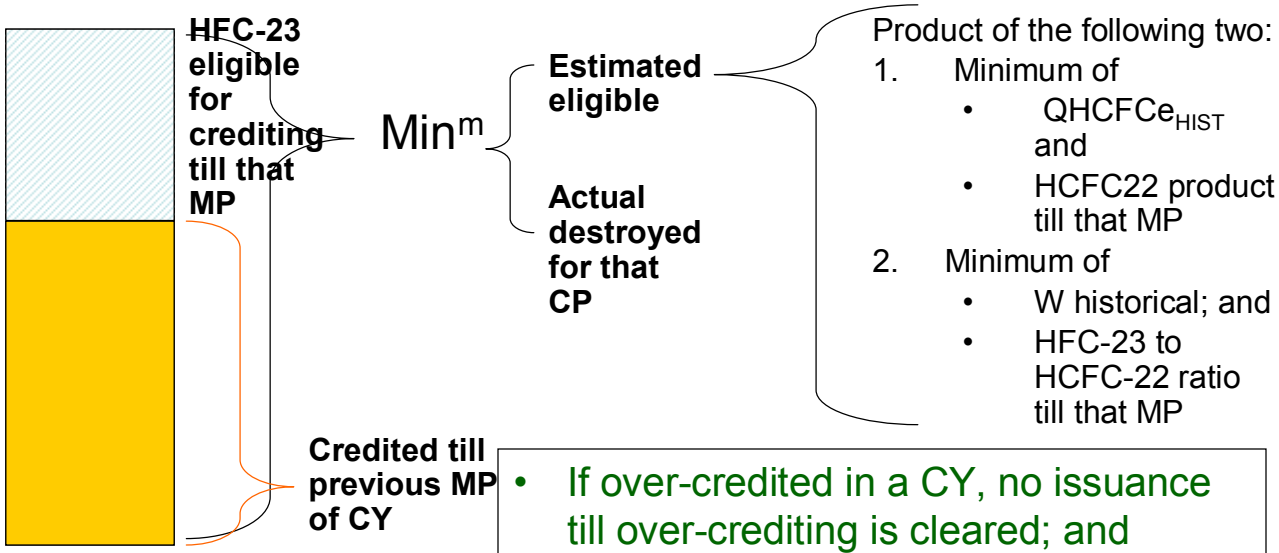
Decision by Board – should bullet 4 be added to methodology and, should be applicable to all registered projects

Accounting procedure

Carry over estimated as follows



Issuance procedure



- If over-credited in a CY, no issuance till over-crediting is cleared; and
- Last issuance under a project activity in the year

EB39 – Annotated agenda item 16

Revision to the tool to determine methane emissions avoided from dumping waste at a solid waste disposal site

Tool to determine methane emissions avoided from dumping waste at a solid waste disposal site

The Panel considered the report of an expert evaluating literature and submissions by project participants on the anaerobic degradation of empty fruit bunches (EFB).

The expert advised that the characteristics of EFB are similar to those of garden waste and not food waste (as proposed by the project participants) or wood (as proposed in the Tool).

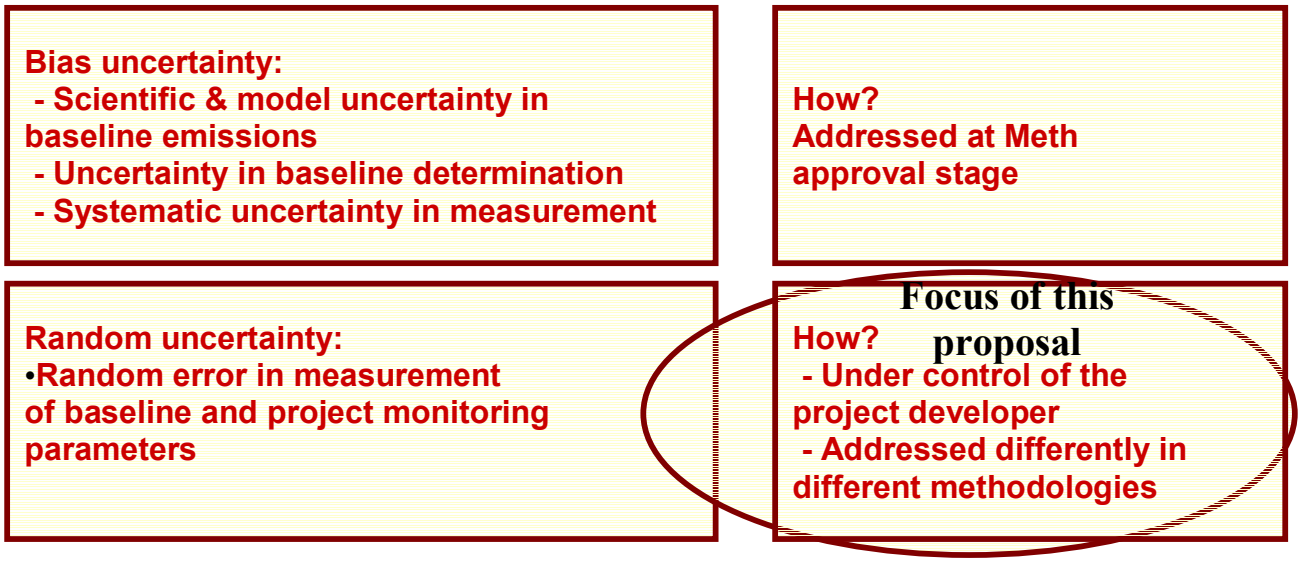
The Panel recommends the revision of the Tool in order to change the “DOC” and “k” for empty fruit bunches.

EB39 – Annotated agenda item 17

Guidance on uncertainty

What is uncertainty in the context of CDM?

- Uncertainty in the CDM can be separated into systematic uncertainty (bias) and random uncertainty (random error). Bias is (should be) addressed in the methodological development stage when approving a new methodology.
- This proposal focuses on addressing **random uncertainty**



Key concepts

Bias: systematic error

Example: a pressure gage is old and very stressed, always has a default measurement or 0.1 Bar for any input of pressure. They are difficult to detect.

Random uncertainty: is the random error in measurement of baseline and project monitoring parameters.

Example: measuring a box with the same scale and getting different values.

Why is addressing random uncertainty relevant?

- Accurate estimation of emission reduction on the project level
- Reduce the risk of systematic bias on emission reduction calculations
- Improving consistency of treating random uncertainty between different methodologies
- Encourage best practice of monitoring of GHG emissions on project level

Proposal to address random uncertainty in CDM (1)

- **At Methodology level:** Proposed new methodologies should provide acceptable uncertainty of individual parameters.
- In doing so, the following principles should be considered:
  - Materiality.
  - Use of "good practice" instrumentation in measurements.
  - Incentives to use more accurate approaches over less accurate approaches.
- Acceptable level of uncertainty is 15% on ER estimates
- If uncertainty in overall ER estimate > 15%, discounted as per following table:

Estimated uncertainty range at 95% confidence level of overall emission reductions	Conservativeness factor
> +/- 15%, ≤ +/- 30%	0.943
> +/- 30%, ≤ +/-50%	0.893
> +/- 50%, ≤ +/- 100%	0.836
> +/- 100%	to be addressed in the methodology

Proposal to address random uncertainty in CDM (2)

- Acceptable level of uncertainty in parameter and variables and the total expected random uncertainty level of overall emission reductions provided in methodology;
- If methodology does not provide overall random uncertainty level, project participants have to address uncertainty at individual project level
  - If overall uncertainty less than 15%, no discount;
  - If overall uncertainty greater than 15%, discount as per table;
- PP can choose to choose uncertainty in parameter and variables, as well as, overall uncertainty – if they do not want to follow the specification in methodology. This is provide flexibility in decision making.
- In all the above three situations:
  - Project developers do no need to adjust their emission reductions provided they stay within the limits for each parameter as defined in the methodology;
  - If the random certainty > 15% overall emission reductions should be adjusted by applying conservative factors (see table).

Case study 1:
Renewable power generation - ACM0002

- ER = EG (electricity generation) * EF (emission factor)
- Monitoring EG has a very low uncertainty (1%)
- The uncertainty of the EF_{CM} is a function of the uncertainties of:
  - The quantity of fossil fuels consumed in each baseline power plant in the OM and BM (assumed to be 10% based on expert judgement)
  - The EF of the fossil fuels consumed (based on IPCC varying from 4% to 31%)
  - The power generated by the baseline power plants (assumed to be 5%)
  - The oxidation factor (based on IPCC, 1-2%).

Conclusion:

- The compound uncertainty of EG_{PJ} * EF_{CM} is 8.2%, well below the limit of 15%.
- CER issues = $ER_{estiamted}$ (Estimated emission reduction are not discounted)

Case study 2:Reduction of GHG emissions by avoided landfilling through composting (AM0025)

- ER = E_{LFG} (landfill gas) – $E_{F/EC}$ (fuel/Electricity consumption) – $E_{Projectwasteprocessing}$
- Largest uncertainty in:
  - E_{LFG} = Fn(Waste, DOC, K,MCF, etc)
  - $E_{Project\ waste\ processing}$ = Fn (burning, composting, or other process of waste stablization)
- The uncertainties related to these sources vary largely
  - baseline emissions uncertainty is 65.6%; and
  - project emissions uncertainty ranging from 4.9 (where waste are burned) to 166% (waste treated through composting or other stablization processes for use as fuel).

Conclusion:

- The overall uncertainty of the project is 67%, which is above the limit of 15%.
- CER issues = (1-16/100)*$Er_{estimated}$ (Estimated emissions discounted by 16%)

EB39 – Annotated agenda item 18

Revision to additionality tool

EB39 – Annotated agenda item 19

Report on energy efficiency work

EB's work on Energy Efficiency

Two reports finalized

- **Experience with EE efforts in other countries**
- **Key issues in rejected EE methodologies**

Secretariat working on identifying possible options for addressing key issues in EE methodologies

- **Based on report on EE experience; and**
- **Developments in approved methodologies**

EB41 to consider the first set of tools

EB's work on Energy Efficiency

Report on EE efforts in US:

- The efforts in US are more akin to programmes rather than individual project activities;
- The M&V are more designed for the Programmatic approach
- The EE efforts use statistical methods to extend sample assessment to population assessment;
- Gross savings estimated using engineering analysis and site assessment;
- Net savings are adjustment for free-riders and postive spillovers;
- The estimates have inherent uncertainties due to extrapolations.

EB's work on EE

Scoping paper for tools under preparation, key findings:

- Adapting the Impact evaluation procedure to CDM
- Data constraints – can developed country data be adapted for developing country conditions
- Technologies/markets where standardization can be achieved
- Development of default values
- Methodological guidance to address issues like AEEI, equipment lifetime, etc.

EB39 – Annotated agenda item 20

Update on biofuel methodologies

AM00047 “Production of biodiesel based on waste oils and/or waste fats from biogenic origin for use as fuel”

- The level of details included in the emission factor for petrodiesel are of the **same level** as that for biofuels, and may be more;
- Two key difference, which may result in significant underestimation of emissions reductions:
  - Default emission for petrodiesel may not capture the key affect of source of crude oil and transportation and thus be an underestimate;
  - All emissions are attributed to biodiesel, which increases the project emissions.

- Meth Panel conclusion:
  - Identify sources that can be neglected on both sides;
  - Provide a simple four stage equation for estimation based on default values;
  - A more detailed procedure also provided, if PPs want more accurate estimates;
  - Integrate partition of project emissions between biofuel and its co-products

EB39 – Annotated agenda item 20

Appointment of new members of the panel

Issues Additionality Tool v 5
+
Guidance on investment analysis

AT issues agreed at EB36 (1)

- Introduction:
  - AT not mandatory when proposing new methodologies, but it is mandatory where part of approved methodology *(=clarification)*
  - Early started projects need to substantiate role of CDM (reference to guidelines CDM-PDD) *(=clarification)*
  - For ACM0002 one alternative is sufficient (AT is not related to establishment of baseline scenario) *(=consistency)*

AT issues agreed at EB36 (2)

- To assess whether simple cost analysis is appropriate, also consider all alternatives identified in step 1 *(=consistency)*
- Add government/ official approved benchmarks as acceptable source of information *(=clarification)*
- Remove footnote 6 *(is now in AT guidance note)* and footnote 7 *(was not correct)*
- No preference for Project IRR or Equity IRR *(=clarification)*
- Reference to “the relevant country/region” *(=clarification)*

Other issues

- Financially or economically feasible *(=consistency)*
- Evidence for claiming barriers should be third party evidence, not documents prepared by PP or statements by PP *(=credibility issue)*
- No common practice test in case of first of its kind *(agreed at EB38)*
- Clarify which CDM projects can be excluded from common practice test *(agreed at EB38)*
- No further quanticifation yet of common practice and first of its kind *(advice Meth Panel 32)*
- Guidance document to investment analysis as annex
- Guidance document to common practice as annex

Guidance to investment analysis (1)

- Complements existing material:
  - Additionality Tool
  - Combined Tool
  - SSC non-binding best practice examples
- Period of assessment in IRR calculations:
  - Preference for technical lifetime
  - Or 10 – 20 years, including fair value at end
- Prevent double counting in IRR/NPV calculation: guidance on depreciation and taxation
- Input values in investment analysis valid at the time of final decision on investment
- Transparency investment analysis (spreadsheets) with option for 2 versions (public version with some black outs if properly justified)
- Guidance on how to calculate project IRR / equity IRR

Guidance to investment analysis (2)

- Which types of benchmarks are appropriate for project IRR / equity IRR
- When to apply internal company benchmarks / expected returns and how to develop them
- Required return on equity: how to apply risk premiums to arrive at similar risk level as the project
- Investment analysis: free choice investment comparison or benchmark analysis, but not always (if PP has no other choice than to invest to supply product or service)
- Sensitivity analysis:
  - Only variables with >20% contribution to costs/revenues or other material impact on investment decision
  - Reasonable range: at least range of +10% to -10%, unless not appropriate
  - In case of scenario(s) passing the benchmark DOE assesses probability of occurence of (combinations of) such scenario(s)