

Calculation method for environmental targets

DSM Corporate Operations & Responsible Care
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Introduction

- All DSM's targets, except the one for greenhouse gas emissions, are efficiency targets. This means that emission and consumption figures are related to production volumes of individual reporting units. The target for greenhouse gas emissions is an absolute target (ton CO_{2,e}/year).
- A reporting unit is generally a BG on a specific location.
- In order to have a good coverage for determining the target performance, DSM applies a 'full scope' consolidation method, in which acquisitions are included as of the second year of reporting. Divestments are included until the moment of divestment.
- The method and algorithm for the determination of the target performance is given on the next slides, using the example of energy efficiency. The same algorithm is used for all other environmental intensity targets.

Definition of the Energy Efficiency Index and improvement

- The Energy Efficiency Index of a reporting unit is the actual energy use in the reporting year divided by the reference energy use.
- The reference energy use is the amount of energy that would have been used in the reporting year, in line with the change in production volume compared with the previous year without any energy efficiency effects.
- This comparison between actual energy use and reference energy use is executed for all reporting units (n in the formula on the next slide).
- The annual Energy Efficiency Index for DSM as a whole is the total actual energy use in the reporting year, divided by the total reference energy use, which is the sum of the reference energy uses of the individual reporting units (see step 1)
- The Energy Efficiency Index over the target period is calculated by multiplying all annual Energy Efficiency Indexes of the relevant years (see step 2)
- The Energy Efficiency improvement (in %) is 100 minus the Energy Efficiency Index (in %) (see step 3)

Calculation of Energy Efficiency Index: formula step 1

Step 1

$$EEI_n = \frac{E_n}{E_{reference,n}} \times 100 = \frac{\sum_p E_{n,p}}{\sum_p \left(\frac{E_{0,p}}{PV_{0,p}} \times PV_{n,p} \right)} \times 100$$

EEI_n	Energy Efficiency Index, year n
E_n	Energy use, year n
$E_{reference, n}$	Reference Energy use, year n
$E_{n,p}$	Energy use, year n, reporting unit p
$E_{0,p}$	Energy use, previous year, reporting unit p
$PV_{0,p}$	Production Volume, previous year, reporting unit p
$PV_{n,p}$	Production Volume, year n, reporting unit p

Calculation of Energy Efficiency Index: formulas step 2 and step 3

Step 2 $EEI_{target\ period} = EEI_1 \times EEI_2 \dots \times EEIX$

$EEI_{target\ period}$	Energy Efficiency Index over the target period
E_x	Energy Efficiency Index, year x
E_1	Energy Efficiency Index, year 1 of target period
E_2	Energy Efficiency Index, year 2 of target period

Step 3 $EE_{improvement} = 100 * (1 - EEI)$

$EE_{improvement}$	Energy Efficiency Improvement
EEI	Energy Efficiency Index



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