

ANNEX 2

NET GRANT EQUIVALENT OF INVESTMENT AID

The method of calculating the net grant equivalent (NGE) is used by the Competition Council in its assessment of aid schemes notified by the grantors.

1. GENERAL PRINCIPLES

The calculation of NGE consists in reducing all the forms of aid connected with an investment to a common measure, i.e. the net intensity, for the purposes of comparing them with each other or with a predetermined ceiling.

What is involved is an *ex ante* comparative method that does not always reflect accounting practice.

Tax aid may be considered to be aid connected with an investment where it is based on an amount invested in the region. In addition, any tax aid may be connected with an investment if one sets a ceiling expressed as a percentage of the amount invested in the region. Where the grant of tax aid is spread over several years, any balance remaining at the end of a given year may be carried over to the following year and increased in accordance with the reference rate.

The net intensity represents the final benefit which a firm is deemed to derive from the value without tax of the aid in relation to the assisted investment. This calculation may take account only of fixed capital expenditure corresponding to land, building and plant, which represent the standard base.

In the case of schemes whose base includes supplementary expenditure, the latter must be limited to a certain proportion of the standard base. Thus, all schemes will be examined, in the light of their intensities reduced to the expenditure appearing in the standard base as shown in the following examples.

This system of recalculating intensities does not apply to the intangible investments referred to in Art.7 of the present Regulation.

Example 1

- Base of scheme: plant
- Maximum intensity of scheme: 30%

As all the expenditure eligible for the scheme appears in the standard base, the Competition Council will take the maximum intensity of the scheme, i.e. 30%, into account without further ado. If the intensity ceiling authorized by the Competition Council in the region in question is 30%, the scheme will be considered compatible in this respect.

Example 2

- Base of scheme: plant, buildings + patents up to 20% of the preceding expenditure
- Maximum intensity of scheme: 30%

All the expenditure eligible for the scheme appears either in the standard base (plant, buildings) or in the list of eligible intangible expenditure (patents). The latter expenditure may not exceed 25% of the standard base. In these circumstances, the Competition Council will take the maximum intensity of the scheme, i.e. 30%, into account without further ado. If the intensity ceiling authorized by the Competition Council in the region in question is 30%, the scheme will be considered compatible in this respect.

Example 3

- Base of scheme: buildings, plant, land + stocks up to 50% of the preceding expenditure
- Maximum intensity of scheme: 30%

The Competition Council will take into account the maximum intensity of the scheme reduced to the standard base, i.e. $30\% \times 1.5 = 45\%$. If the intensity ceiling authorized by the Competition Council in the region in question is 30%, the scheme will not be considered compatible, unless its intensity is reduced to $30\% \div 1.5 = 20\%$.

Example 4

- Base of scheme: buildings
- Maximum intensity of scheme: 60%

If the regional ceiling authorized by the Competition Council is 30%, there is nothing to ensure that the aid will comply with the ceiling. The intensity provided for by the scheme is higher than the regional ceiling, but it is applied to a reduced base. The scheme will therefore not be considered compatible in this respect, unless an express condition is added concerning compliance with the regional ceiling applied to the complete base.

The determination of the NGE is based solely on calculation of tax and present value, except in the case of certain forms of aid which require specific treatment. Such calculations are based on elements supplied by the aid scheme or the tax law concerned, as well as on certain parameters fixed by convention.

1.1 TAXATION

The intensity of aid must be calculated after taxation, i.e. after having deducted the taxes payable on it, and in particular taxes on company profits. This is the basis for the term Net Grant Equivalent (NGE), which represents the aid accruing to the recipient after payment of the relevant tax, assuming that the enterprise makes a profit right from the first year, so that maximum tax is charged on the aid.

1.2 DISCOUNTING

Present value is calculated at various stages in the determination of an NGE. First, when aid and/or investment expenditure is staggered over time, the actual timing of aid disbursement and expenditure must be taken into account. Consequently, the investment expenditure and aid payments are discounted back to the end of the year in which the enterprise made its first depreciation write-off. Second, the present value is calculated of benefits obtained on repayment of a subsidized loan, or of the tax charged on a grant.

The rate used in such cases is the reference/discount rate. In addition to being used as the discount rate, it is also used to calculate the interest subsidy on a low-interest loan.

1.3 SPECIFIC CASES

In addition to the taxation and discounting calculations described above, some forms of aid require specific handling. Thus, in the case of aid for the renting of a building, the aid is measured by discounting the differences between the rent paid by the enterprise and a theoretical rent equivalent to the reference rate applied to the value of the building, plus an amount corresponding to depreciation for the building in the year in question. A similar method is used for aid to finance leasing.

It should be noted that the expenditure associated with the purchase of the land or the building by the renting firm may be considered as eligible, provided that the need for the aid in question is demonstrated.

In the case of aid for the renting of land, the theoretical rent is calculated on the basis of the reference rate, minus the rate of inflation, applied to the value of the land.

2. NET GRANT EQUIVALENT OF INVESTMENT AID IN THE FORM OF A CAPITAL GRANT

2.1 GENERAL PRINCIPLES

Investment aid given to an enterprise in the form of a capital grant is expressed first as a percentage of the investment, representing the nominal grant equivalent or the gross grant equivalent.

According to the common assessment method, NGE of aid is the benefit accruing to the recipient after payment of taxes on company profits. In most cases, grants are not taxable in themselves, but are deducted from the value of the depreciable investment. This means that the investor depreciates a smaller amount each year than if he had not received aid. Since depreciation amounts are deductible from taxable profits, a grant increases the proportion taken by the State each year in the form of tax on company profits.

The taxation method applying to grants described above, which consists in adding the grant to profits in step with depreciation, is the one most commonly used in European Union, but other taxation methods, in other countries, are encountered in certain schemes.

2.2 CALCULATION EXAMPLES

Example 1: The aid is not subject to tax

Grants are generally entered in the accounts as income and are made subject to tax. It may be, however, particularly in the case of certain Research and Development aid, that they are exempt from tax. In this case, the NGE is equal to the nominal grant.

Example 2: The investment involves only one category of expenditure and the grant is fully subject to tax at the end of the first financial year

This means that the full grant is subject to corporate profits tax from the first year onward. This convention is not excessive, if one remembers that firms, which generally record a loss

in their first years of operation, can carry over their losses for several financial years. To calculate the NGE of the grant, the amount of tax charged is deducted from it.

For instance: investment: 100
nominal grant: 20
rate of tax :40%

The tax charged on the grant is thus $20 \times 40\% = 8$

The NGE will thus be: $(20 - 8)/100 = 12\%$

Example 3: The investment involves only one category of expenditure and the grant is subject to tax on a straight-line basis over five years.

Here the grant is subject to tax in equal portions over five years. One fifth of the aid will thus be added to profits each year for five years. To calculate the NGE, the discounted amounts of tax charged each year on each fifth under the tax arrangements applicable are deducted from the grant.

For instance: investment: 100
nominal grant: 20
rate of tax : 40%
discount rate: 8 %

The table below shows how the taxes charged each year, and the discounted values, are calculated:

Period	Tax charged on grant	Discount factor	Discounted value
	(1)	(2)	(1) x (2)
End of 1st year	$(20/5) \times 40\%$	1,0	1,600
End of 2nd year	$(20/5) \times 40\%$	$1/(1 + 0,08)^1$	1,481
End of 3rd year	$(20/5) \times 40\%$	$1/(1 + 0,08)^2$	1,372
End of 4th year	$(20/5) \times 40\%$	$1/(1 + 0,08)^3$	1,270
End of 5th year	$(20/5) \times 40\%$	$1/(1 + 0,08)^4$	1,176
Total			6,900

The total in the last column represents the sum of the discounted taxes charged each year. It has to be deducted from the nominal grant to obtain the NGE.

Thus the NGE is: $(20 - 6.9)/100 = 13.1\%$

Note: The tax charged on the grant is discounted at the end of the first year on the assumption that this is the date when the enterprise makes its first depreciation write-off.

Example 4: The investment involves three categories of capital expenditure: land, buildings and plant, taxed over different timescales

The three types of expenditure constitute what is referred to as the standard base for aid. In order to calculate the NGE under aid scheme, the expenditure is apportioned using the following breakdown. The Competition Council will establish the value taking into account the conditions existing at that time. (sum of percentages =100)

- land – between 1% and 5%
- buildings – between 30% and 50%
- plant – between 45% and 65%

In individual cases of aid, on the other hand, the actual apportionment breakdown of the three categories of expenditure in the standard base is used. As the timescale over which a grant is subject to tax differs according to the category of expenditure, the first step is to allocate the grant proportionally among the items forming the base of the aid.

The next step is to calculate the amounts charged as tax, separately for each category of expenditure (the calculations are of the same kind as those in Example 3). Lastly, the taxes are deducted from the nominal grant in order to arrive at the NGE:

NGE = NOMINAL GRANT less:

- The tax charged on aid allocated to land
- The tax charged on aid allocated to buildings
- The tax charged on aid allocated to plant

For instance: Investment: 100, of which:

land: 3 not depreciable

buildings: 33 straight-line depreciation over 20 years

plant: 64 decreasing-line over 5 years.

Nominal grant: 20

Rate of tax: 55%

Discount rate: 8%

To calculate the tax on aid allocated to land

In general, land is not depreciable. Assuming that the aid is to be subject to tax at the same pace as depreciation, aid granted to land is not taxed and no tax is to be deducted from the grant made in respect of land.

To calculate the tax on aid allocated to buildings

Assuming that the aid allocated to buildings is to be subject to tax in equal portions at the same pace as depreciation, i.e. over 20 years:

- the nominal grant allocated to buildings would be: $20 \times 33\% = 6,6$
- each year, the portion of the grant included in profits would be: $6,6/20 = 0,33$
- the amount of tax charged on that portion would be: $0,33 \times 55\% = 0,18$

An amount of 0.18 would be due from profits each year for 20 years in respect of the grant made for buildings. If this stream of amounts is discounted at the end of the first year (same kind of calculation as in the table in Example 3), the total tax charged in the period on the aid grant to buildings will be 1.925.

To calculate the tax on aid allocated to plant

Let us assume that the aid allocated to plant is to be subject to tax at the same pace as depreciation, i.e. by the decreasing-line method, over five years, at the following rates: 40%, 24%, 14.4%, 10.8% and 10.8%.

Unlike the case of buildings, taxation here is different each year. The tax will therefore have to be calculated year by year. The share of the nominal grant allocated to plant is $20 \times 64\% = 12.8$.

To calculate the tax charges:

Period	Tax charged on grant (1)	Discount factor (2)	Discounted value (1) x (2)
End of 1st year	$12,8 \times 40\% \times 55\%$	1,0	2.816
End of 2nd year	$12,8 \times 24\% \times 55\%$	$1/(1 + 0,08)^1$	1,564
End of 3rd year	$12,8 \times 14,4\% \times 55\%$	$1/(1 + 0,08)^2$	0,869
End of 4th year	$12,8 \times 10,8 \times 55\%$	$1/(1 + 0,08)^3$	0,604
End of 5th year	$12,8 \times 10,8\% \times 55\%$	$1/(1 + 0,08)^4$	0,559
Total			6,412

To calculate the NGE:

- nominal grant : 20

less:

- tax charged on aid allocated to land 0
 - tax charged on aid allocated to buildings 1.925
 - tax charged on aid allocated to plant 6.412
- NGE = 11.6%

Note:

1. The taxation of grants, referred to in the common method of assessing aid, is governed both by the tax laws and by any special arrangements under the scheme in question.

2. For the purposes of determining an NGE, it is therefore necessary to have precise information on:

- the scale of tax rates on profits in the country concerned;
- the depreciation rules in force, or the specific method of incorporating aid into profits prescribed by the scheme in question.

3. NET GRANT EQUIVALENT OF INVESTMENT AID IN THE FORM OF A SUBSIDIZED LOAN

3.1 GENERAL PRINCIPLES

Investment aid given to an enterprise in the form of a subsidized loan is expressed first as the number of percentage points of the rebate, i.e. the difference between the reference rate and the rate charged by the lender.

The sole effect of the interest rebate is to reduce interest charges, since it is assumed that capital repayments are carried out in the same way whether the interest rate is normal or reduced.

This benefit obtained on repayment of the loan is expressed as a percentage of the investment, as for capital grants. This gives the nominal grant equivalent or gross grant equivalent.

This does not represent the final benefit which the enterprise derives from the interest subsidy. Since interest charges are deductible from taxable profits, an interest subsidy means the loss of part of such tax benefit by increasing the share taken by the State in the form of tax on company profits.

Consequently, the NGE is obtained by deducting from the gross grant equivalent the tax charged by the State on the increase in taxable profits that is attributable to the rebate.

As in the case of a grant, the NGE of a subsidized loan is based on elements supplied either by the aid scheme or by the tax law of the country in question, plus any other factors established by convention.

The following elements are needed to calculate the NGE of investment aid in the form of a subsidized loan:

- period of the loan;
- length of the grace period, i.e. the initial period when no repayments need to be made, interest being paid on the total amount of principal;
- number of percentage points of the rebate;
- duration of the rebate, not necessarily the same as the loan;
- amount of the loan as a percentage or proportion of the investment;
- reference/discount rate;
- rate of tax.

It is also necessary to know the terms for repayment of the loan. In most cases the loan is repaid on a straight-line basis, in equal portions, interest being due on the balance

outstanding. Repayment is occasionally by constant annual installments, in which case this is taken into account in calculating the NGE.

3.2 CALCULATION EXAMPLES

Example 1

1. Parameters

- the loan is for ten years with straight–line repayment and no grace period;
- the rebate is three percentage points throughout the period of the loan;
- the loan is for 40% of the investment;
- the reference/discount rate is 8%;
- the rate of tax is 35%.

2. Calculation of the unit gift element

The unit gift element is the nominal grant equivalent of a one–point interest rebate on a loan of 100% of the investment, taking account of the characteristics of the aid used as parameters. It is calculated as follows:

End of year	No loan: balance outstanding (1)	1-point rebate (2)	Benefit obtained (1) x (2)	Discount factor (3)	Discounted value (*) (1) x (2) x (3)
1	100	1%	1	$1/(1 + 0,08)^1$	0,926
2	90	1%	0,9	$1/(1 + 0,08)^2$	0,772
3	80	1%	0,8	$1/(1 + 0,08)^3$	0,635
4	70	1%	0,7	$1/(1 + 0,08)^4$	0,515
5	60	1%	0,6	$1/(1 + 0,08)^5$	0,408
6	50	1%	0,5	$1/(1 + 0,08)^6$	0,315
7	40	1%	0,4	$1/(1 + 0,08)^7$	0,233
8	30	1%	0,3	$1/(1 + 0,08)^8$	0,162
9	20	1%	0,2	$1/(1 + 0,08)^9$	0,100
10	10	1%	0,1	$1/(1 + 0,08)^{10}$	0,046
UNIT GIFT ELEMENT					4,112
(*)Discounting starts at the beginning of the first year.					

3. Calculation of net grant equivalent

The net grant equivalent is obtained simply by multiplying the unit gift element by the characteristics of the aid (three–point rebate, 40% share, non–taxable portion of aid: 1 – 35%):

$$\text{NGE} = 4.112 \times 3 \times 40\% \times (1 - 35\%) = 3.21\%$$

Example 2

1. Parameters

The parameters are the same as in Example 1, but with a two-year grace period from repayment. This means that capital is not repaid in the first two years. The ten-year loan will thus be repaid in eight equal portions from the third to the tenth year. Interest is payable during the ten years on the balance outstanding.

2. Calculation of unit gift element

End of year	No loan: balance outstanding (1)	1-point rebate (2)	Benefit obtained (1) x (2)	Discount factor (3)	Discounted value (*) (1) x (2) x (3)
1	100	1%	1	$1/(1 + 0,08)^1$	0,926
2	100	1%	1	$1/(1 + 0,08)^2$	0,857
3	100	1%	1	$1/(1 + 0,08)^3$	0,794
4	87,5	1%	0,875	$1/(1 + 0,08)^4$	0,643
5	75,0	1%	0,750	$1/(1 + 0,08)^5$	0,510
6	62,5	1%	0,625	$1/(1 + 0,08)^6$	0,394
7	50	1%	0,500	$1/(1 + 0,08)^7$	0,292
8	37,5	1%	0,375	$1/(1 + 0,08)^8$	0,203
9	25,0	1%	0,250	$1/(1 + 0,08)^9$	0,125
10	12,5	1%	0,125	$1/(1 + 0,08)^{10}$	0,058
UNIT GIFT ELEMENT					4,802 %
(*) Discounting starts at the beginning of the first year.					

3. Calculation of the net grant equivalent

As in Example 1, the unit gift element is multiplied by the number of rebate points, the proportion of expenditure covered by the loan and the complement to unity of the rate of tax:

$$\text{NGE} = 4.802 \times 3 \times 40\% \times (1 - 35\%) = 3.75\%$$

Note: It will be seen that, other things being equal, the result of introducing a grace period from capital repayments is to increase the NGE. The grace period increases the balance due each year and hence the benefit attributable to the rebate and, consequently, the unit gift element.

Example 3

1. Parameters

The same facts as in Example 2, but the loan is to be repaid in constant annual installments.

In this case, the calculation method differs fundamentally from that used in the preceding two examples: first the "normal" annual installments excluding the interest rebate are calculated,

then the "rebated" installments; the difference between the two series is established year by year, and the results discounted in order to obtain the grant equivalent.

2. To calculate the grant equivalent

The constant annual installments, expressed as a percentage of the loan, are calculated as follows:

$$A = i/(1 - r^n)$$

where $r = 1/(1 + i)$

i being the interest rate and n the number of years for which the installment is calculated. The calculations below are based on a loan of 100 units:

Years	Year normal installment (1)	Rebated annual installment (2)	Benefit obtained (3)	Discount factor (4)	Discounted value (*) (3) x (4)
1	8	5	3	$1/(1 + 0,08)^1$	2.778
2	8	5	3	$1/(1 + 0,08)^2$	2.572
3	17,401	15,472	1,929	$1/(1 + 0,08)^3$	1.532
4	17,401	15,472	1,929	$1/(1 + 0,08)^4$	1.418
5	17,401	15,472	1,929	$1/(1 + 0,08)^5$	1.313
6	17,401	15,472	1,929	$1/(1 + 0,08)^6$	1.216
7	17,401	15,472	1,929	$1/(1 + 0,08)^7$	1.126
8	17,401	15,472	1,929	$1/(1 + 0,08)^8$	1.042
9	17,401	15,472	1,929	$1/(1 + 0,08)^9$	0.965
10	17,401	15,472	1,929	$1/(1 + 0,08)^{10}$	0.894
Unitatea de ajutor					14.85%
(*)Discounting starts at the beginning of the first year.					

3. To calculate the net grant equivalent

The net grant equivalent is obtained by multiplying the grant equivalent by the proportion, then deducting the portion charged as tax:

$$NGE = 14.85 \times 40\% \times (1 - 35\%) = 3.86\%$$

Note: If there is no grace period from repayment, the NGE calculated in the same way is 3.41%.

3.3 FORMULAE FOR CALCULATING THE NGE OF A SUBSIDIZED LOAN

The previous methods, which can easily be transposed to a spreadsheet, make it possible to calculate the NGE of a low-interest loan according to the characteristics of the case in question. In standard cases, the NGE may also be calculated direct by means of the following formulae.

1. Terms

- i is the reference rate per maturity interval and $r = 1/(1+i)$
- i' is the subsidized rate, per maturity interval and $r' = 1/(1+i')$
- P is the period (in number of maturity intervals) of the loan
- Q is the proportion
- T is the rate of tax
- F is the period, in number of intervals, of any grace period from repayment of principal: during the grace period, only interest on the loan is repaid, at the subsidized rate.
($F = 0$ where there is no grace period)

2. Straight-line repayment

$$\text{NGE} = (1-T)Q \left(1 - \frac{i'}{i} \right) \left(1 + \frac{r^P - r^F}{i \times (P - F)} \right)$$

3. Repayment in constant annual installments

$$\text{NGE} = (1-T)Q \left[1 - \left(\frac{i'}{i} \right) \times \left(1 - r^F + \frac{r^F - r^P}{1 - r'^{P-F}} \right) \right]$$