WOOD COATING

SYNOPSIS SHEET

Prepared in the framework of EGTEI

1. Activity description and EGTEI contribution - summary

This sector covers the industrial application of paints onto wooden surfaces. Here, mainly the use of paints and varnishes in the furniture and panel coating industry is considered.

This activity emits NMVOC originating from the use of paints containing solvents, thinners and cleaning solvents. NMVOC emissions from this sector may vary significantly from country to country. At a EU25 level for the year 2000 (according to the RAINS model: version CP_CLE_Aug04(Nov04)), NMVOC emissions were 202.1 kt representing 1.9% of total NMVOC emissions. Total activity being, 2,118 Mm² of wood coated, average emission factor is about 95.4 g NMVOC/m² coated meaning that emissions from this sector are already partly treated in EU25 (unabated emission factor being 345.6 g/m²). These estimations could be modified in a near future due to information delivered by national experts during the bilateral consultation in 2005.

Coating of wooden surfaces is addressed by the European Directive 1999/13/EC (SED) [1] related to the reduction of NMVOC emissions from the use of solvents in some industrial activities. In order to be able to better represent the impact of this Directive in terms of emission reduction and costs, **it has been considered as an individual activity by EGTEI [2]**. This sector was not considered separately in the previous RAINS version [3]. It was covered as a part of "Industrial Use of Paints under Other Industrial Use of Paints" concerning the ship building industry, manufacture of plastic and metal articles and wood products industry. **EGTEI has been able to develop an approach for representing this sector and estimate costs of reduction techniques**. The methodology (on the emission side) was developed in cooperation with representatives from the European Council of the Paint, Printing Ink and Artists'Colours Industry (CEPE) [4]. Investments come from a study concerning the SED impact and released in 2000 [5].

Presently, RAINS has been modified and integrates EGTEI proposals [6]. **Data provided by EGTEI (emission factors and costs) have been implemented in the new RAINS version** for the modelling work carried out in the scope of the CAFÉ programme and the revision of the Gothenburg Protocol and national emission ceiling Directive.

The representative unit used is the area of wood coated annually (m²/year). This unit is usually used to define paint consumptions in this sector. Four reference installations (RI) have been defined with CEPE to take into account the impact of the size on secondary measure costs. If no detail data exist, a simplification process is defined in this document.
Eight primary measures are considered based on different types of paints and different application efficiencies: emissions depend highly on these two parameters. Solvent-based paints are commonly used and represent the reference situation. According to [4], very small installations use predominantly high solvent coatings and very large installations use predominantly very low solvent coatings. UK experience, where there is already a 15 tonne threshold rule, is that most installations can adapt their process to fall under the threshold.

Thermal oxidation is considered as the unique secondary measure for this sector. Its use allows installations being in compliance with the SED requirements. The situation might be very different from country to country but the use of alternative coatings is usually preferred to the use of a thermal oxidiser in this sector.

EGTEI provides default emission factors (EF) with abatement efficiencies, investments and variable and fixed operating costs (OC) as well as unit costs (€/t NMVOC abated and €/activity unit) for all the measures according to the installation size.

The use of a thermal oxidiser associated with solvent-based paints enables installations complying with the SED requirements but at higher unit costs than the use of primary measures (from -211 k€/Mm² to 4,317 k€/Mm² according to the type of solvent-based paints used and to the size of the installation). Unit costs for alternative coatings are negative because fewer products are needed for the same job (dry matter contents are higher and application efficiency can be greatly improved). **Unit costs depend highly on the cost of the paints used: it is thus very important to provide realistic country specific data.**

National experts have to collect 3 country specific parameters (wages, electricity and natural gas costs) and 5 country and sector specific parameters (costs of four different types of paints and cleaning solvents). The first ones can be very easily known. The second ones can be defined with the help of national wood coater associations. EGTEI provides default costs for country and specific

parameters which can be used if no better national data exist. National experts have also to provide the trends in activity level from 2000 to 2020, the activity shares according to the different RI as well as the application and applicability rates of each abatement technique.

As the representation of this sector in RAINS is based on the EGTEI proposal, it is recommended to national experts to complete ECODAT with country specific parameters which are not known from CIAM.

EGTEI proposals for the representation of wood coating and definitions of abatement techniques have been considered in the last RAINS update [6]. In the future however, any new technology which could be developed should be considered by EGTEI in the background document to continuously improve the representation of the sector and the capacity of EGTEI to describe new technologies.

2. European regulation

As mentioned above, the European Directive 99/13/EC [1] applies to this sector (annex IIA, n°10).

Operators can conform to the Directive in either of the following ways:

by complying with the canalised and fugitive emission limit values,

by introducing a reduction scheme to obtain an equivalent emission level (in particular by replacing conventional products with a high solvent content with low-solvent or solvent-free products).

The SED applies to installations with a solvent consumption above 15 t per year. Emission limit values defined in the SED are presented in table 2.1. All obligations are not described in this chapter.

Table 2.1: Emission limit values for wood coating

Solvent consumption threshold [t / y]	NMVOC emission limit value in residual gases [mg C / Nm^3]	Fugitive emission limit values [% of solvent input*]
15-25	Application and drying: 100	25
> 25	Application: 50 Drying: 75	20

* Solvent input: quantity of organic solvents used as input into the process in the time frame over which the mass balance is being calculated (purchased solvent) + quantity of organic solvents recovered and reused as solvent input into the process (recycled solvents are counted every time they are put back into the process cycle).

The respect of the reduction scheme defined in Annexe IIB of the SED leads to the following factors:

- For installations with a solvent consumption between 15 and 25 tonnes, the target emission is equal to 0.4 multiplied by the annual reference emission (emission factor = 360 g of coatings/m² x 0.2g solid/g of coating x 4 g solvent/g solid x (0.25+0.15) = 115.2 g solvent/m²).
- For installations with a solvent consumption above 25 tonnes, the target emission is equal to 0.25 multiplied by the annual reference emission (emission factor = 360 g of coatings/m² x 0.2g solid/g of coating x 4 g solvent/g solid x (0.2+0.05) = 72 g solvent/m²).

The compliance date for existing installations is October 30th, 2007. Following the transcription of the Directive in Member States, this date can be different from country to country. For example, in France, the compliance date is October 30th, 2005.

3. Methodology developed within EGTEI to represent the sector

3.1 Definition of reference installations

Four reference installations (RI) were defined with CEPE [4]. According to [4], probably 75% of all installations have a coating consumption of less than 5 tonnes per year. Therefore, a very small installation was defined.

The representative unit used is the area of wood coated annually (m²/year). The four reference installations considered enable to take into account the costs of secondary measures which are size-dependant.

Table 3.1.1: Reference installations

Reference Installation Code RIC	Description	Technical characteristics
01	Very Small Installation: Output: 15,000 m^2/y coated	Full load hours: 1,840 h/y [NMVOC]: 0.5 g/m^3 Flow rate: 4,500 m^3/h Solvent input (I*): 5.2 t/y
02	Small Installation: Output: 65,000 m^2/y coated	Full load hours: 1,840 h/y [NMVOC]: 0.5 g/m^3 Flow rate: 19,500 m^3/h Solvent input (I*): 22.7 t/y
03	Medium Installation: Output: 300,000 m^2/y coated	Full load hours: 1,840 h/y [NMVOC]: 0.5 g/m^3 Flow rate: 90,200 m^3/h Solvent input (I*): 103.7 t/y
04	Large Installation: Output: 1,400,000 m^2/y coated	Full load hours: 4,000 h/y [NMVOC]: 0.5 g/m^3 Flow rate: 193,500 m^3/h Solvent input (I*): 483.8 t/y

* As mentioned in the Solvent Management Plan implemented by the SED [2], inputs of organic solvents (I) equal the quantity of organic solvents or their quantity in preparations purchased (I1) + the quantity of organic solvents recovered and reused as solvent input into the process (I2). In this sector, I = I1 because no solvent is recovered. All solvents consumed are assumed to be emitted when no add-on technique is used.

The small reference installation has a solvent input below the Directive solvent consumption threshold of 15 t of solvents/y. Thus, installations corresponding to this definition do not have to respect the SED requirements.

3.2 Definition of emission abatement techniques

3.2.1 Primary measures

Eight primary measures are defined according to the type of coating used (i.e. low solid to very high solid coatings). Application efficiencies are also part of the definition: two different efficiencies are defined per type of coating.

Solvent-based paints are commonly used and represent the uncontrolled situation. The potential of use of the different coatings is different. According to [4], very small installations use predominantly high solvent coatings and very large installations use predominantly very low solvent coatings. UK experience, where there is already a 15 tonne threshold rule, is that most installations can adapt their process to fall under the Directive threshold.

Table 3.2.1.1: Primary measures

Primary Measure Code PMC	Description
00	Low solid systems (80% solvent content), Conventional application process with an efficiency of 35% (spray application technique).
01	Low solid systems (80% solvent content) and application process with an efficiency of 75% (electrostatic, roller coating, curtain coating, dipping)
02	Medium solid systems (55% solvent content), conventional application process with an efficiency of 35%
03	Medium solid systems (55% solvent content), application process with an efficiency of 75%
04	High solid coating systems (20% solvent content), application process with an efficiency of 35%
05	High solid coating systems (20% solvent content), application process with an efficiency of 75%
06	Very high solid systems (5% solvent content), application process with an efficiency of 35%
07	Very high solid systems (5% solvent content), application process with an efficiency of 75%

Coating system consists of filler, sealer, basecoat, ink, and topcoat. The solvent content given in brackets defines the amount of solvents in wt.-% for the entire coating system.

PMC 01 can be used to reduce solvent consumption bellow the SED threshold of 15 tonnes per year. PMC 02 is almost in compliance with the SED requirements. All other primary measures lead to higher VOC reductions than the SED requirements.

3.2.2 Secondary measures

Only the thermal oxidation is considered as secondary measures. A thermal oxidizer will only be used in specific cases when no substitution is technically available.

Table 3.2.2.1: Secondary measures

Secondary Measure Code SMC	Description
00	No secondary measure
01	Thermal oxidiser

4. Country specific data to be collected

Different types of country specific data have to be collected to give a clear picture of the situation in each Party. EGTEI proposes default values for the economical parameters which can be modified by the national expert if better data are available.

For this activity as for all NMVOC sectors, country specific economical parameters are used to calculate variable operating costs. They are presented in table 4.1 as the default costs proposed by EGTEI (these costs are entered only once in ECODAT).

Table 4.1: Country specific costs

Parameters	Default costs provided by EGTEI	Country specific costs
Electricity [€/kWh] (net of taxes)	0.0686	To be provided by national experts
Natural gas [€/GJ] (net of taxes)	5.926	To be provided by national experts
Wages [€/h]	25.9	To be provided by national experts

For wood coating, some additional country and sector specific parameters are necessary to calculate variable operating costs. They correspond to the costs of different types of paints and cleaning solvents. Default costs proposed by EGTEI are presented in table 4.2. They are based on the market in UK [4].

Table 4.2: Country and sector specific economic parameters (net of taxes)

Parameters	Default costs provided by EGTEI [€/kg]	Country and sector specific costs [€/kg]
Low solid systems	2.9	To be provided by national experts
Medium solid systems	3.9	To be provided by national experts
High solid systems	8.5	To be provided by national experts
Very high solid systems	6.8	To be provided by national experts
Cleaning solvents	1.5	To be provided by national experts

The best source of information for the determination of country and sector specific economic parameters is the national wood coating or paint manufacturer association and it is recommended to national experts to contact it.

Default data have been used to calculate variable and annual unit costs presented in table 5.1.

Information concerning activity levels from 2000 to 2020 as well as the description of the control strategy is also necessary (these data can be directly entered in the database ECODAT). A full definition of the work to be done by national experts is provided in the general EGTEI methodology [7].

National experts can also modify the default unabated emission factor proposed by EGTEI to represent the reference situation of the wood coating for all Parties, in a range of ± 10%. If the modification is higher than 0%, then appropriate explanations are required.

Table 4.3: Unabated emission factor [g of NMVOC / m² wood coated]

Default emission factor	Country specific emission factor
345.6	To be provided by national expert

5. Default emission factors and cost data defined with the EGTEI methodology

Table 5.1 gives an overview of all data provided by EGTEI for the wood coating sector: default emission factors (EF) with abatement efficiencies, investments, and variable and fixed operating costs (OC) as well as unit costs per t NMVOC abated and unit costs per unit of activity.

Variable costs account for paint and electricity consumptions for the primary measures and electricity, natural gas and labour if a thermal oxidiser is used. Fixed operating costs are only considered for secondary measures and correspond to 5% of the thermal oxidiser investment (for maintenance and insurance). As no economic data are available, it is assumed that fixed operating costs are the same for all primary measures so no additional costs are taken into account (that is why fixed operating costs appear as 0 costs in table 5.1).

Investments and variable operating costs of secondary measures presented in table 5.1 are calculated from the equations defined in the document “derivation of secondary measure costs: thermal oxidation” downloadable on EGTEI website [8]. Energy can be recovered from exhaust gases in some cases but this assumption is not considered in the variable cost calculation. Technical characteristics of the installations are given in table 3.1.1.

Table 5.1: Default emission factors (EF), abatement efficiencies and costs for each combination

RIC PMC SMC	NMVOC EF [g NMVOC / m² coated]	Abatement efficiency [%]	Investment [k€]	Variable Operating Costs [k€ / year]	Fixed Operating Costs [k€/y]	Unit cost [k€/t NMVOC abated]	Unit cost [k€/Mm² coated]
01 00 00	345.6	0.0	0.0	17.0	0.0	-	0.0
01 00 01	83.0	76.0	333.0	24.0	16.7	16.4	4,316.8
01 01 00	163.2	52.8	0.0	8.0	0.0	-3.3	-596.6
01 01 01	39.0	88.7	219.0	12.9	11.0	7.4	2,258.6
01 02 00	105.6	69.4	12.8	9.8	0.0	-1.7	-417.0
01 02 01	25.0	92.8	187.8	14.0	8.8	5.9	1,887.7
01 03 00	46.2	86.6	12.8	4.3	0.0	-2.6	-782.9
02 00 00	345.6	0.0	0.0	73.5	0.0	-	0.0
02 00 01	83.0	76.0	747.0	94.1	37.4	8.8	2,308.5
02 01 00	163.2	52.8	0.0	34.7	0.0	-3.3	-596.6
02 01 01	39.0	88.7	494.0	46.0	24.7	2.9	894.2
02 02 00	105.6	69.4	30.9	42.3	0.0	-1.9	-445.0
02 02 01	25.0	92.8	421.4	50.7	19.5	2.3	725.4
02 03 00	46.2	86.6	30.9	18.5	0.0	-2.6	-787.2
02 04 00	21.6	93.8	38.7	50.1	0.0	-0.9	-286.6
02 05 00	9.6	97.2	38.7	22.3	0.0	-2.1	-714.6
02 06 00	4.8	98.6	61.9	35.4	0.0	-1.4	-467.8
02 07 00	2.4	99.3	77.4	17.7	0.0	-2.1	-711.1
03 00 00	345.6	0.0	0.0	339.1	0.0	-	0.0
03 00 01	83.0	76.0	1,737.0	423.6	86.9	4.9	1,285.1
03 01 00	163.2	52.8	0.0	160.1	0.0	-3.3	-596.6
03 01 01	39.0	88.7	1,150.0	201.6	57.5	0.7	206.0
03 02 00	105.6	69.4	77.5	195.1	0.0	-1.9	-461.0
03 02 01	25.0	92.8	977.5	223.0	45.0	0.5	151.7
03 03 00	46.2	86.6	77.5	85.4	0.0	-2.7	-814.0
03 04 00	21.6	93.8	96.8	231.1	0.0	-1.0	-320.2
03 05 00	9.6	97.2	96.8	102.7	0.0	-2.2	-748.2
03 06 00	4.8	98.6	154.9	163.6	0.0	-1.5	-521.5
03 07 00	2.4	99.3	193.6	81.8	0.0	-2.3	-778.2
04 00 00	345.6	0.0	0.0	1,582.6	0.0	-	0.0
04 00 01	83.0	76.0	2,645.0	1,969.3	132.3	2.3	603.6
04 01 00	163.2	52.8	0.0	747.3	0.0	-3.3	-596.6
04 01 01	39.0	88.7	1,750.0	933.4	87.5	-0.8	-247.1
04 02 00	105.6	69.4	195.2	910.6	0.0	-2.0	-469.7
04 02 01	25.0	92.8	1,571.2	1,033.2	68.8	-0.7	-211.8
04 03 00	46.2	86.6	195.2	398.4	0.0	-2.8	-828.7
04 04 00	21.6	93.8	244.0	1,078.6	0.0	-1.0	-338.5
04 05 00	9.6	97.2	244.0	479.4	0.0	-2.3	-766.5
04 06 00	4.8	98.6	390.4	763.3	0.0	-1.6	-550.8
04 07 00	2.4	99.3	488.0	381.6	0.0	-2.4	-814.8

Investments correspond to the additional cost for new coating lines and the cost of the thermal oxidiser when appropriate.

Unit costs [k€/ t of NMVOC abated] are obtained by dividing the annual total additional cost of a measure by the amount of NMVOC abated (costs and emissions are compared to the uncontrolled measure PMC 00/SMC 00).

The use of substitution products is the cheapest way of complying with the SED requirements. Variable operating costs depend on the cost of the coatings and on the amount of coatings used which depends on the dry matter content and on the application efficiency.

Primary measure unit costs are not very different from one reference installation to another one. Consequently, if the structure of this activity in a given country cannot be precisely defined, only the medium RI with average thermal oxidation unit costs can be considered (*thermal oxidation will not be used in small and very small RI*).

This simplification is presented in the table bellow:

Table 5.2: Simplified approach

RIC PMC SMC	Application rate in 2000 [%]	Application rate in 2005 [%]	Appl. [%]	Application rate in 2010 [%]	Appl. [%]	Application rate in 2015 [%]	Appl. [%]	Application rate in 2020 [%]	Appl. [%]
03 00 00									
03 00 01									
03 01 00									
03 01 01									
03 02 00									
03 02 01									
03 03 00									
03 04 00									
03 05 00									
03 06 00									
03 07 00									
Total RIC 03	**100**	**100**	**-**	**100**	**-**	**100**	**-**	**100**	**-**

Appl.: applicability factor

6. Relevance of EGTEI information for Integrated Assessment Modelling (IAM)

In the previous RAINS version [3], wood coating was not studied as a separate sector. It was considered as part of “Industrial Use of Paints in Other Industrial Use of Paints” (sector gathering both ship building industry, manufacture of plastic and metal articles, wood products industry and other applications of paints). Thus, emission factors, abatement techniques and costs considered in [3] were not specific to this sector and it was very difficult to define a reduction scenario. That is why this sector was identified as a priority sector at the beginning of the EGTEI work.

EGTEI provides now an approach to consider this sector and test the impact of the current legislation as well as the maximum achievable reduction. The approach has been developed in cooperation with industry.

Data provided by EGTEI (emission factors and costs) have been implemented in the new RAINS version [6] for the modelling work carried out in the scope of the CAFÉ programme and the revision of the Gothenburg protocol.

For this activity, data provided by national experts through ECODAT can then be directly used by CIAM for introduction in RAINS.

7. Perspective for the future

In the future, any new technology which could be developed should be considered by EGTEI in the background document to continuously improve the representation of the sector.

8. Bibliography

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[7] Methodology http://citepa.org/forums/egtei/wood_coating_300603.pdf
[8] http://citepa.org/forums/egtei/egtei_index.htm
[9] CITEPA: National reference centre for emission inventories

ANNEXE: Example of data collection and use of EGTEI data – Case of France

A. Country specific data collection and scenario CLE developed

The French national expert has been able to complete ECODAT for the wood coating with the help of CITEPA [9] and the consultation of the French Wood and Furniture Technical Centre (CTBA).

All collected data have been provided to IIASA for the bilateral consultation France – IIASA in March 2004.

Country and sector specific economic parameters

Country specific parameter costs have been defined from costs encountered in the medium size industry which are monthly published by official French statistic organisations.

Table A.1: French specific costs

Parameters	French specific costs
Electricity [€/kWh] (net of taxes)	0.05
Natural gas [€/GJ] (net of taxes)	5.33
Wages [€/h]	23.4

As no better product costs are available, default costs for country and sector specific parameters are taken into account for describing the French situation.

Table A.2: French and sector specific costs (net of taxes)

Parameters	Default costs provided by EGTEI [€/kg]	Country and sector specific costs [€/kg]
Low solid systems	2.9	2.9
Medium solid systems	3.9	3.9
High solid systems	8.5	8.5
Very high solid systems	6.8	6.8
Cleaning solvents	1.5	1.5

Activity level

The activity in 2000 is derived from the report [5]: activity level in surface of wood coated is difficult to define. For the French case, this figure has been double-checked with the coating consumption which is given in the European statistics [4]. In France, the wood coating consumption is 2.5% of the total paint market representing about 20,000 tonnes of coatings. The paint consumption calculated with EGTEI consumption factors provided in the background document [2] is the same as the one in the statistics which means that the activity defined is in the good range. **Thus, the surface coated can be back-calculated from the amount of paints used**.

The wood coating activity forecast from 2000 to 2020 comes from data developed by the French expert: it is based on the wood industry's added value trend from 1995 to 2001.

Respective shares (Mm² wood/y) of total activity level carried out on each reference installation in 2000, 2005, 2010, 2015, 2020 are derived from the report [5]. These shares are presented in table A.3.

Table A.3: Activity levels on Reference Installations (Mm² wood / year)

RIC	2000	2005	2010	2015	2020
01	18.8	21.5	24.7	28.3	32.4
02	18.8	21.5	24.7	28.3	32.4
03	25.6	29.3	33.6	38.5	44.1
04	87.3	100.0	114.6	131.3	150.4
Total (Mm²)	150.4	172.4	197.5	226.3	259.3

Current legislation control scenario (CLE)

In the current legislation control scenario (CLE), the application rates of the different abatement techniques depend on the regulation implemented and on the dates of compliance.

According to the French wood industry, secondary measures will not be used by installations to be in compliance with the SED requirements. The respect with the Directive is expected to happen between 2005 and 2010 in this sector as a lot of small installations are concerned. The rates of use of the different reduction techniques for the year 2000 are based on information provided by CEPE.

For the following years, as very small installations (RIC 01) are under the SED threshold, the situation is assumed to evolve very slowly. For small installations (RIC02), PMC01 is sufficient to fall under the Directive threshold. In larger installations (RIC 03 and 04), the use of high solid and very high solid paints will be considered to be in compliance with the SED requirements.

The application rates and applicability factors for the CLE scenario are presented in table A.4.

Table A.4: Definition of the CLE scenario

RIC PMC SMC	Application rate in 2000 [%]	Application rate in 2005 [%]	Appl. [%]	Application rate in 2010 [%]	Appl. [%]	Application rate in 2015 [%]	Appl. [%]	Application rate in 2020 [%]	Appl. [%]
01 00 00	42	40	100	35	100	35	100	35	100
01 00 01	0	0	100	0	100	0	100	0	100
01 01 00	58	60	100	65	100	65	100	65	100
01 01 01	0	0	100	0	100	0	100	0	100
01 02 00	0	0	100	0	100	0	100	0	100
01 02 01	0	0	100	0	100	0	100	0	100
01 03 00	0	0	100	0	100	0	100	0	100
Total RIC 01	**100**	**100**		**100**		**100**		**100**	
02 00 00	10	10	100	0	100	0	100	0	100
02 00 01	0	0	100	0	100	0	100	0	100
02 01 00	85	85	100	95	100	95	100	95	100
02 01 01	0	0	100	0	100	0	100	0	100
02 02 00	0	0	100	0	100	0	100	0	100
02 02 01	0	0	100	0	100	0	100	0	100
02 03 00	0	0	100	0	100	0	100	0	100
02 04 00	0	0	95	0	95	0	95	0	95
02 05 00	0	0	95	0	95	0	95	0	95
02 06 00	3	3	80	3	80	3	80	3	80
02 07 00	2	2	80	2	80	2	80	2	80
Total RIC 02	**100**	**100**		**100**		**100**		**100**	
03 00 00	10	10	100	0	100	0	100	0	100
03 00 01	0	0	100	0	100	0	100	0	100
03 01 00	85	85	100	0	100	0	100	0	100
03 01 01	0	0	100	0	100	0	100	0	100
03 02 00	0	0	100	0	100	0	100	0	100
03 02 01	0	0	100	0	100	0	100	0	100
03 03 00	0	0	100	0	100	0	100	0	100
03 04 00	0	0	95	10	95	10	95	10	95
03 05 00	0	0	95	85	95	85	95	85	95
03 06 00	3	3	80	3	80	3	80	3	80
03 07 00	2	2	80	2	80	2	80	2	80
Total RIC 03	**100**	**100**		**100**		**100**		**100**	
04 00 00	10	10	100	0	100	0	100	0	100
04 00 01	0	0	100	0	100	0	100	0	100
04 01 00	10	10	100	0	100	0	100	0	100
04 01 01	0	0	100	0	100	0	100	0	100
04 02 00	0	0	100	0	100	0	100	0	100
04 02 01	0	0	100	0	100	0	100	0	100
04 03 00	0	0	100	0	100	0	100	0	100
04 04 00	0	0	95	10	95	10	95	10	95
04 05 00	0	0	95	10	95	10	95	10	95
04 06 00	5	5	80	5	80	5	80	5	80
04 07 00	75	75	80	75	80	75	80	75	80
Total RIC 04	**100**	**100**		**100**		**100**		**100**	

B. Trends in emissions and total costs of the CLE scenario

Data shown in the table below are directly provided by ECODAT and based on input parameters defined in chapter A.

Table B.1 presents NMVOC emissions from 2000 to 2020 and total annual costs of emissions reduction for the CLE scenario.

Table B.1: Trends in emissions and total annual costs of emission reductions in the CLE scenario

	2000	2005	2010	2015	2020
NMVOC emissions	**t NMVOC**	**t NMVOC**	**t NMVOC**	**t NMVOC**	**t NMVOC**
CLE scenario	16,826	19,201	10,382	11,896	13,631
Annual total costs	**k€/year**	**k€/year**	**k€/year**	**k€/year**	**k€/year**
CLE scenario	-91,000	-105,000	-134,000	-153,000	-175,000

Emissions shown in table B.1 for the year 2000 according to the CLE scenario have been calculated with EGTEI emission factors. In the French inventory, VOC emissions from the coating of wood are considered together with the general industry. VOC emissions from this sector in 2000 were 89,195 tonnes. Wood coating represents 15% of the paint consumed in the general industry and 19% of the emissions which is consistent.

EGTEI approach allows estimating sectors which were not considered separately before because of a lack of information.