

# Croatia

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## 1. SOURCES OF INFORMATION

Croatia's Second, Third and Fourth National Communication submitted to the UNFCCC, dated November 2006.

### **Base-year emissions**

For Croatia base year emissions of greenhouse gases are calculated using 1990 emissions for all greenhouse gases including fluorinated gases (SF<sub>6</sub>, HFCs and PFCs) plus 3.5 Mio t<sup>1</sup>.

As of 31 May 2007, Croatia had not submitted an Initial Report under the Kyoto Protocol to the UNFCCC, thus the Second, Third and Fourth National Communication represents the most recently published calculation of the base year.

Croatia submitted a request to the Conference of Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) for the recognition of specific circumstances under Article 4.6 of the UNFCCC, to increase the base year emission levels. The resulting Decision 7/CP.12 of 17 November 2006 allows Croatia to add 3.5 Mt CO<sub>2</sub> equivalent to its 1990 (base year) level of greenhouse gas emissions. However the Second, Third and Fourth National Communication report does not include this additional 3.5 MtCO<sub>2</sub>-eq. in the base year values.

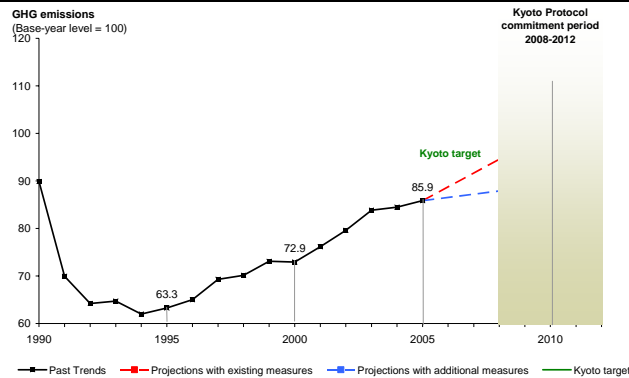
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<sup>1</sup> According to Decision 7/CP.12 (FCCC/CP/2006/5/Add1, page 15)

## 2. SUMMARY

### CROATIA

Emissions base year (incl. 3.5 Mt CO <sub>2</sub> eq.)	34.6 Mt
Emissions 2005	29.7 Mt
Emissions base year (for projections) (incl. 3.5 Mt CO <sub>2</sub> eq.)	35.2 Mt
Projections 2010 with existing measures	35.3 Mt
Projections 2010 with additional measures	31.4 Mt
Kyoto target (absolute)	32.9 Mt
Kyoto target (% from base year)	- 5.0 %
Change base year to 2005	- 14.1 %
Change 2004-05	+ 1.6 %
Change base year to 2010 with existing measures	+ 0.4 %
Change base year to 2010 with additional measures	- 10.8 %
Distance to linear target path 2005	-10.4 index points
Use of Kyoto mechanisms	n.a.
Sinks (Articles 3.3. and 3.4)	n.a.
Emissions in 1990 (Article 3.7)	n.a.

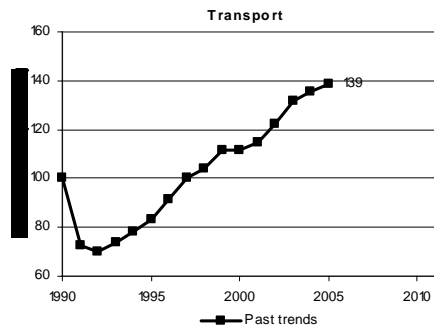
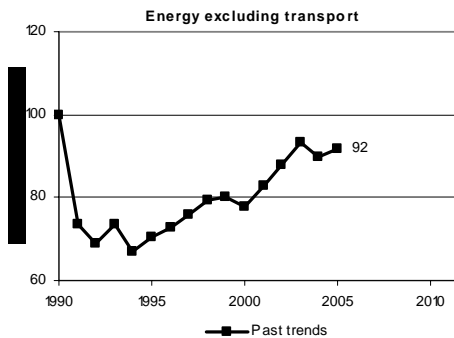
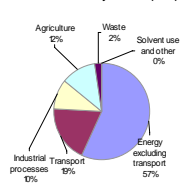


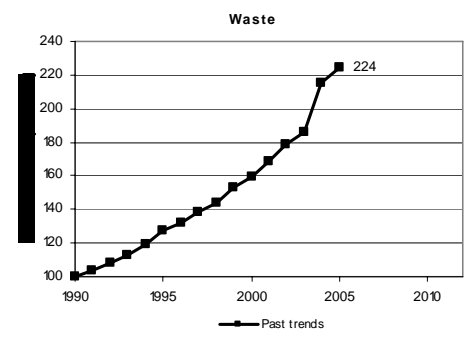
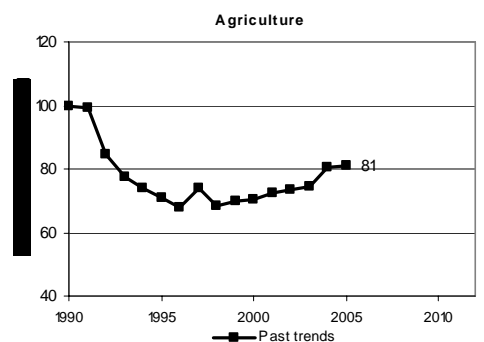
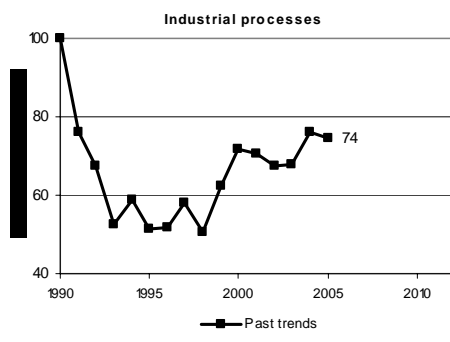
**Past emissions:** In 2005 Croatia's GHG emissions were 1.6 % above those of 2004 and 14.1 % below base-year levels. Main factors for increasing emissions with regard to the previous year were mainly growing fossil fuel combustion in the energy sector, process related emissions from chemical industry decreased. Looking at the change 1990-2005, it can be seen that emissions decreased in the beginning and started increasing after 1995. Sectoral emissions are still below 1990 levels, except for transport and waste.

Base year emissions include 3.5 Mt according to the decision (FCCC/CP/2006/5/Add1, page15) of the Conference of the Parties under the UNFCCC.

**Emission projections:** In 2005 Croatia is 9.1 percentage points below its target. Both scenarios project increasing emissions. The 'with existing measures' scenario projects that 2010 emissions will be at about base year level, whereas the 'with additional measures' scenario projects that the Kyoto target will be reached.

Emissions by sectors (2005)





### 3. COMPLETENESS OF REPORTING

The 2nd, 3rd, 4th National Communication provides projections for the following sectors: energy (including transport), industrial processes, agriculture, forestry and waste management.

The projection scenarios for the non-energy sectors are labelled as “no measures/with measures” in the report. In this Country Profile we have reassigned these scenarios so that “with measures” is separate to “no measures”, with nomenclature as follows:

Country Profile	2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> NC
“without measures”	“no measures” in energy sector; “no measures/ with measures” in other sectors
“with measures”	“with measures” in energy sector; “with additional measures” in other sectors
“with additional measures”	“with additional measures” in the energy sector.

This effectively means that there are “without measures” and “with measures” scenarios for all sectors, and a “with additional measures” scenario for the energy sector only.

**Table 1. Information provided on policies and measures**

Information provided	Level of information provided	Comments
Policy names	++	Mostly specified
Objectives of policies	++	Some description
Which greenhouse gases?	++	Only specified for PAMs in the energy sector
Status of Implementation	+	Not clear
Implementation body specified	+++	Specified
Quantitative assessment of implementation	+	Only for the energy sector in 2010 and 2020.
Interaction with other policies and measures discussed	0	Not discussed.

**Table 2. Information provided on projections**

Category of Information	Level of information provided	Comments
Scenarios considered	+++	“Without measures”, “with measures”, and “with additional measures” (energy sector only).
Expressed relative to base year	+++	Relative to 1990 base year
Starting year for projections	?	Not clear
Split of projections	++	Sector splits are provided for energy (including transport), industrial processes, agriculture, forestry and waste management. However only a

		<p>graph (Fig 5-2) is provided for the energy sector; the projection values (numbers) are not reported.</p> <p>No split of projections by gas.</p> <p>Full time series given: 1990, 1995, 2000, 2005, 2010, 2015, 2020.</p>
Presentation of results	++	<p>Graphs only are provided for the total projections (Fig 5-1) and energy sector (Fig 5-2); the required values cannot be deduced.</p> <p>No split/summary tables by gas.</p>
Description of model (level of detail, approach and assumptions)	0	Not provided
Sensitivity analysis (key inputs to model / high, central and low projections scenarios / robustness of model)	0	Not provided
Discussion of uncertainty	0	Not provided
Details of parameters and assumptions	+	Only two parameters/assumptions are discussed in the report.

#### 4. ASSESSMENT OF POLICIES AND MEASURES

**Table 3. Summary of the effect of policies and measures included in the 2010 projections (Mt CO<sub>2</sub>-eq.)**

	<b>With measures</b>	<b>With additional measures</b>
Energy (total, including transport)	0.873 <sup>a</sup>	2.047 <sup>b</sup>
Industrial processes	0.819 <sup>c</sup>	NE
Waste	0.347 <sup>c</sup>	NE
Agriculture	0.722 <sup>c</sup>	NE
Cross-sectoral	NE	NE
<b>Total (excluding LULUCF)</b>	<b>2.761</b>	<b>2.047</b>

<sup>a</sup> Total value given in 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> NC Table 5-1, reproduced below in Table 4.

<sup>b</sup> Total value given in 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> NC Table 5-3, reproduced below in Table 4.

<sup>c</sup> Calculated by “without measures” minus “with measures” projections, as shown in Table 6.

**Table 4. Detailed information on policies and measures****Policies and measures in the “with measures” projection**

Croatia’s 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> National Communication provides the following table quantifying the effect of policies and measures in the “with measures” scenario, for the energy sector only:

Emission reduction measures	2010				2020			
	CO <sub>2</sub> (kt)	CH <sub>4</sub> (t)	N <sub>2</sub> O (t)	CO <sub>2</sub> eq (kt)	CO <sub>2</sub> (kt)	CH <sub>4</sub> (t)	N <sub>2</sub> O (t)	CO <sub>2</sub> eq (kt)
Wind power plants	108.9	2.1	1.3	109.4	285.1	3.6	3.4	286.3
Small hydropower plants	64.2	1.2	0.8	64.4	125.1	1.6	1,5	125.6
Use of biomass in cogeneration	44.1	1.1	0.2	44.2	204.9	5.1	0.8	205.2
Fuel cells	14.0	0.3	0.2	14.0	48.8	0.6	0.6	49.0
Biodiesel and hydrogen	53.8	4.4	0.4	54.1	261.7	27.7	2.2	263.0
Solar energy	311.6	15.4	3.4	313.0	624.8	32.7	6.0	627.3
Geothermal energy	239.1	11.0	2.6	240.1	539.2	25.8	5.3	541.4
More efficient heat generation	33.7	2.7	0.5	33.9	78.6	6.5	1.2	79.1
<b>TOTAL</b>	<b>869.4</b>	<b>38.2</b>	<b>9.4</b>	<b>873.1</b>	<b>2168.2</b>	<b>103.6</b>	<b>21.0</b>	<b>2176.9</b>

Source: 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> NC, Table 5-1, p. 74.

**Policies and measures in the “with additional measures” projection**

Croatia’s 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> National Communication provides the following table quantifying the effect of policies and measures in the “with additional measures” scenario, for the energy sector only:



Emission reduction measures	2010				2020			
	CO <sub>2</sub> (kt)	CH <sub>4</sub> (t)	N <sub>2</sub> O (t)	CO <sub>2</sub> eq (kt)	CO <sub>2</sub> (kt)	CH <sub>4</sub> (t)	N <sub>2</sub> O (t)	CO <sub>2</sub> eq (kt)
<b>ELECTRIC POWER SUPPLY</b>	<b>727.3</b>	<b>13.9</b>	<b>8.5</b>	<b>730.2</b>	<b>1225.4</b>	<b>15.3</b>	<b>14.5</b>	<b>1230.2</b>
Savings in electricity transmission and distribution	39.6	0.8	0.5	39.8	99.2	1.2	1.2	99.6
Wind power plants	451.1	8.6	5.3	452.9	762.1	9.5	9.0	765.1
Small hydropower plants	62.7	1.2	0.7	62.9	105.9	1.3	1.3	106.3
Use of biomass in cogeneration (electricity generation)	174.0	3.3	2.0	174.7	258.2	3.2	3.1	259.2
<b>INDUSTRY</b>	<b>258.8</b>	<b>12.6</b>	<b>3.4</b>	<b>260.1</b>	<b>795.6</b>	<b>19.0</b>	<b>12.2</b>	<b>799.8</b>
Motor drive regulation	12.2	0.2	0.2	12.3	470.7	5.9	7.4	473.1
Contribution of cogeneration plants	52.8	0.9	0.9	53.1	150.1	2.7	2.7	151.0
More efficient generation of low-temperature heat	115.2	5.4	1.1	115.7	102.1	4.8	1.0	102.5
More efficient generation of high-temperature heat	78.5	6.0	1.2	79.0	72.7	5.6	1.1	73.1
<b>TRANSPORT</b>	<b>59.4</b>	<b>4.1</b>	<b>0.5</b>	<b>59.6</b>	<b>910.2</b>	<b>70.4</b>	<b>34.5</b>	<b>922.3</b>
Measures in long-distance passenger transport	0.0	0.0	0.0	0.0	93.0	21.5	16.6	98.6
Measures in public passenger transport	0.0	0.0	0.0	0.0	77.0	15.4	11.9	81.0
Measures in goods transport	0.0	0.0	0.0	0.0	458.5	14.4	3.7	460.0
Increase in biodiesel use	59.4	4.1	0.5	59.6	281.6	19.2	2.3	282.7
<b>SERVICES</b>	<b>406.8</b>	<b>21.4</b>	<b>4.4</b>	<b>408.6</b>	<b>835.5</b>	<b>44.3</b>	<b>7.9</b>	<b>838.8</b>
Savings on electricity for non-heating purposes	14.4	0.3	0.2	14.5	32.1	0.4	0.4	32.2
Increased use of solar energy	78.5	3.9	0.8	78.8	140.2	7.3	1.3	140.7
Increased use of thermal energy	16.4	0.8	0.2	16.4	27.9	1.3	0.3	28.0
Increased use of central heating systems and cogeneration	66.8	3.6	0.7	67.1	145.6	8.0	1.4	146.2
Thermal insulation improvements	230.8	12.8	2.5	231.8	489.6	27.2	4.6	491.6
<b>HOUSEHOLDS</b>	<b>586.8</b>	<b>22.4</b>	<b>4.4</b>	<b>588.6</b>	<b>1789.2</b>	<b>87.0</b>	<b>13.9</b>	<b>1795.3</b>
Increased use of solar energy	28.4	1.8	0.2	28.5	286.7	21.3	1.9	287.7
Savings on electricity for non-heating purposes	12.4	0.2	0.1	12.5	192.3	2.4	2.3	193.0
Increased use of central heating systems and cogeneration	20.7	2.2	0.1	20.8	156.8	17.2	1.1	157.5
Thermal insulation improvements	73.0	2.5	0.7	73.2	376.4	18.7	3.1	377.8
Use of biomass for generation of heating energy (cogeneration + boiler houses)	452.2	15.6	3.1	453.5	777.0	27.4	5.5	779.3
<b>TOTAL EMISSION REDUCTION POTENTIAL</b>	<b>2039.1</b>	<b>74.3</b>	<b>21.2</b>	<b>2047.2</b>	<b>5555.8</b>	<b>236.1</b>	<b>83.1</b>	<b>5586.5</b>

Source: 2<sup>nd</sup>, 3<sup>rd</sup> & 4<sup>th</sup> NC, Table 5-3, p. 75.



## 5. EVALUATION OF PROJECTIONS

**Table 5. Summary of projections by gas in 2010 (Mt CO<sub>2</sub>-eq.)**

The split of projections by gas was not provided.

**Table 6. Summary of projections (6 gas basket) by sector in 2010 (Mt CO<sub>2</sub>-eq.)**

	Base year	without measures	% change relative to base year	with measures	% change relative to base year	with additional measures	% change relative to base year
Energy (total, including transport)	22.554 <sup>a</sup>	NE <sup>b</sup>	NA	28.631 <sup>a</sup>	27%	24.711 <sup>a</sup>	10%
Industrial processes	3.892	3.119	-20%	2.300	-41%	2.300	-41%
Waste	0.933	1.553	66%	1.206	29%	1.206	29%
Agriculture	4.321	3.920 <sup>c</sup>	-9%	3.198	-26%	3.198	-26%
<b>Total (excl. LULUCF)</b>	<b>31.700</b>	<b>NE<sup>b</sup></b>	<b>NA</b>	<b>35.335 <sup>d</sup></b>	<b>11%</b>	<b>31.415 <sup>e</sup></b>	<b>-1%</b>

<sup>a</sup> Calculated from total greenhouse gas emissions minus the other sectors.

<sup>b</sup> Cannot be calculated as no energy sector values are given (only graph). Estimate for energy sector from graph is approx. 27.5 so the scenario total is approx. 36.1.

<sup>c</sup> Assumed value (reported as "3,92.3" kt CO<sub>2</sub> eq.)

<sup>d</sup> Total calculated from report text stating that emissions are projected to exceed the Kyoto commitment by 5.22 MtCO<sub>2</sub>-eq. in the "with measures" scenario.

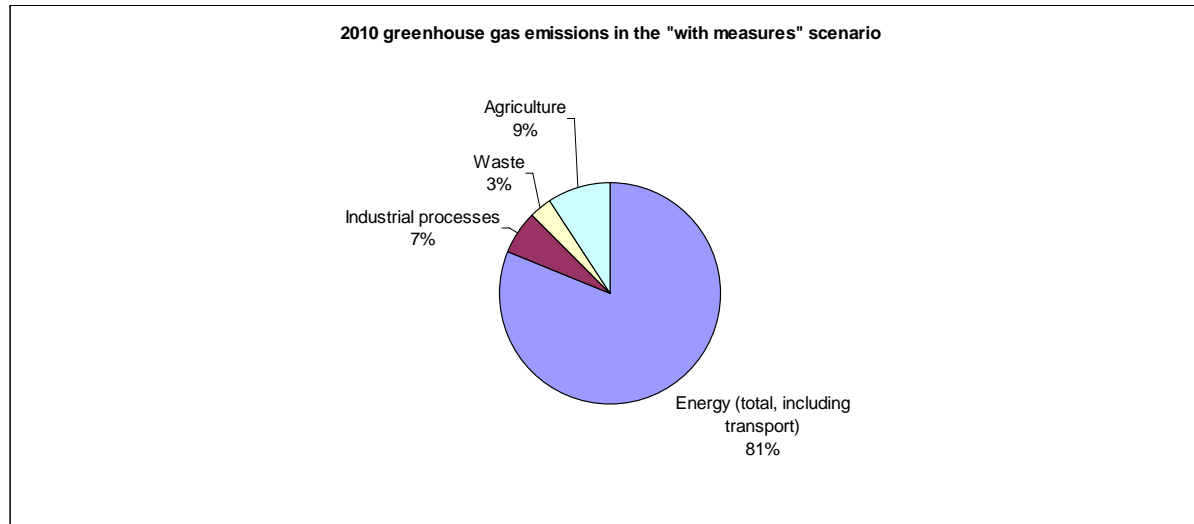
<sup>e</sup> Total calculated from report text stating that emissions are projected to exceed the Kyoto commitment by 1.3 MtCO<sub>2</sub>-eq. in the "with additional measures" scenario.



Table 7. Summary of projections by sector and by gas in 2010 (Mt CO<sub>2</sub>-eq.) compared to base-year emissions

	Carbon dioxide			Methane			Nitrous oxide			F-gases (SF <sub>6</sub> , HFCs and PFCs)		
	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures	Base-year	With measures	With additional measures
Energy (incl. transport)	20.959	24.959	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Energy (excl. transport)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Transport (energy)	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Industrial processes	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Waste	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
Agriculture	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE
<b>Total (excl. LULUCF)</b>	20.959	24.959	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE

Figure 1. Share by sector of 2010 greenhouse gas emissions according to the "with measures" projection



**Table 8. Summary of projections (6 gas basket) in 2010, 2015 and 2020 (Mt CO<sub>2</sub>-eq.)**

	Base-year*	2010	2010 % of base- year level	2015	2015 % of base- year level	2020	2020 % of base- year level
Total (excl. LULUCF)	31.700	31.415	99.1%	NE	NA	NE	NA

\* Base year is 1990 for all gases  
2015 and 2020 projections were not reported.

**Table 9. Assessment of the target (6 gas basket), with a comparison of 2010 projections in 2005, 2006 and 2007 national reports**

	Emissions in MtCO <sub>2</sub> -equiv., excluding LULUCF			
	2010 projections from 2005	2010 projections from 2006	2010 projections from 2007	2010 projections from 2007 % of base- year level
Base year emissions used for projections	31.6	31.1	31.7	100%
Kyoto Commitment/burden sharing	30.0	29.6	30.1	-5.0%
With existing P&Ms projections	NE	NE	35.3	111.5%
Gap (-ve means overachievement of target)	NE	NE	5.2	16.5%
With additional P&Ms projections	NE	NE	31.4	99.1%
Remaining gap	NE	NE	1.3	4.1%
Effect of flexible mechanisms	0.0	0.0	0.0	0.0%
Remaining gap (with use of flexible mechanisms)	NE	NE	1.3	4.1%

NE: not estimated

Above table excludes LULUCF. LULUCF will be covered in the main report, based on the questionnaire submissions.

Source for 2005 and 2006 data is the First National Communication of Croatia (2002). No 'with measures' or 'with additional measures' projections were provided in the First National Communication.

## 6. DESCRIPTION OF MODELLING APPROACH

### Overview of modelling approach

The report does not describe the model or models used for the projections, and does not indicate whether they were verified.

### Sensitivity analysis

Not described in the report.

### Details of the uncertainty assessment

Not described in the report.

## 7. PROJECTION INDICATOR REPORTING

The projection indicators in Table 10 were not provided in the report.

## 8. REPORTING OF PARAMETERS ON PROJECTIONS

Croatia's 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> NC includes the following table for the "with measures" scenario with projections out to 2020 (the CO<sub>2</sub> emissions provided are for the energy sector only):

	1990	1995	2000	2005	2010	2015	2020
Total energy requirements (PJ)	408	314	370	411	453	503	552
CO <sub>2</sub> emission according to "with measures" scenario (kt)	20,959	15,082	17,447	21,678	24,959	27,674	30,390
Electricity consumption (GWh)	14,749	11,404	13,836	16,048	19,127	22,103	24,865

There is no further discussion of modelling parameters and assumptions in the report.

**Table 10. Indicators for projections to monitor and evaluate progress with policies and measures (2005/166/EC) Annex III**

Not reported.

N°	Eurostat Sectors	Indicator	2005	2010	2015	2020	Numerator/denominator	2005	2010	2015	2020
1	Macro	CO <sub>2</sub> intensity of GDP, t/Euro million					Total CO <sub>2</sub> emissions, kt GDP, bio Euro (EC95)				
2	Transport C0	CO <sub>2</sub> emissions from passenger cars, kt Number of kilometres by passenger cars, Mkm									
3	Transport D0	CO <sub>2</sub> emissions from freight transport (all modes), kt Freight transport (all modes), Mtkm									
4	Industry A1	Energy related CO <sub>2</sub> intensity of industry, t/Euro million					CO <sub>2</sub> emissions from fuel consumption industry, kt Gross value-added total industry, Bio Euro (EC 95)				
5	Households A1	Specific CO <sub>2</sub> emissions of households, t/dwelling					CO <sub>2</sub> emissions from fossil fuel consumption households, kt Stock of permanently occupied dwellings, 1000				
6	Services A0	CO <sub>2</sub> intensity of the services sector, t/Euro million					CO <sub>2</sub> emissions from fossil fuel consumption services, kt gross value-added services, bio Euro (EC95)				
7	Transformation B0	Specific CO <sub>2</sub> emissions of public and autoproducer power plants, t/TJ					CO <sub>2</sub> emissions from public and autoproducer thermal power stations, kt all products-output by public and autoproducer thermal power stations, PJ				
8	Agriculture	Specific N <sub>2</sub> O emissions of fertilizer and manure use, kg/kg					N <sub>2</sub> O emissions from synthetic fertilizer and manure use, kt use of synthetic fertiliser and manure, kt nitrogen				



9	Agriculture	Specific CH <sub>4</sub> emissions of cattle production, kg/head					CH <sub>4</sub> emissions from cattle, kt				
							cattle populations, 1000 head				
10	Waste	Specific CH <sub>4</sub> emissions from landfills, kt/kt					CH <sub>4</sub> emissions from landfills, kt				
							Municipal solid waste going to landfills, kt				

**Table 11. List of parameters on projections (Annex IV of Implementing Provisions<sup>2</sup>)**

Not reported.

<b>1. Mandatory parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions for general economic parameters</b>				
GDP (value at given years or annual growth rate and base year)				
Population (value at given years or annual growth rate and base year)				
International coal prices at given years in euro per tonne or GJ (Gigajoule)				
International oil prices at given years in euro per barrel or GJ				
International gas prices at given years in euro per m3 or GJ				
<b>Assumptions for the energy sector</b>				
Total gross inland consumption (PJ) (split by oil, gas, coal, renewables, nuclear, other)				
Total electricity production by fuel type (oil, gas, coal, renewables, nuclear, other)				
Energy demand by sector split by fuel (delivered)				
Assumptions on weather parameters, especially heating or cooling degree days				
<b>Assumptions for the industry sector</b>				
<i>For Member States using macroeconomic models:</i>				
The share of the industrial sector in GDP and growth rate				
<i>For Member States using other models:</i>				
The production index for industrial sector				
<b>Assumptions for the transport sector</b>				
<i>For Member States using macroeconomic models:</i>				
The growth of transport relative to GDP				
<i>For Member States using other models:</i>				
The growth of passenger person kilometres				
The growth of freight tonne kilometres				
<b>Assumptions for buildings (in residential and commercial or tertiary sector)</b>				
<i>For Member States using macroeconomic models:</i>				
The level of private consumption (excluding private transport)				
The share of the tertiary sector in GDP and the growth rate				
<i>For Member States using other models:</i>				
The rate of change of floor space for tertiary buildings and dwellings				
The number of dwellings and number of employees in the tertiary sector				
<b>Assumptions in the agriculture sector</b>				
<i>For Member States using macroeconomic models:</i>				
The share of the agriculture sector in GDP and relative growth				
<i>For Member States using other models:</i>				
Livestock numbers by animal type (for enteric fermentation beef, cows, sheep, for manure management pigs and poultry)				
The area of crops by crop type				
Emissions factors by type of livestock for enteric fermentation and manure management (t)				

<sup>2</sup> Commission Decision of 10 February 2005 laying down rules implementing Decision No 280/2004/EC of the European Parliament and of the Council concerning a mechanism for monitoring Community greenhouse gas emissions and for implementing the Kyoto Protocol

<b>1. Mandatory parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions in the waste sector</b>				
Waste generation per head of population or tonnes of municipal solid waste				
The organic fractions of municipal solid waste				
Municipal solid waste disposed to landfills, incinerated or composted (in tonnes or %)				
<b>Assumptions in the forestry sector</b>				
Forest definitions				
Areas of:				
managed forests				
unmanaged forests				

<b>2. Recommended parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions for general economic parameters</b>				
GDP growth rates split by industrial sectors in relation to 2000				
Comparison projected data with official forecasts				
<b>Assumptions for the energy sector</b>				
National coal, oil and gas energy prices per sector (including taxes)				
National electricity prices per sector as above (may be model output)				
Total production of district heating by fuel type				
<b>Assumptions for the industry sector</b>				
Assumptions fluorinated gases:				
Aluminium production and emissions factors				
Magnesium production and emissions factors				
Foam production and emissions factors				
Stock of refrigerant and leakage rates				
<i>For Member States using macroeconomic models:</i>				
Share of GDP for different sectors and growth rates				
Rate of improvement of energy intensity (1990 = 100)				
<i>For Member States using other models:</i>				
Index of production for different sectors				
Rate of improvement or index of energy efficiency				
<b>Assumptions for buildings (in residential and commercial / tertiary sector)</b>				
<i>For Member States using macroeconomic models:</i>				
Share of tertiary and household sectors in GDP				
Rate of improvement of energy intensity				
<i>For Member States using other models:</i>				
Number of households				
Number of new buildings				
Rate of improvement of energy efficiency (1990 = 100)				

<b>2. Recommended parameters on projections</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
<b>Assumptions for the transport sector</b>				
<i>For Member States using econometric models:</i>				
Growth of transport relative to GDP split by passenger and freight				
Improvements in energy efficiency split by vehicle type				
Improvements in energy efficiency split by vehicle type, whole fleet/new cars				
Rate of change of modal split (passenger and freight)				
Growth of passenger road kilometres				
Growth of passenger rail kilometres				
Growth of passenger aviation kilometres				
Growth of freight tonne kilometres on road				
Growth of freight tonne kilometres by rail				
Growth of freight tonne kilometres by navigation				
<b>Assumptions for the agriculture sector</b>				
<i>For Member States using econometric models:</i>				
Agricultural trade (import/export)				
Domestic consumption (e.g. milk/beef consumption)				
<i>For Member States using other models:</i>				
Development of area of crops, grassland, arable, set-aside, conversion to forests etc				
Macroeconomic assumptions behind projections of agricultural activity				
Description of livestock (e.g. by nutrient balance, output/animal production, milk production)				
Development of farming types (e.g. intensive conventional, organic farming)				
Distribution of housing/grazing systems and housing/grazing period				
Parameters of fertiliser regime:				
Details of fertiliser use (type of fertiliser, timing of application, inorganic/organic ratio)				
Volatilisation rate of ammonia, following spreading of manure on the soil				
Efficiency of manure use				
Parameters of manure management system:				
Distribution of storage facilities (e.g. with or without cover):				
Nitrogen excretion rate of manures				
Methods of application of manure				
Extent of introduction of control measures (storage systems, manure application), use of best available techniques				
Parameters related to nitrous oxide emissions from agricultural soils				
Amount of manure treatment				

## 9. COUNTRY CONCLUSIONS

According to the projections in the Second, Third and Fourth National Communication, Croatia is projected to exceed its Kyoto Protocol target of a 5% reduction in base year emissions by 2010. Greenhouse gas emissions are projected to exceed the Kyoto commitment by 5.22 MtCO<sub>2</sub>-eq. in the “with measures” scenario and by 1.3 MtCO<sub>2</sub>-eq. in the “with additional measures” scenario.

In terms of report completeness and clarity, Croatia’s reporting could benefit from summary tables showing projections for each scenario, including a split by sector and gas. The 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> National Communication provides graphs for total projections (Fig 5-1) and the energy sector (Fig 5-2), but the actual values were not reported. As a result, some values for the energy sector are missing from this Country Profile. Also, the total values for each scenario as reproduced in Table 9 could only be deduced from the report text about the amount of Kyoto commitment exceedences for the “with measures” (5.22 MtCO<sub>2</sub>-eq.) and “with additional measures” (1.3 MtCO<sub>2</sub>-eq.) scenarios.