

## Air

## CSI 001 Emissions of acidifying substances

**Indicator definition:**

Emissions of acidifying pollutants tracks trends in anthropogenic emissions of acidifying substances such as nitrogen oxides, ammonia, and sulphur dioxide, each weighted by their acidifying potential. Projections of emissions of acidifying pollutants present results of the RAINS and EMEP models for nitrogen oxides, sulphur dioxide and ammonia.

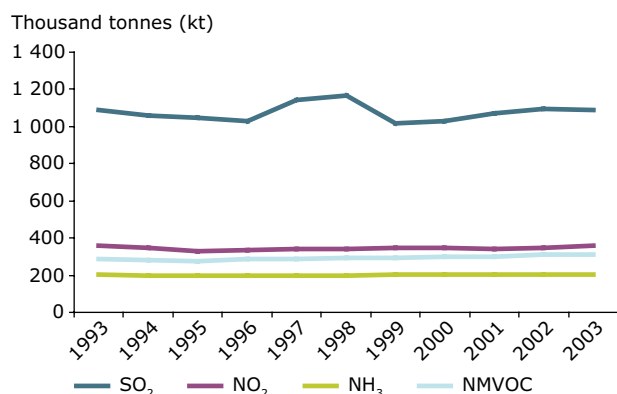
**Key policy question:**

What progress is being made and what are the prospects in reducing the emission of acidifying pollutants in the Western Balkans?

## Past and present trends

**Key message:**

Comparing emissions of acidifying pollutants from 1993 to 2003 \*, most ended the time period at levels to those at the start, with minor variations in between. SO<sub>2</sub> and NO<sub>2</sub> show similar levels in 1993 and 2003, and while NH<sub>3</sub> emissions register a reduction of 2 % over the 10-year timeframe, and NMVOC emissions show an increase of 8.4 %.

**Emissions of acidifying substances in the Western Balkans, 1993–2003****Assessment:**

SO<sub>2</sub> emissions remained stable in the Western Balkan region as a whole from 1993 to 2003, but significantly different trends were registered in the countries. While Croatia managed to reduce emissions by 41 % (from 114 kt to 67 kt) emissions in the former Yugoslav Republic of Macedonia increased by 42 % (from 105 kt to 150 kt), though the country registered their first decrease in SO<sub>2</sub> emissions in 2003, breaking that trend. Bosnia and Herzegovina and Serbia and Montenegro together accounted for ca 75 % of total SO<sub>2</sub> emissions with roughly equally equal shares in 2003.

Similar to SO<sub>2</sub>, NO<sub>2</sub> emissions remained at a stable level from 1993 to 2003, also with different trends within individual countries. Albania, Croatia and the former Yugoslav Republic of Macedonia registered increased emissions (by 21 %, 17 % and 47 % respectively), while Bosnia and Herzegovina and Serbia and Montenegro saw reductions in their emissions of 14 % and 11 %.

NH<sub>3</sub> showed an overall reduction of 2 % in Western Balkan between 1993 and 2003. Albania is the only country which registered an increase in NH<sub>3</sub> emissions (+ 10 %) while the other Western Balkan states were able to reduce or at least stabilise their NH<sub>3</sub> emissions. In 2003 Serbia was responsible for 39% of NH<sub>3</sub> emissions in the region, followed by Croatia with 25 %.

Emissions of NMVOC increased in all Western Balkan states other than Bosnia and Herzegovina (– 4.5 %) amounting to a total 8.4 % increase between 1993 and 2003. The most significant increases were registered in Croatia with 27.5 % (from 69 kt to 88 kt) and in Albania with 17.2 % (from 29 kt to 32 kt). Serbia has been able to hold emissions stable, but was nevertheless responsible for 41 % of total Western Balkan NMVOC emissions in 2003.

**Source:** Inventory Review 2005, Emission Data reported to LRTAP Convention and NEC Directive ISSN 0804-2446.

**Temporal coverage:** 1993–2003.

**Spatial coverage:** Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Serbia and Montenegro.

\* It should be noted that for some of the Western Balkan countries (Croatia, the former Yugoslav Republic of Macedonia, Serbia) updated national data sets until 2007 are available at Eionet as part of the reporting obligations for the LRTAP Convention. However, construction of an update for the regional indicator was not possible due to lack of updated data for some of the pollutants and lack of updates for the other countries in the region.

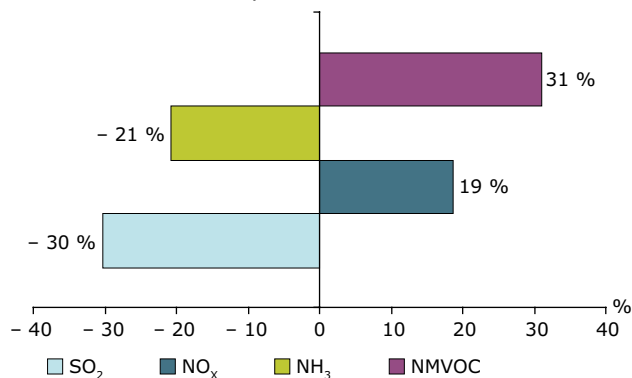


## Outlook trends

### Key message:

Outlook trends under the baseline scenario in Western Balkans indicate that while SO<sub>2</sub> emissions are projected to decline by 30 % between 2000 and 2020 and NH<sub>3</sub> emissions could fall by 21 %; NO<sub>2</sub> and NMVOC emissions are forecast to grow by 19 % and 31 % respectively\*.

### Projected change in emissions of acidifying substances in the Western Balkans, 2000–2020



### Assessment:

Bosnia and Herzegovina, despite a projected reduction of 9% between 2000 and 2020, will likely stay the biggest emitter of SO<sub>2</sub>, accounting for 53 % (380 kt) of all SO<sub>2</sub> emissions in the region in 2020. Serbia and Montenegro projects the biggest reduction in emissions with 57 % down to 167 kt. Croatia is projected to increase SO<sub>2</sub> emissions between 2000 and 2020 (by 12 %), at the same time the emission ceiling target set for 2010 under the Gothenburg Protocol (70 kt) is not expected to be exceeded\*\*.

All Western Balkan countries are projected to increase their NO<sub>2</sub> emissions between 2000 and 2020. Increases vary from state to state with so little as a 5 % in Bosnia and Herzegovina and as much as 35 % in Croatia and 43 % in the former Yugoslav Republic of Macedonia.

As opposed to NO<sub>2</sub>, between 2000 and 2020 NH<sub>3</sub> emissions are projected to decline in all countries with reductions ranging from 6 % in the former Yugoslav Republic of Macedonia to 37 % in Croatia.

NMVOC will likely present significant growth in emissions in all Western Balkan countries from 2000 to 2020, growing with 31 % overall. Emission growth rates for the individual countries are projected to be between 21 % and 33 % with the exception of the former Yugoslav Republic of Macedonia where a growth of 124 % is forecast.

**Source:** Inventory Review 2005, Emission Data reported to LRTAP Convention and NEC Directive, ISSN 0804-2446\*\*.

**Temporal coverage:** 2000–2020.

**Spatial coverage:** Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Serbia and Montenegro.

\* New projections will be available in December 2009 from IIASA's model GAINS-Europe as part of the work dedicated to the revision of the Gothenburg Protocol.

\*\* Available national projections from Croatia are different from these projections and suggest a decrease of SO<sub>2</sub> emission in 2010 and 2020 (Eionet data flow, Status October 2009).

