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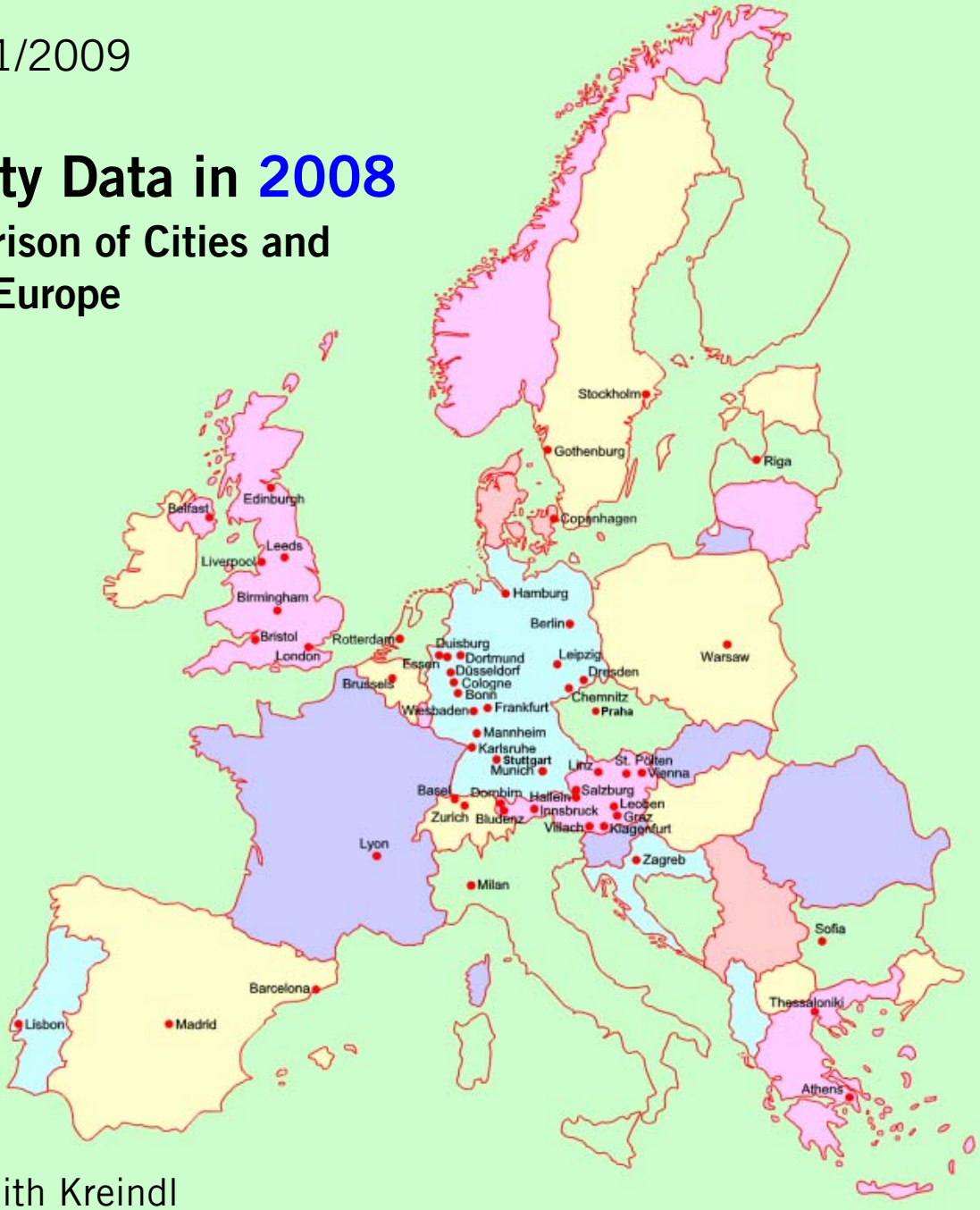
Report Nr. 1/2009

Air Quality Data in 2008

The Comparison of Cities and Regions in Europe



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Environment + Technics

LINZ verändert

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Einführung

Die Bekämpfung der Luftverschmutzung ist auch noch heute eines der zentralen Themen, mit denen Umweltämter, Umweltbehörden bzw. sonstige für den Umweltschutz tätige Organisationen beschäftigt sind. In Form von regionalen oder nationalen Luftreinhalteplänen versucht man, die Luftverschmutzung in den Griff zu bekommen und Luftqualität sukzessive zu verbessern. In den letzten Jahren ist die Belastung an Feinstaub (PM_{10}) und Stickoxiden besonders in den Mittelpunkt des Interesses gerückt, da die Grenzwerte für diese Luftschadstoffe in den meisten Ballungsräumen überschritten werden.

Um überhaupt den Erfolg von Sanierungsmaßnahmen nachweisen zu können, ist die Beobachtung der Schadstoffkonzentrationen mit Hilfe von Luftmessnetzen sinnvoll. In den meisten Messgebieten sind Luftmessnetze seit 2 bis 3 Jahrzehnten installiert, sodass bei einer Verfolgung der Luftschadstoffdaten über mehrere Jahre ein Trend zur Verbesserung (oder auch Verschlechterung) der Luftbelastung herauslesbar sein sollte. Sanierungsmaßnahmen in Betrieben und bei anderen Emittentengruppen müssten sich jedenfalls langfristig in einer verminderten Immissionsbelastung an Luftschadstoffen manifestieren.

Die Verfolgung *längerer Zeiträume* zur Bestimmung des Belastungstrends ist unbedingt notwendig, da auf Grund von unterschiedlichen meteorologischen Einflüssen die Immissionsbelastungen außerordentlich stark schwanken können. Beispielsweise wird ein Monat mit vornehmlich regnerischer Witterung und viel Wind wesentlich geringere Immissionskonzentrationen aufweisen als ein Monat, in dem häufig Inversionswetterlagen vorherrschen.

Air Quality Data in 2008 The Comparison of Cities and Regions in Europe

Introduction

The fight against air-pollution is still one of the major topics to deal with of organisations concerned with environmental affairs, such as national and local authorities. In the form of regional or national air-cleaning programmes one tries to get air pollution under control as well as to increase the air quality step by step. During the last years the pollutant stress of fine particulates (PM_{10}) and nitrogen oxides has become of more and more importance, for the European air quality standards for these pollutants are exceeded in most of the agglomerations.

To prove the success of measurements of redevelopment at all, the observation of the concentrations of noxious compounds by means of monitoring station networks is useful. In most of the referred monitored areas air quality monitoring station networks have been being installed for 2 – 3 decades. Thus following the air quality data through a longer period of years a trend for improvement (or even a change to the worse) of the air-pollutant stress should be able to be recognized. Measurements of redevelopment in companies, factories and other groups of emission sources should manifest in a reduced immission stress of air pollutants.

It is absolutely necessary to determine the trends of pollution through a *longer period of time*, because due to various meteorological influences the immission stress can alter extremely. For instance, a month with mostly rainy weather conditions and high wind speeds will have much less immission concentrations than a month, where the formation of inversion layers can be observed often.

Luftgütevergleiche werden durch das Umwelt- und Technik-Center (früher: Amt für Natur- und Umweltschutz) bereits seit vielen Jahren durchgeführt, genau genommen seit 1989. Anfänglich wurden nur österreichische Städte miteinander verglichen. In den folgenden Jahren wurde der Städtevergleich auf immer mehr europäische Städte und Regionen wegen des großen Interesses ausgedehnt. Im Jahr 2008 wurden Städte bzw. Regionen aus Deutschland, England, Frankreich, Belgien, Niederlande, Dänemark, Schweden, Italien, Schweiz, Spanien, Portugal, Polen, Bulgarien, Tschechien, Ungarn, Griechenland, Lettland und Kroatien mit einbezogen. Die Stadt Budapest lieferte die Daten der Jahre 2007 und 2006 nach. Die Stadt Luxemburg lieferte für das Jahr 2008 keine Daten.	Comparisons of the air quality have been carried out by our organization already for a number of years, exactly since 1989. At first only Austrian Cities were compared. During the last years the comparison was extended to other European cities and regions, for there is much interest in such studies. The comparison of the air quality of the year in 2008 comprised cities and regions of Austria, Germany, cities from England, France, Belgium, The Netherlands, Denmark, Sweden, Italy, Switzerland, Spain, Portugal, Poland, Bulgaria, Czech Republic, Hungary, Greece, Latvia and Croatia. The city Budapest supported us in addition the data for the year 2007 and 2006. No data were sent to us by the city Luxemburg.
Die Städte Bukarest und Debrecen liefern seit 9 Jahren keine Daten. Sollten diese noch eintreffen, werden sie in künftigen Städtevergleichen in Form von Zeitreihen mit berücksichtigt.	The cities Bucharest and Debrecen have not been delivering any data since 9 years. In the case of delivery to us they will be taken into account for future reports in terms of time series.
Im Jahr 2008 wurde der Luftgütevergleich mit dem lungengängigen Feinstaubanteil $PM_{2,5}$ ergänzt. Da diese Partikel erhebliche negative Auswirkungen auf die menschliche Gesundheit besitzen.	This year the comparison of the air quality is extended with fine particle matter $PM_{2,5}$. These respirable particles are responsible for significant negative impacts on human health.
Heuer wurde die Größe des Immissionsgebietes und die Bevölkerungszahl in den Luftgütevergleich aufgenommen, um die Messstellendichte miteinander zu vergleichen.	This year the comparison is extended with the immission area and the population in order to compare the closeness of the measurement points.

Kritische Anmerkungen

Als Kritikpunkt wird immer wieder angemerkt, dass ein Vergleich der Immissionsbelastung aus fachlichen Gründen nicht möglich ist, da

1. die Zahl der Messstellen sehr verschieden ist (die Anzahl der Messstellen pro Messgebiet ist in der Tabelle auf Seite 19 und den nachfolgenden Grafiken angeführt),
2. die Messstellendichte unterschiedlich ist,
3. die Situierung der Messstellen nicht immer vergleichbar ist (In manchen Städten hat man deswegen bei den Schadstoffkomponenten zwischen verkehrsbelasteten Messstationen und anderen Messstationen unterschieden).

Den Autoren sind sich dieser Tatsachen durchaus bewusst. Trotz der erhobenen Einwände gibt es einige Argumente für die Fortführung der Städtevergleiche:

1. Die Luftschadstoffmessungen werden im allgemeinen technisch in der gleichen oder in ähnlicher Weise durchgeführt. Das bedeutet, dass die Luftüberwachung an bestimmten *Punkten* einer Stadt oder einer Region mit Hilfe automatisch registrierender Immissionsmessstationen durchgeführt wird. Die gemessenen Konzentrationen repräsentieren die Belastung eines mehr oder weniger weiten Bereiches um die Messstation. Die *Art der Probenahme* müsste also *vergleichbar* sein.

2. Die Luftgütestationen sollten an Punkten errichtet werden, die einen größeren Bereich um die Messstation abdecken und nicht nur die Schadstoffbelastung an einem bestimmten Punkt widerspiegeln. Ausgenommen sind besondere verkehrsbelastete Probenahmepunkte. Die Messnetzbetreiber wurden eingeladen, diese Messpunkte getrennt anzugeben, um die wirkliche Situation des überwachten Gebietes wiederzugeben. Wie bereits erwähnt, unterscheiden einige Städte zwischen verkehrsbelasteten und

Critical remarks

Over and over again there are critical remarks of comparisons of the pollutant stress between monitoring areas not being possible. The following technical reasons are mentioned by some monitoring network services:

1. The number of monitoring stations differs very much (the number of monitoring stations of each monitoring network is mentioned in the table on page 19 and the subsequent graphics),
2. the density of distribution of the monitoring stations is different,
3. the location of the monitoring station is not always comparable (for that reason in some cities the network services distinguish between traffic-stressed and non-traffic-influenced monitoring stations).

The authors of the comparative study are thoroughly conscious of these facts. But despite to the raised objections there are also some arguments of continuing the activities:

1. The kind of measurement of air pollutants is carried out by the same ore similar technical methods. This means the results of air monitoring activities are obtained by sampling at special sampling *points* in a city or region by means of automatically recording monitoring stations. The registered concentrations represent the stress of a more or less wide area around the monitoring station. Due to this reason the *method of sampling* itself should be *comparable*.

2. The monitoring stations should be located at points that represent a wider portion of the monitored area, not only the pollution stress representative for a focal point. Exceptions are specially traffic stressed sampling points. The monitoring station network services were invited to separate such monitoring points in order to reproduce the real situation of the monitored area. As already mentioned, some cities distinguish between traffic-stressed and non-traffic-influenced monitoring stations.

nicht vom Verkehr beeinflussten Messstationen.	
3. Schließlich wird eine stärker objektivierende Basis der Auswertungen besonders dann erreicht, wenn man längere Zeiträume betrachtet und daraus die Trends der Entwicklung der Schadstoffimmissionen abliest. Nachdem die Stadt Linz internationale und nationale Städtevergleiche schon seit einigen Jahren durchführt, wurde in diesen Bericht für die Jahresmittelwerte auch die mehrjährige *Trendentwicklung* der Schadstoffbelastung seit 1993 für die einzelnen Immissionsgebiete mit aufgenommen. Die Daten von Städten bzw. Regionen, die erst seit kurzem im Städtevergleich integriert sind, wurden dabei auch so weit wie möglich nachgeführt.	3. And finally the evaluations are put to a more objectified basis, if one observes longer term developments and derives from these the trends of the pollutant immission. Since the city of Linz has been carrying out comparisons of the air quality for years, in this report the *trend developments* for the annual mean value since 1993 for all immission regions have been included. The data of cities or regions which only have been participating the comparison since a couple of years, have been updated as far back as possible

Immissionskenngrößen

In der vorliegenden Studie wurden verschiedene Immissionskenngrößen erhoben:

- Jahresmittelwert (Mittel aus allen Stationen einer Stadt/Region)
- Max. Monatsmittelwerte (höchstbelastete Station einer Stadt/Region)
- Max. Tagesmittelwert (höchstbelastete Station einer Stadt/Region)
- Max. 3-Stunden-Mittelwert (höchstbelastete Station einer Stadt/Region)
- Max. Einstunden-Mittelwert (höchstbelastete Station einer Stadt/Region)
- Max. Halbstunden-Mittelwert (höchstbelastete Station einer Stadt/Region)
- Max. 98-Percentil/Jahr (höchstbelastete Station einer Stadt/Region)
- Anzahl der Überschreitungen des PM_{10}-Tagesgrenzwertes an der höchstbelasteten Messstation
- Anzahl der Überschreitungen des NO_2-Grenzwertes für den 1h-Mittelwert an der höchstbelasteten Messstation

Von den einzelnen Messnetzbetreibern wurden die gewünschten Immissionsdaten in sehr unterschiedlicher Vollständigkeit zur Verfügung gestellt. Insbesondere betrifft dies die Perzentil-Auswertungen und manchmal auch die Auswertungen für max. HMW oder max. 3h-MW. Oftmals ist auch nicht das 98-Percentil verfügbar, sondern es werden andere Perzentilgrößen (z. B. 95-Percentil) gebildet. Die meisten Messnetzbetreiber berechnen die Perzentile aus den Halbstunden-Mittelwerten eines Jahres, manchmal werden jedoch auch die Tagesmittelwerte dafür herangezogen.

Wie schon im letzten Bericht, ist der vorliegende Bericht ist bei den grafischen Auswertungen kürzer gefasst als in den früheren Jahren. Herausgenommen wurden die grafischen Darstellungen für die Perzentile, die max. 3-Stunden-Mittelwerte, die max. Halbstundenmittelwerte und die max. Monatsmittelwerte, da sie im allgemeinen von nicht so starkem öffentlichem Interesse sind. Neu aufgenommen hingegen wurden die grafischen Auswertungen über 1-Stunden-Mittelwerte, die nunmehr fast überall die Norm für die Bewertung von Kurzzeitbelastungen darstellen.

Immission reference values

The present study various immission reference values have been surveyed, such as:

- annual mean value (mean of all monitoring stations of a city/region)
- max. monthly mean value (max. stressed monitoring station of a city/region)
- max. daily mean value (max. stressed monitoring station of a city/region)
- max. 3-hours mean value (max. stressed monitoring station of a city/region)
- max. 1-hours mean value (max. stressed monitoring station of a city/region)
- max. 1/2-hours mean value (max. stressed monitoring station of a city/region)
- max. 98-Percentile/year (max. stressed monitoring station of a city/region)
- Number of violations of the PM_{10} daily mean standard at the highest stressed monitoring station
- Number of violations of the NO_2 1h mean standard at the highest stressed monitoring station

The individual monitoring network services supported us with immission data of very different completeness, especially referring to the evaluation of the percentiles or sometimes the evaluations of the max. 1/2-hours mean-value or the max. 3-hours mean-value. Often the 98-Percentile was not available but the value for the 95-Percentile was given. Most of the monitoring network services calculate the percentiles from the 1/2-hours mean values of a calendar year, sometimes they were based on the daily mean values.

As already done in the latest report the present report has been shortened in comparison to former years, regarding the graphical evaluations of immission reference values. The graphical presentation of percentiles, max. 3h mean values, max. monthly mean values, 1/2h mean values has not been carried out any more, for they seem not to be of such a public interest as others. On the other hand a new graphical evaluation has been added: Max. 1h mean values, the evaluation standard now for short term stress nearly everywhere.

Sämtliche Werte, von denen ein Teil für die Grafiken verwendet wurde, können nach wie vor aus den Übersichtstabellen im Anhang entnommen werden.

All air quality values partly used for graphical evaluation can be obtained from the overview tables of the annex.

Verglichene Luftschadstoffe

Folgende Luftschadstoffe wurden miteinander verglichen:
SO_2, CO, NO, NO_2, O_3, Feinstaub (PM_{10} und $PM_{2,5}$)

Anmerkung:
Schwebestaub (TSP) wurde nicht mehr ausgewertet, da die Messungen in den einzelnen Messgebieten mittlerweile durch PM_{10}-Messungen ersetzt worden sind.

Pollutants compared

The following air pollutants have been compared:

SO_2, CO, NO, NO_2, O_3, fine particulates (PM_{10} and $PM_{2,5}$)

Remark:
TSP has not been evaluated any more due to the fact that in most monitoring networks the TSP measurements are already replaced by monitoring of PM_{10}.

Mehrjahresvergleich

Ein gutes Bild über die Entwicklung der Luftbelastung geben die Grafiken wieder. Dabei wurde von den am Luftgütevergleich teilnehmenden Städten die Entwicklung der Immissionsbelastung von 1993 bis 2008 aufgetragen.

Wenn man die Daten analysiert, können folgende Aussagen getroffen werden:

1. Einige Städte und Regionen haben ein dichtes Messstellennetz bezogen auf die Größe des Immissionsgebietes. Beispiele: Berlin, Linz, Wien. Andererseits werden manchmal sehr große Gebiete durch eine geringe Zahl von Messstationen überwacht.
2. Aufgrund dieser Tatsache ist die Vergleichbarkeit einzelner Regionen begrenzt.
3. Die Belastung (Jahresmittelwerte) einzelner Regionen und Städte ist noch immer sehr unterschiedlich.
   Bei einigen Städten kann man erkennen, dass in jenen Situationen, bei denen 1993 relativ hohe Immissionsbelastungen registriert wurden, seitdem oftmals eine deutlich sichtbare Besserung der Immissionssituation eingetreten ist, während in Städten mit niedriger Immissionsbelastung im Vergleich dazu nahezu keine Änderung der Luftbelastung eingetreten ist.

Comparison over a period of years

One can get a good impression of the development of the air pollutant stress by studying the graphics. For this the immission stress for the area of each participating city and region from 1993 through 2008 are plotted.

The following statements can be given in analysing the data:

1. Some cities and regions have - according to the area - a high monitoring network density. Examples: Berlin, Linz, Vienna. On the other hand very large areas are monitored only by a little number of stations.
2. Due to this fact the comparability between regions is limited.
3. The range of the annual mean immission stress still is very different between the viewed cities and regions.
   In some cities it can be seen that where the pollution stress in 1993 was relatively high, there often has been a visible betterment of the immission situation, while in cities with low immission stress compared to other cities and regions there was nearly no change in air pollution.

4. Es zeigt sich, dass in immer mehr Städten und Regionen die Schwebstaub (TSP)-Messungen abgeschaltet werden. Andererseits werden diese Messungen immer mehr durch Feinstaub (PM_{10}-Messungen abgelöst). TSP-Messungen wurden daher im vorliegenden Vergleich nicht mehr miteinbezogen.	4. It can be seen that more and more cities and regions do not monitor TSP any more. On the other hand the percentage of monitoring networks including the pollutant PM_{10} increasing rapidly. So TSP measurements have not been included in the present report any more.
5. Entwicklung der Langzeitbelastung (Jahresmittelwerte SO_2, Schwebestaub (TSP) (nur bis 2004!), NO, NO_2, CO, und O_3) gegenüber 1993 (PM_{10}: gegenüber 2001):	5. Development of the air pollution stress (annual mean values of SO2, TSP (only until 2004!), NO, NO_2, CO, O_3) in comparison with 1993 (for PM_{10}: comparison with 2001):
SO_2: Nahezu alle Regionen *geringer* belastet	SO_2: Nearly all regions *less* stressed
Staub: TSP-Messung in nahezu allen Regionen eingestellt. Wenn vorhanden, ist die Tendenz zu *geringeren* Belastungen (Vergleich nur bis 2004).	TSP: Nearly no TSP-measurements any more. If there is still monitoring, regions are *less* stressed in tendency (Comparison only up to 2004).
PM_{10}: uneinheitlich , tendenziell *gleich bleibend* oder *leicht geringer belastet*	PM_{10}: non-uniform, trend is constant or *slightly lower* stressed
NO: uneinheitlich , tendenziell *geringer* belastet oder *gleich bleibend*	NO: non-uniform, trend of lower stress or staying constant
NO_2: uneinheitlich , tendenziell *gleich bleibend, oder leicht geringer* belastet	NO_2: non-uniform, trend is constant or *slightly lower* stressed
CO: Nahezu alle Regionen *geringer* belastet	CO: nearly all regions *lower* trend of stress
O_3: Belastung tendenziell *gleich bleibend oder leicht erhöht*	O_3: trend is constant or *slightly higher* stressed

Übersicht über die Entwicklung der Schadstoffbelastungen 1993 -2008 [1)]

Beurteilungsbasis: Jahresmittelwerte über alle Stationen einer Region

Overview over the development of the stress of air pollutants from 1993 through 2008 [1)]

based on the mean of all annual mean values of a region

Austrian Towns, Cities and Regions

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [2)]	Trend last 5 years	Stress in 2008	Stress in 1993 [2)]	Trend last 5 years	Stress in 2008	Stress in 1993 [2)]	Trend last 5 years	Stress in 2008	Stress in 1993 [2)]	Trend last 5 years	Stress in 2008	Stress in 1993 [2)]	Trend last 5 years	Stress in 2008
Linz		↘			==			==			==			↘	
Bludenz		-	2004	1994	==			↘		-	-	-	1994	==	
Dornbirn		-	2007	1994	-	2007		-	2007	1998	-	2003	-	-	-
Graz		↓		1994	==			==			==			==	
Hallein		↘		2003	-			==			↘			==	
Innsbruck		↓			↘			↘			↘			==	
Klagenfurt		↓			↘			↘			==			==	
Region Leoben		↘			==			==			==			==	
Salzburg		↓		2003	-			↘			↘			==	
St. Pölten	1994	↘		**1994**	↘		1994	==		1994	==		1994	↘	
Vienna		↘		**1994**	==			==			==			==	
Villach		↓			↘			==			==			↗	

[1)] TSP measurements are mostly replaced by PM_{10} monitoring (see page 13). So no comparison of TSP has been carried out since 2004. If you are interested in TSP-values until 2005 please refer to the report of 2005 (available via internet, URL http://www.linz.at/umwelt/4109.asp)

[2)] Or year, when data were primarily available

European Cities and Regions

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [3]	Trend last 5 years	Stress in 2008	Stress in 1993 [4]	Trend last 5 years	Stress in 2008	Stress in 1993 [4]	Trend last 5 years	Stress in 2008	Stress in 1993 [4]	Trend last 5 years	Stress in 2008	Stress in 1993 [4]	Trend last 5 years	Stress in 2008
Athens	2007	-		2007	-		2007	-		2007	-		2007	-	
Barcelona	1994	==		1994	↓		1994	↘			==		1994	==	
Basel		↘			==			↘			↘	1999		==	
Belfast		↓			==			==			↗			==	
Berlin		↘			↘			==			↗			==	
Birmingham		↓			==			==			-	2007		==	
Bristol		↓			↘			==			==			↗	
Brussels	1995	↓		1995	↘		1995	↘			↘		1995	==	
Budapest	1996	==		2003	==		2003	==			↘		2003	==	
Chemnitz		-	2007		==			↗			↘			==	
Copenhagen		↓		1994	-	2005	1995	==			↘		1994	↗	
Debrecen		-	2001	1995	-	2001		-	2001		-	2001		-	2001
Dresden		-	2007		↗			↗			-	2007		↘	
Edinburgh		==			↗			↗			==			↘	
Frankfurt		==			↗			==			==			==	
Gothenburg		↘			↘			↘			==			↘	
Hamburg		==			==			==			↘			↗	
Karlsruhe		↓			==			==			==			==	
Leeds		↓			↘			↗			↓			↗	
Leipzig		↘			↘			↘			-			↘	
Lisbon	1997	↘		-	↘		1997	↘			==		1997	==	
Liverpool		↑			==			==			==			==	
London		↘			==			==			==			==	

[3] … or year when data were primarily available

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [4]	Trend last 5 years	Stress in 2008	Stress in 1993 [6]	Trend last 5 years	Stress in 2008	Stress in 1993 [6]	Trend last 5 years	Stress in 2008	Stress in 1993 [6]	Trend last 5 years	Stress in 2008	Stress in 1993 [6]	Trend last 5 years	Stress in 2008
Luxemburg	1996	-	2003	1996	-	2003	1996	-	2003	1996	-	2003	1996	-	2003
Lyon		↘			==			↘		1994	↘		1994	↘	
Madrid	1994	==		1999	↓		1994	==		1994	↘		1994	↗	
Mannheim		↘			==			==			==			==	
Milan	1994	↓		1994	↘		1994	==		1994	↓		1994	↗	
Munich		↗			↗			↗			↘			==	
Prague	2007	-		2007	-		2007	-		2007	-		2007	-	
Riga	1999	↘		-	-		1999	↘		2002	↓↓		1999	↓	
Rhine/Ruhr Area		↗			↘			↘			-	2005		==	
Rotterdam	1995	↘		1995	↘		1995	↘		2003	↘		1995	==	
Sofia	1999	↘		2003	-	2005	1999	↗		1999	==		1999	==	
Stockholm		==		1994	-	2004	1994	↘		1994	↘			==	
Stuttgart	2007	-		-	-	2008	2007	-		2007	-		2007	-	
Thessaloniki	2007	-		2007	-		2007	-		2007	-		2007	-	
Warsaw	1995	==		2001	==		1995	↗		1995	==		1995	↘	
Wiesbaden		==			↑			↗			↗			==	
Zagreb		↓		-	-	-	1994	==		2005	-		1999	↗	
Zurich		==			↘			==			==			==	

Legend:

- slightly stressed (SO_2 < 15, TSP < 30, NO < 30, NO_2 < 30, CO < 1000, O_3 < 30 µg/m³)
- Medium stressed (SO_2 < 30, TSP < 60, NO < 60, NO_2 < 60, CO < 2000, O_3 < 60 µg/m³)
- Highly stressed (SO_2 > 30, TSP > 60, NO > 60, NO_2 > 60, CO > 2000, O_3 > 60 µg/m³)
- – missing data

- ↘ slight stress decrease
- ↓ strong stress decrease
- == constant stress
- ↗ slight stress increase
- ↓↓ very strong stress decrease
- ↑ strong stress increase

[4] … or year when data were primarily available

	PM10		
	Stress in 2002 [5]	Trend of 5 years	Stress in 2008 [6]
Linz		==	
Bludenz	2005	-	
Dornbirn		-	
Graz		↘	
Hallein		==	
Innsbruck		↘	
Klagenfurt		↘	
Region Leoben	2003	==	
Salzburg		==	
St. Pölten		↘	
Vienna		↘	
Villach		↘	
Athens	2007	-	
Barcelona		↘	
Basel		↘	
Belfast		↗	
Berlin		↘	
Birmingham		==	
Bristol		↘	
Brussels		↘	
Budapest	2004	🡻	
Chemnitz		==	
Copen-hagen		↘	
Dresden		==	
Edinburgh		↘	
Frankfurt		↘	

	PM10		
	Stress in 2002 [7]	Trend of 5 years	Stress in 2008 [8]
Gothenburg		==	
Hamburg		↘	
Karlsruhe		↘	
Leeds		==	
Leipzig		==	
Lisbon		↘	
Liverpool		↘	
London		↗	
Luxemburg		-	2003
Lyon		==	
Madrid		↘	
Mannheim		↘	
Milan		==	
Munich		↘	
Prague	2007	-	
Riga		🡻	
Rhine/Ruhr Area		↘	
Rotterdam		↘	
Sofia		-	
Stockholm		==	
Stuttgart	2007	-	
Thessaloniki	2007	-	
Warsaw		↘	
Wiesbaden		==	
Zagreb		==	
Zurich		↘	

Legend:

- slightly stressed (PM_{10} < 20 µg/m³)
- Medium stressed (PM_{10} < 40 µg/m³)
- Highly stressed (PM_{10} > 40 µg/m³)
- --- missing data

[5] If values of 2002 are not available, data of the year mentioned are compared.

[6] If values of 2008 are not available, data of the year mentioned are compared.

Anzahl der Tage mit Überschreitungen des PM_{10}-Tagesmittelwertes von 50 µg/m³ in den Jahren 2001 bis 2008 [7)]

Beurteilungsbasis: Anzahl der Überschreitungen an der höchstbelasteten Station eines Messgebietes (einschließlich verkehrsbelastete Stationen) [8)]

Number of days with exceedances of the PM_{10} daily mean of 50 µg/m³ in 2001 through 2008 [9)]

based on the number of exceedances at the peak stressed monitoring station of a region(including traffic stressed stations) [10)]

	PM_{10} number of days >50 µg/m³							
	2001	2002	2003	2004	2005	2006	2007	2008
Linz	62	66	80	46	68	71	41	47
Bludenz	-	-	-	-	13	45	16	13
Dornbirn	-	-	38	21	22	40	18	20
Graz	159	131	131	117	127	113	76	73
Hallein	-	28	49	26	27	50	20	13
Innsbruck	-	50	61	52	55	83	46	28
Klagenfurt	36	58	74	80	82	79	42	33
Region Leoben	26	7	42	29	36	49	36	25
Salzburg	-	34	62	34	39	56	25	34
St. Pölten	-	-	58	79	87	57	23	20
Vienna	-	57	95	54	92	108	48	39
Villach	-	24	35	25	29	45	10	9
Athens	-	-	-	-	-	-	178	163
Barcelona	-	86	-	47	74	100	97	72
Basel	11	22	23	16	15	24	12	6
Belfast	16	7	33	8	5	7	5	7
Berlin	60	91	117	62	74	71	30	24
Birmingham	2	1	5	4	5	9	18	10
Bristol	7	1	9	12	4	6	15	15
Brussels	52	153	163	127	67	56	56	66
Budapest	-	-	-	178	160	162	117	96
Chemnitz	41	20	35	12	59	65	27	19
Copenhagen	-	59	91	-	-	68	60	59
Dresden	53	36	53	27	78	49	27	35
Edinburgh	3	8	2	0	3	2	6	0
Frankfurt	42	44	51	19	48	24	33	22
Gothenburg	1	10	12	2	7	13	3	4
Hamburg	33	43	62	20	45	31	26	18
Karlsruhe	6	33	33	25	22	34	16	10
Leeds	3	3	9	4	15	10	11	8

7 Bei den Werten wurden bereits die Korrekturfaktoren berücksichtigt. Diese sind aus den Tabellen im Anhang zu ersehen.

8 Nähere Details zur Unterscheidung zwischen verkehrsbelasteten Stationen und sonstigen urbanen Messstationen siehe Tabellen am Ende des Berichtes bzw. diverse grafische Auswertungen.

9 For the number of exceedances the correction factors already have been considered. One can refer to the tables at the end of the report.

10 For details in order to distinguish between traffic stressed stations and other urban monitoring stations see tables at the end of the report and graphical evaluations.

	PM_{10} number of days >50 µg/m³							
	2001	2002	2003	2004	2005	2006	2007	2008
Leipzig	109	63	92	49	82	74	40	40
London	28	29	61	107	121	157	124	157
Lisbon	230	222	183	147	180	145	154	82
Liverpool	4	2	1	14	5	8	11	12
Lyon	-	83	124	71	153	-	142	79
Madrid	-	98	-	121	159	181	123	65
Mannheim	25	44	36	41	43	20	26	12
Milan	148	177	137	139	152	149	132	115
Munich	64	75	123	59	107	92	53	60
Prague	-	-	-	-	-	-	132	84
Riga	57	74	105	160	88	244	148	126
Rhine/Ruhr Area	40	48	58	38	21	-	71	68
Rotterdam	98	103	123	54	30	31	26	12
Sofia	-	-	225	178	162	-	195	199
Stockholm	101	113	80	80	80	74	75	77
Stuttgart	-	-	-	-	-	-	110	14
Thessaloniki	-	-	-	-	-	-	152	155
Warsaw	-	-	89	184	162	192	136	133
Wiesbaden	15	35	19	11	18	32	20	8
Zagreb	-	-	-	75	89	134	108	116
Zurich	18	23	38	23	15	39	17	11

Anzahl der Überschreitungen des 1h-Grenzwertes für NO_2 von 200 µg/m³ in den Jahren 2004 bis 2008

Beurteilungsbasis: Anzahl der Überschreitungen an der höchstbelasteten Station eines Messgebietes

Number exceedances of the NO_2 1h mean value of 200 µg/m³ in 2004 through 2008
based on the number of exceedances at the peak stressed monitoring station of a region

	NO_2 number of 1 h mean values >200 µg/m³				
	2004	2005	2006	2007	2008
Linz	0	1	4	4	1
Bludenz	0	0	0	0	0
Dornbirn	-	0	0	0	0
Graz	0	0	4	0	0
Hallein	0	0	1	3	0
Innsbruck	0	0	4	0	0
Klagenfurt	-	1	1	1	0
Region Leoben	0	0	0	0	0
Salzburg	0	0	2	1	2
St. Pölten	0	0	0	0	1
Vienna	8	24	26	11	17
Villach	0	0	0	0	0
Athens	-	-	-	192	56
Barcelona	13	-	18	22	13
Basel	0	0	0	0	0
Belfast	0	4	5	0	3
Berlin	-	-	-	6	0
Birmingham	0	2	0	0	3
Bristol	0	22	13	8	5
Brussels	24	90	2	2	6
Budapest	1	25	19	9	1
Chemnitz	1	0	0	1	0
Copenhagen	-	-	-	-	-
Dresden	0	0	0	0	0
Edinburgh	0	0	0	0	6
Frankfurt	0	10	3	6	2

	NO_2				
	number of 1 h mean values >200 µg/m³				
	2004	2005	2006	2007	2008
Gothenburg	2	0	7	1	1
Hamburg	0	0	26	19	30
Karlsruhe	5	0	0	0	3
Leeds	0	0	0	0	8
Leipzig	1	39	0	0	0
Liverpool	0	458	0	0	0
Lisbon	52	-	80	39	20
London	542	139	686	458	822
Luxemburg	-	267	-	-	-
Lyon	35	0	-	139	66
Madrid	83	-	208	267	119
Mannheim	0	69	0	0	0
Milan	47	1	123	-	241
Munich	11	0	103	69	56
Prague	-	0	-	1	106
Riga	0	0	0	0	0
Rhine/Ruhr Area	0	24	-	0	0
Rotterdam	10	3	2	0	0
Sofia	7	450	-	24	155
Stockholm	0	3	1	3	1
Stuttgart	-	17	-	450	9
Thessaloniki	-	3	-	3	1
Warsaw	0	0	5	17	0
Wiesbaden	0	0	2	3	1
Zagreb	0	0	0	0	0
Zurich	0	0	0	0	0

Anzahl der Messstellen Number of monitoring stations

Country	Monitored Area	SO_2	PM_{10}	$PM_{2,5}$	NO	NO_2	CO	O_3
Austria	Bludenz	-	1	-	1	1	-	1
	Dornbirn	1	1	-	1	1	-	-
	Graz	4	7	1	5	6	3	4
	Hallein	2	2	-	3	3	2	1
	Innsbruck	1	2	1	2	2	1	2
	Klagenfurt	1	2	1	2	2	2	2
	Region Leoben	3	4	-	3	3	1	1
	Linz	4	5	1	5	5	5	2
	Salzburg	2	3	2	3	3	2	2
	St. Pölten	1	2	1	2	2	1	1
	Vienna	10	13	2	17	17	4	5
	Villach	1	1	-	1	1	1	1
Belgium	Brussels	7	6	5	10	10	7	7
Bulgaria	Sofia	4	1	6	4	4	2	3
Croatia	Zagreb	6	6	1	-	5	-	5
Czech Republic	Prague	10	19	6	15	21	12	8
Denmark	Copenhagen	1	3	2	-	3	3	3
France	Lyon	5	7	3	10	10	5	4
Germany	Berlin	2	13	4	15	15	2	7
	Chemnitz	-	3	2	3	3	-	1
	Dresden	1	4	2	4	4	-	3
	Frankfurt	4	6	-	6	6	2	4
	Hamburg	7	12	4	18	18	8	6
	Karlsruhe	1	3	-	3	3	2	2
	Leipzig	1	3	1	3	3	-	1
	Mannheim	2	3	-	4	4	2	3
	Munich	2	6	-	7	7	5	3
	Rhine/Ruhr Area	7	31	4	18	18	-	14
	Stuttgart	1	2	-	3	3	2	2
	Wiesbaden	1	2	1	2	2	1	1
Greece	Athens	7	7	4	15	15	7	13
	Thessaloniki	4	4	-	7	7	4	6
Hungary	Budapest	9	11	1	11	11	11	9
Italy	Milan	1	3	1	6	6	4	2
Latvia	Riga	3	3	2	1	4	1	4
Luxemburg	Luxemburg (2003)	2	1	-	2	2	1	2
The Netherlands	Rotterdam	7	3	2	3	3	2	3
Poland	Warsaw	9	11	2	9	9	5	4
Portugal	Lisbon	5	4	2	7	7	7	4
Spain	Barcelona	6	9	2	6	6	6	6
	Madrid	25	24	7	25	25	23	24

Country	Monitored Area	SO_2	PM_{10}	$PM_{2,5}$	NO	NO_2	CO	O_3
Switzerland	Basel	1	1	1	1	1	1	1
	Zurich	1	1	1	1	1	1	1
Sweden	Gothenburg	2	1	2	1	3	1	3
	Stockholm	1	4	3	-	4	1	1
U.K.	Belfast	1	1		1	1	1	1
	Birmingham	1	2		2	2	-	2
	Bristol	1	1		2	2	1	1
	Edinburgh	1	1		1	1	1	1
	Leeds	1	1		1	1	1	1
	Liverpool	1	1		1	1	1	1
	London	6	6	4	14	14	8	9

Immissionsgebiete und Bevölkerung

Immission area and population

Country	Monitored Area	immission area [km²]	population
Austria	Bludenz	9	14 740
	Dornbirn	14	47 050
	Graz	128	255 354
	Hallein	27	18 900
	Innsbruck	105	140 000
	Klagenfurt	120	93 306
	Region Leoben	108	24 999
	Linz	96	189 355
	Salzburg	66	149 000
	St. Pölten	108	51 500
	Vienna	415	1 687 000
	Villach	135	59 004
Belgium	Brussels	161	416 400
Bulgaria	Sofia	1 311	1 356 877
Croatia	Zagreb	641	779 145
Czech Republic	Prague	496	1 223 368
Denmark	Copenhagen	88	518 574
France	Lyon	954	1.348.832
Germany	Berlin	892	3 431 000
	Chemnitz	221	245 700
	Dresden	328	504 795
	Frankfurt	248	676 197
	Hamburg	755	1 769 000
	Karlsruhe	173	288 903
	Leipzig	298	506 578
	Mannheim	145	310 329
	Munich	310	1 348 832
	Rhine/Ruhr Area	5 770	8 213 872
	Stuttgart	207	597 596
	Wiesbaden	204	275 482
Greece	Athens	1 948	3 551 370
	Thessaloniki	129	794 330
Hungary	Budapest	525	1 702 297
Italy	Milan	182	1 304 183
Latvia	Riga	307	717 371
Luxemburg	Luxemburg	52	90 000
The Netherlands	Rotterdam	803	1 186 434
Poland	Warsaw	517	1 706 624
Portugal	Lisbon	85	499 700

Country	Monitored Area	immission area [km²]	population
Spain	Barcelona	341	1 615 908
	Madrid	604	3 213 271
Switzerland	Basel	557	486 952
	Zurich	1 086	111 090
Sweden	Gothenburg	198	501 429
	Stockholm	48	296 323
U.K.	Belfast	115	277 000
	Birmingham	268	1 010 200
	Bristol	110	416 400
	Edinburgh	262	463 510
	Leeds	552	761 100
	Liverpool	112	435 500
	London	1 572	7 512 400

Quellen für die Immissionsdaten Sources for the immission data

Austria Umweltinstitut des Landes Vorarlberg
Bludenz, Dornbirn Montfortstraße 4
A-690 1 Bregenz
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Austria Amt der Tiroler Landesregierung
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Austria Amt der Salzburger Landesregierung, Umweltschutz
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Bulgaria ***Sofia***	Executive Environmental Agency 136 Tzar Boris III Blvd. BG-1618 Sofia Bulgaria e-mail: *Rosen@nfp-bg.eionet.eu.int* Homepage: http://nfp-bg.eionet.eu.int/
Croatia ***Zagreb***	Institute of Medical Research and Occupational Health Ksaverska cesta 2 HR-10000 Zagreb Croatia e-mail: *vvadjic@imi.hr* Homepage: -
Czech Republic ***Prague***	Czech Hydrometeorological Institute Na Sabatce 17 14306 Praha 4 Czech Republic e-mail: osta@chmi.cz Homepage: http://www.chmi.cz
Denmark ***Copenhagen***	National Environmental Research Institute Atmospheric Environment Frederiksborvej 399 DK-4000 Copenhagen Denmark Homepage: http://www2.dmu.dk/AtmosphericEnvironment/aq_aar/aovers.htm

France COPARLY-A SCOPARG-SUPAIRE
Lyon Rue des Frères Lumière, - parc d' Affaires Roosevelt
F-69120 Vaulx en velin
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Germany Sächsisches Landesamt für Umwelt, Landwirtschaft und Geologie
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http://www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_luft/luftbelastung/index.html

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Liverpool, London London SW 1E 6DE
Home page: *http://www.airquality.co.uk*

Luftgütevergleich

2008

Jahresmittelwert (Gebietsmittel)

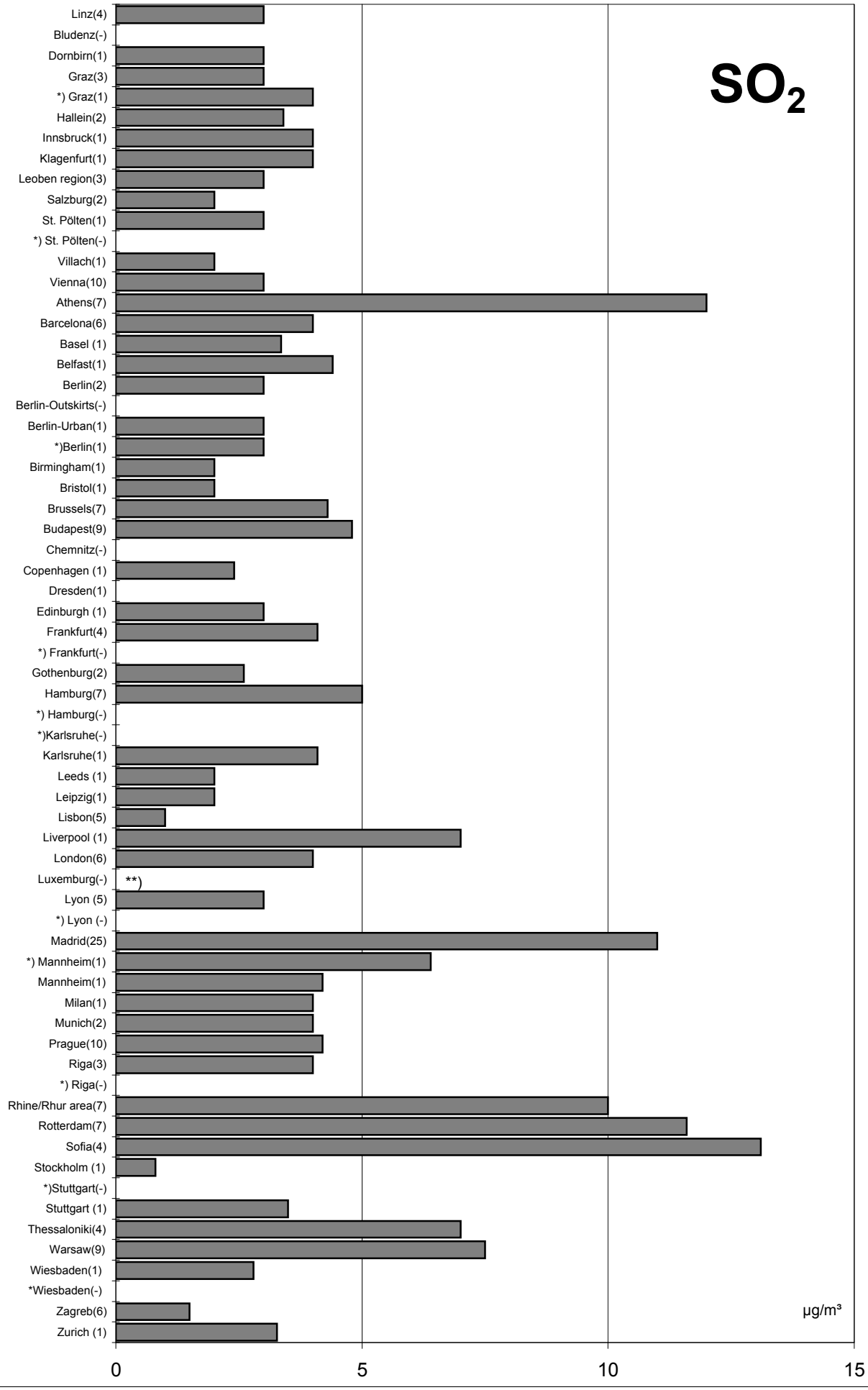
Comparison of The Air Quality

2008

Annual Mean Values

Comparison of The Air Quality in 2008

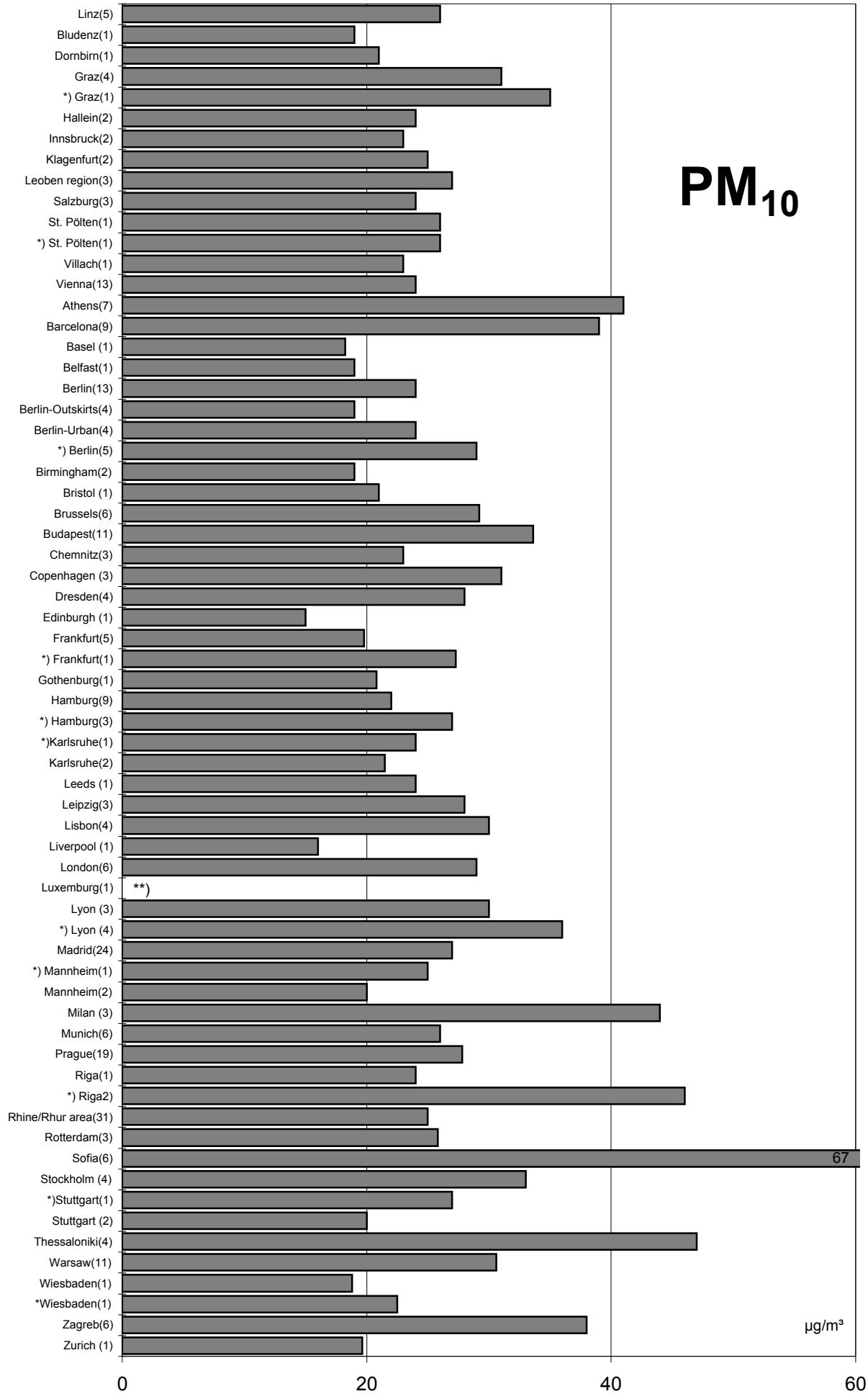
annual mean values (in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**) no data

Comparison of The Air Quality in 2008

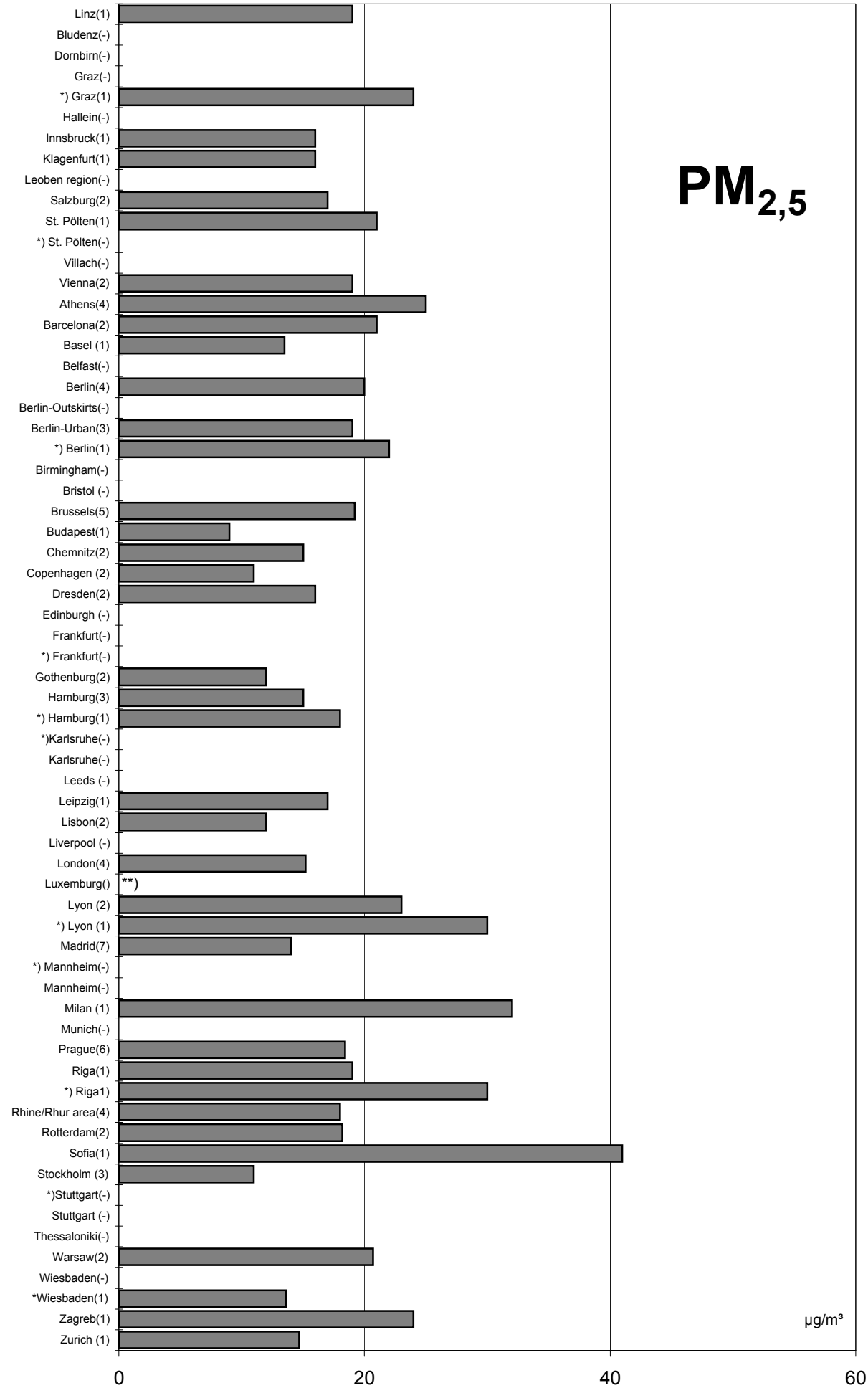
annual mean values (in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**) no data

Comparison of The Air Quality in 2008

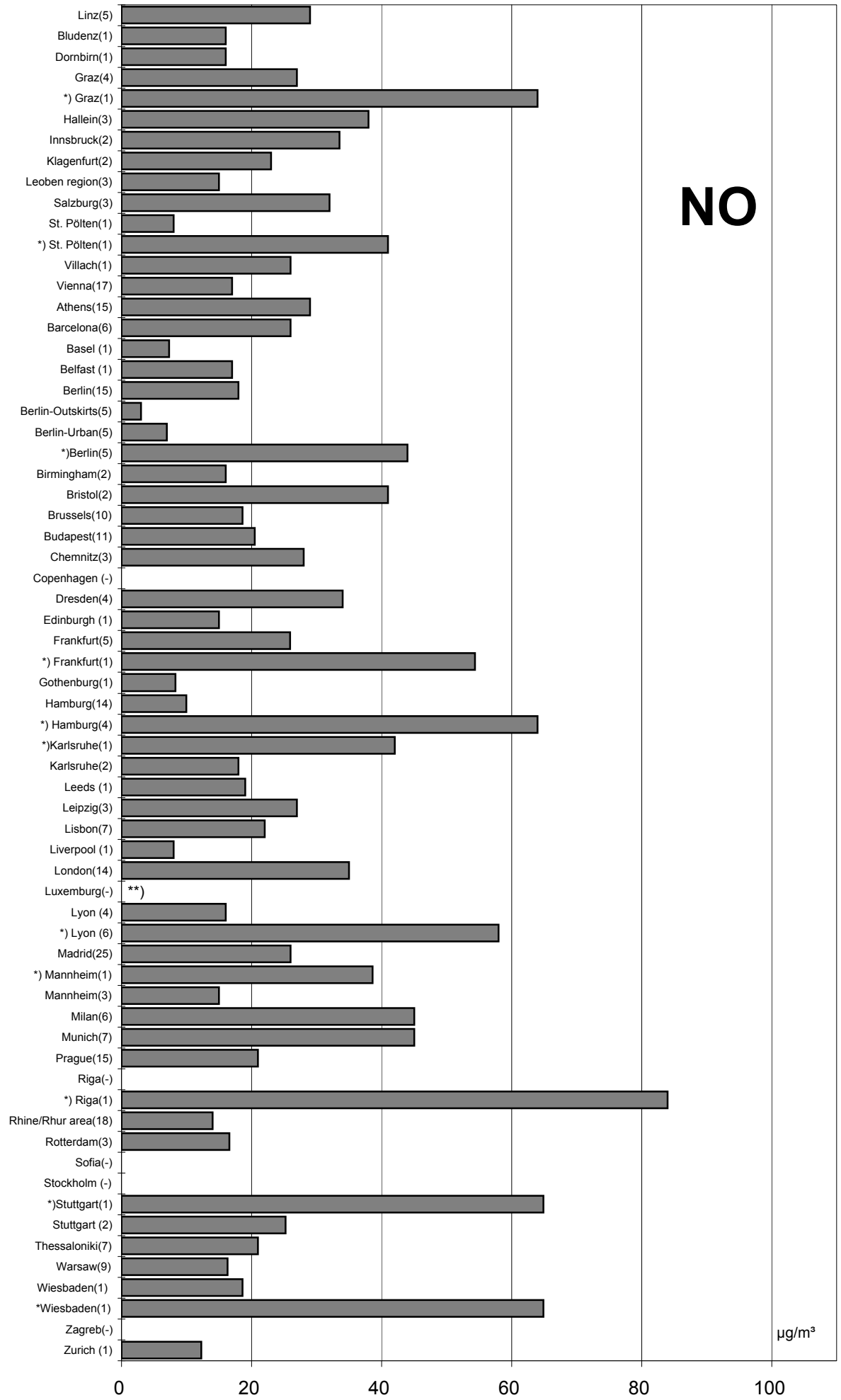
annual mean values (in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**) no data

Comparison of The Air Quality in 2008

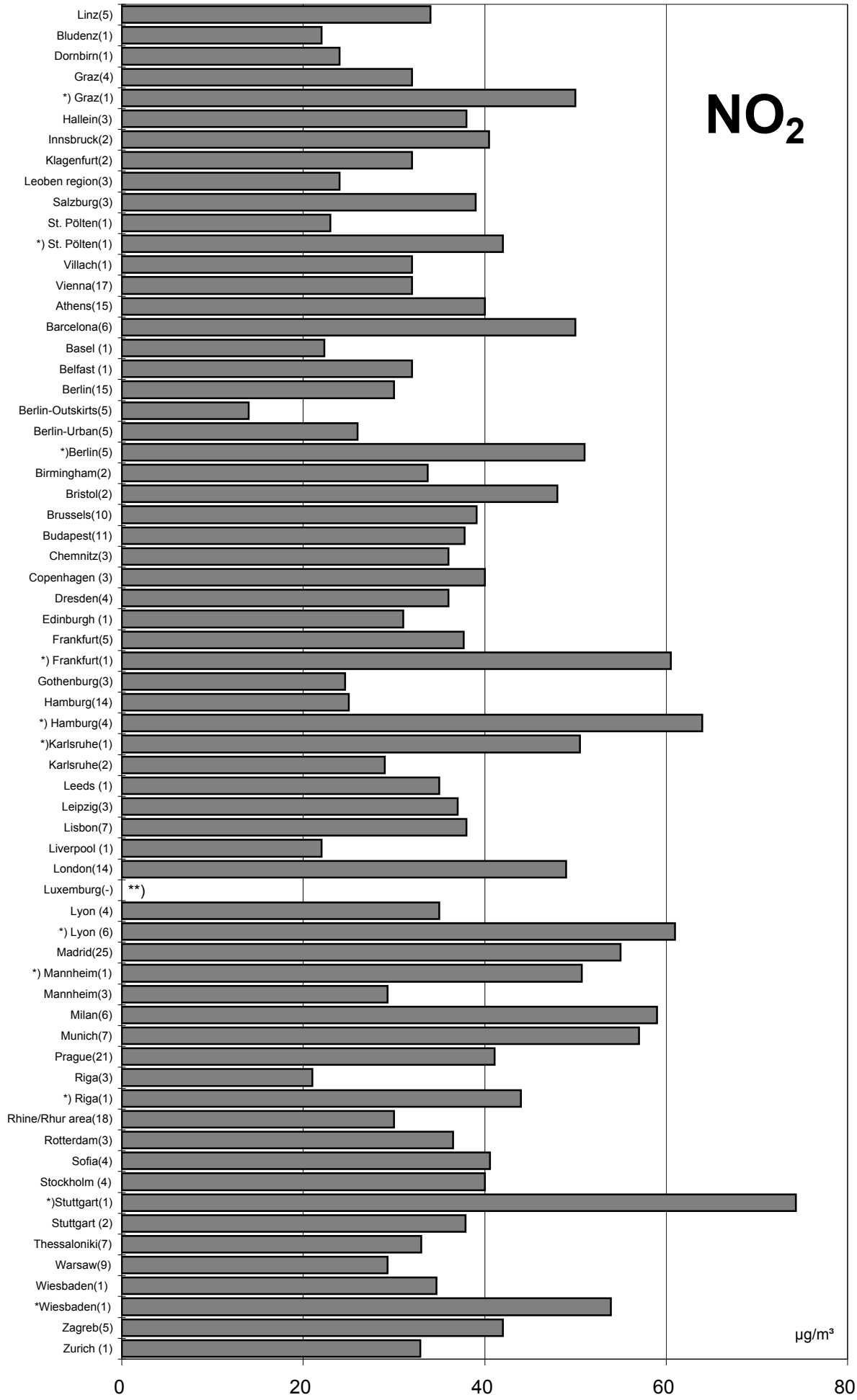
annual mean values (in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**) no data

Comparison of The Air Quality in 2008

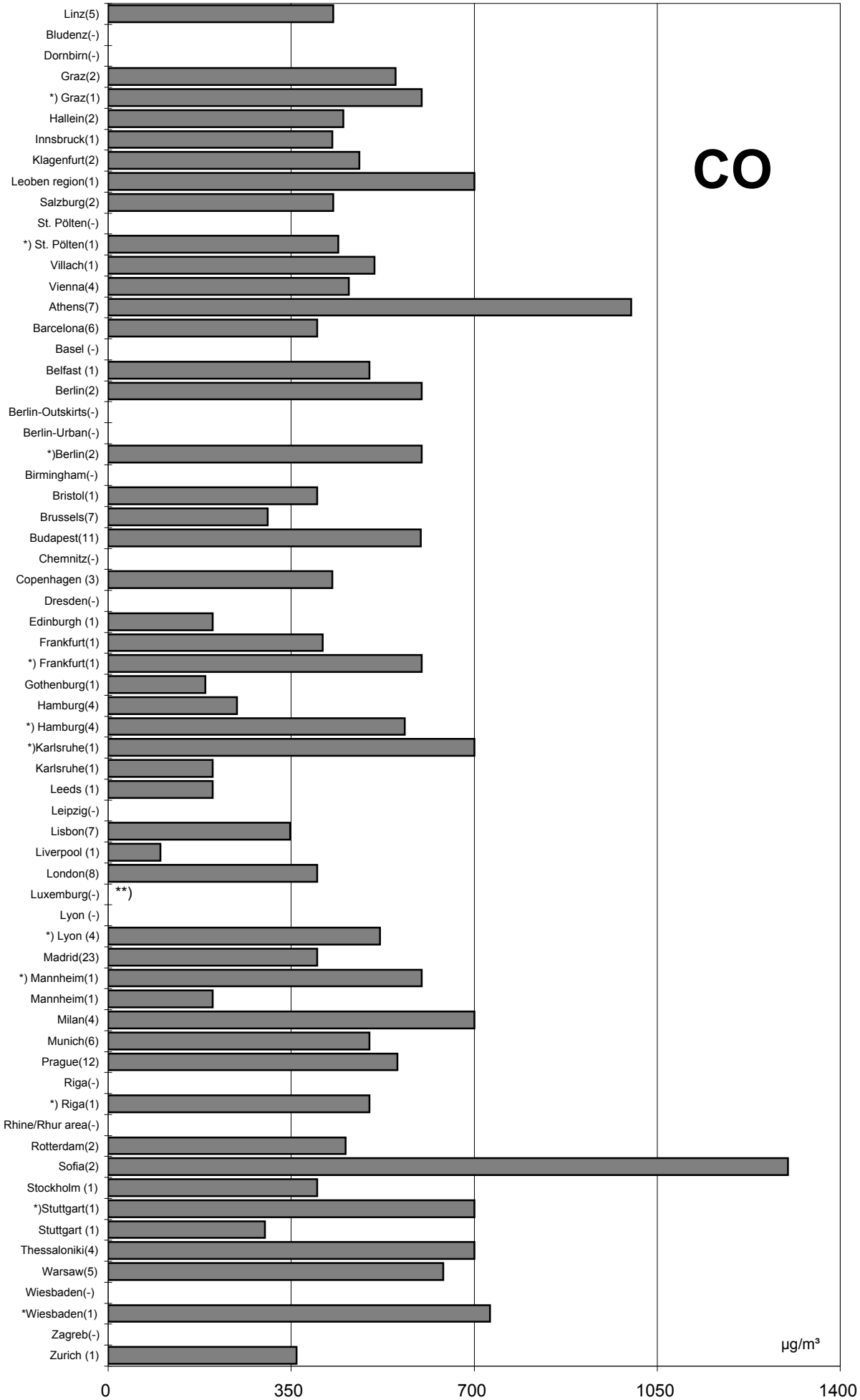
annual mean values (in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**) no data

Comparison of The Air Quality in 2008

annual mean values (in parentheses: number of monitoring stations)

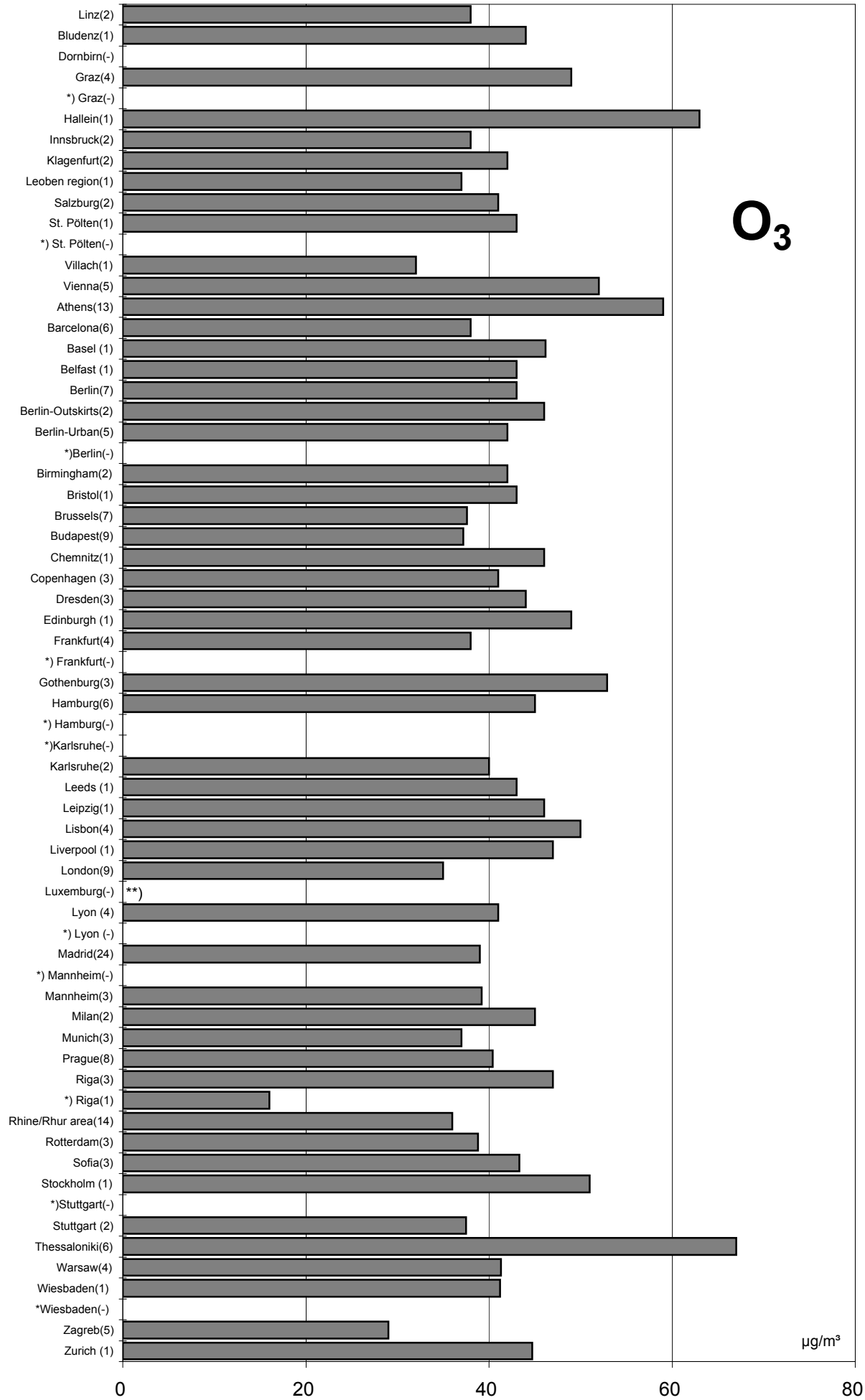


*) traffically influenced monitoring stations

**) no data

Comparison of The Air Quality in 2008

annual mean values (in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**) no data

Luftgütevergleich

2008

max. Tagesmittelwert

Comparison of The Air Quality

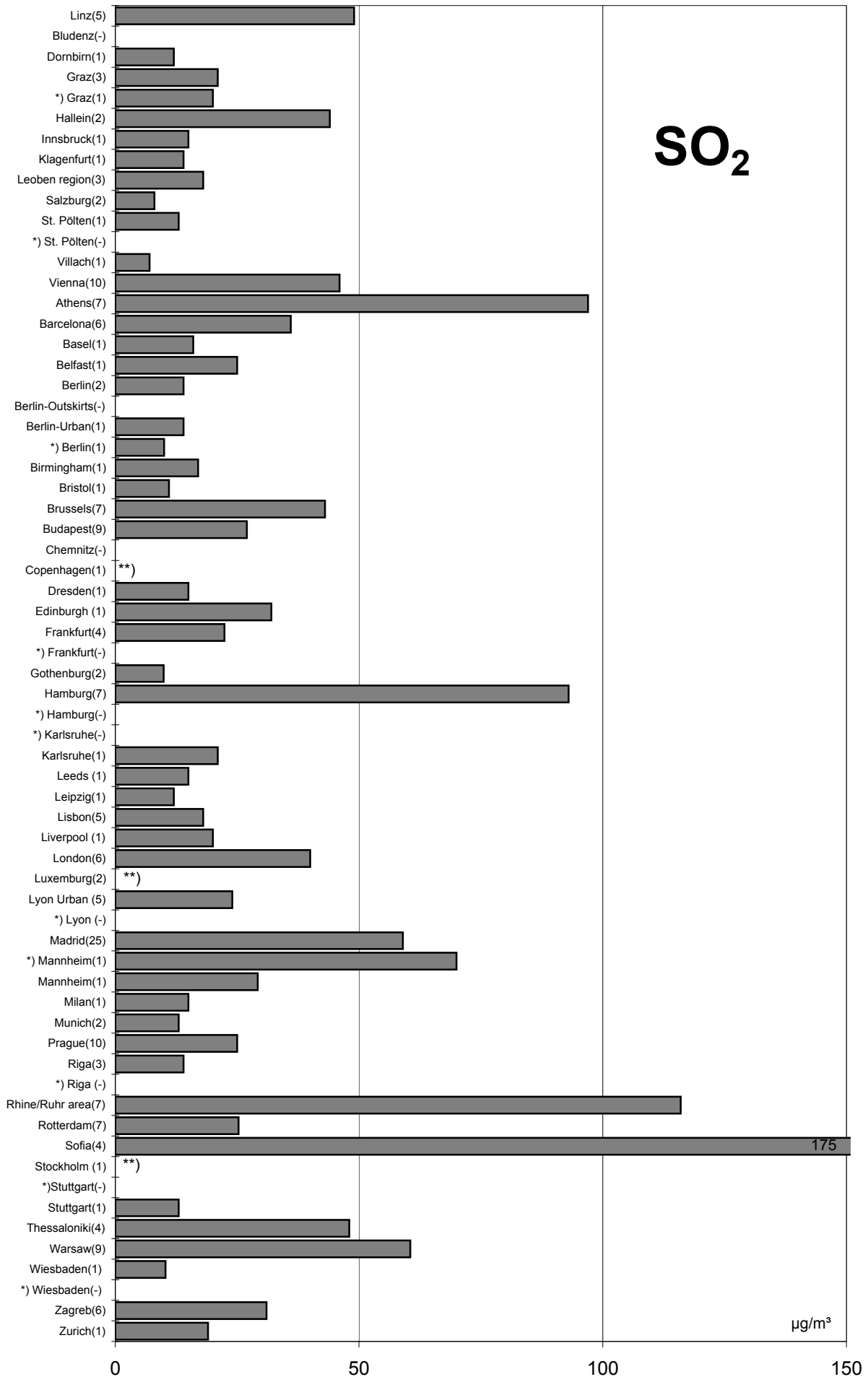
2008

Max. Daily Mean Values

Comparison of The Air Quality in 2008

max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

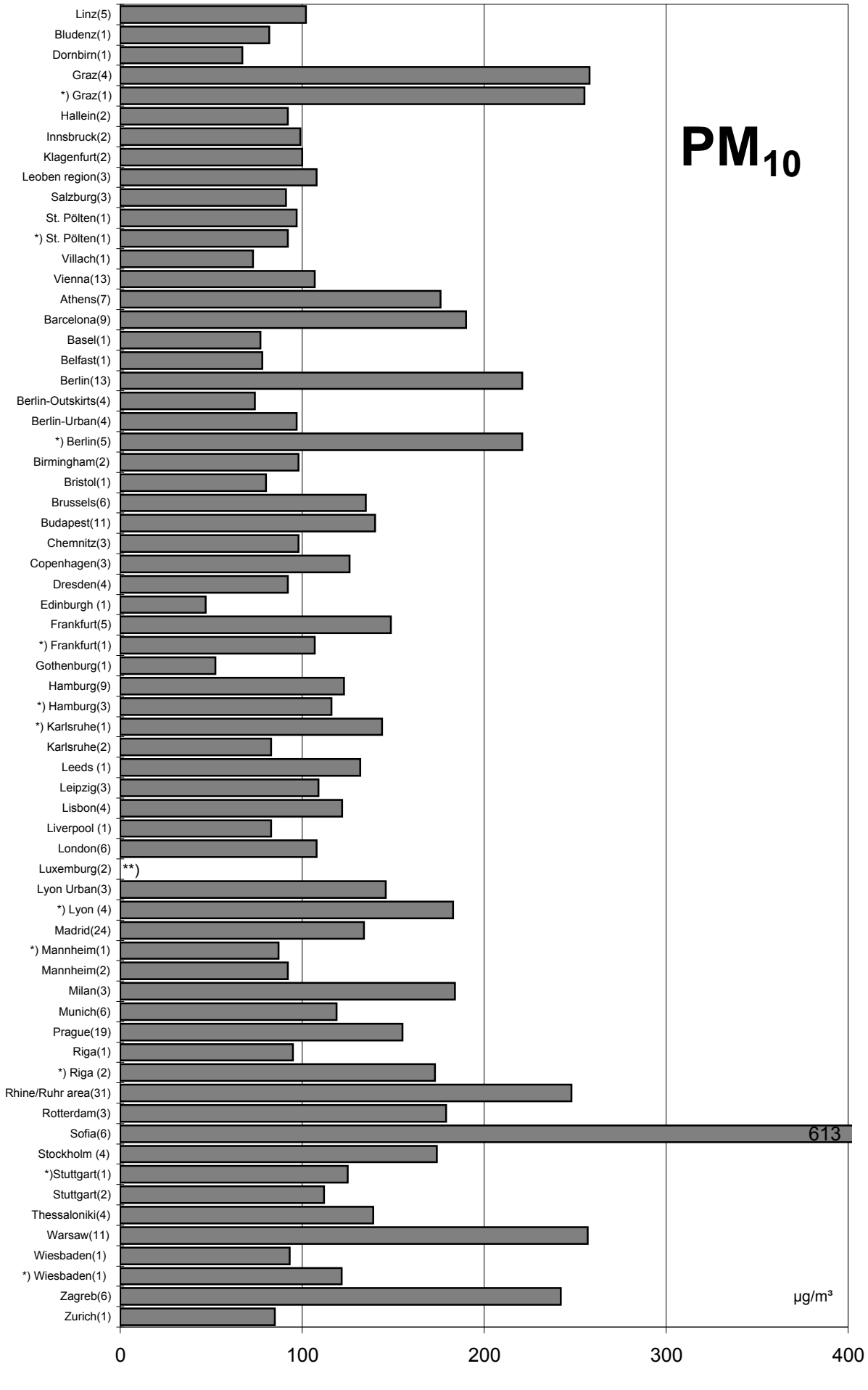


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

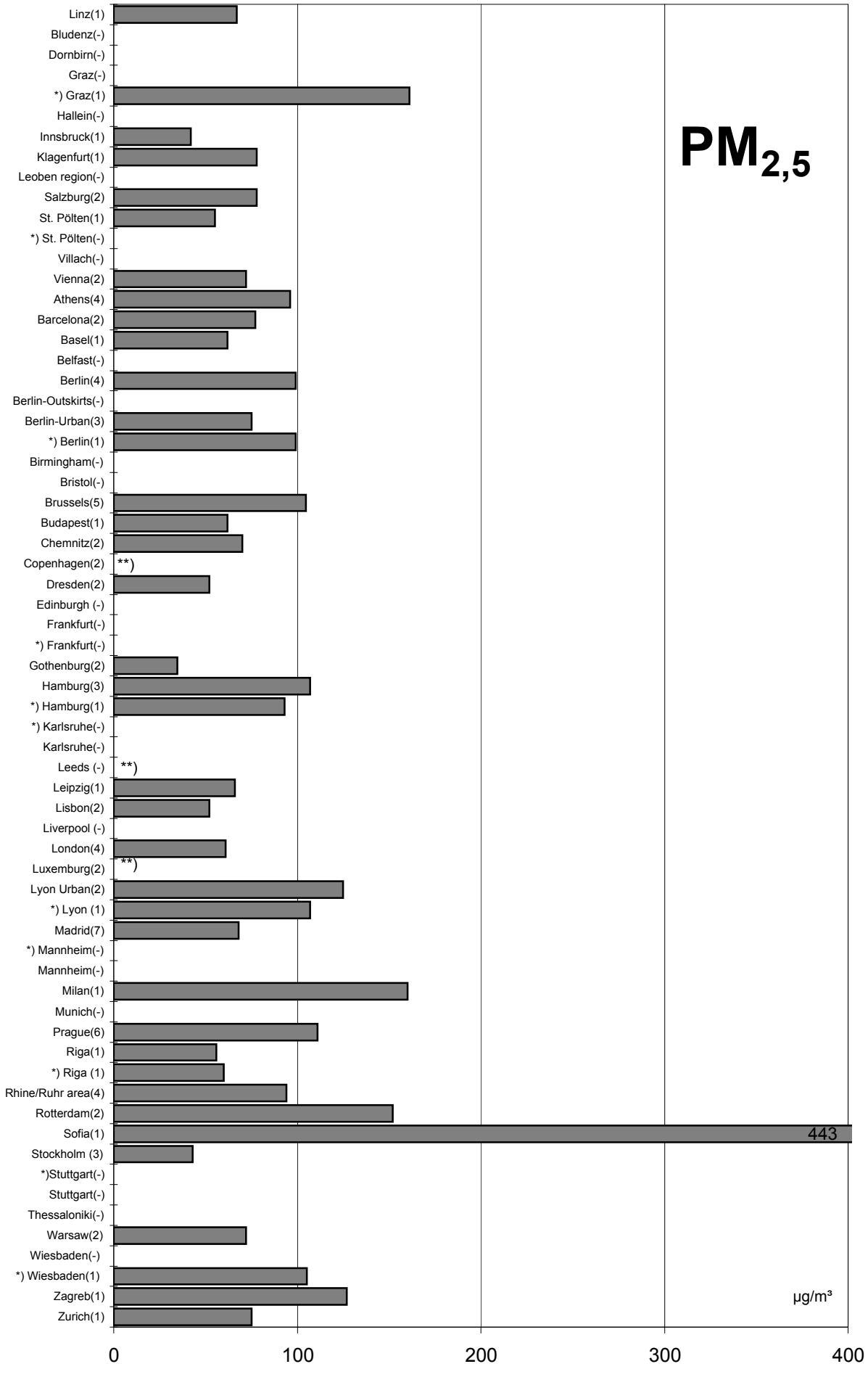


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



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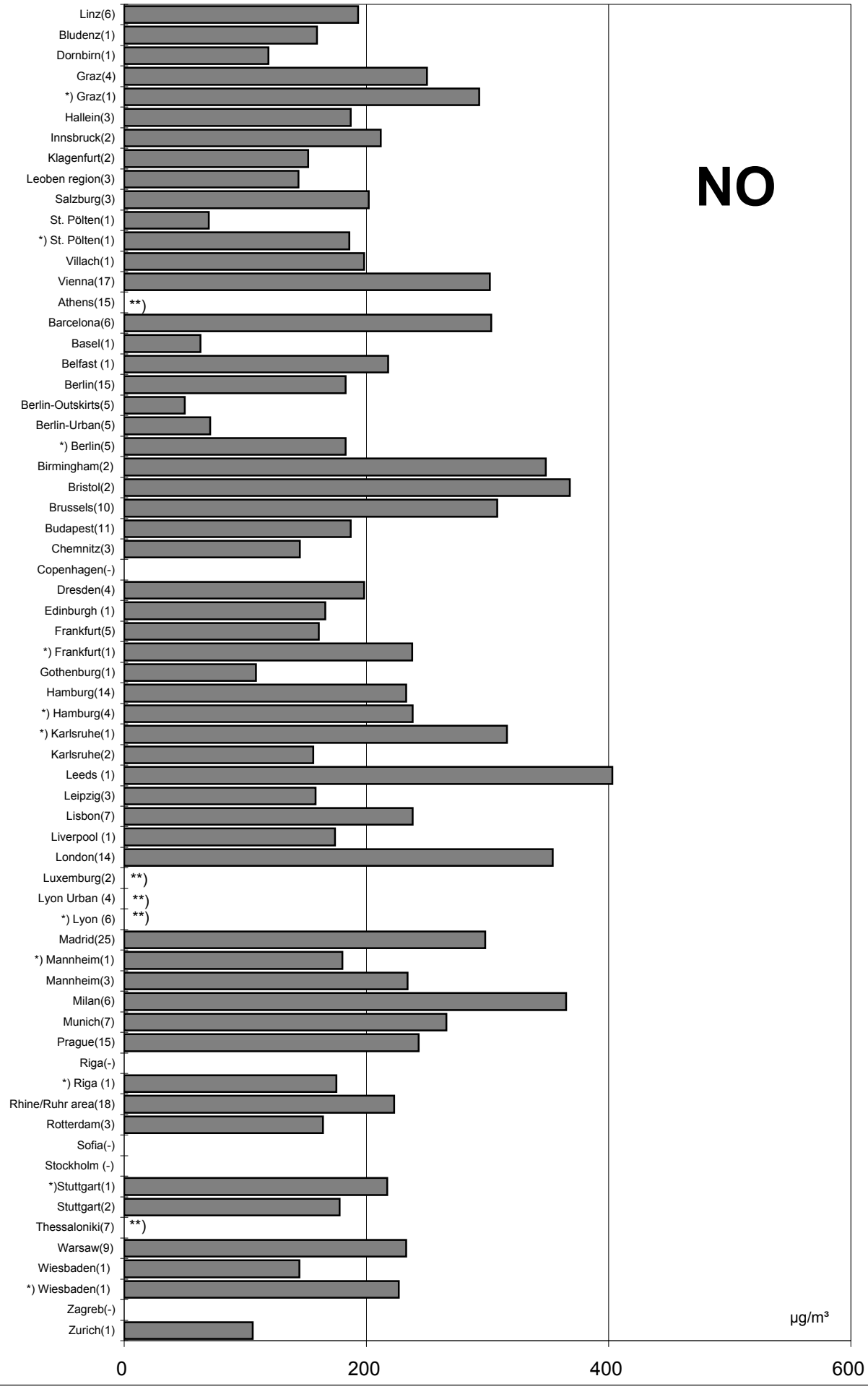
**)no data

Comparison of The Air Quality in 2008

max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

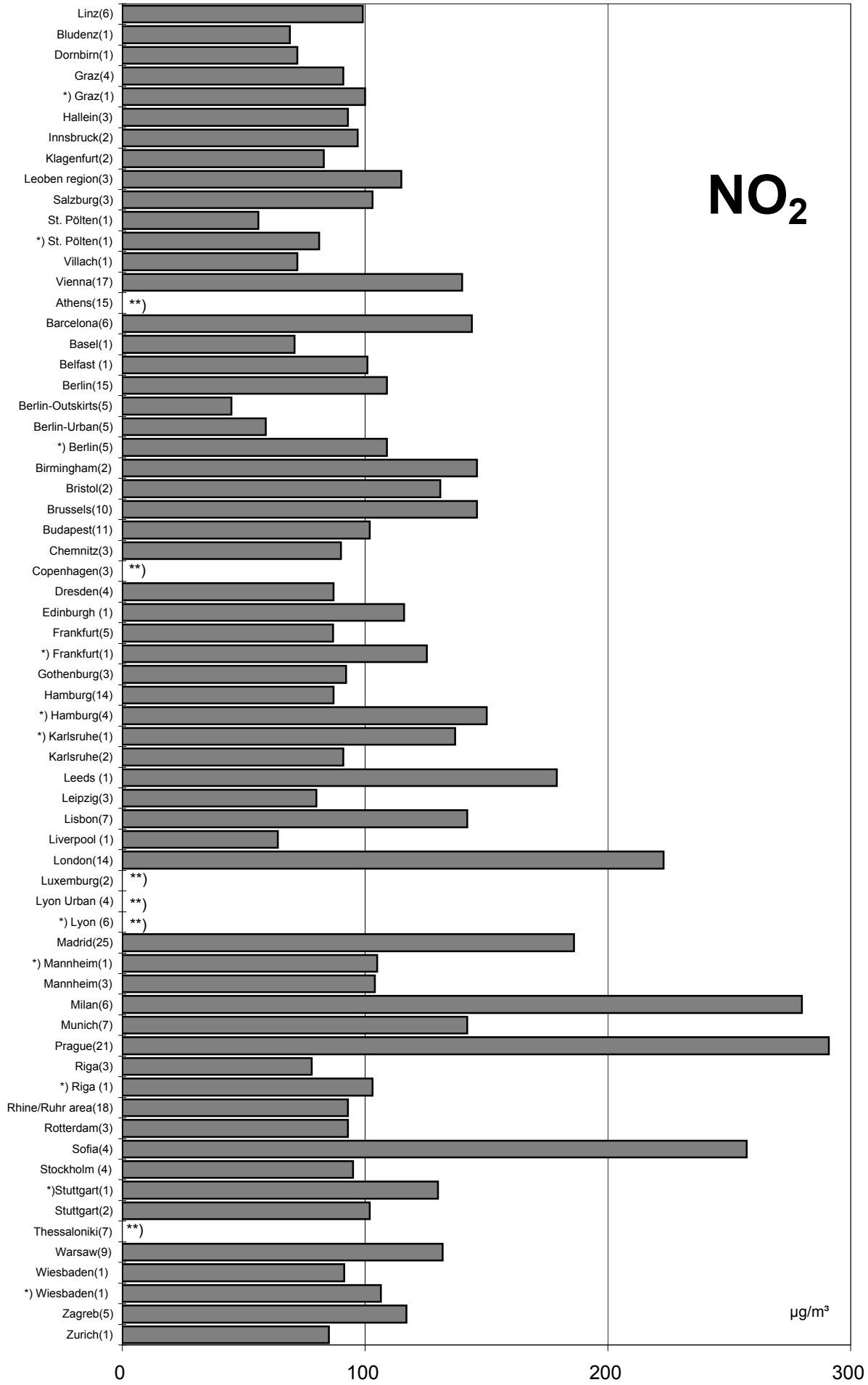


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



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Comparison of The Air Quality in 2008

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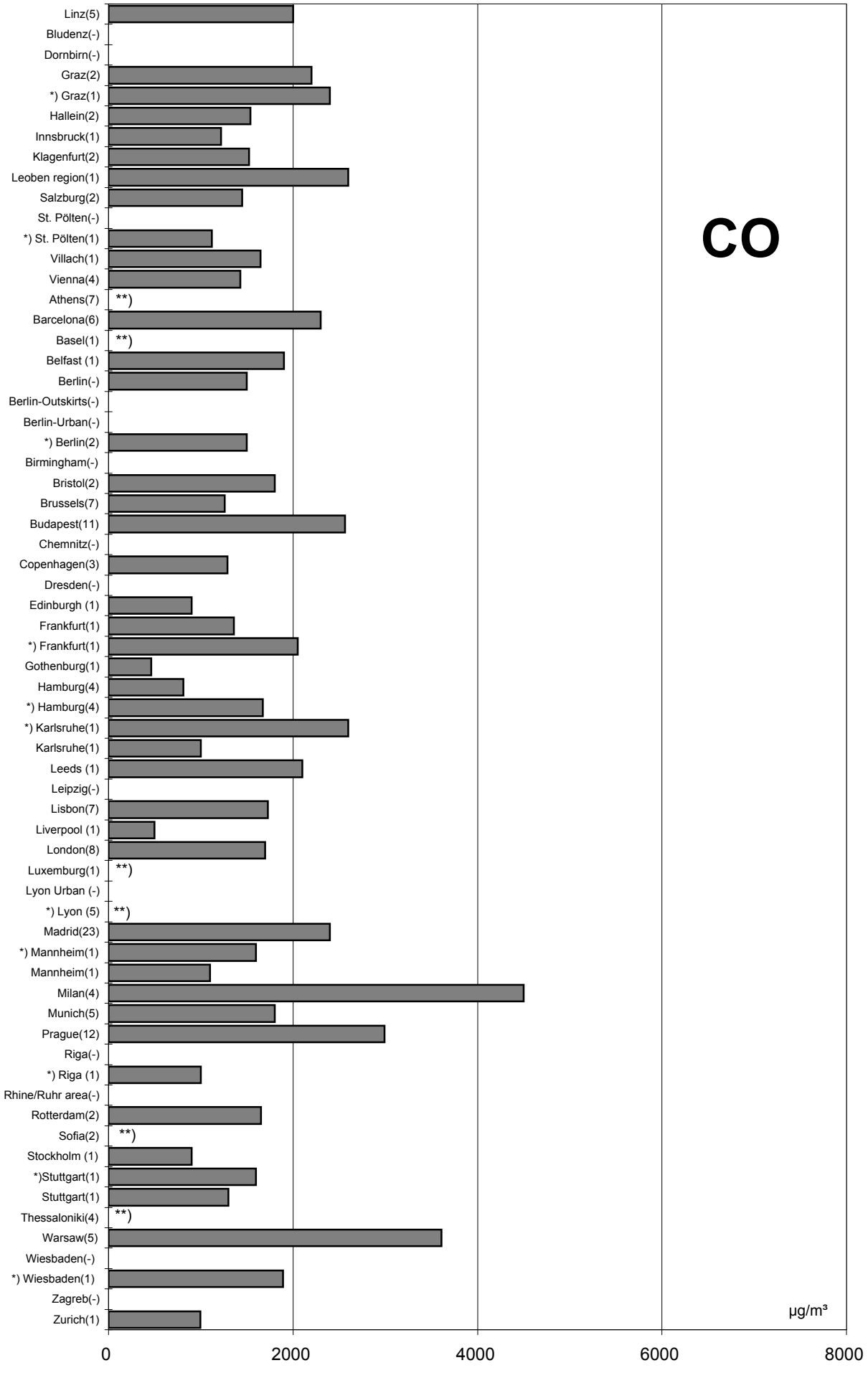
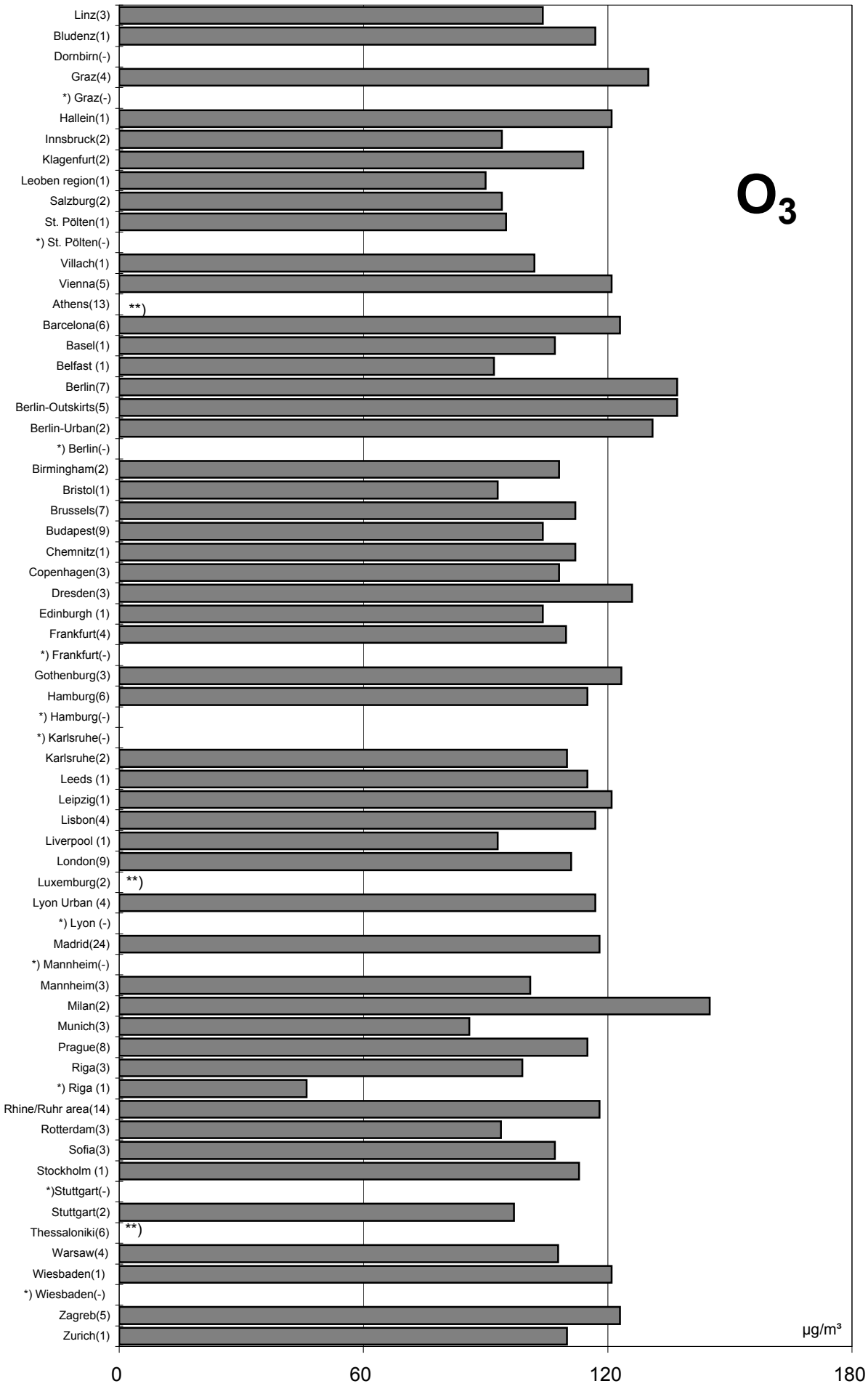


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**)no data

Luftgütevergleich

2008

max. 1h-Mittelwerte

Comparison of The Air Quality

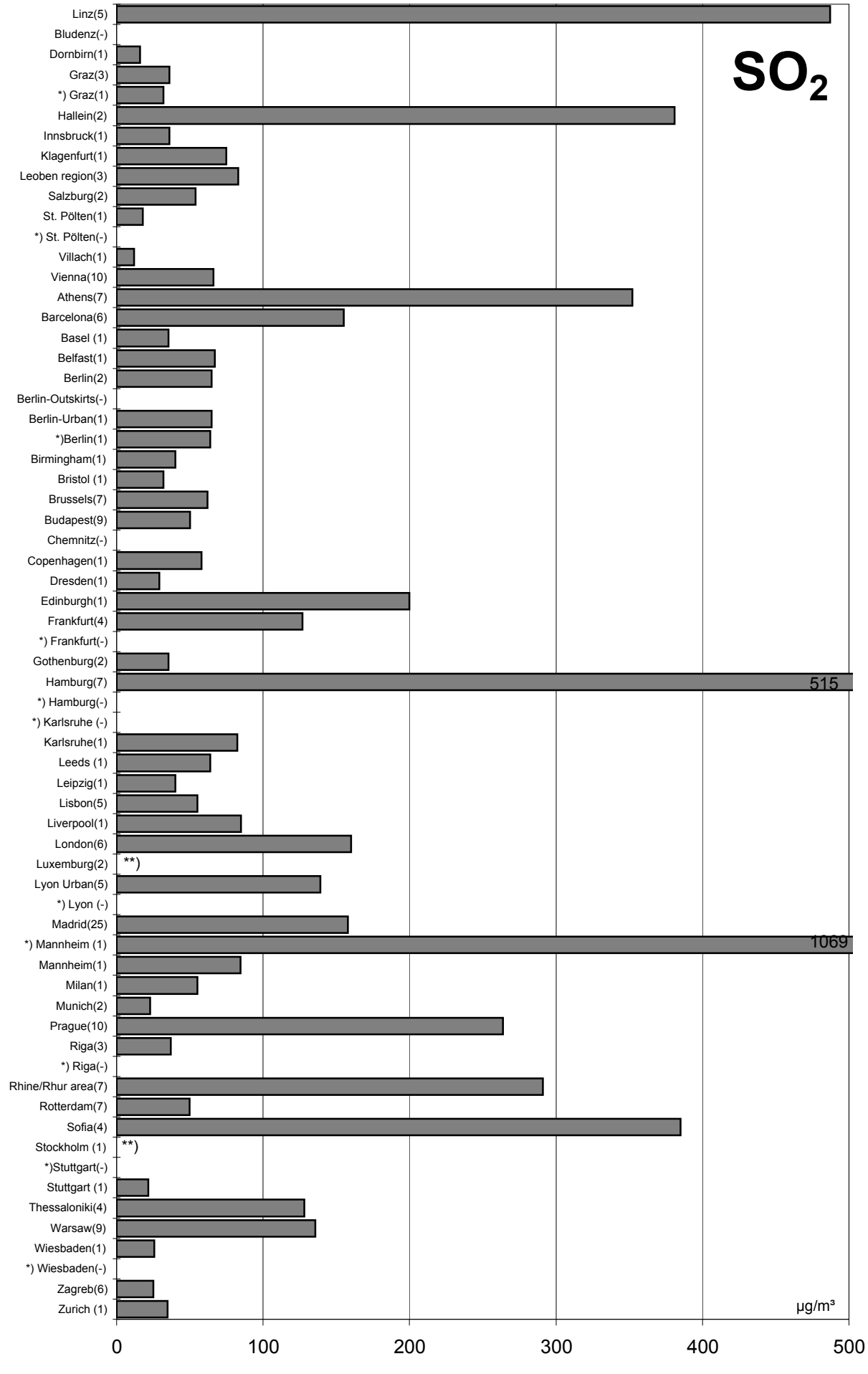
2008

Max. 1h-Mean Values

Comparison of The Air Quality in 2008

max. 1h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

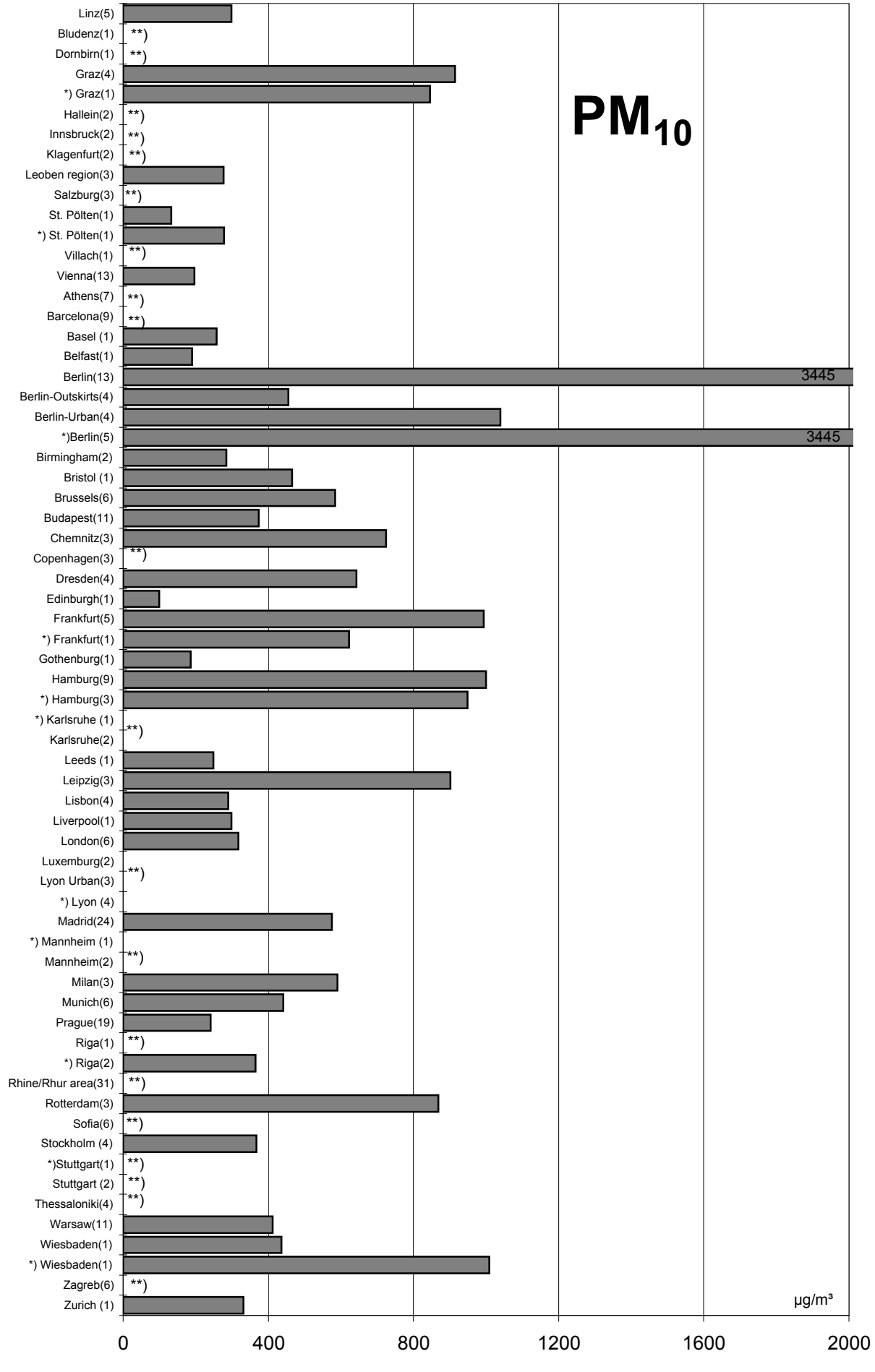


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. 1h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



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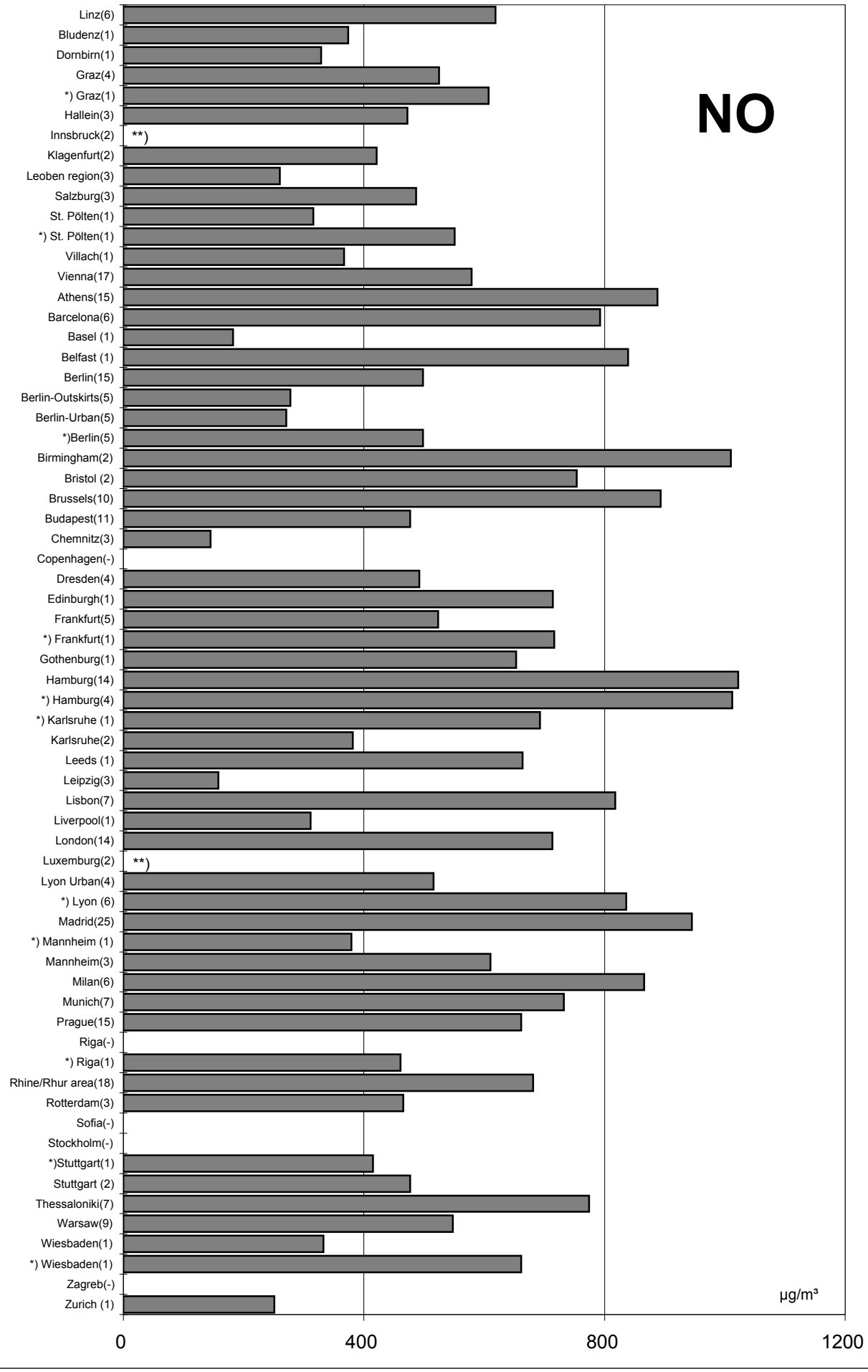
**)no data

Comparison of The Air Quality in 2008

max. 1h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

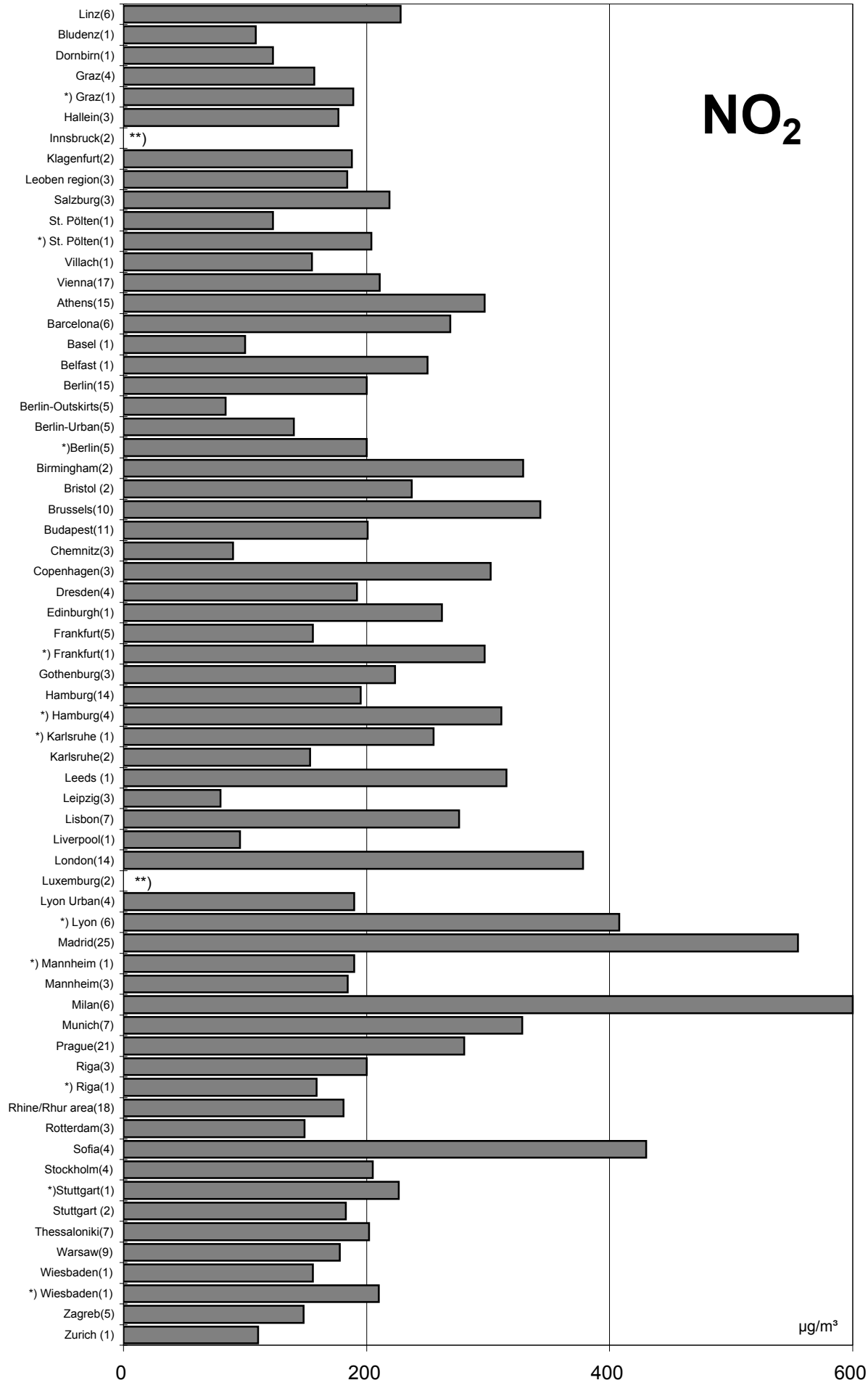


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. 1h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



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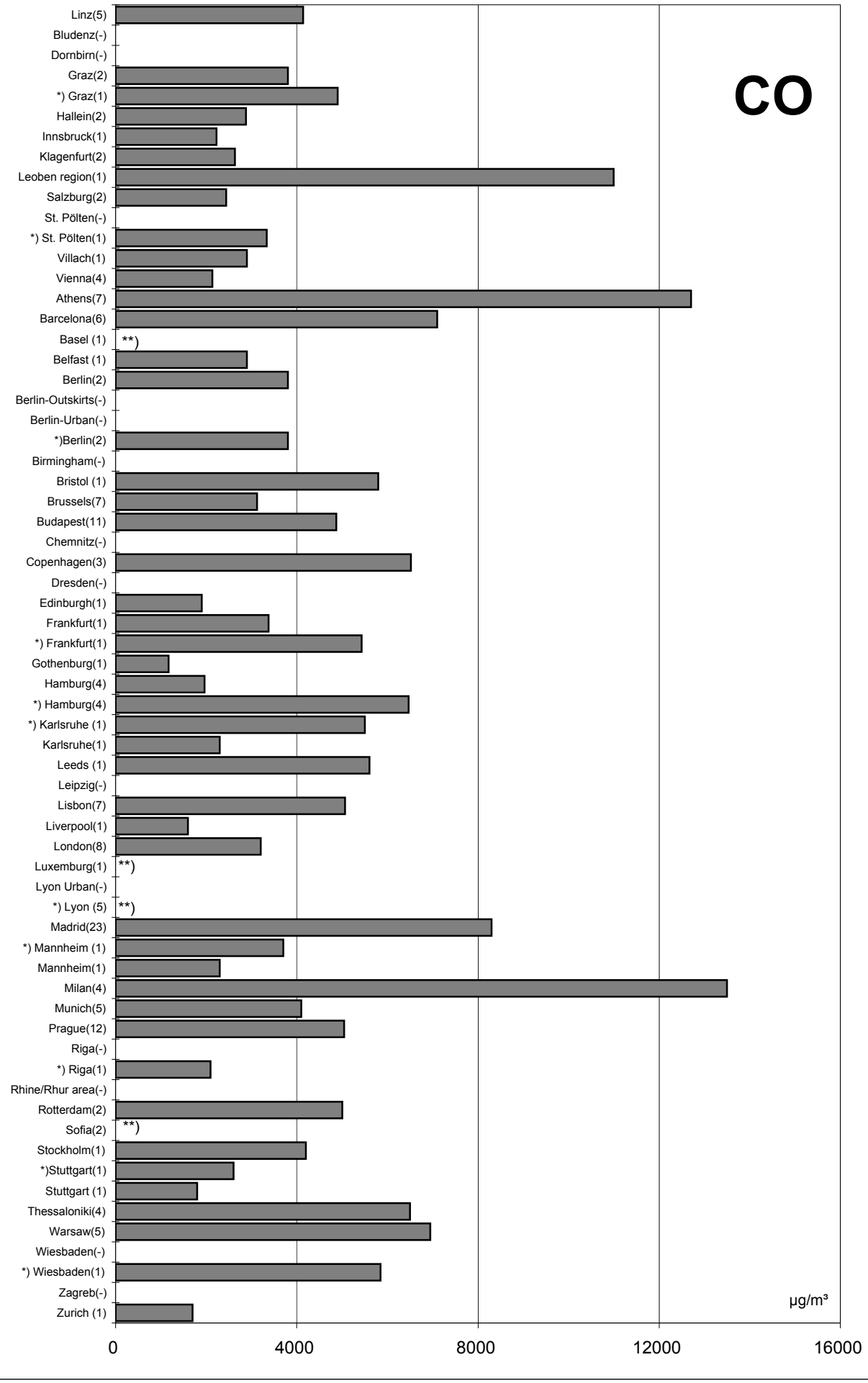
**)no data

Comparison of The Air Quality in 2008

max. 1h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

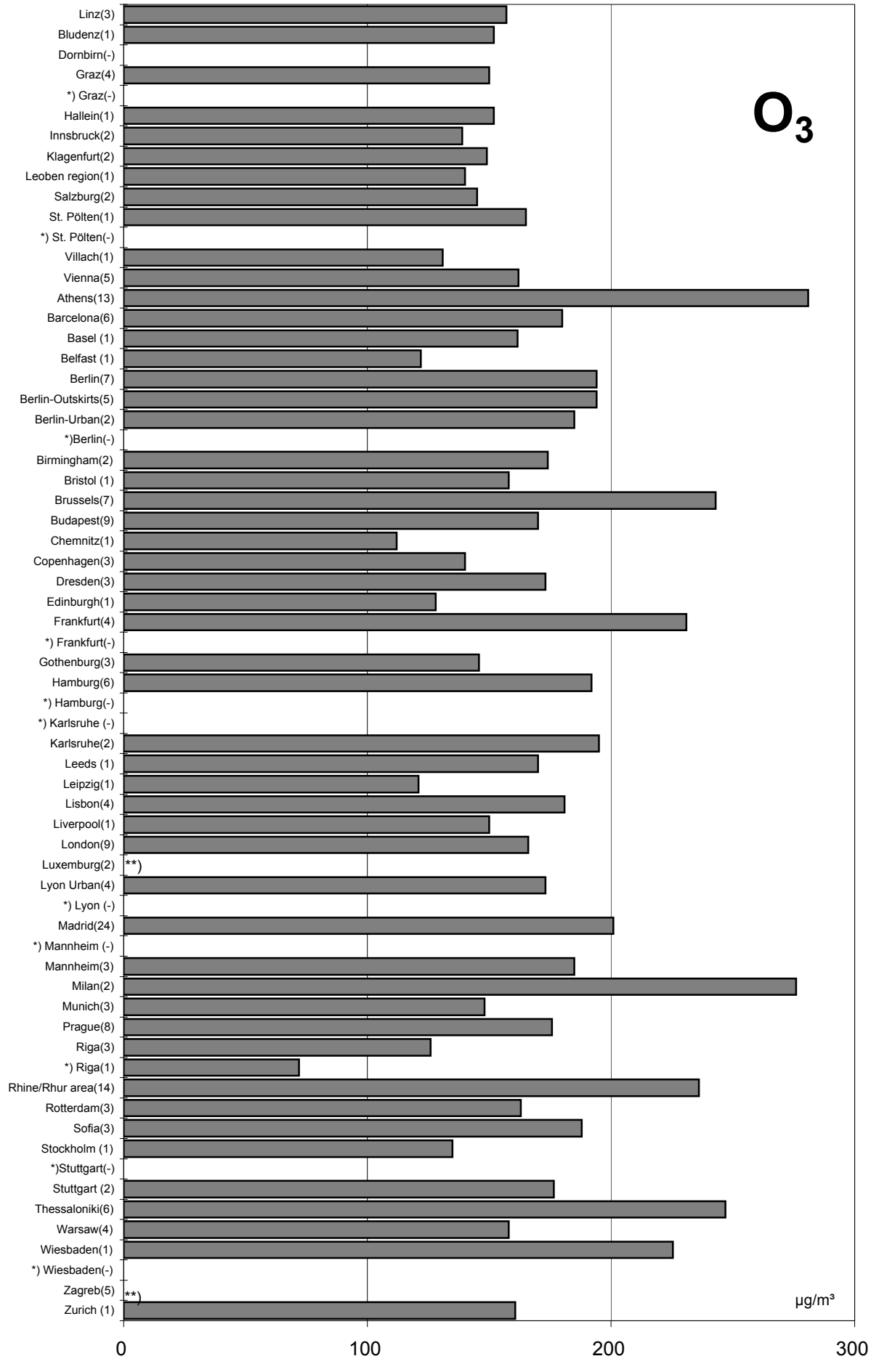


*) traffically influenced monitoring stations
**)no data

Comparison of The Air Quality in 2008

max. 1h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffically influenced monitoring stations
**)no data

Jahresvergleich

1992 - 2008

Jahresmittelwerte

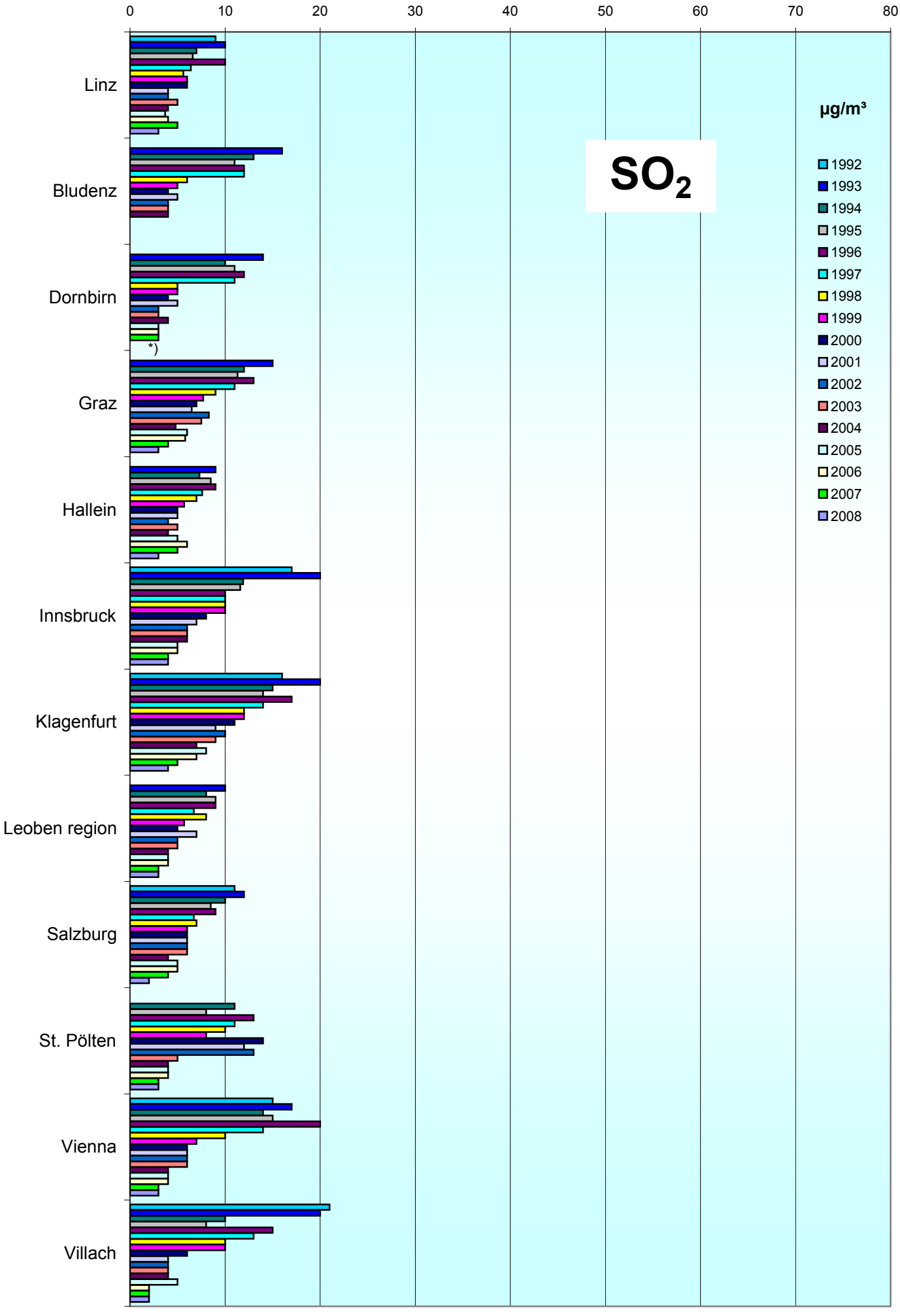
Comparison of The Air Quality Over The Years

1992 - 2008

Annual Mean Values

Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



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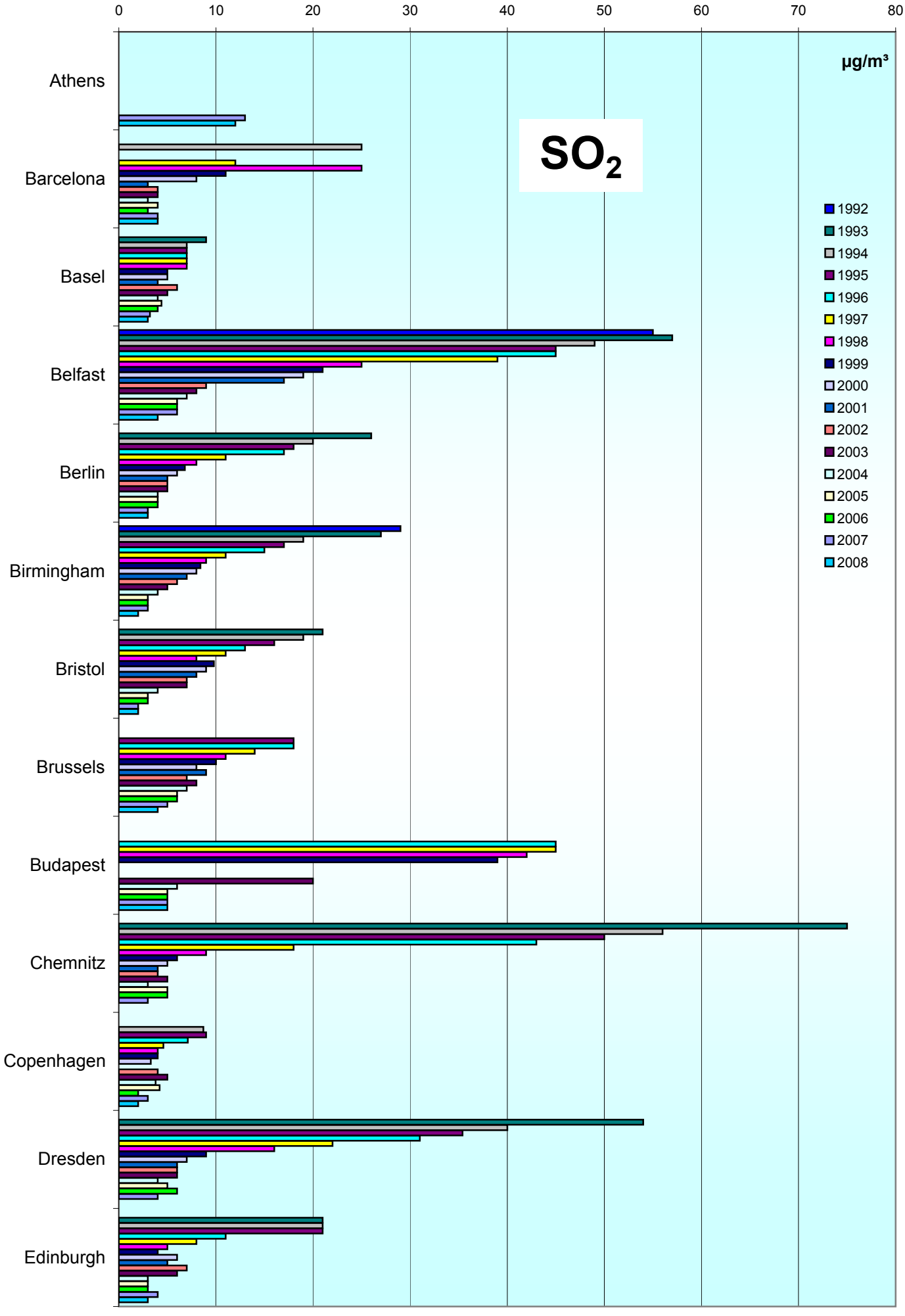
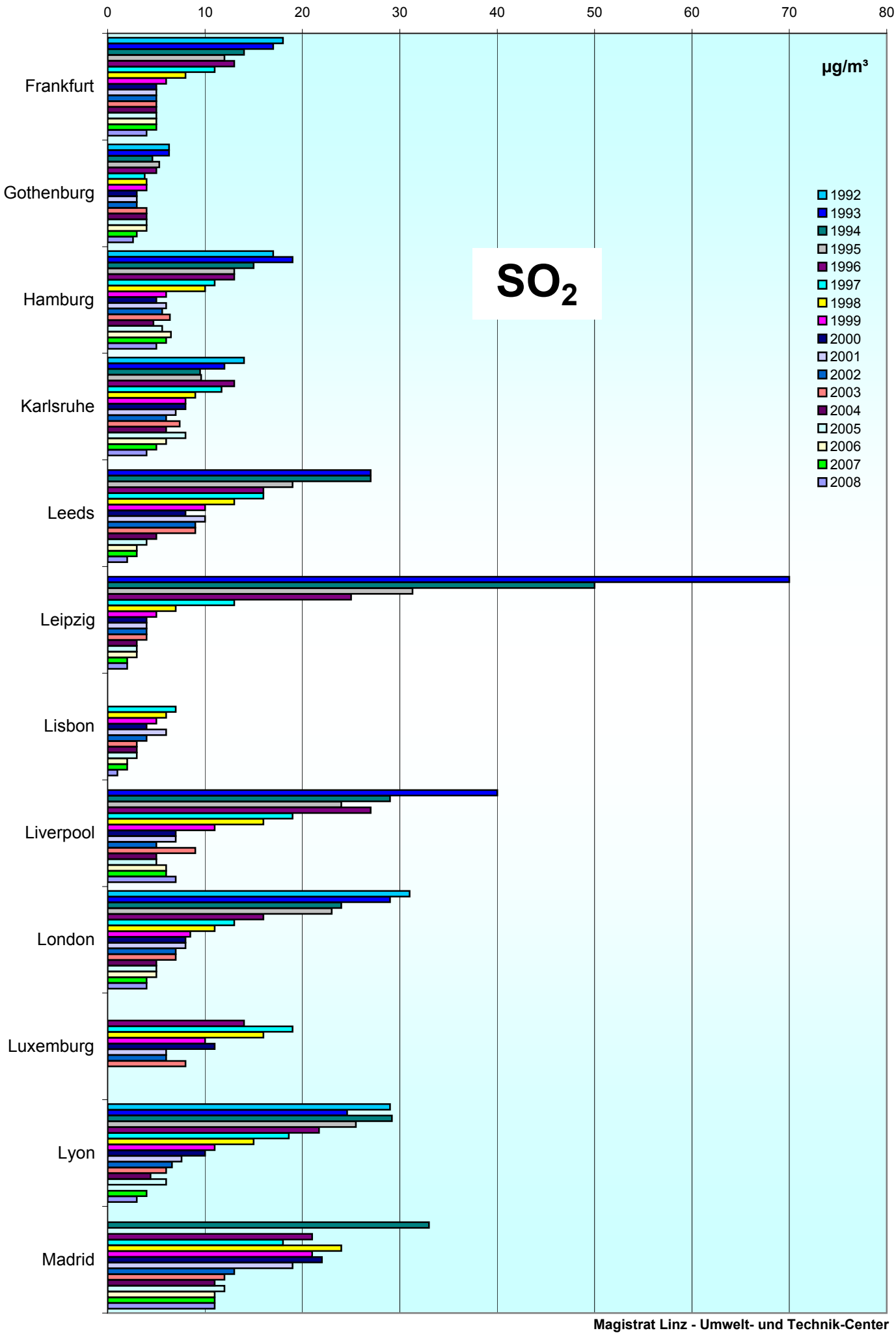
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



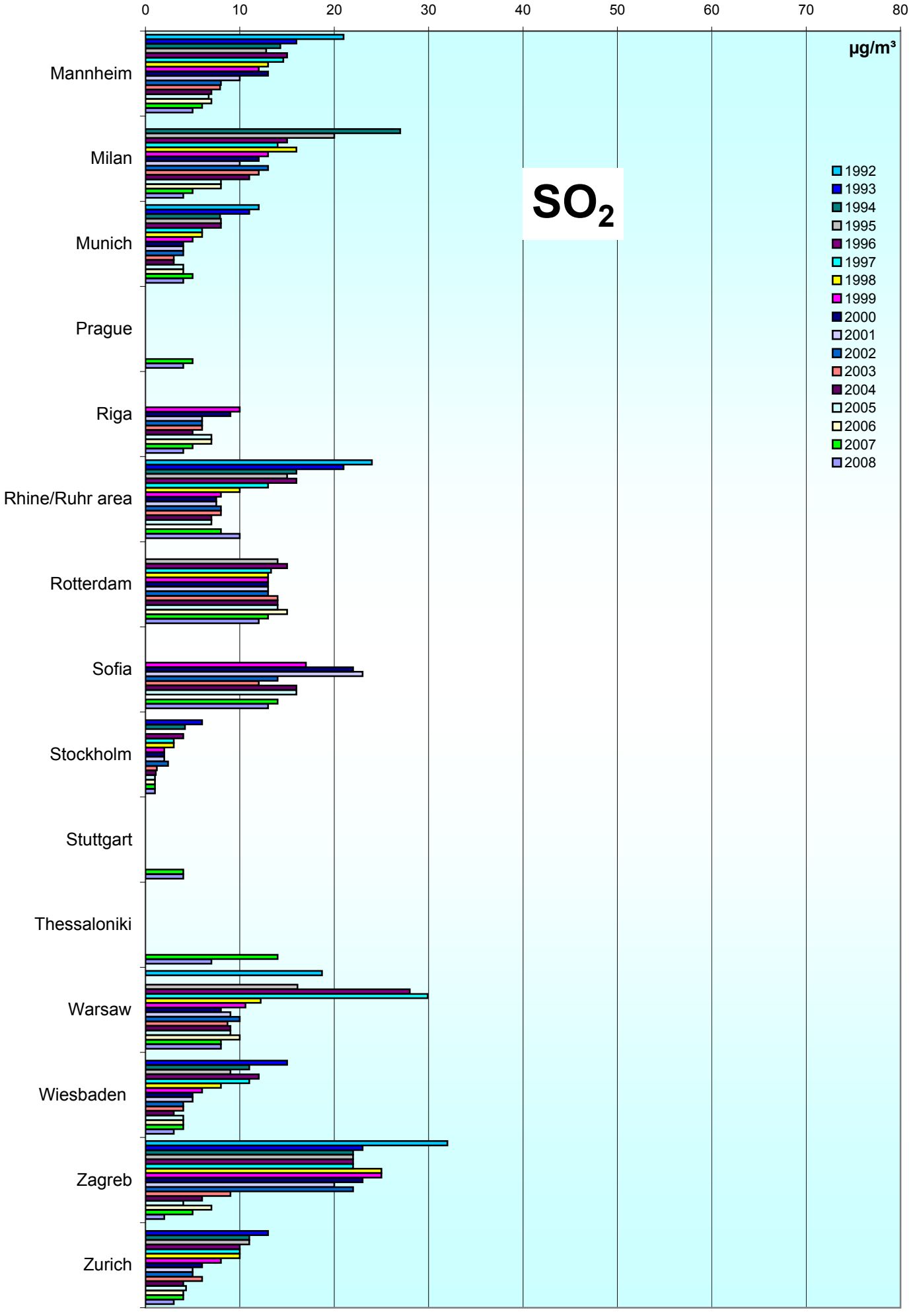
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



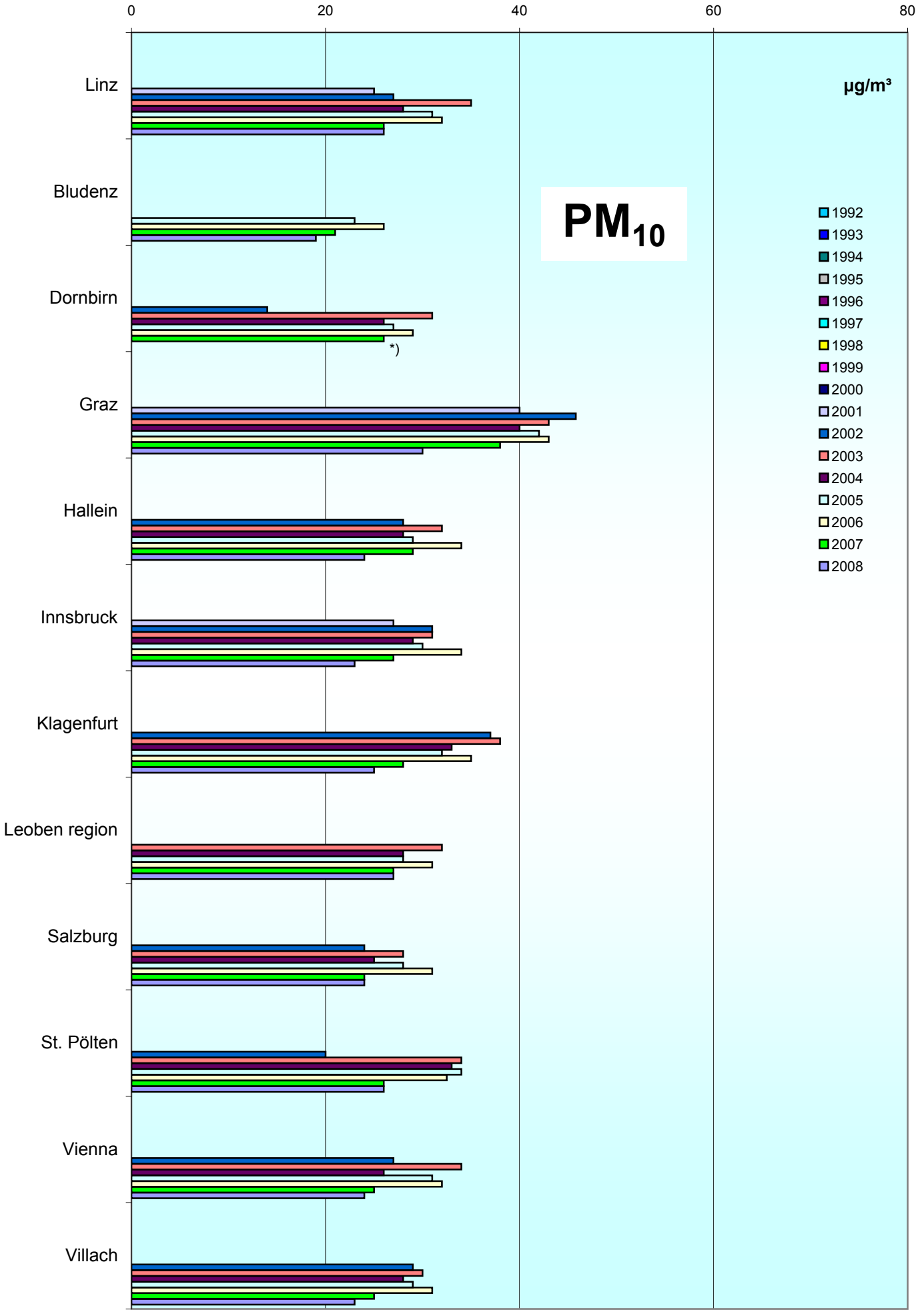
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



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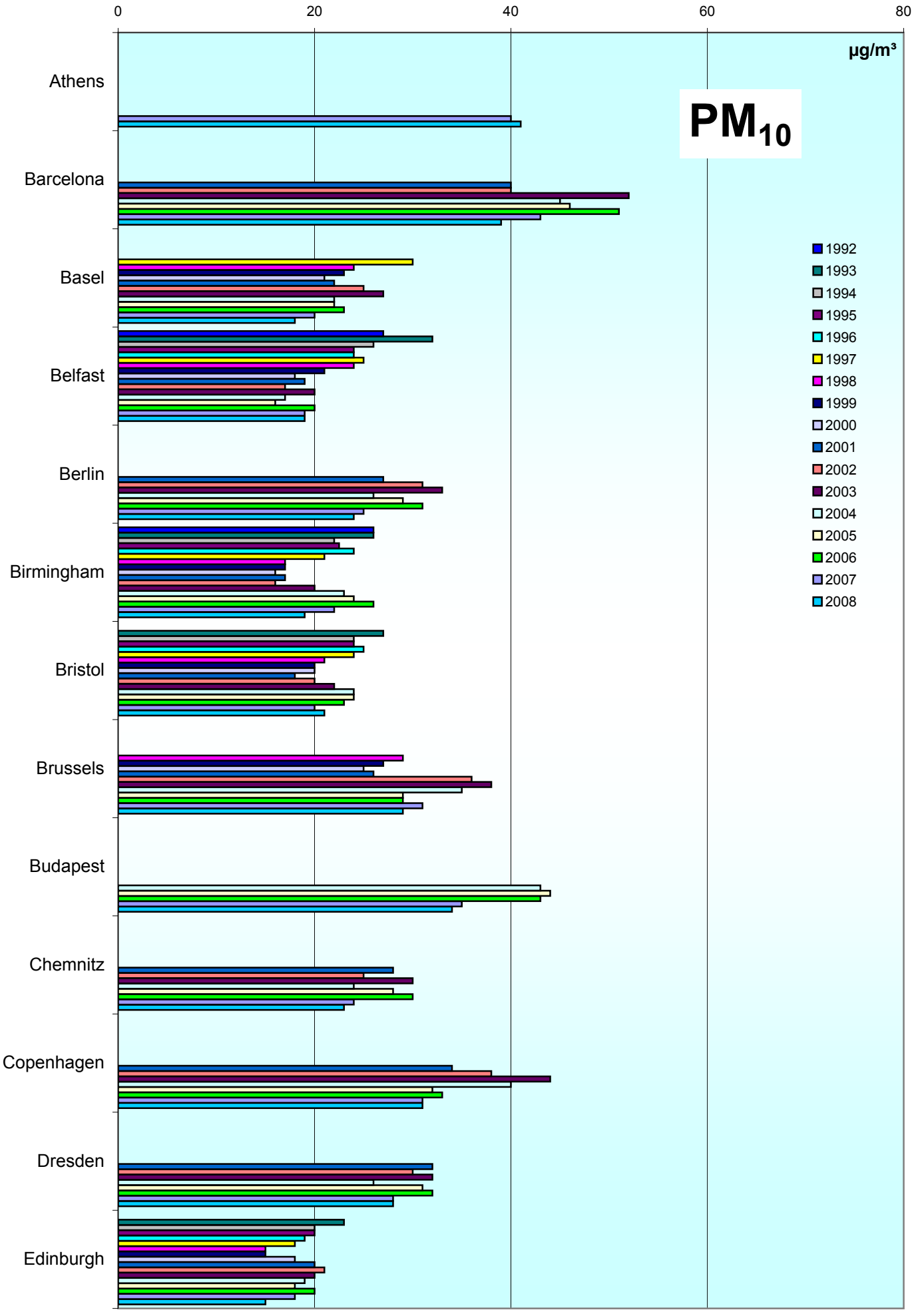
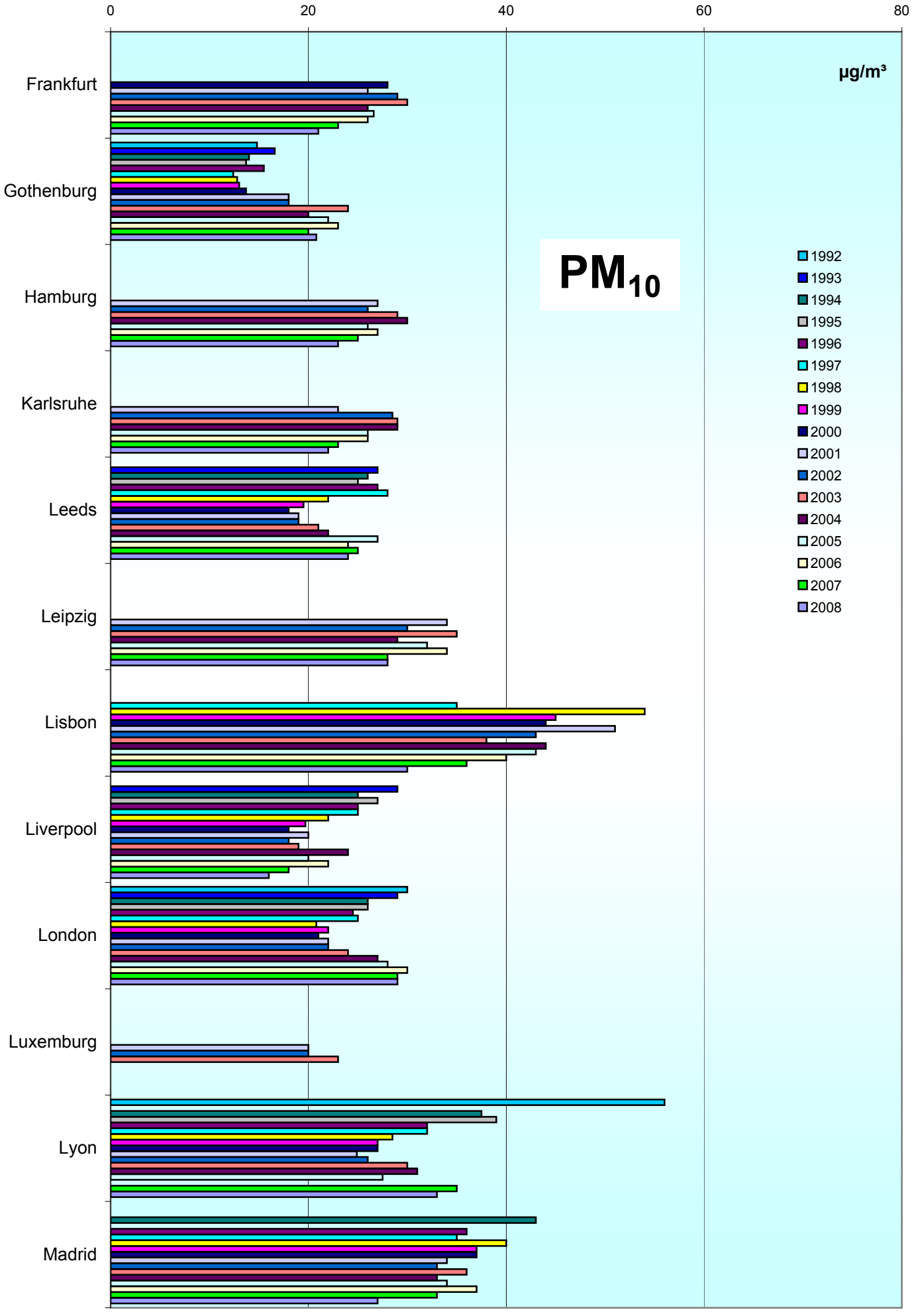
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



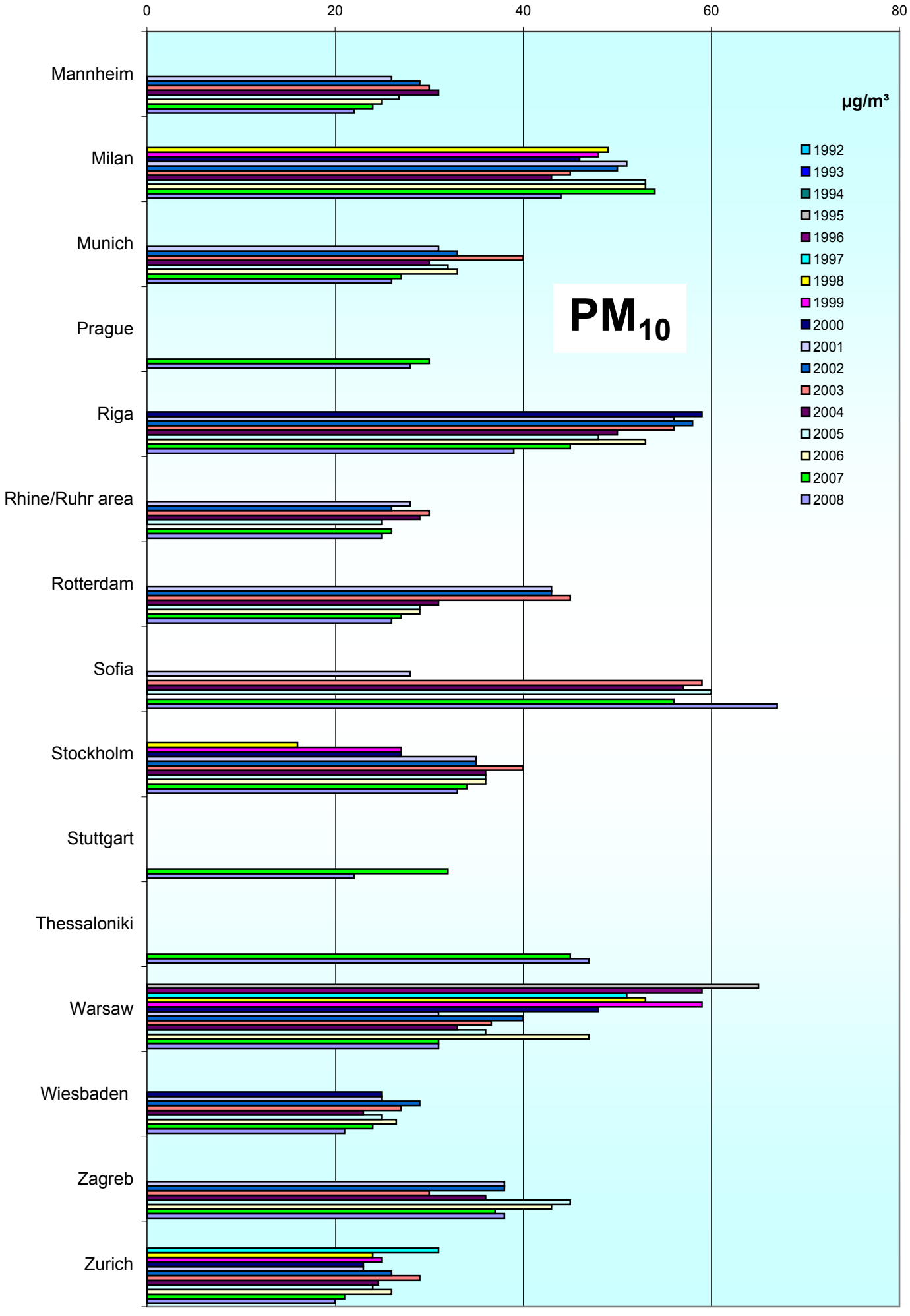
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



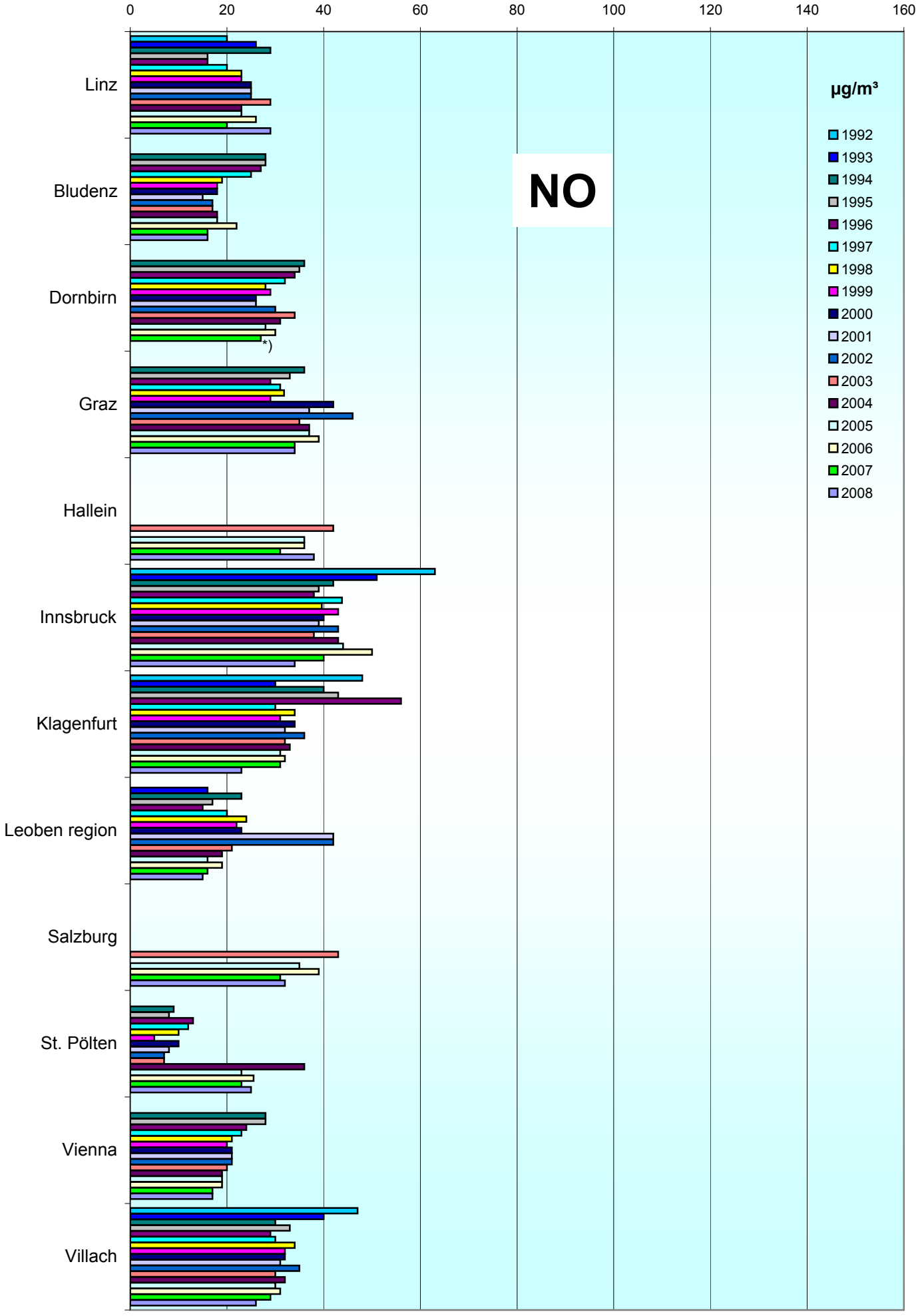
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



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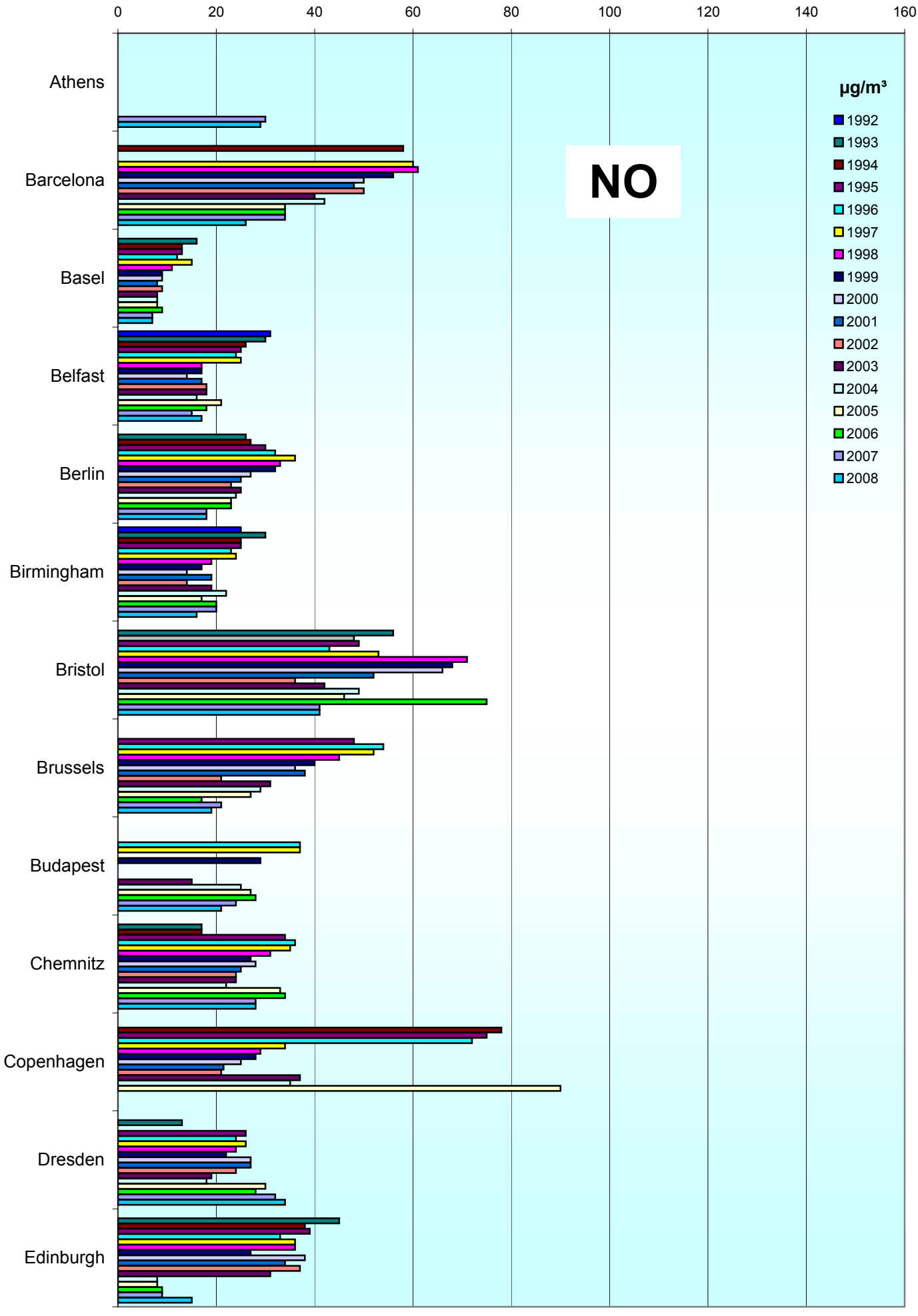
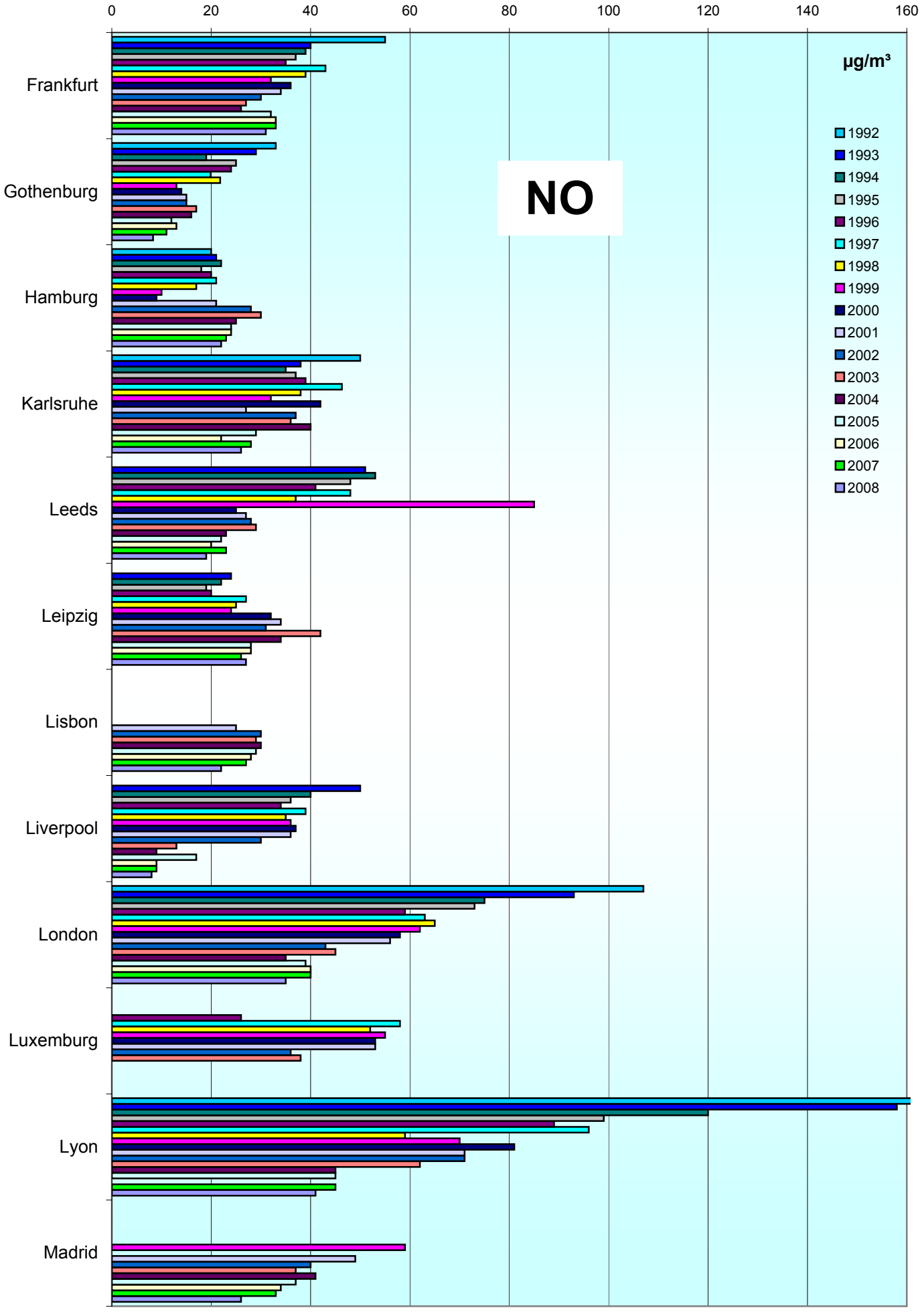
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



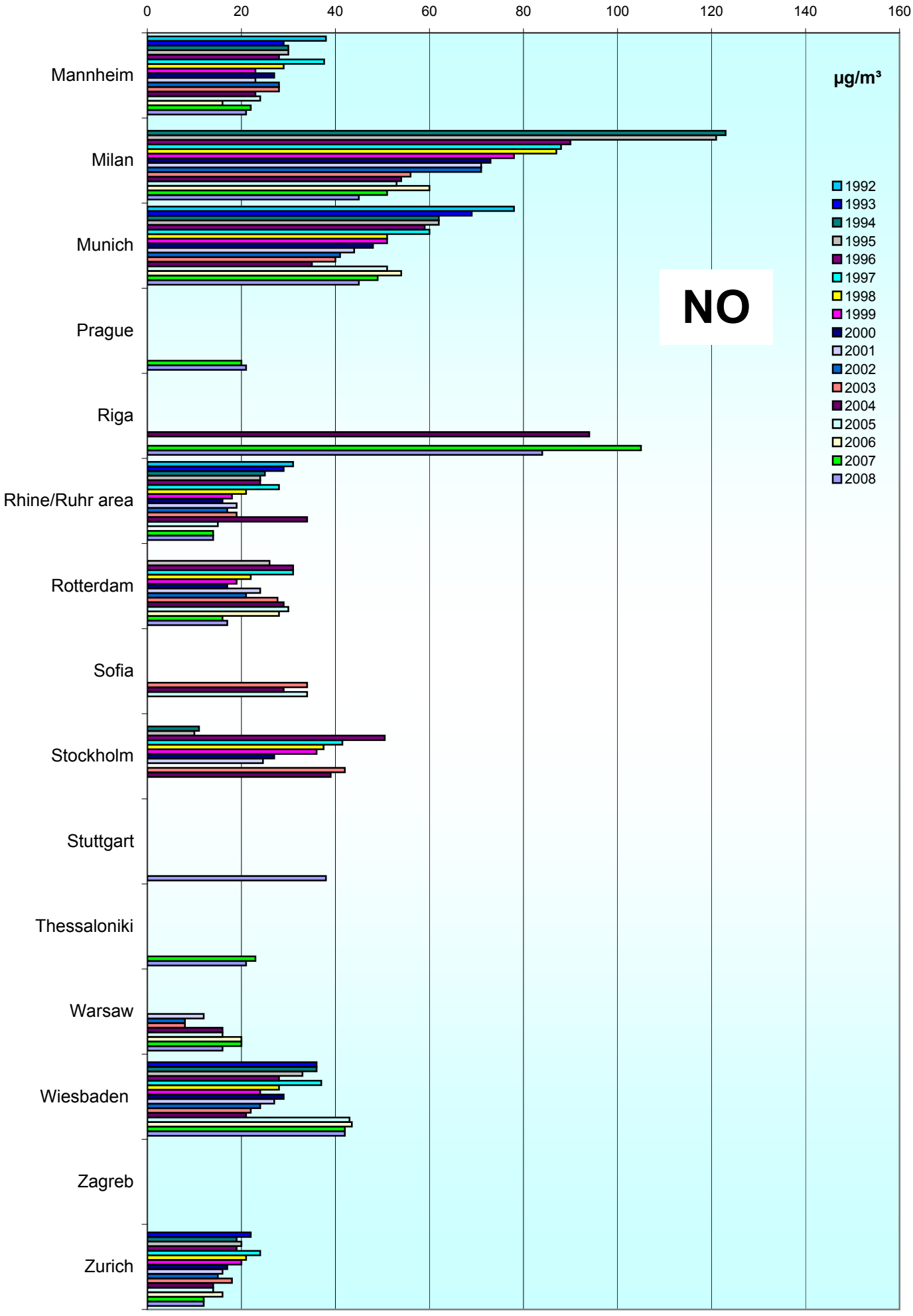
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



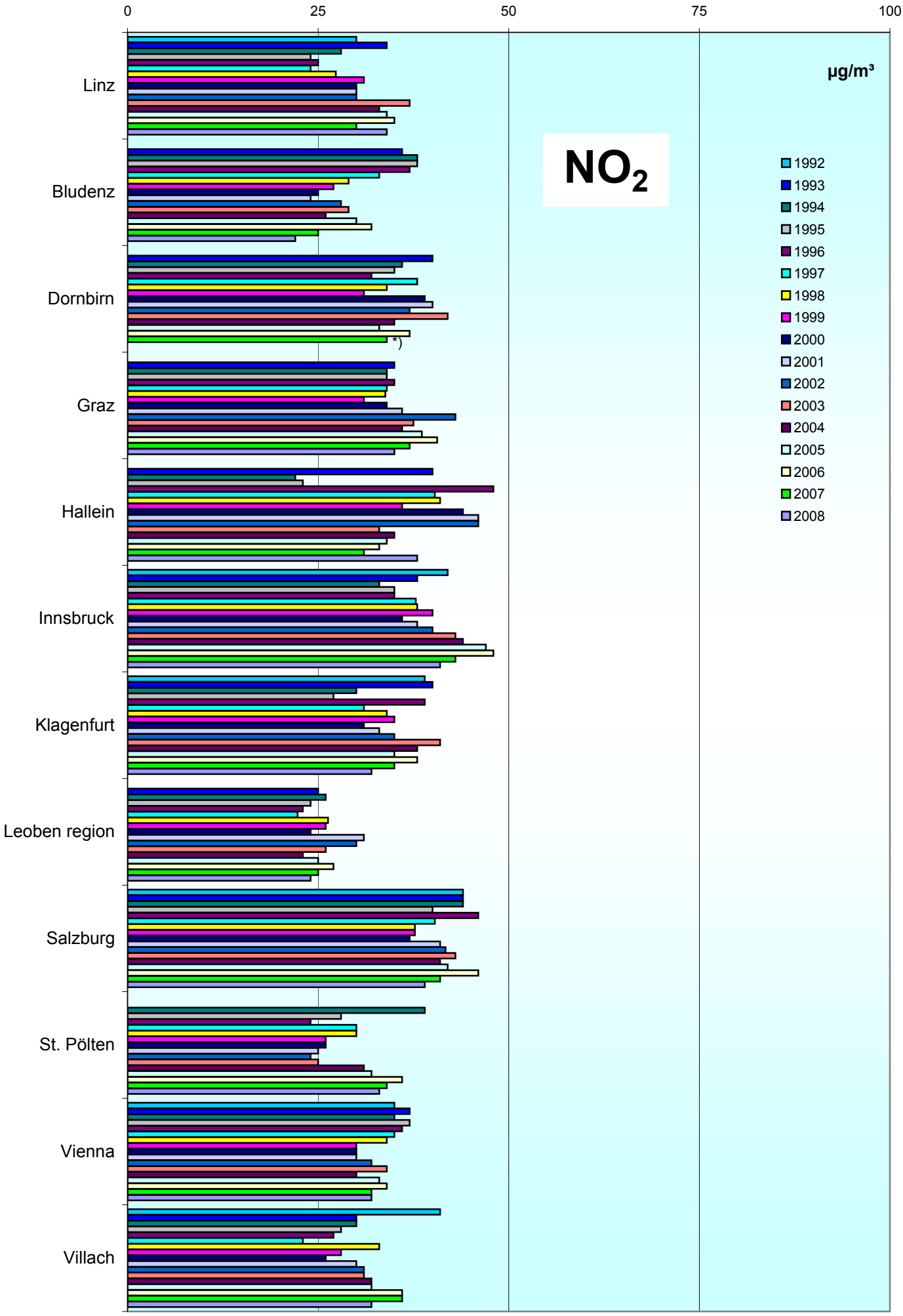
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



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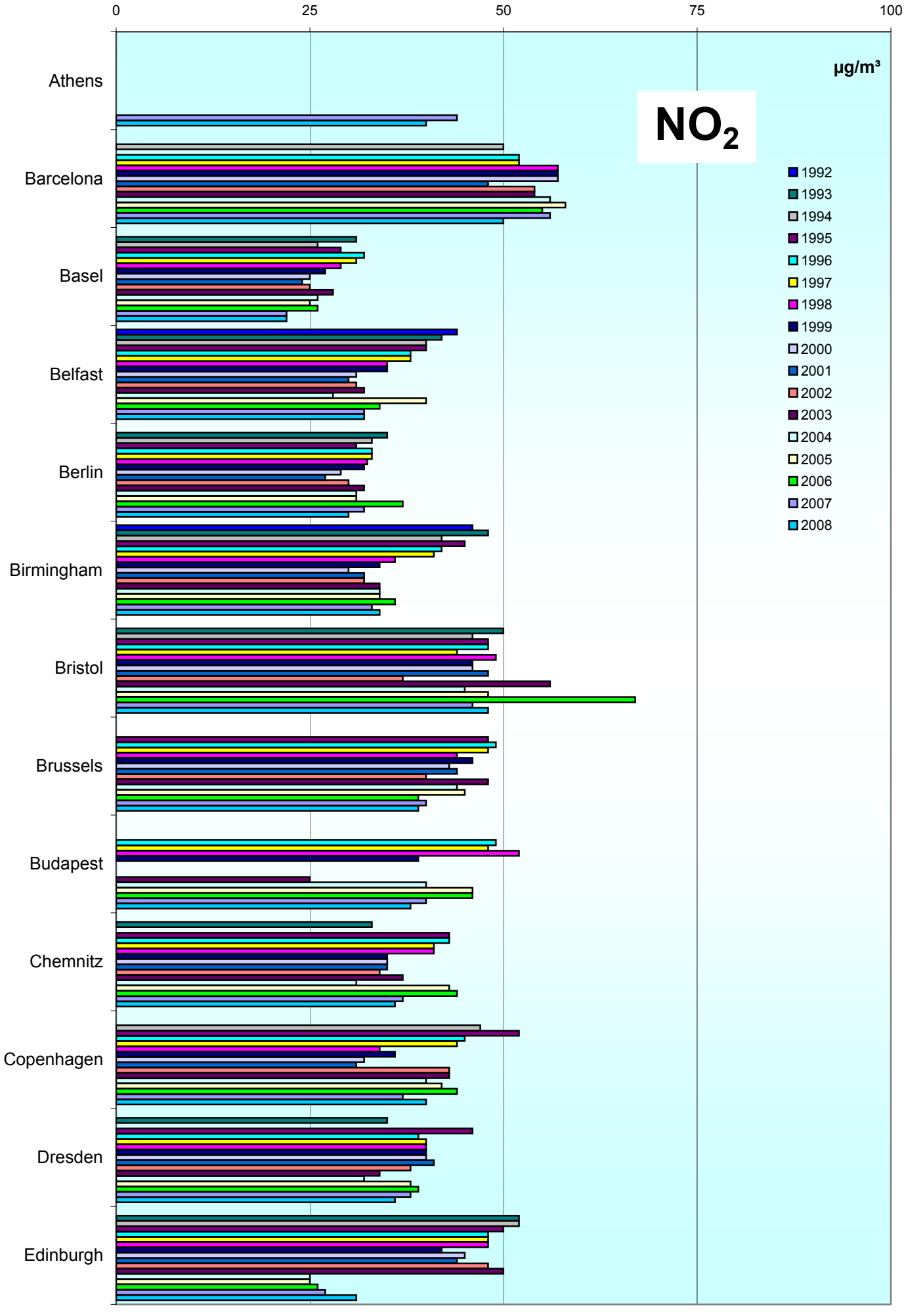
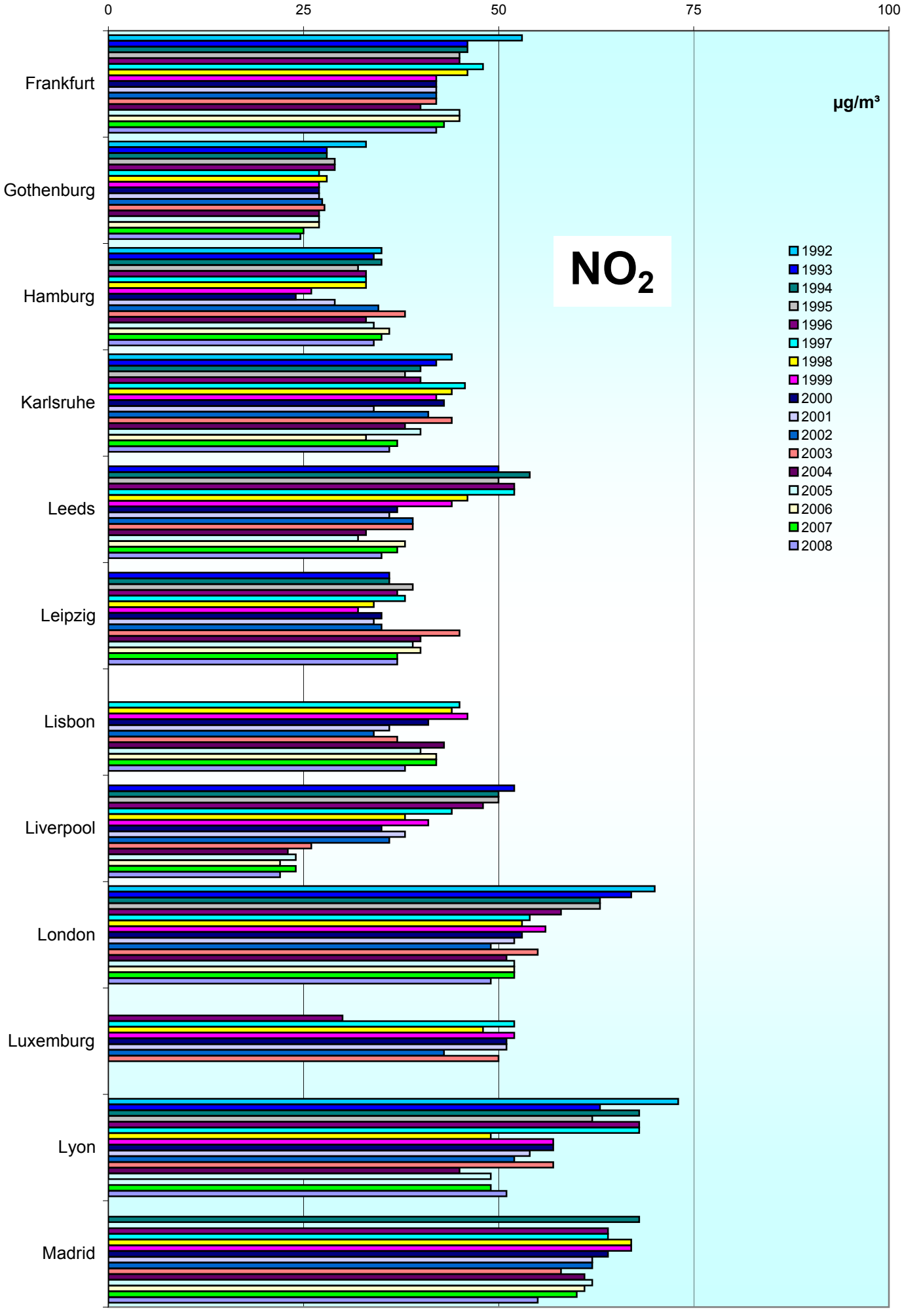
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



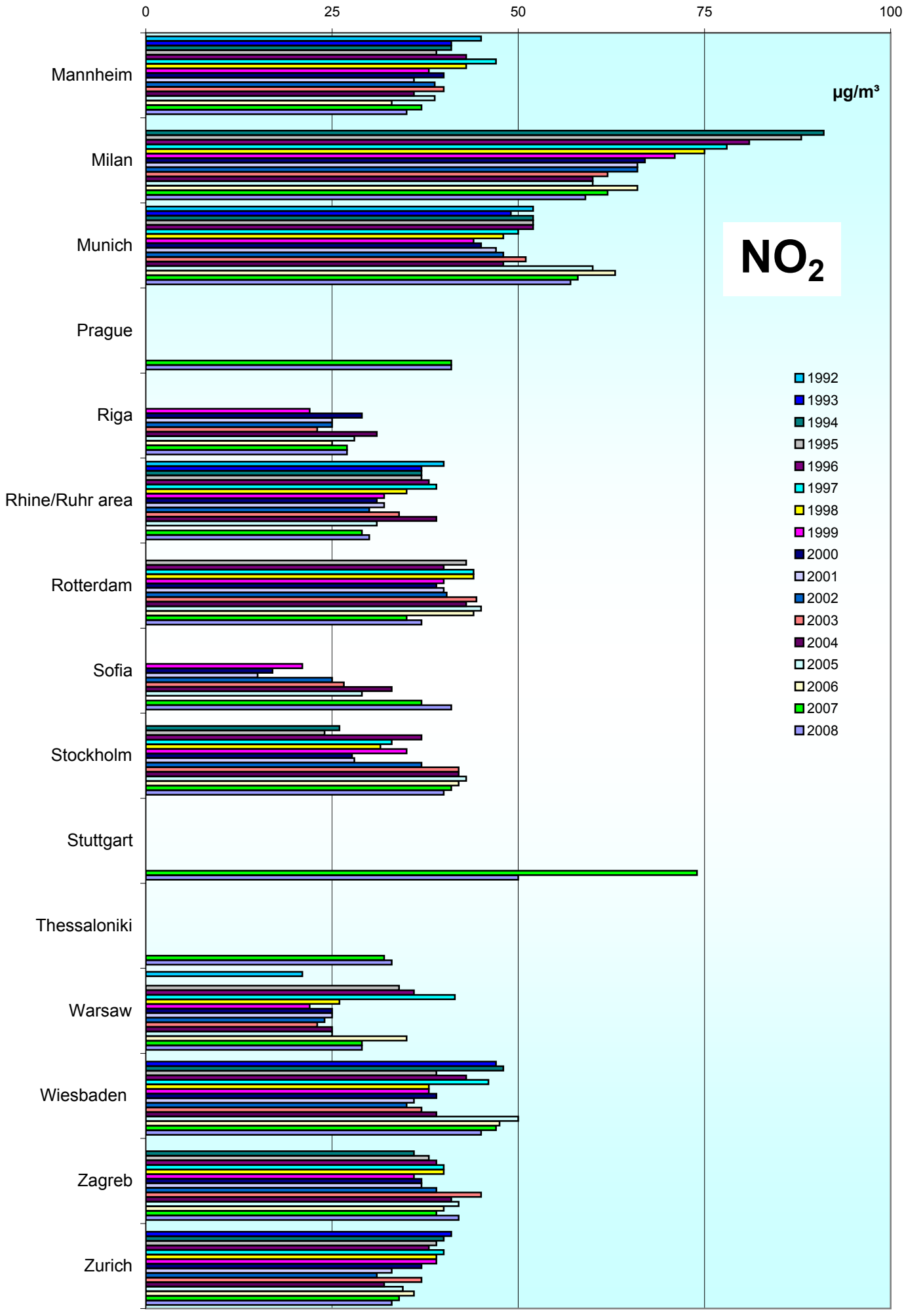
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



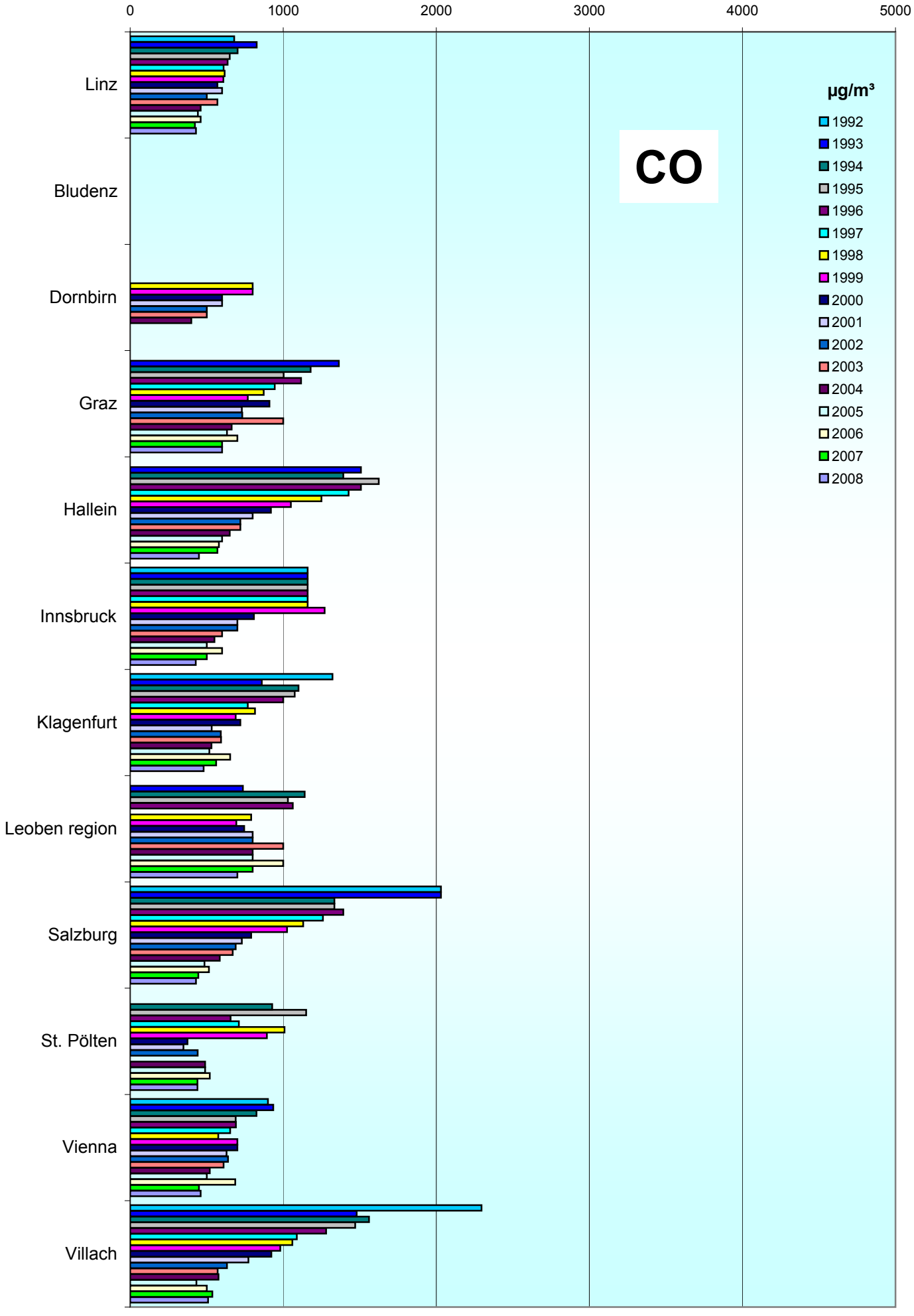
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



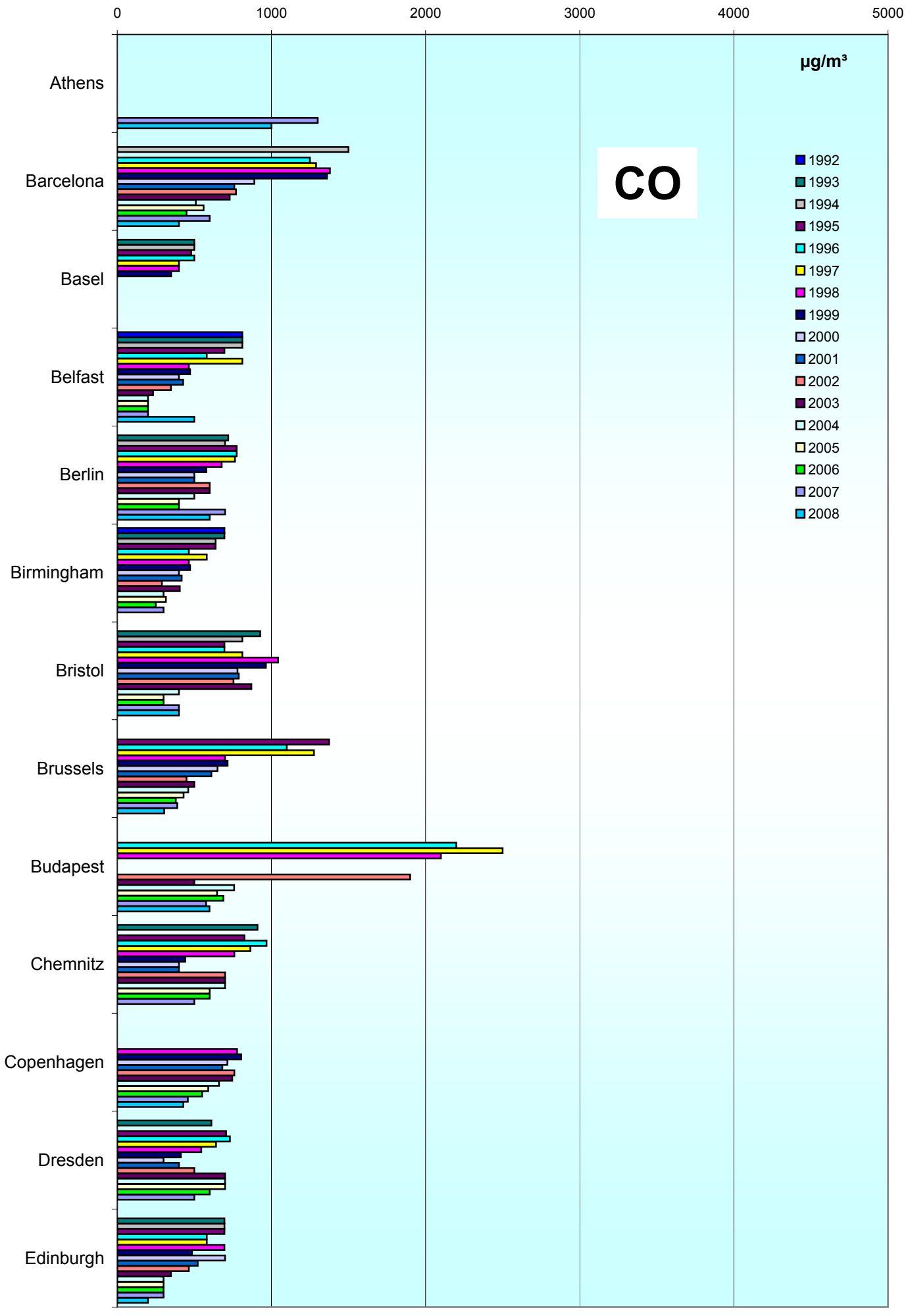
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



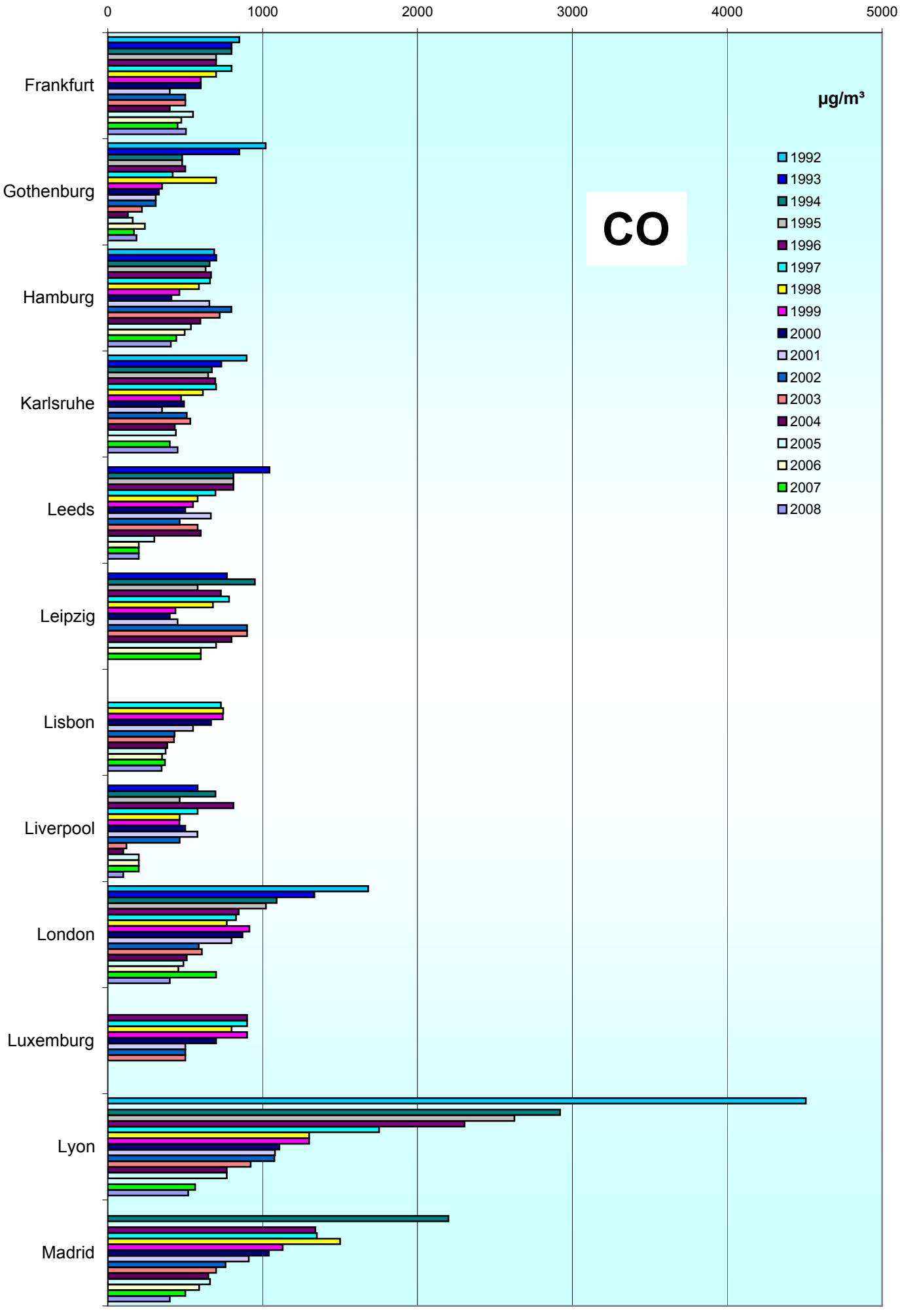
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



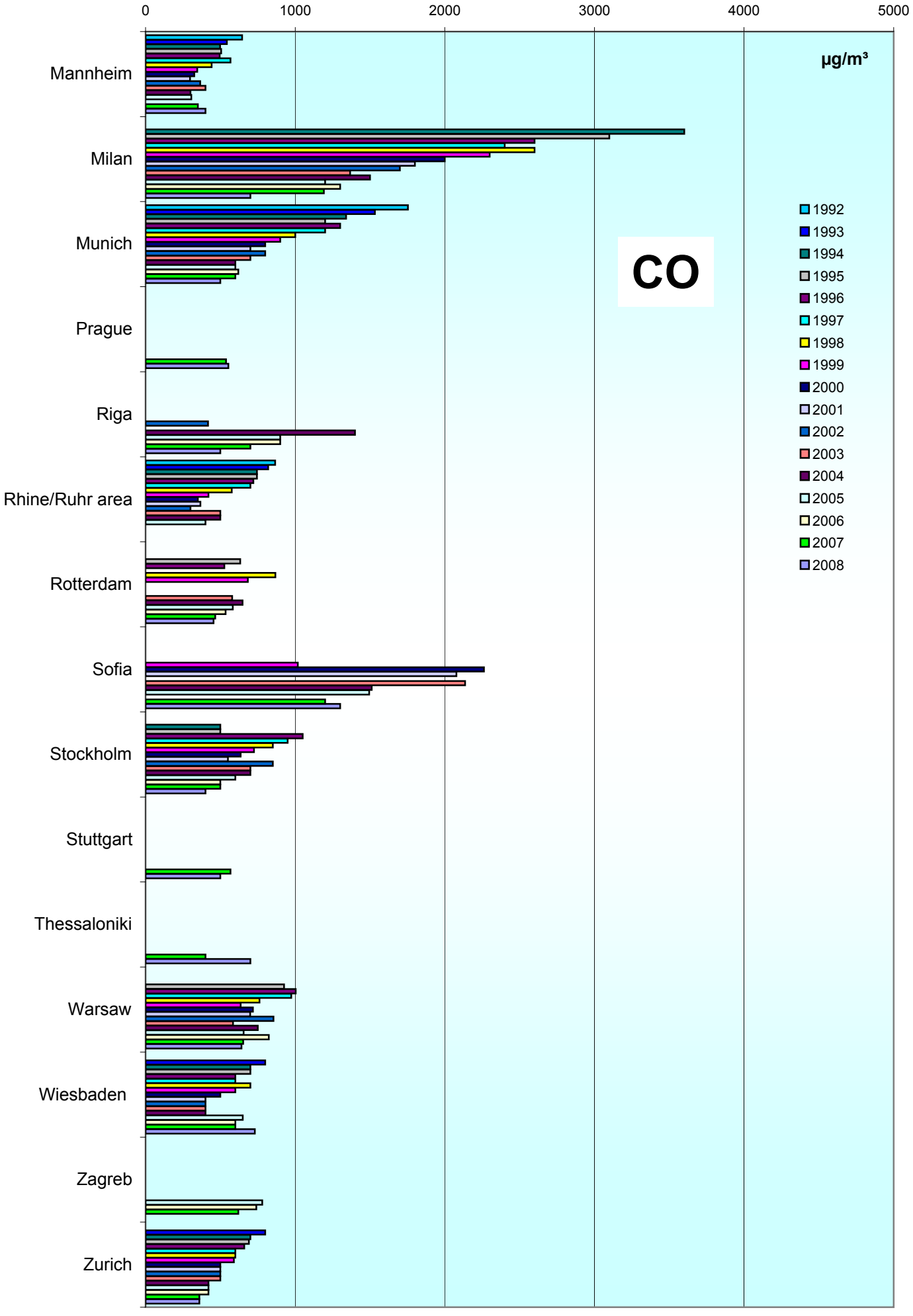
Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2008

Annual mean values (mean of all monitoring stations)



Jahresvergleich

1992 - 2008

max. Tagesmittelwerte

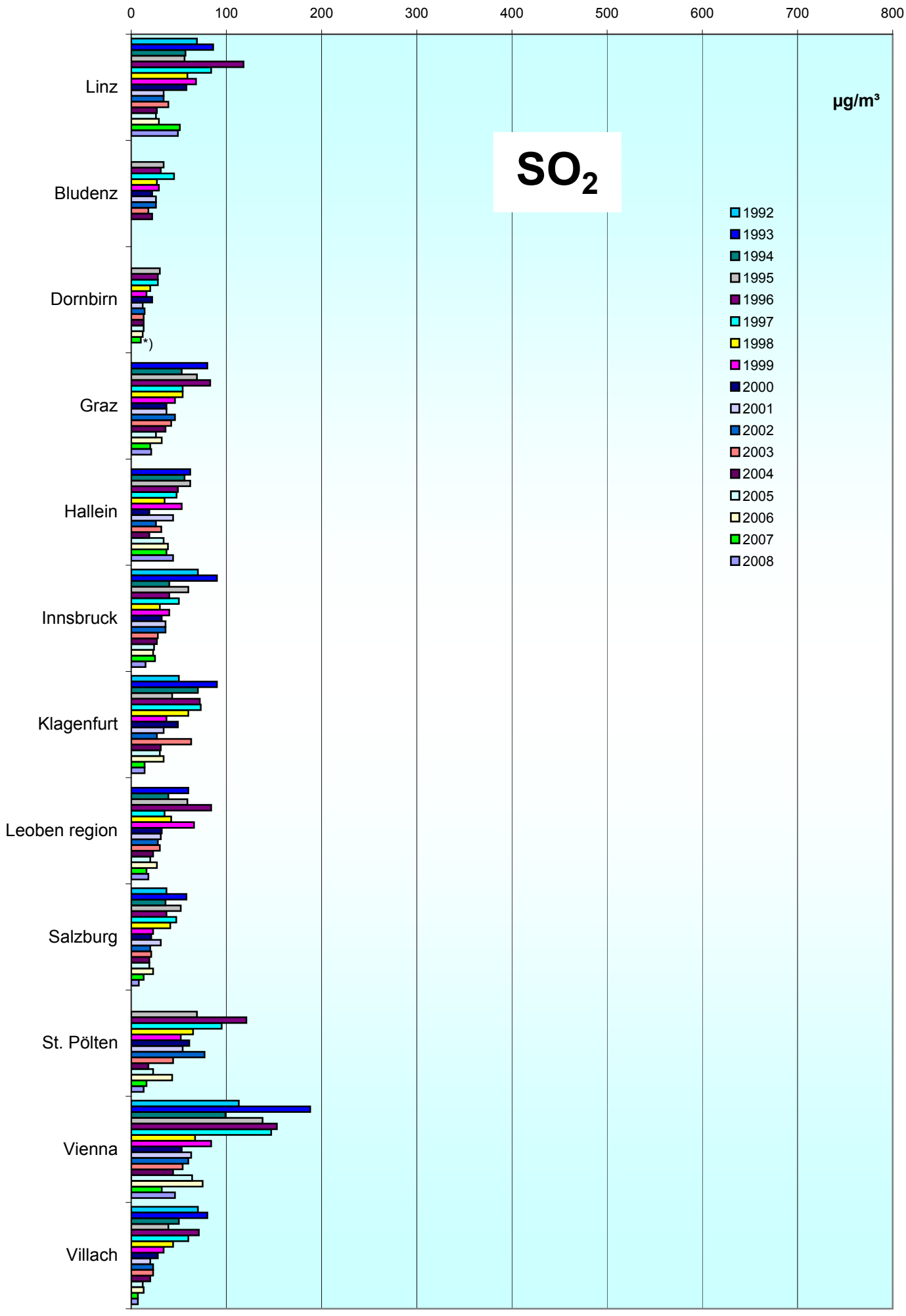
Comparison of The Air Quality Over The Years

1992 - 2008

Max. Daily Mean Values

Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



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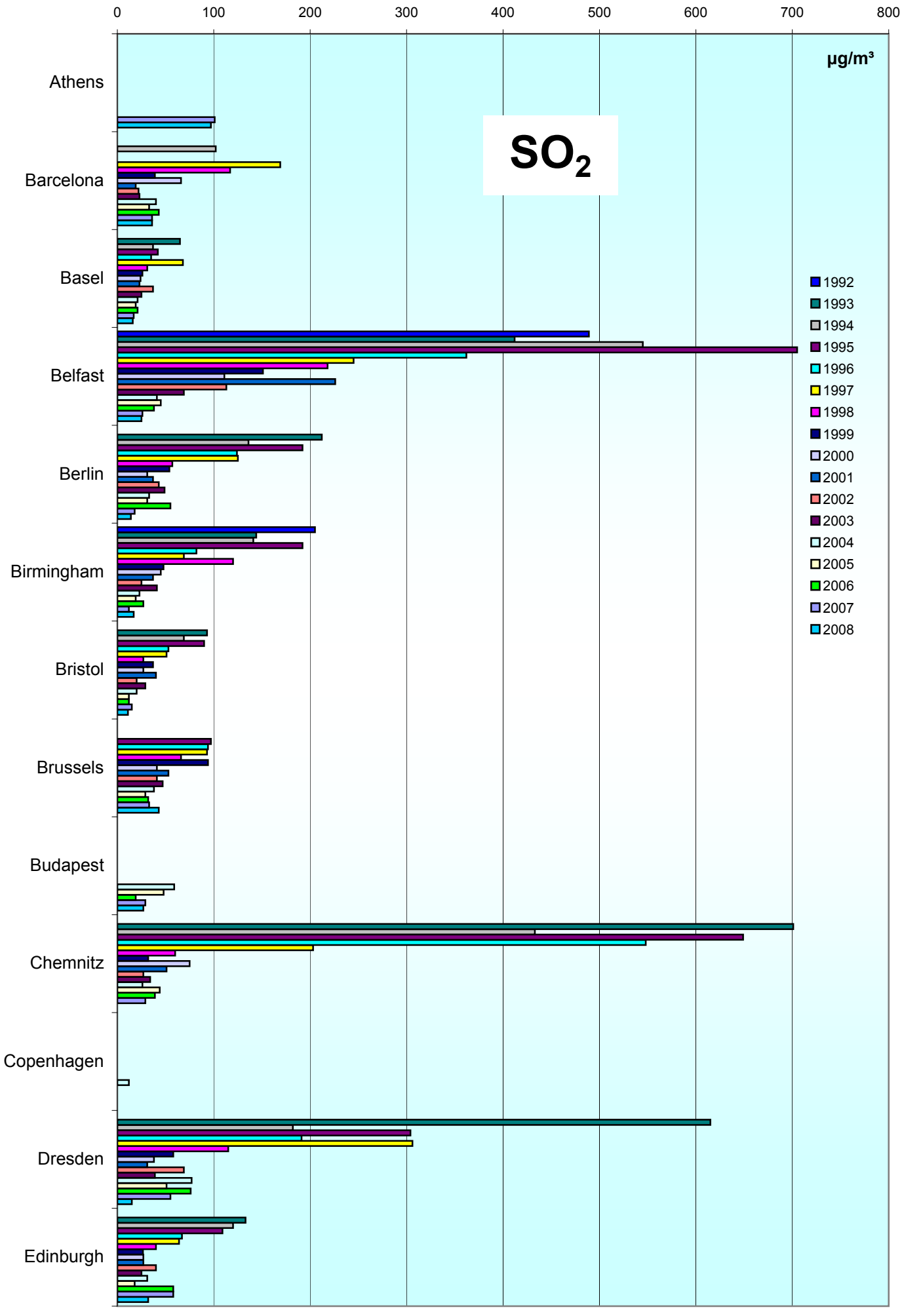
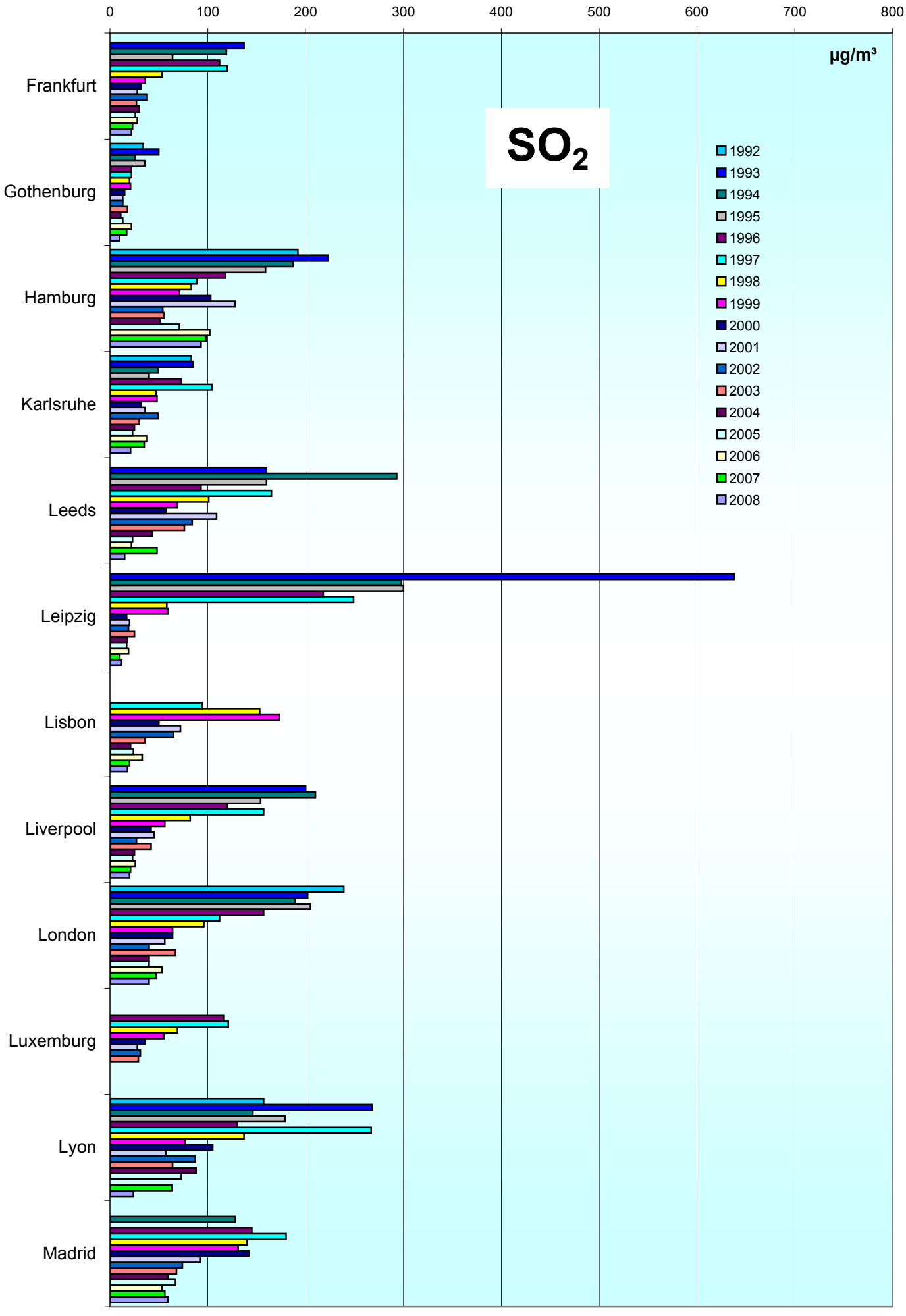
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



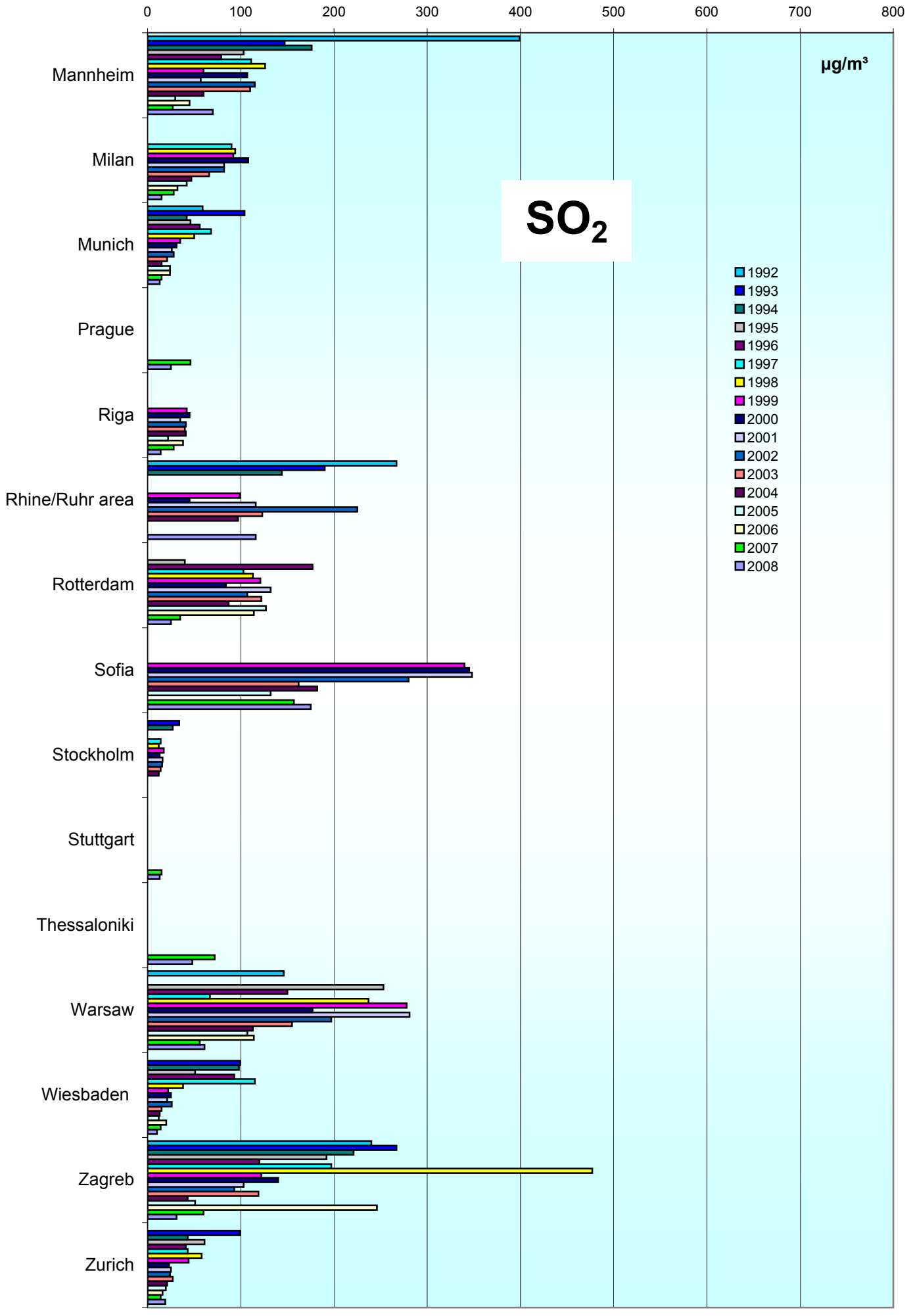
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



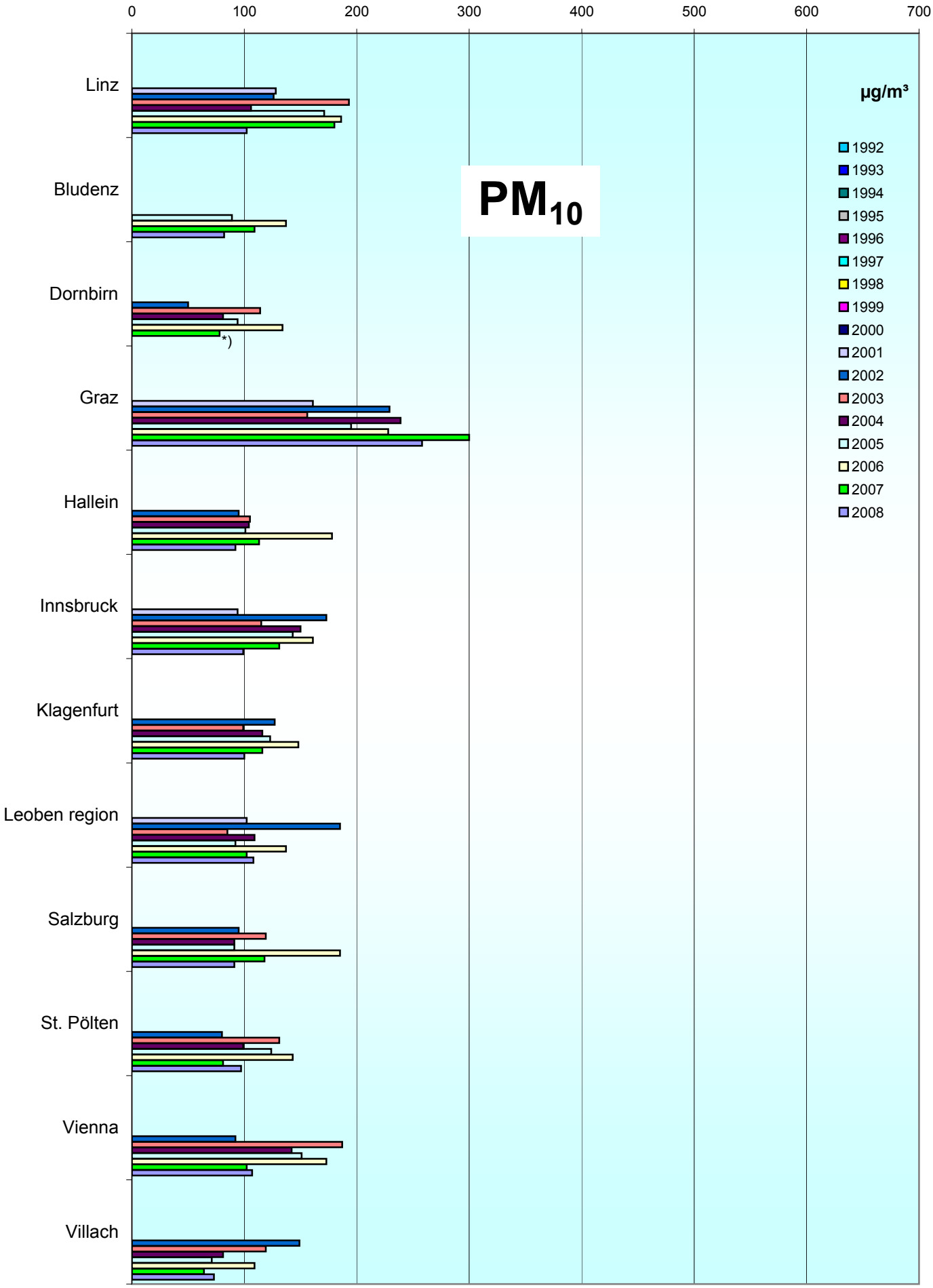
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



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Comparison of The Air Quality 1992 - 2008

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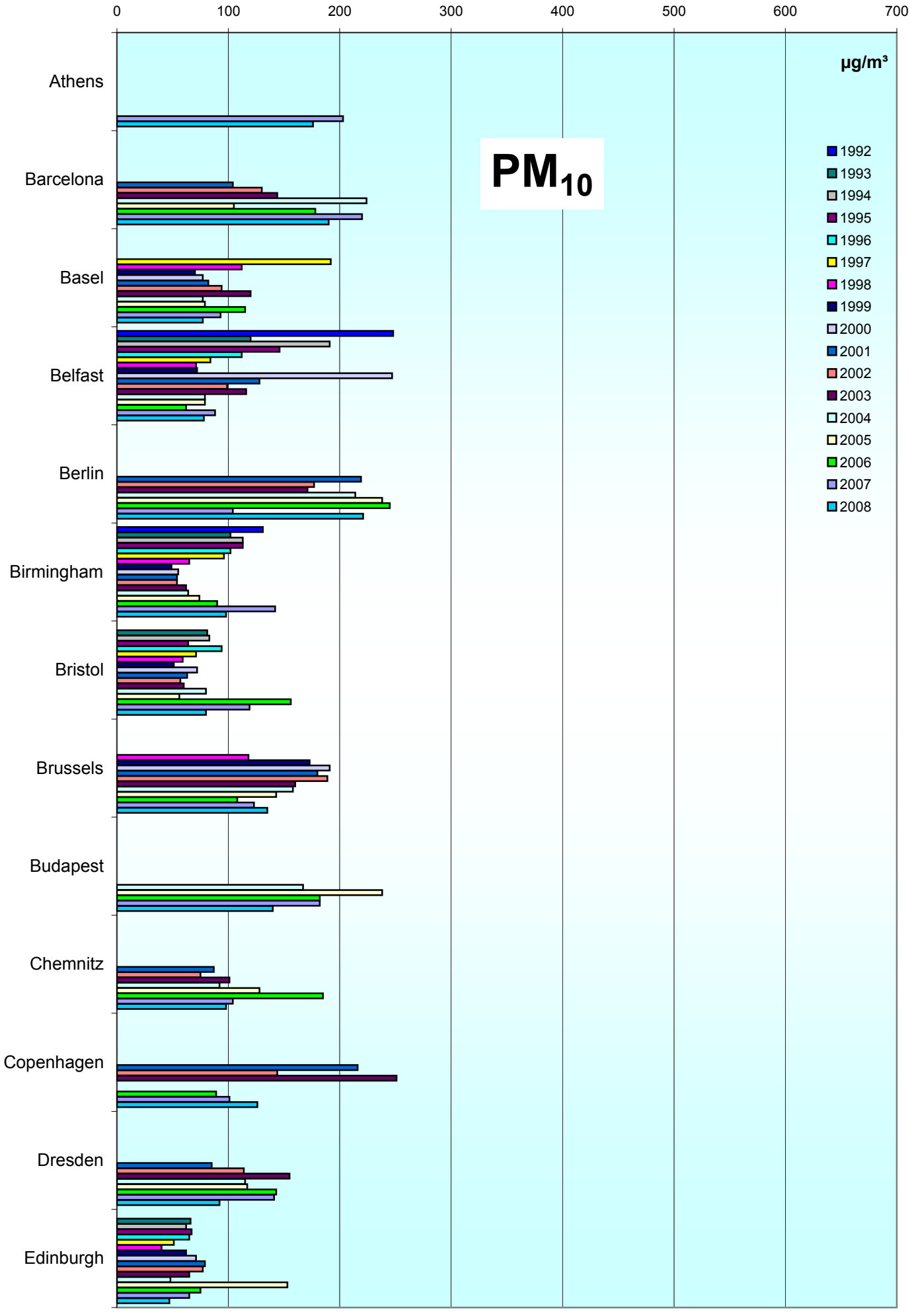
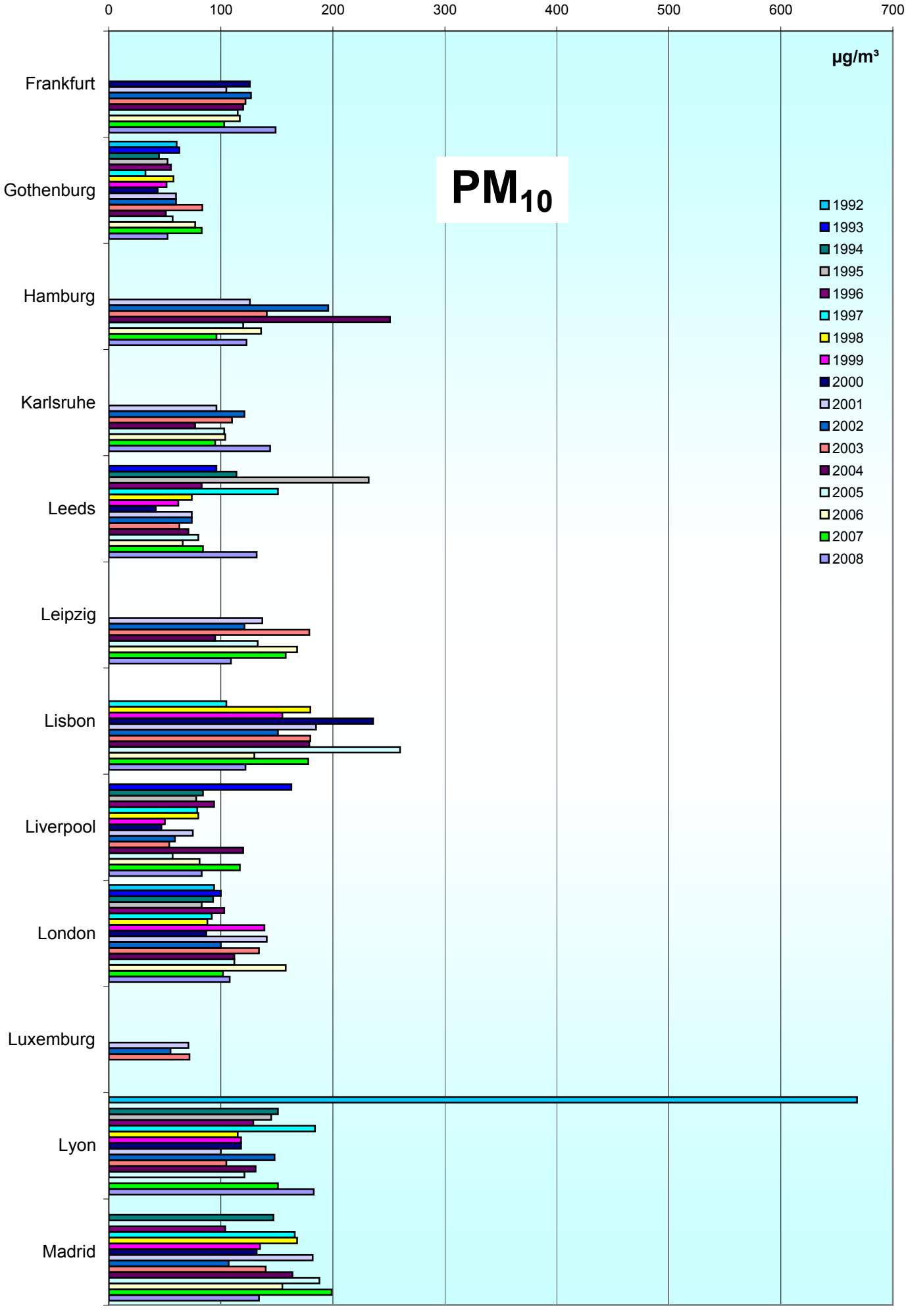


Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2008

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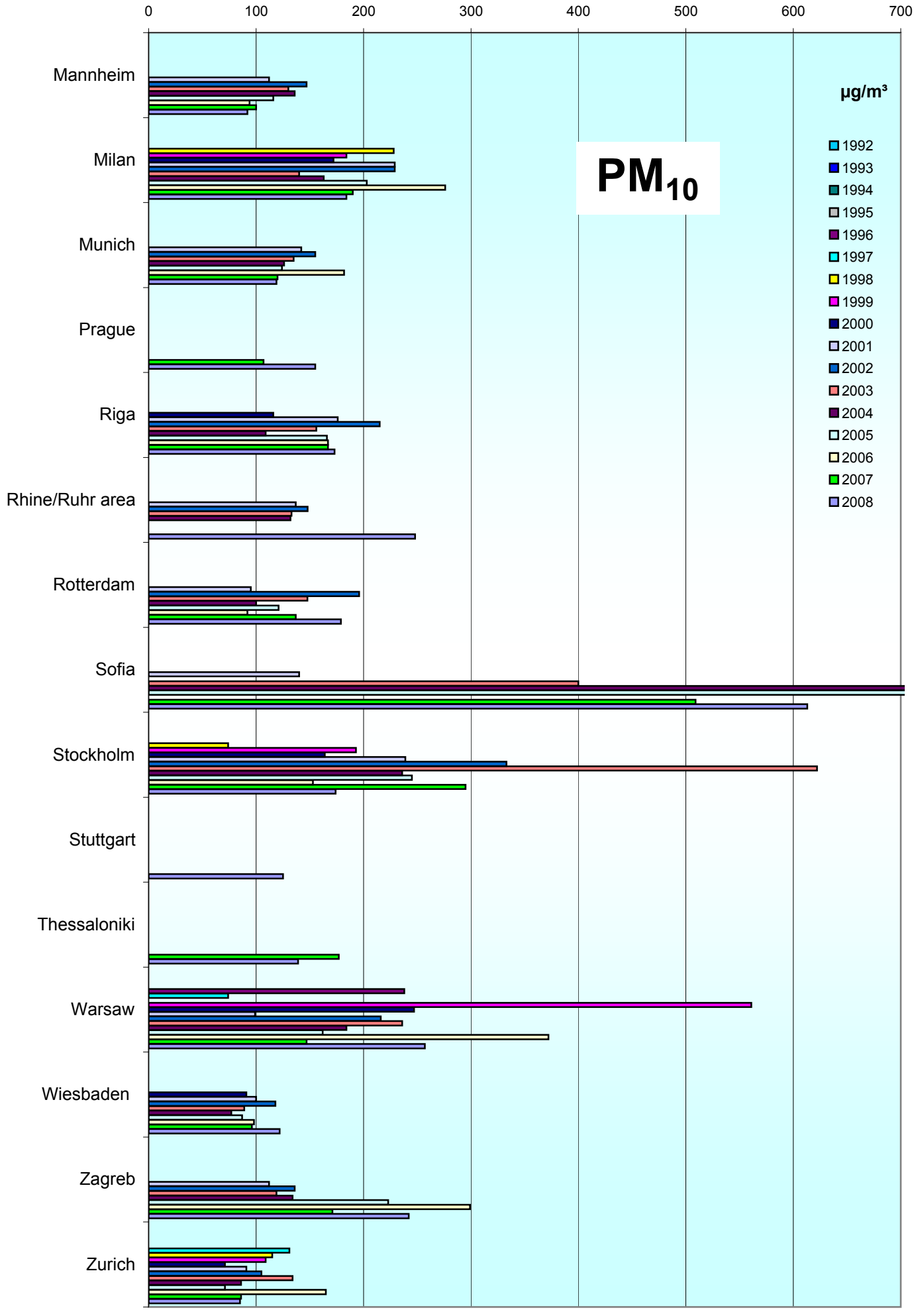

Comparison of The Air Quality 1992 - 2008

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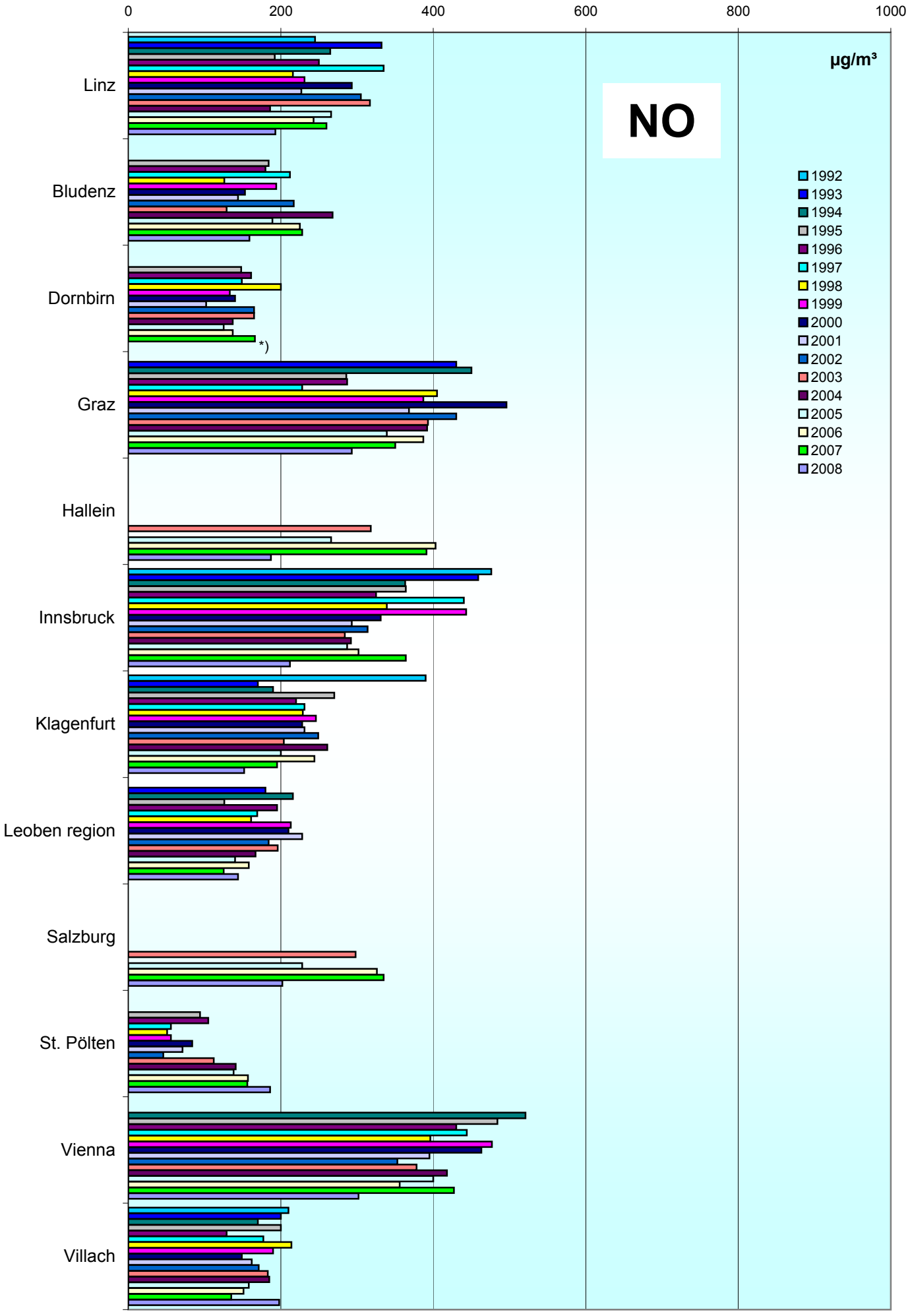

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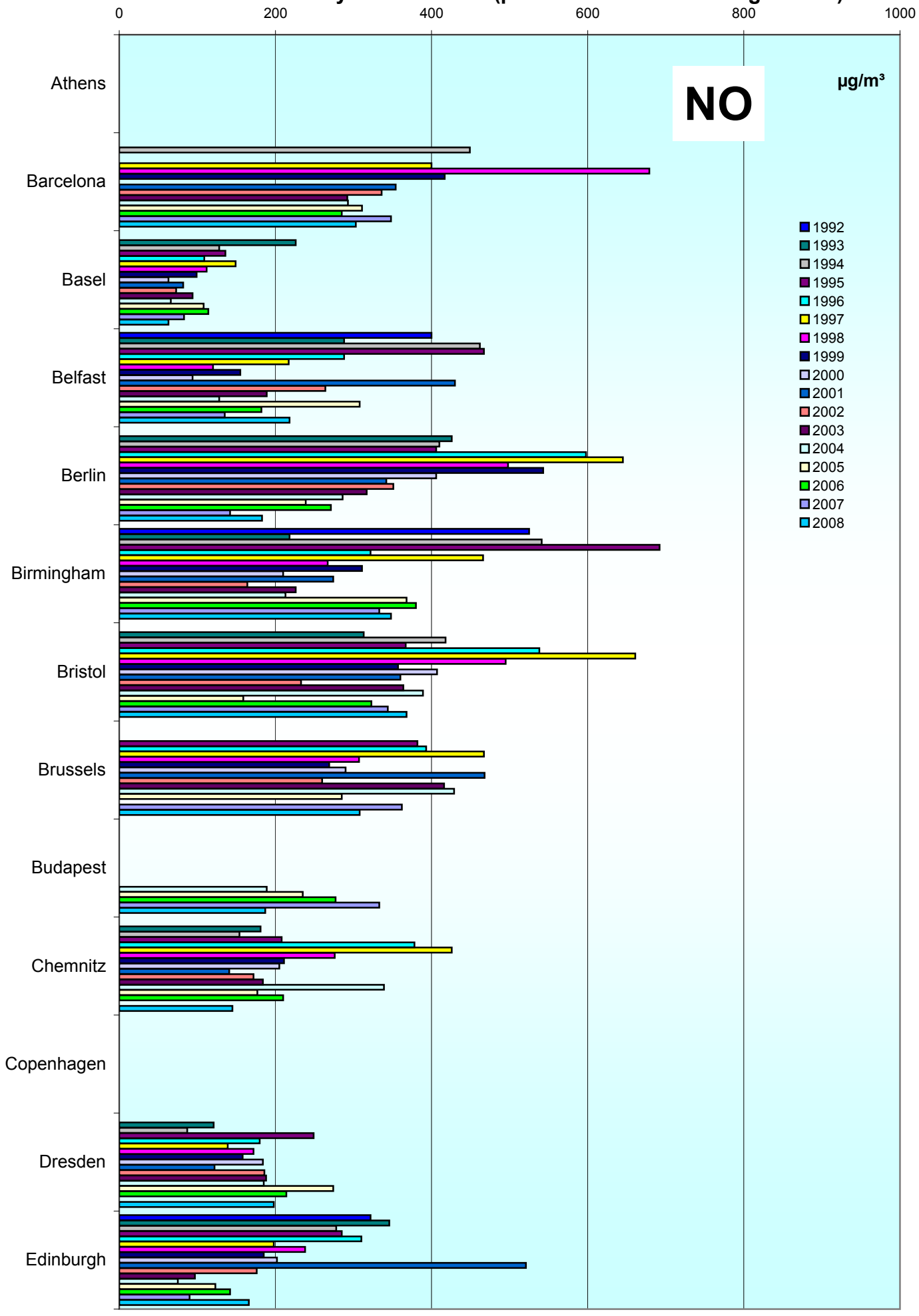
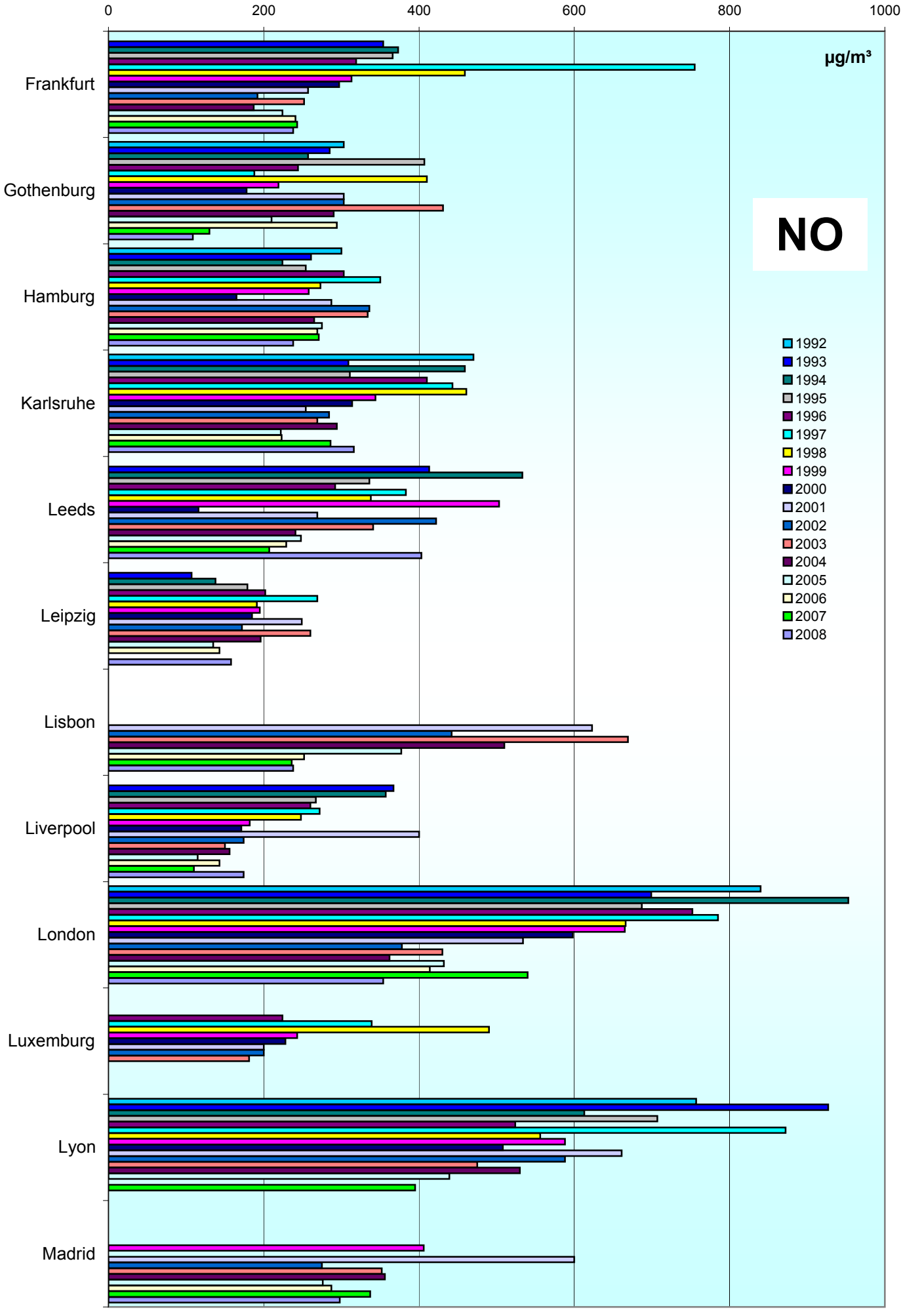
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



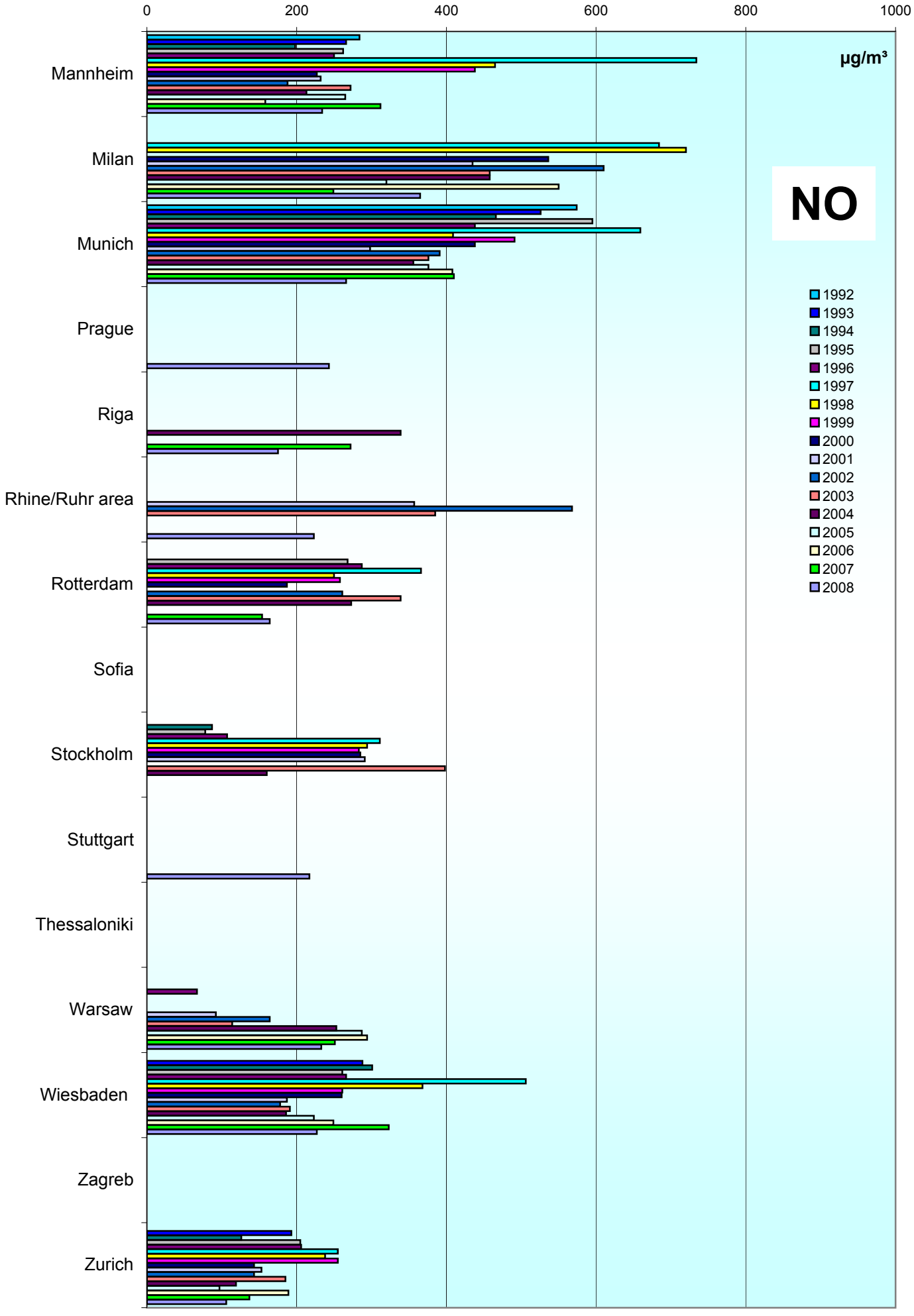
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2008

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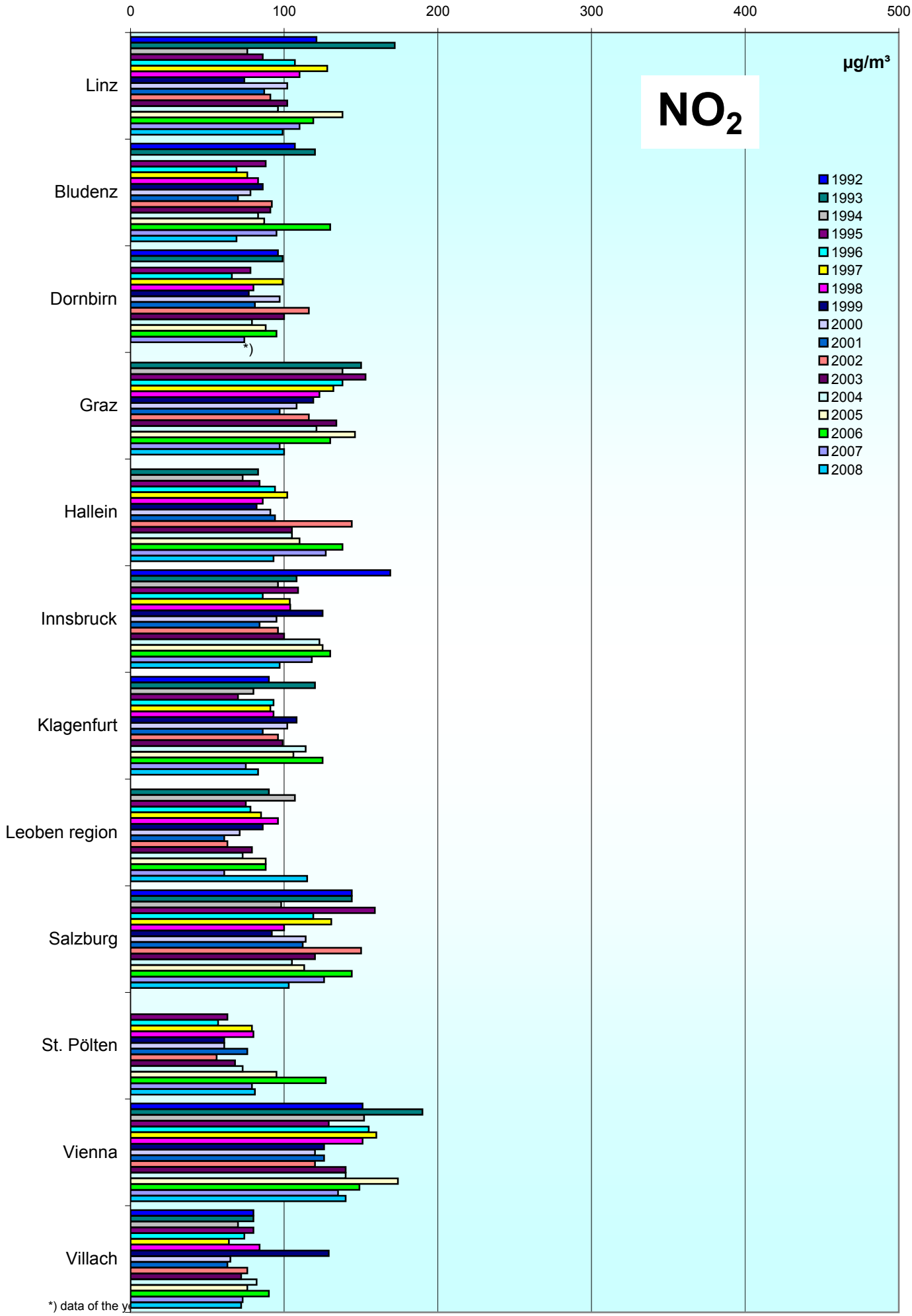

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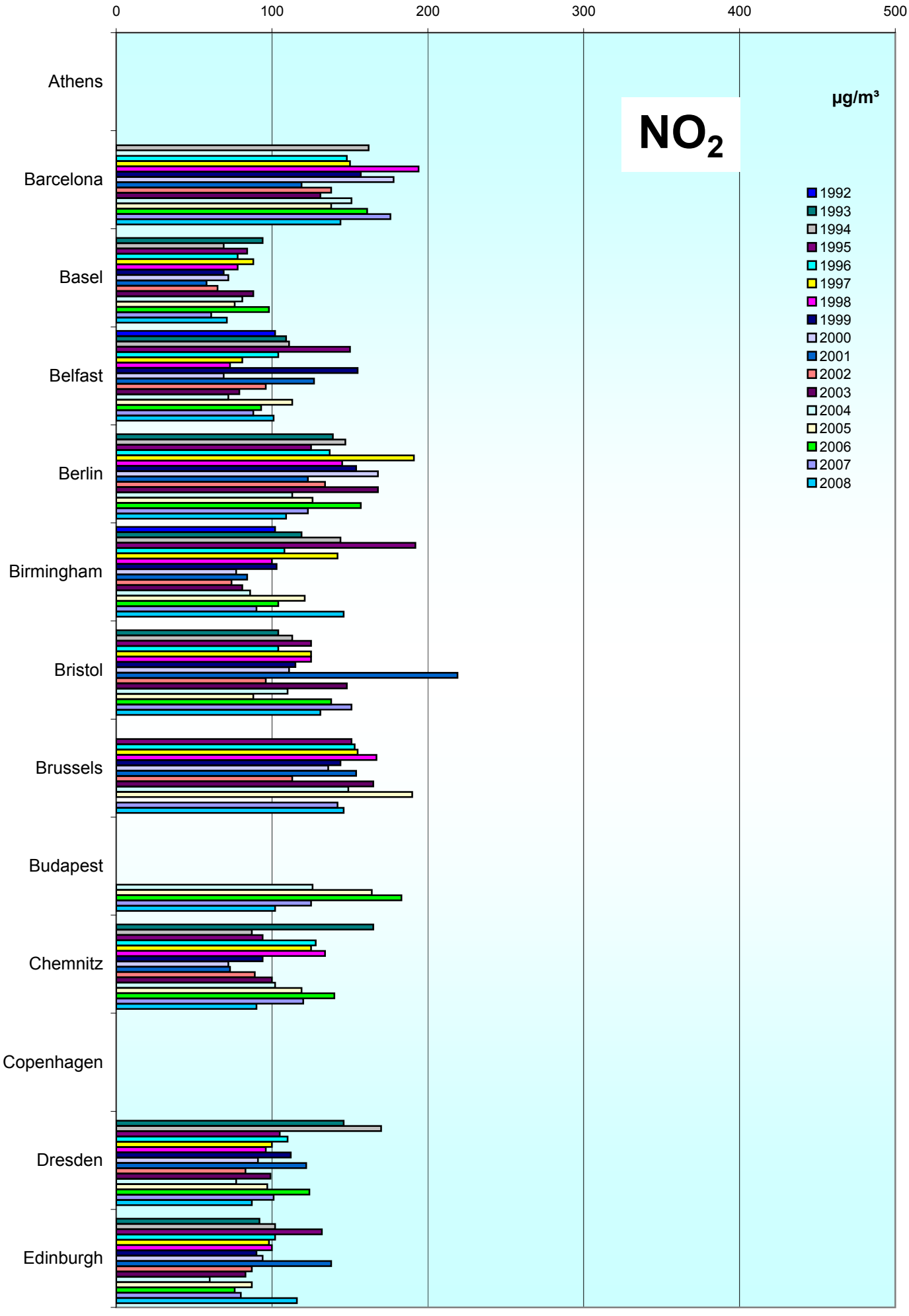
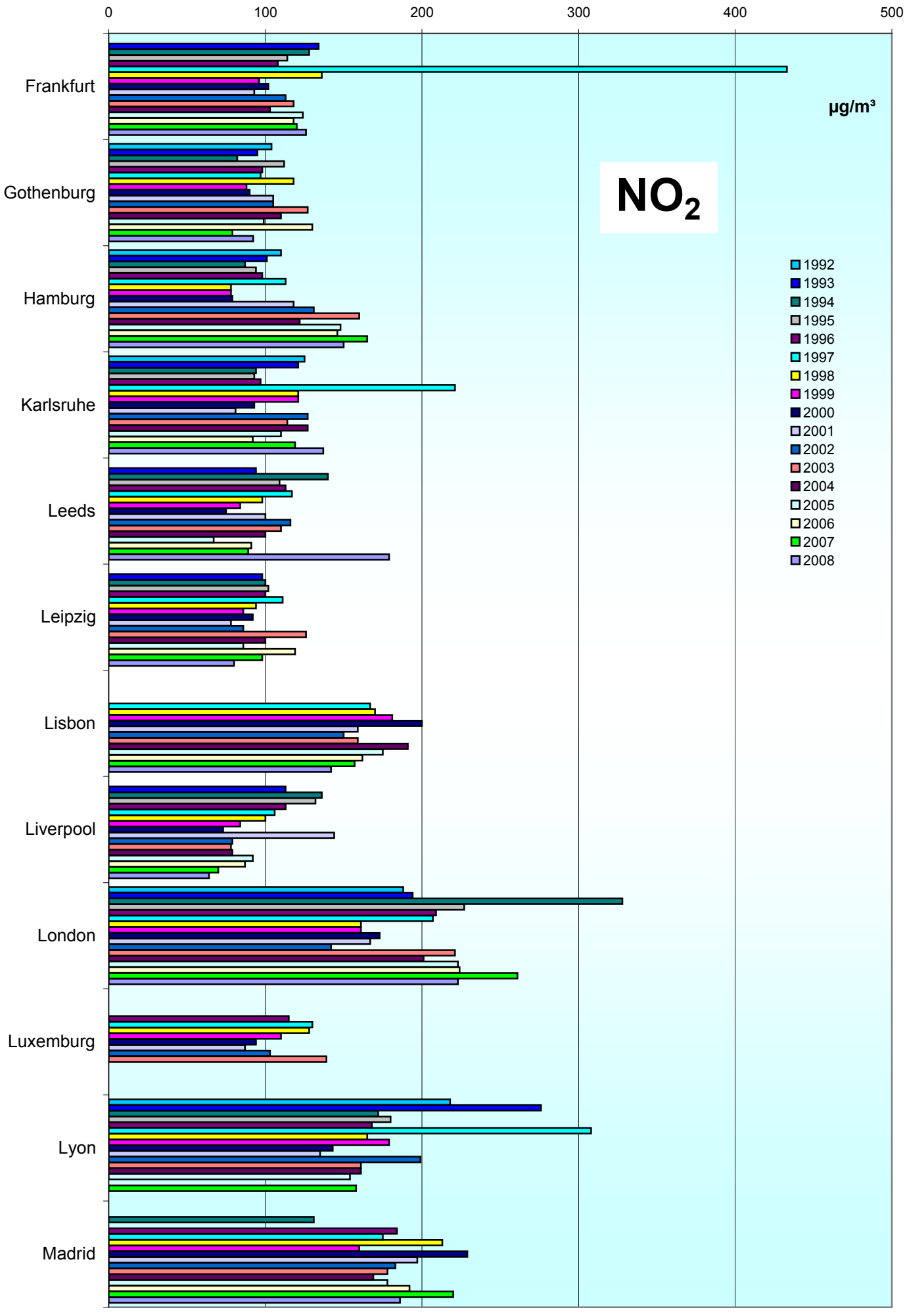
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



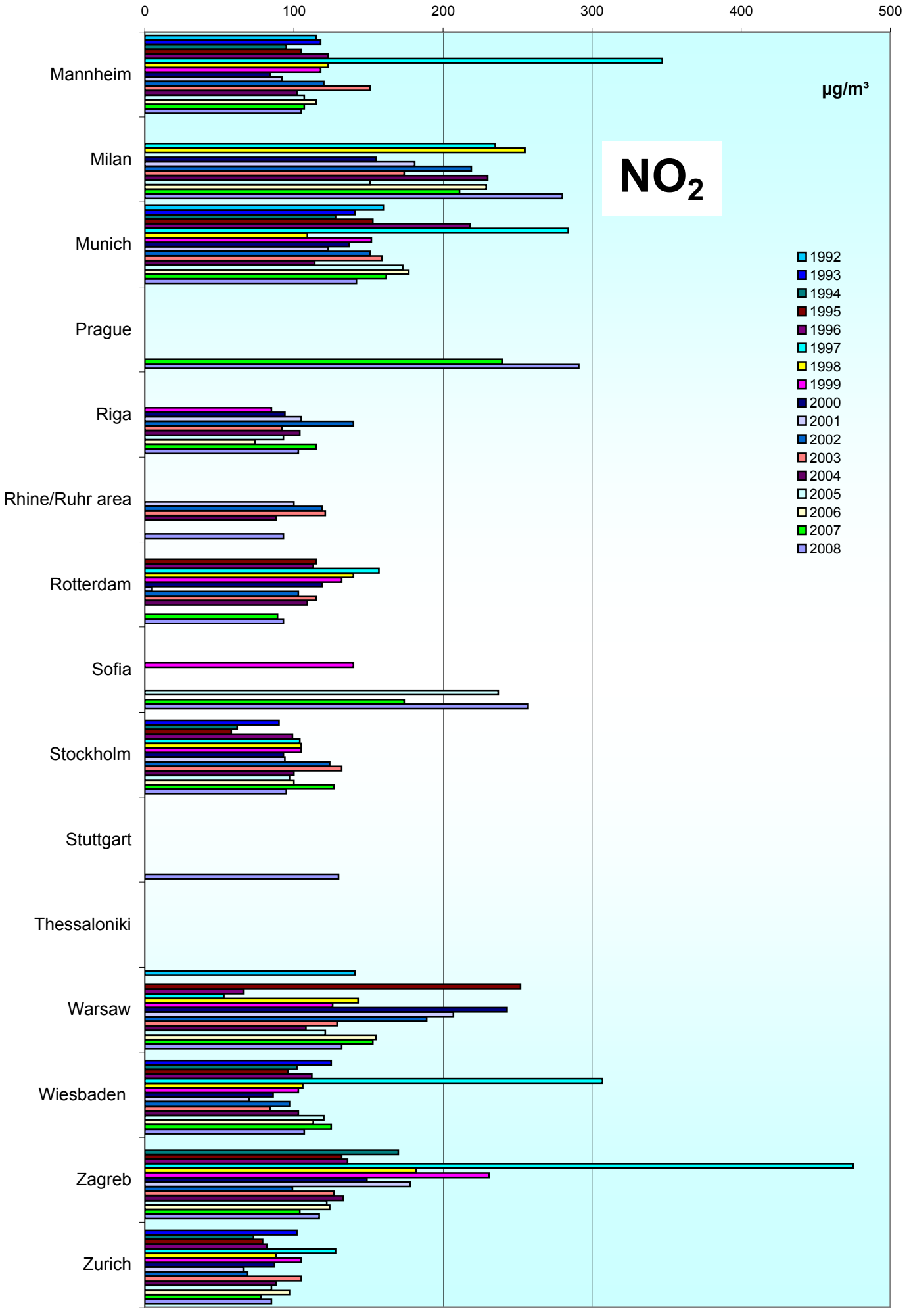
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



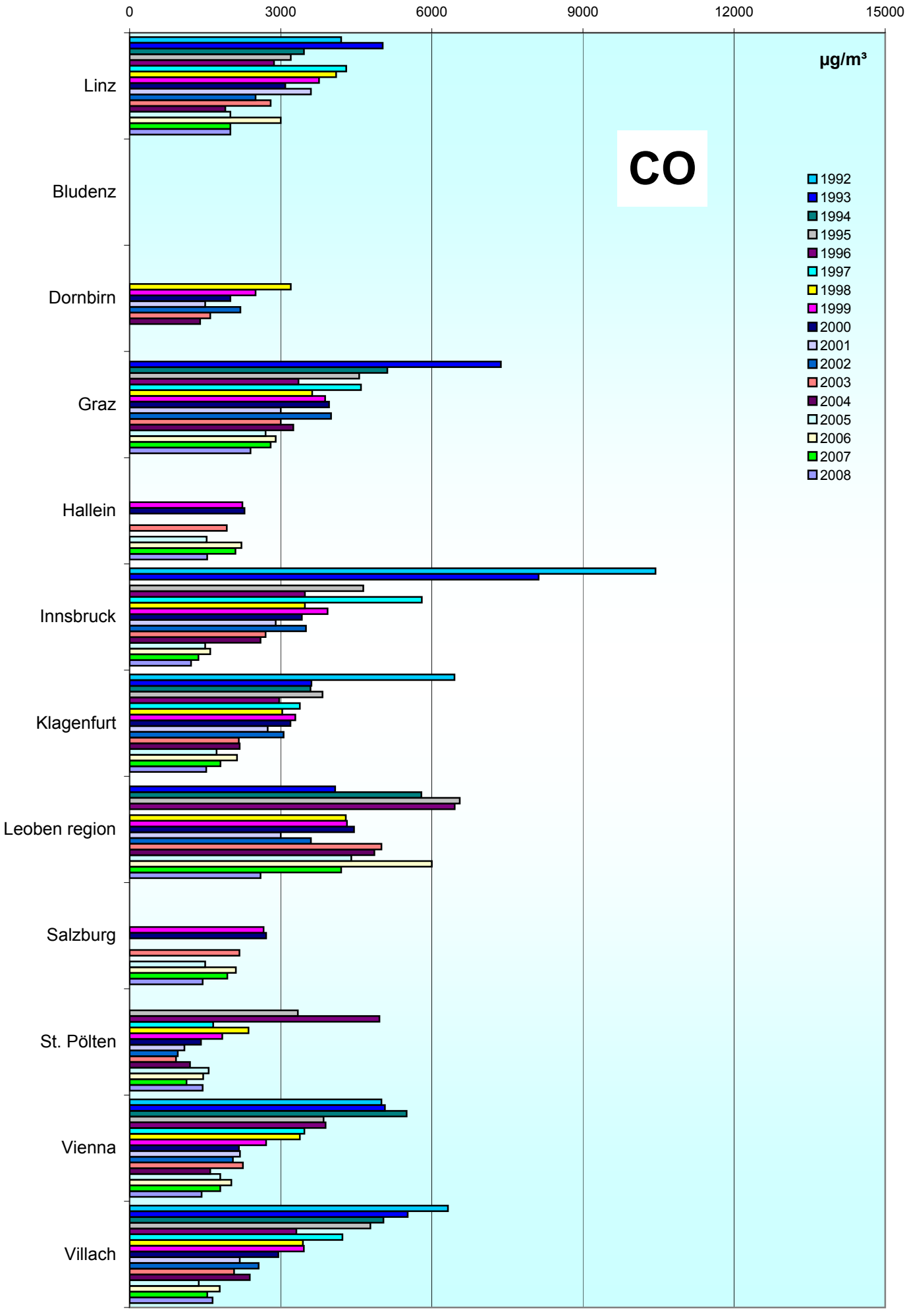
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



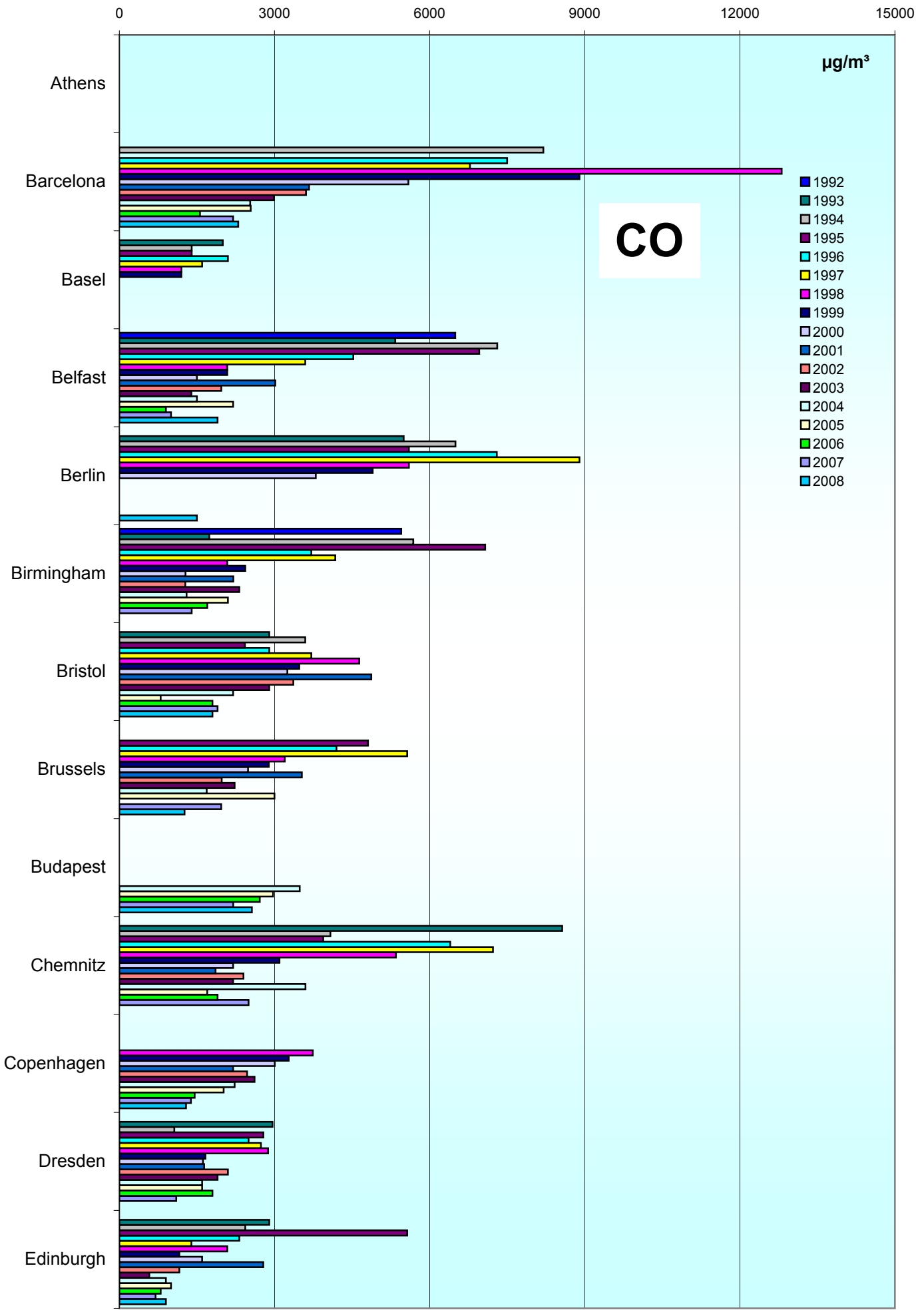
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



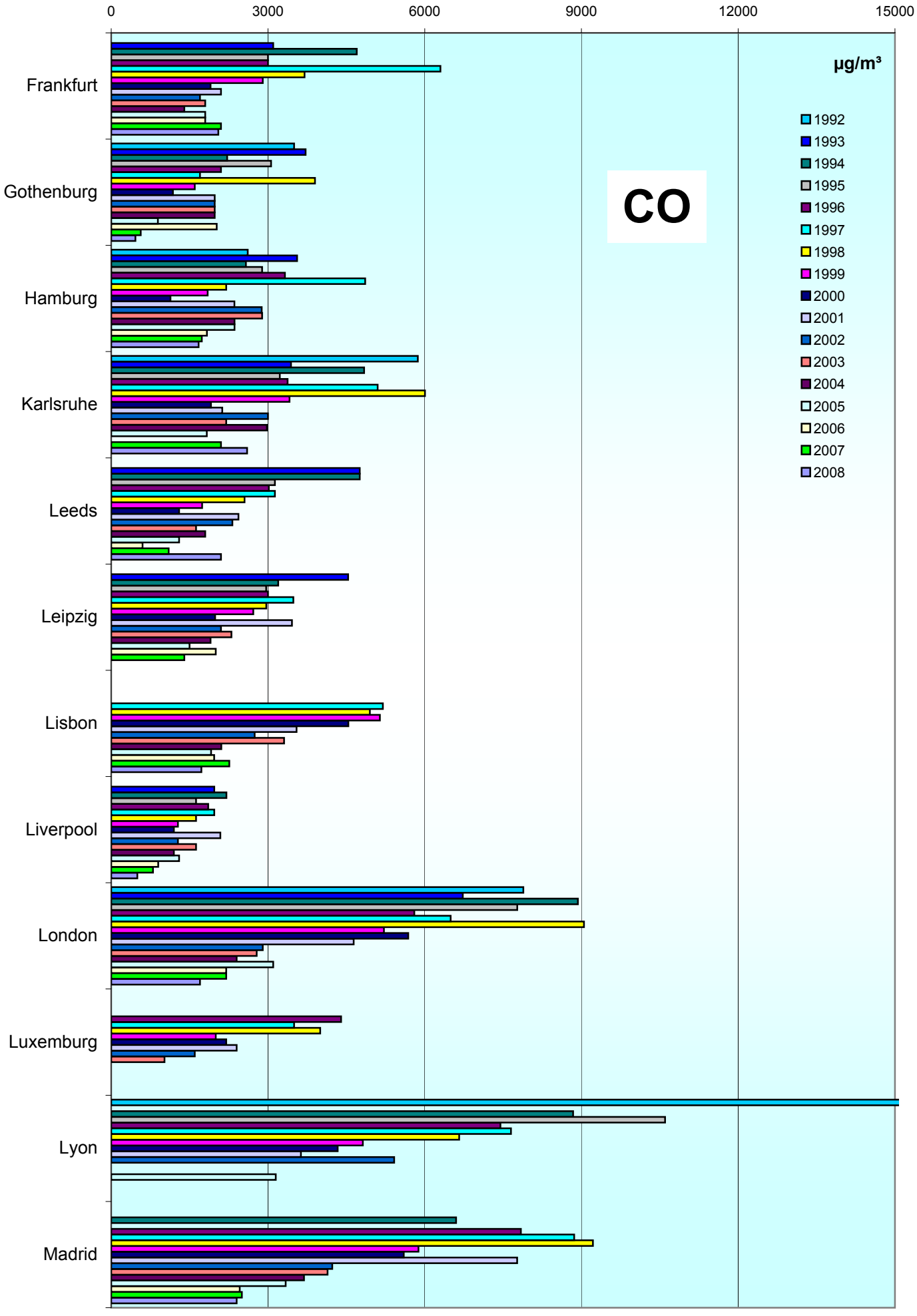
Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2008

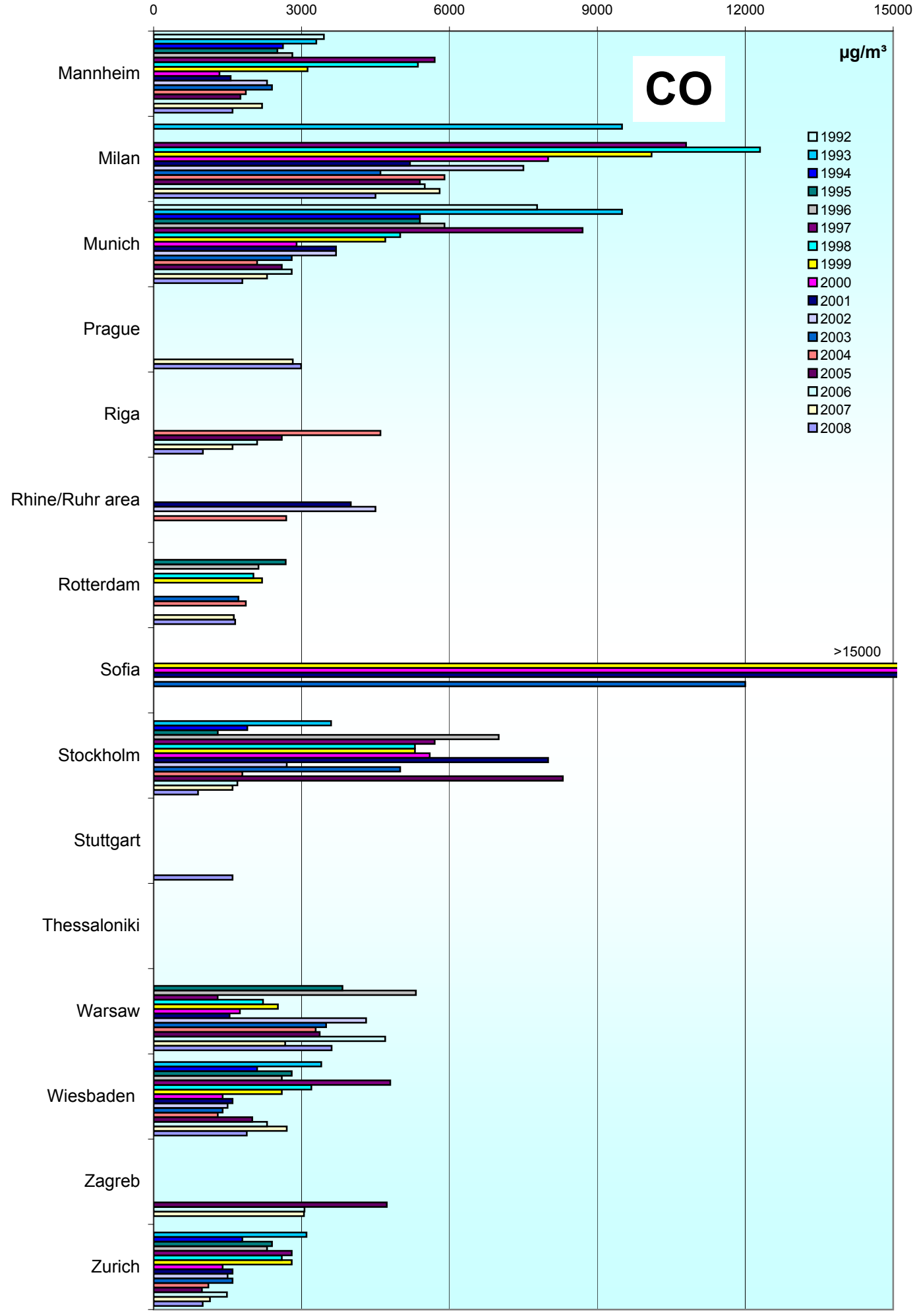
max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2008

max. daily mean values (peak-stressed monitoring station)

100



Jahresvergleich

1993 - 2008

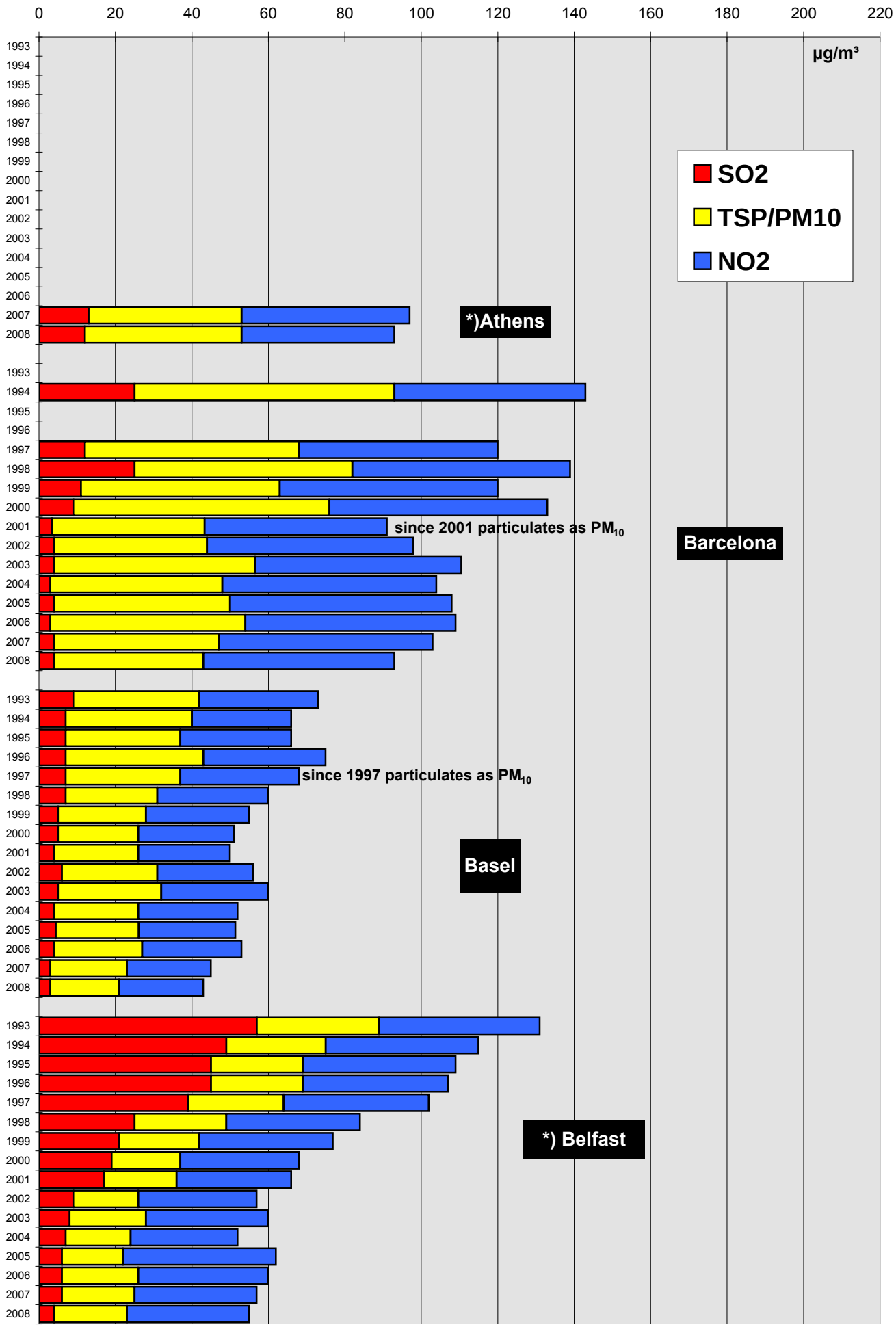
Jahresmittelwerte, Σ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality

1993 - 2008

Annual Mean Values, Σ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality 1993-2008
Development of the annual mean values, Σ SO2, TSP/PM10, NO2
(mean of all monitoring stations)

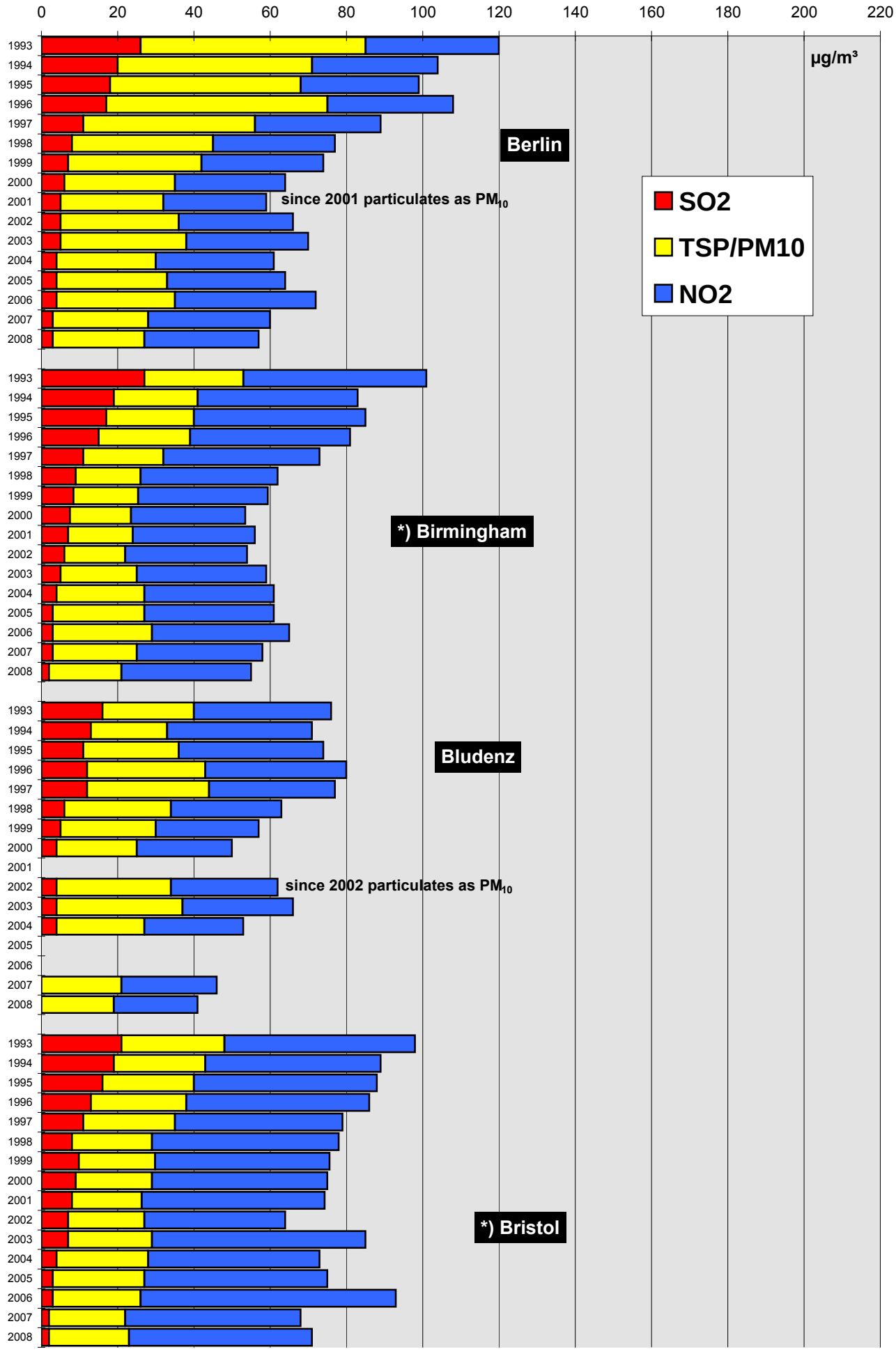


*) particulates calculated as PM 10

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

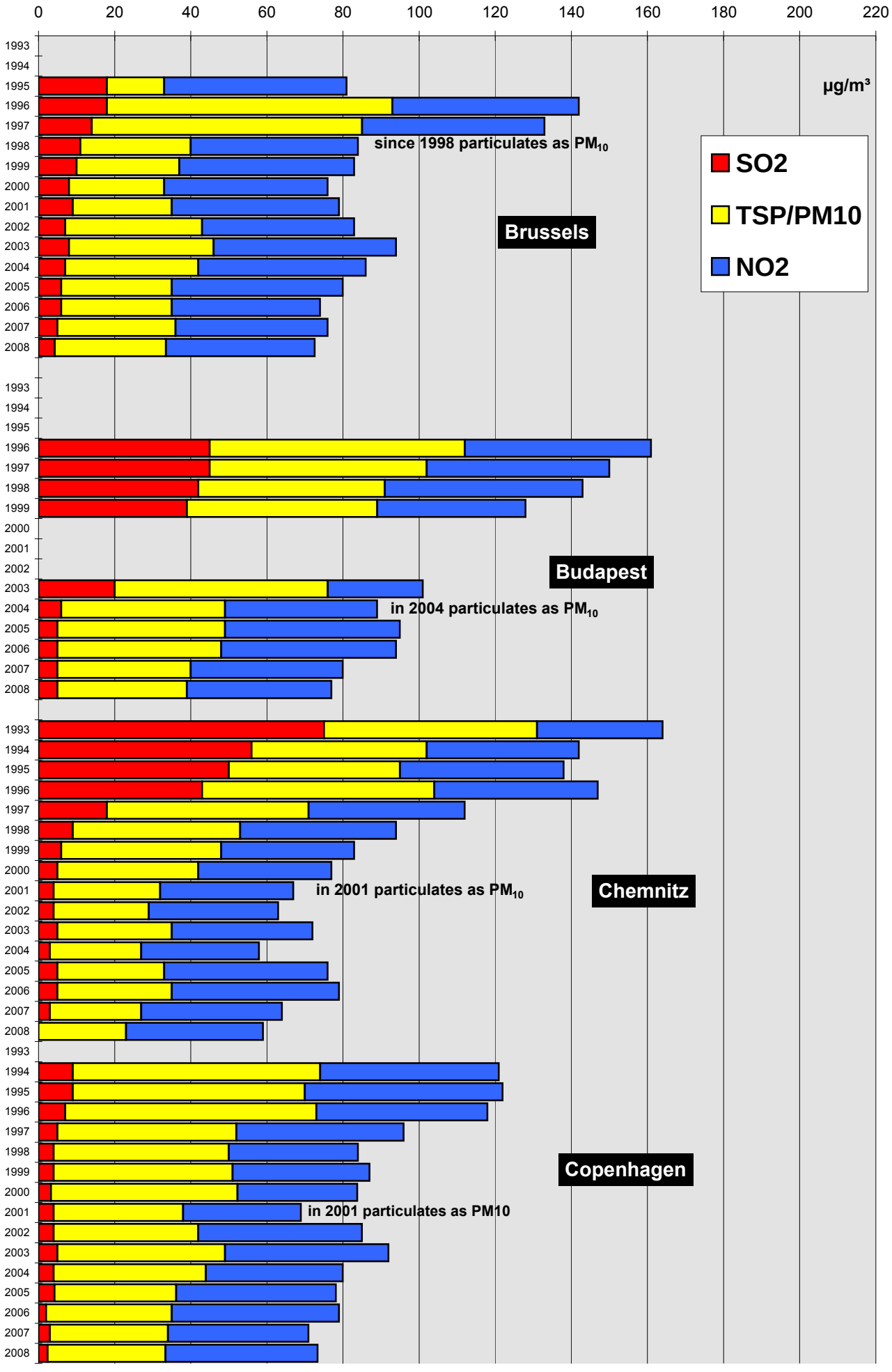


*) particulates calculated as PM 10

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

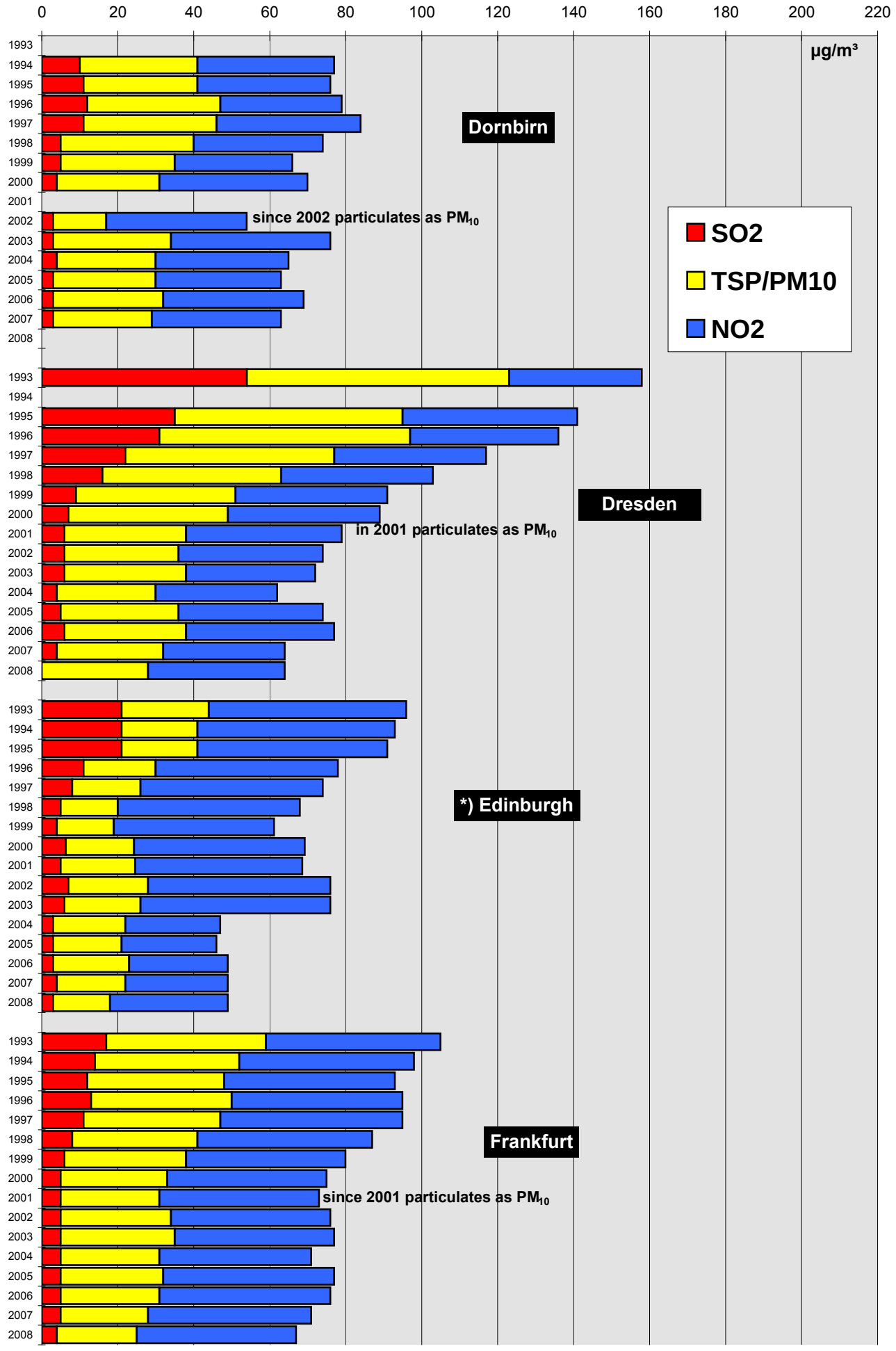
(mean of all monitoring stations)



Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

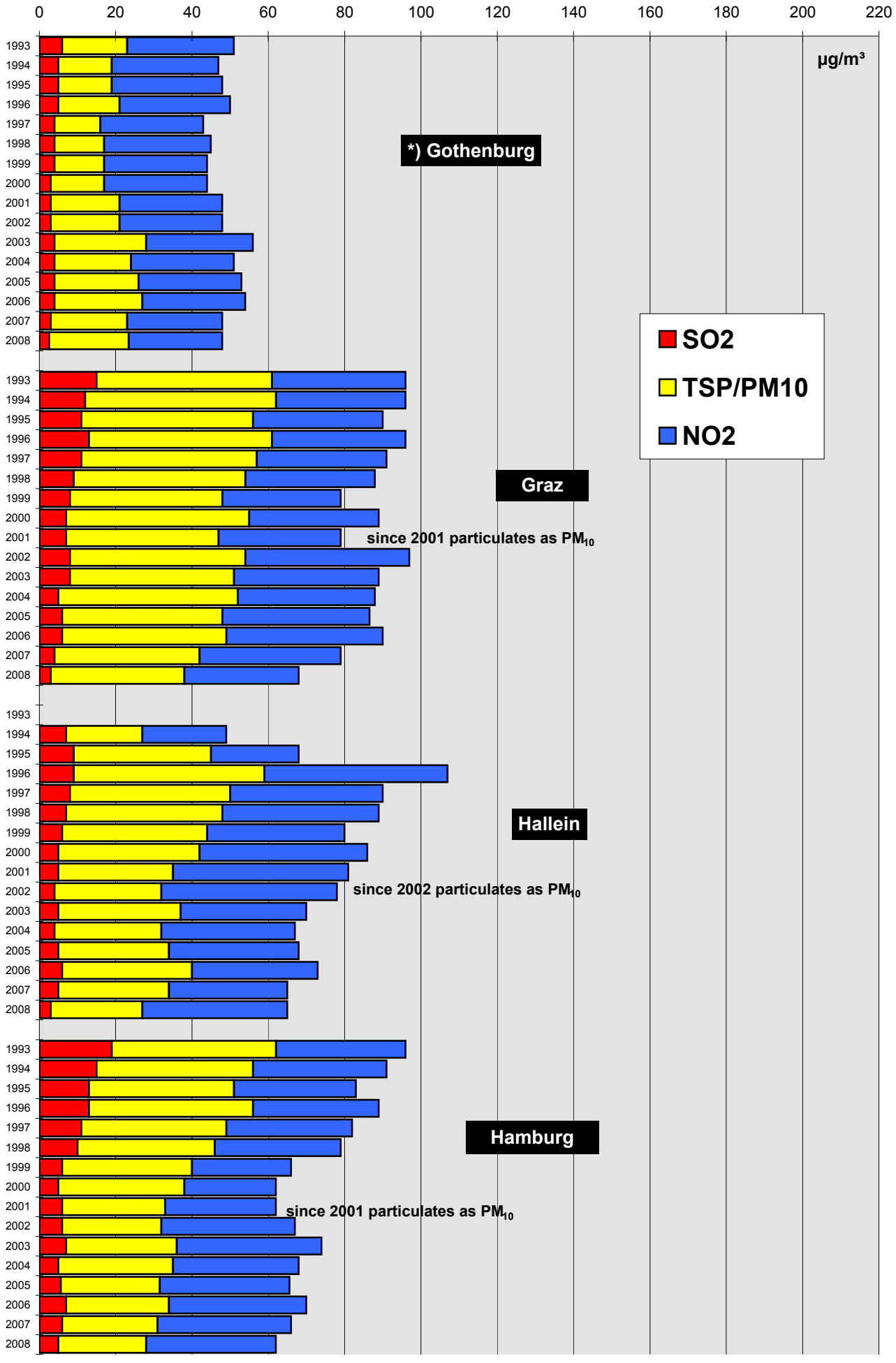


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

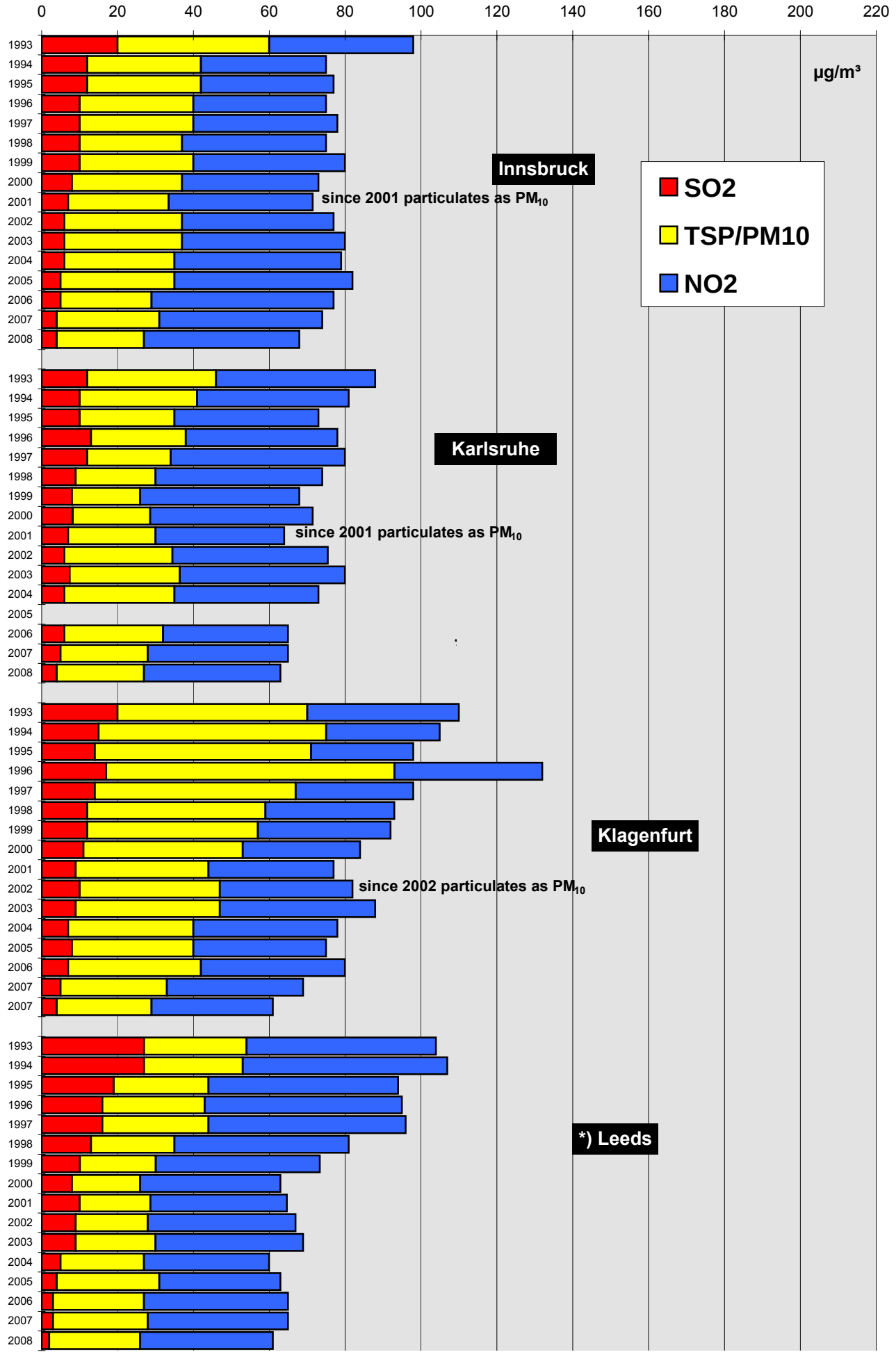


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

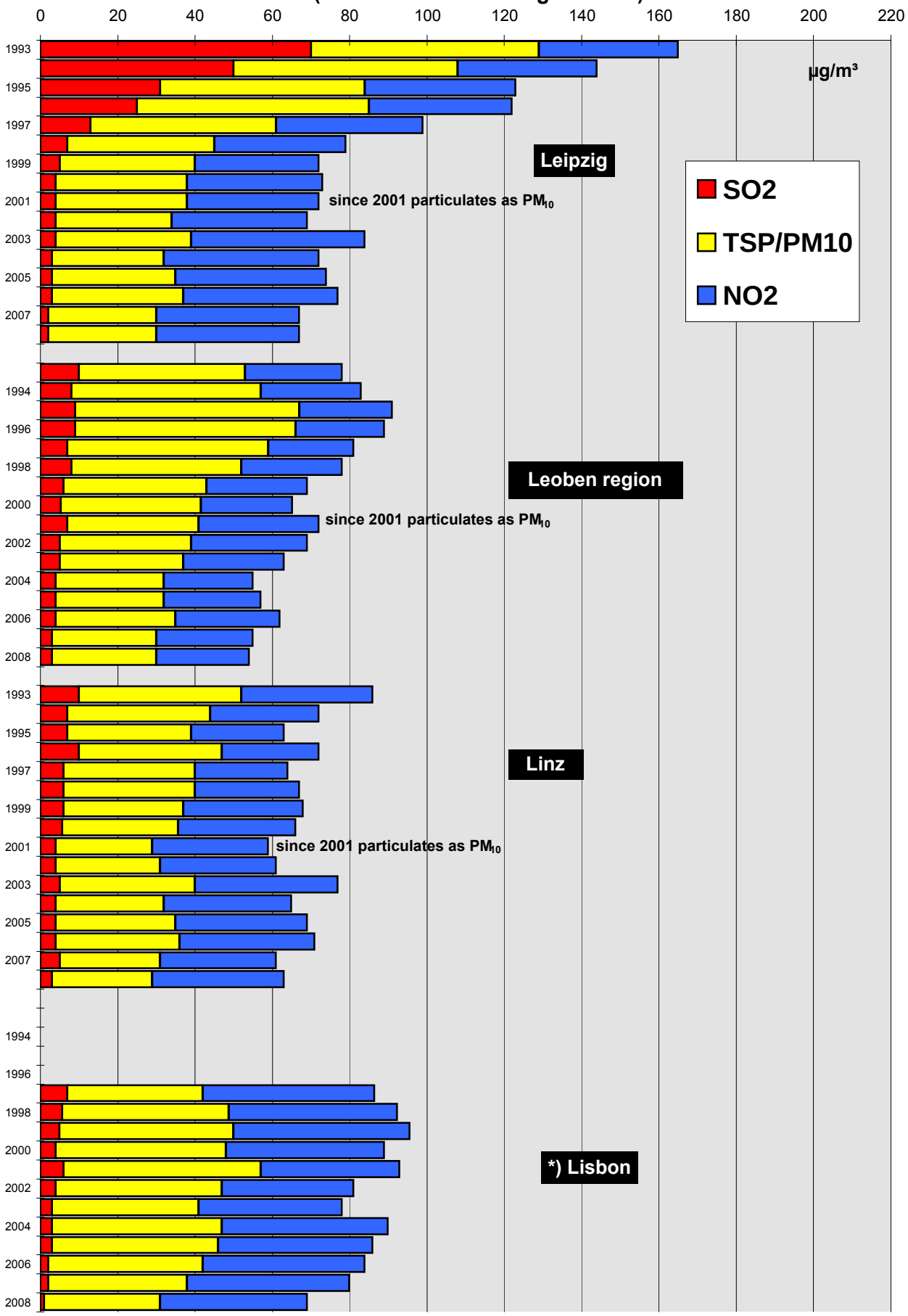


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

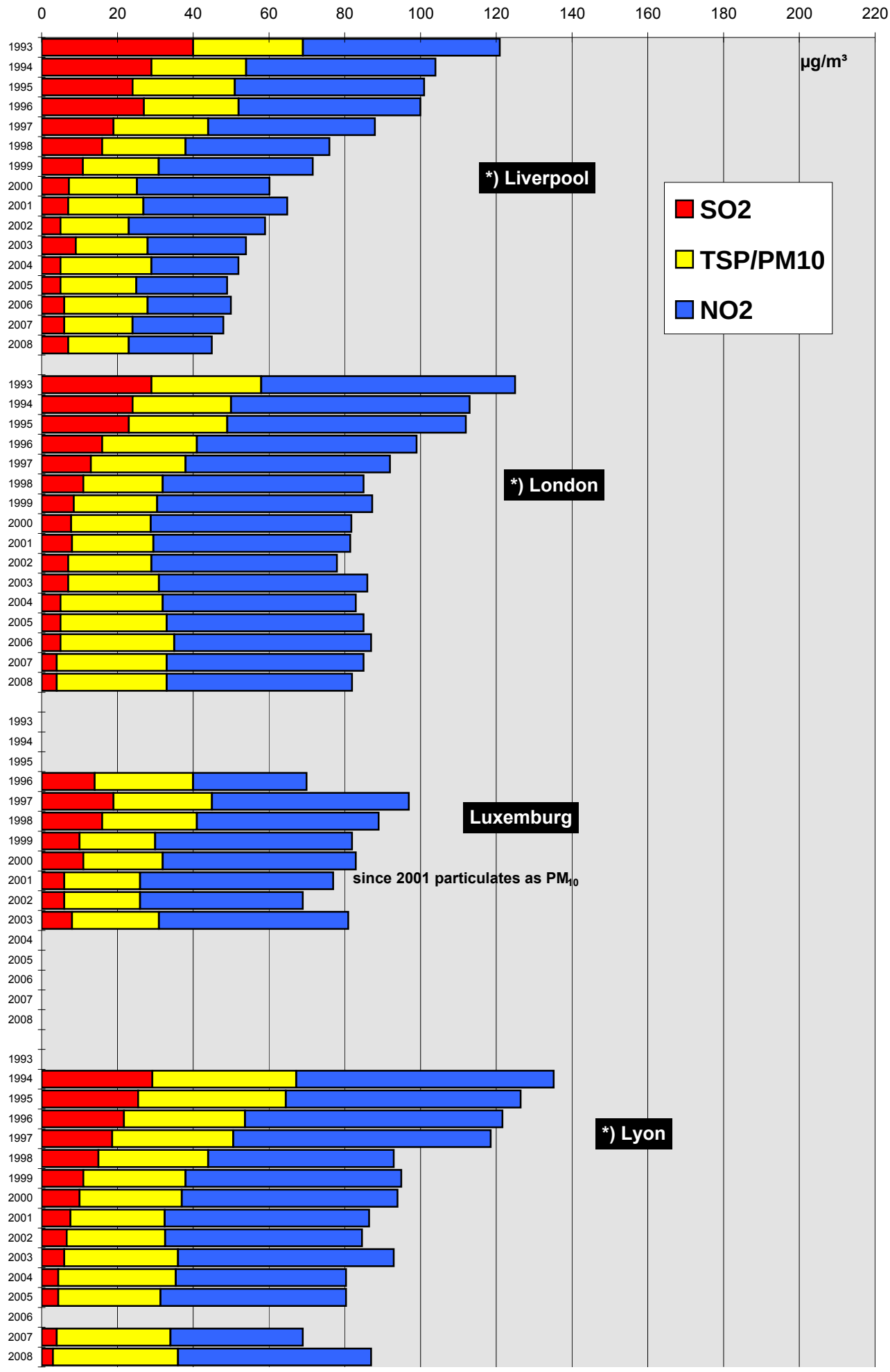


*) particulates calculated as PM10

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

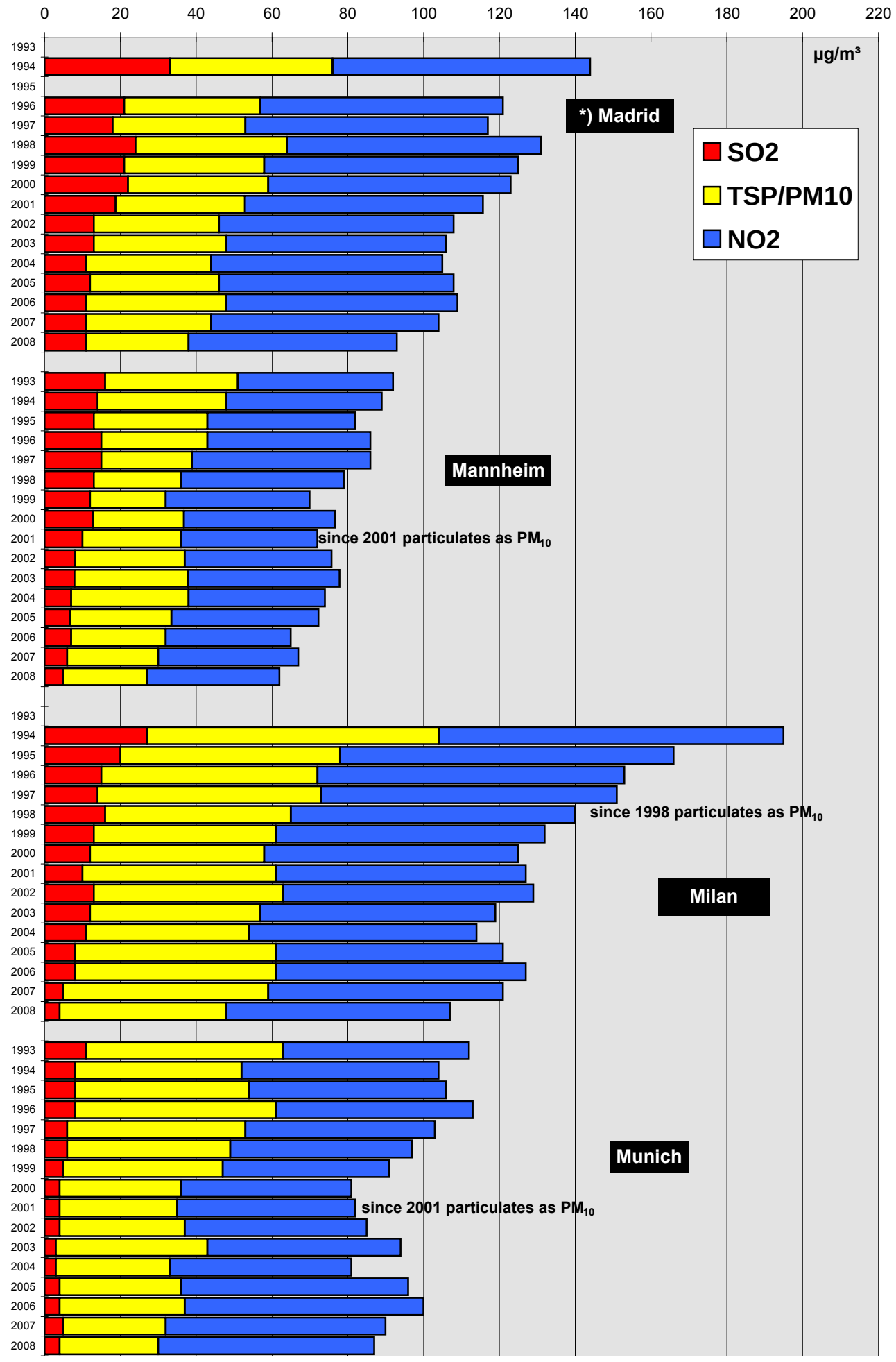


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

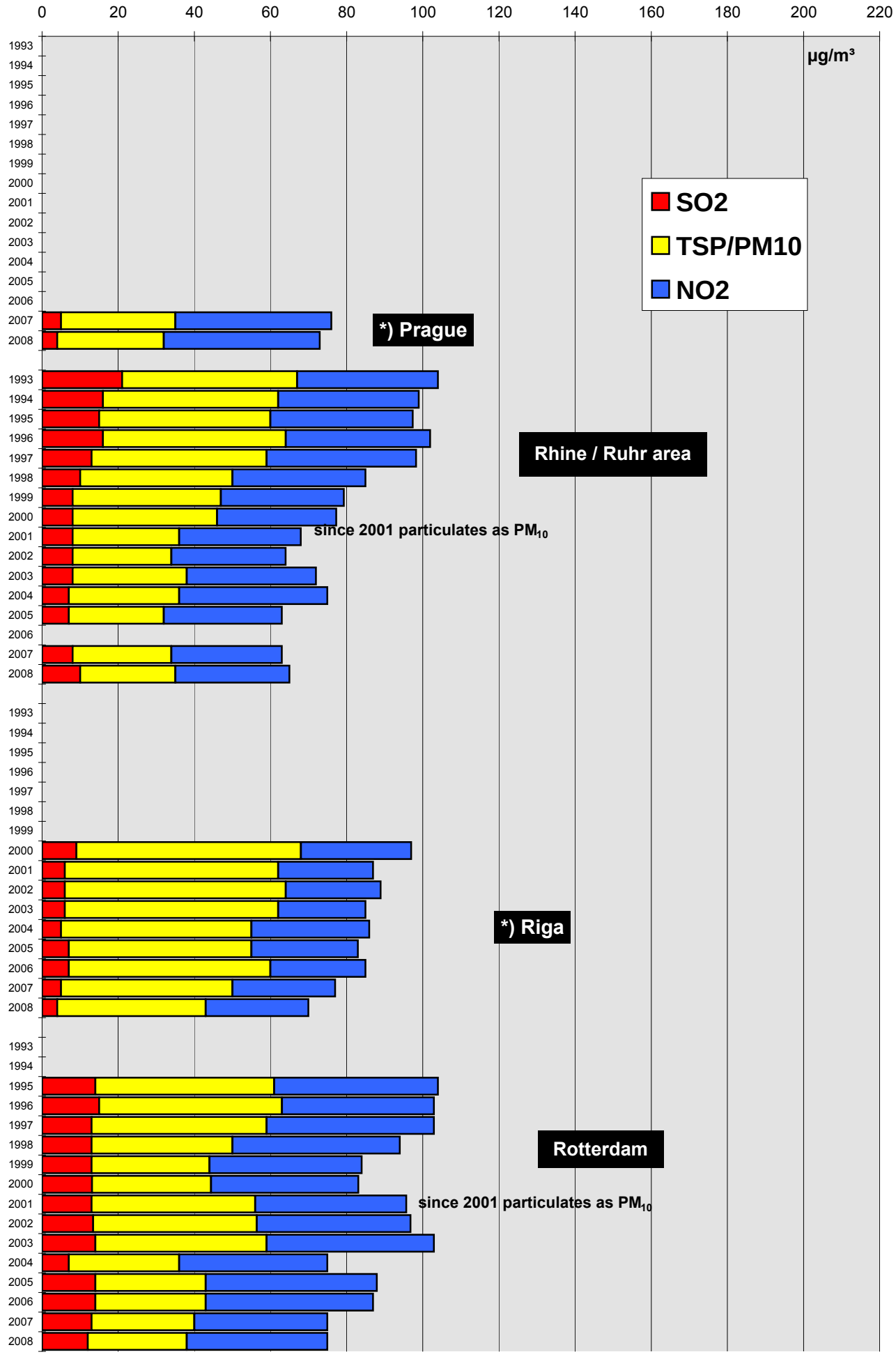


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)

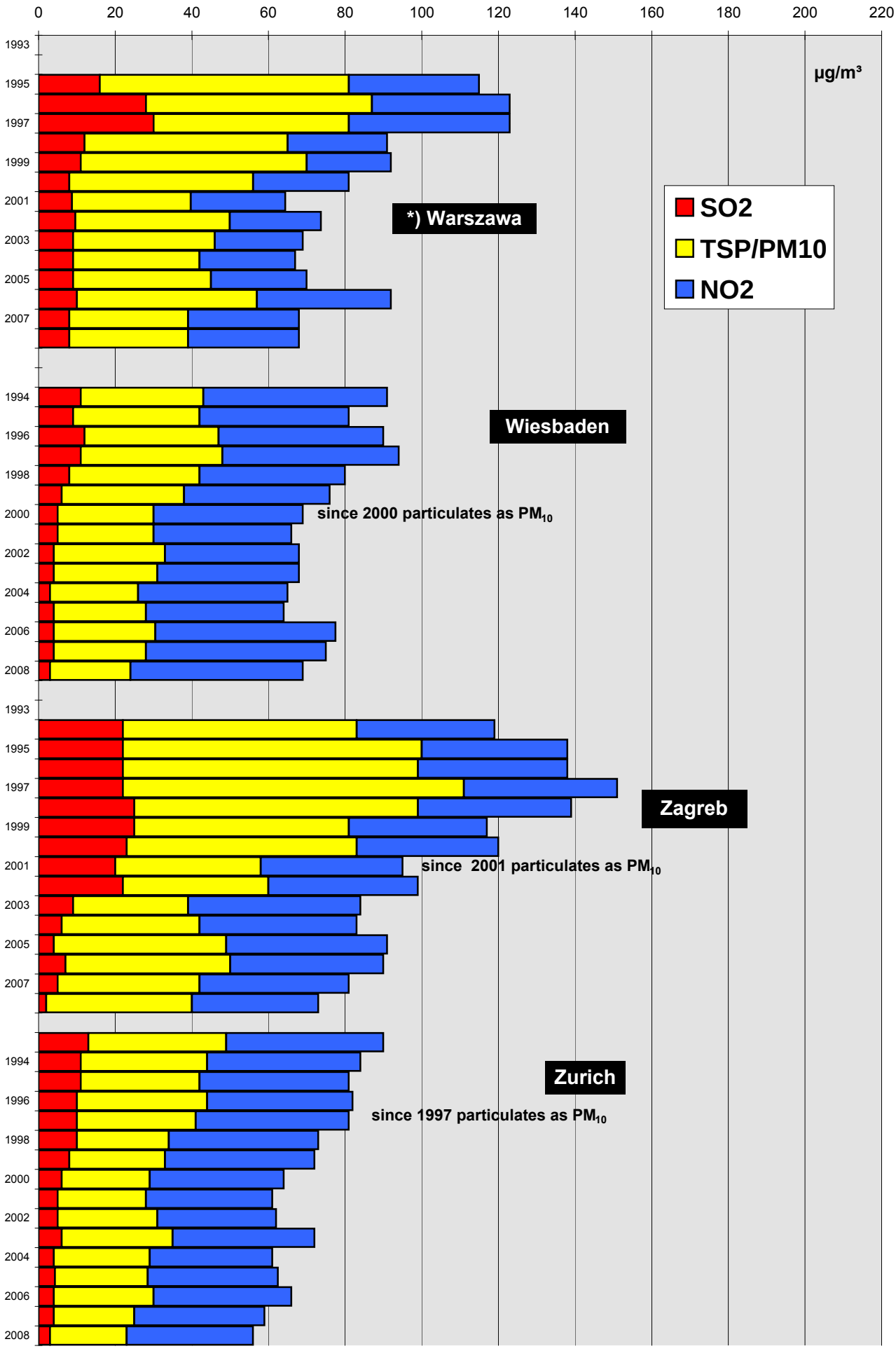


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2008

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)



*) particulates calculated as PM_{10}

Luftgütekennzahlen 2008

der einzelnen

Vergleichsregionen

Immission Reference Values 2008

Of All Compared Regions

Comparison of The Air Quality in 2008

Athens

immission area: 1 948 km^2 population: 3 551 370

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	7	12	46	97		352		75
PM_{10}	7	41	80	176				129
$PM_{2,5}$	4	25	47	96				58
NO	15	29	175			888		406
NO_2	15	40	104			297		175
CO	7	1000	3000			12700		5500
O_3	13	59	130			281		165

PM_{10}:	Monitoring method(s) used:	β-attenuation
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	163
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	56

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Barcelona

immission area: 341 km^2 population: 1 615 908

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]*	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]**
SO_2	6	4	9	36	100	155	-	22
PM_{10}*	9	39	65	190	-	-	-	96(24h)
$PM_{2,5}$*	2	21	38	77	-	-	-	60(24h)
NO	6	26	103	303	667	793	-	256
NO_2	6	50	90	144	210	269	-	136
CO	6	400	1100	2300	4900	7100	-	2100
O_3	6	38	74	123	162	180	-	125

PM_{10}:	Monitoring method(s) used:	Gravimetry apart from (BARCELONA(c/Llum Sole i Sabaris),ES1782A, 8019051 which uses Scattering effect)
	Correction factor for this method according to EU-directive 1999/30/EC):	1 (Scattering effect)
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	72 (ID_BARCELONA, ES1396A, 8019042) P90.4=66
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	13 (IH-BARCELONA (EIXAMPLE), ES1438A,8019043) P99.8=194

Comments:

* *Static average (not moving average)*

** *Maximum 98 percentile of 1-hour values, except PM_{10} and $PM_{2,5}$ 24-hour values*

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Basel

immission area: 557 km^2 population: 486 952

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	7	16	31	36	38	21
PM_{10}	1	18	31	77	122	258	269	76
$PM_{2,5}$	1	14	26	62	-	-	-	-
NO	1	7	17	63	139	182	195	92
NO_2	1	22	40	71	95	100	101	84
CO	1	-	-	-	-	-	-	-
O_3	1	46	72	107	154	162	167	144

PM_{10}:	Monitoring method(s) used:	β-Meter-measurements, calibrated with gravimetrical measurements every 4 days
	Correction factor for this method according to EU-directive 1999/30/EC):	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	6
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Belfast

immission area: 115 km^2 population: 277 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	7	25	59	67	-	19
PM_{10}	1	19	33	78	154	190	-	59
$PM_{2,5}$								
NO	1	17	45	218	708	839	-	114
NO_2	1	32	44	101	211	250	-	84
CO	1	500	900	1900	2800	2900	-	1600
O_3	1	43	71	92	121	122	-	92

PM_{10}:	Monitoring method(s) used:	GRAV EQ, TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	7
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	3

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Berlin (traffic station)

immission area: 892 km^2 population: 3 431 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	39	10	46	64	77	10
PM_{10}	5	27/29*	40/45*	85/221*	120/1505*	182/3445*	280/3850*	66
$PM_{2,5}$	1	22	32	99	-	-	-	55
NO	5	44	94	183	377	498	603	223
NO_2	5	51	69	109	158	200	305	124
CO	2	600	900	1500	3200	3800	3900	1600
O_3	-	-	-	-	-	-	-	-

PM_{10}:	Monitoring method(s) used:	β-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.1/1.6
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	24
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Berlin (urban station)

immission area: 892 km^{2}population: 3 431 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	4,8	14	48	65	92	12
PM_{10}	4	24	34/38*	79/97*	110/528*	125/1039*	142/1329*	61
$PM_{2,5}$	3	19	29	75	-	-	-	49
NO	5	7	16	71	193	271	288	49
NO_2	5	26	35	59	127	140	147	66
CO	-	-	-	-	-	-	-	-
O_3	2	42	60	131	183	185	187	118

PM_{10}:	Monitoring method(s) used:	β-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.1/1.6
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	10
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments Berlin: PM_{10}*: values contest the New Years Eve Day
$PM_{2,5}$: mean values and max. values form the daily values

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Berlin (outskirt station)

immission area: 892 km^2 population: 3 431 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	4	19	29/30*	72/74*	109/339*	120/455*	124/582*	50
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	5	3	8	50	242	278	301	31
NO_2	5	14	22	45	73	84	85	45
CO	-	-	-	-	-	-	-	-
O_3	5	46	84	137	192	194	195	126

PM_{10}:	Monitoring method(s) used:	β-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.1/1.6
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	6
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments: PM_{10}*: values contents the New Years Eve Day
$PM_{2,5}$: mean values and max. values form the daily values

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Birmingham

immission area: 268 km^2 population: 1 010 200

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	17	40	40	-	8
PM_{10}	2	19	33	98	161	285	-	64
$PM_{2,5}$	-							
NO	2	16	58	348	831	1010	-	171
NO_2	2	34	52	146	284	329	-	84
CO	0						-	
O_3	2	42	67	108	173	174		104

PM_{10}:	Monitoring method(s) used:	TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	10
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	3

Bludenz

immission area: 9 km^2 population: 14 740

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-							
PM_{10}	1	19	31	82				53
$PM_{2,5}$	-							
NO	1	16	43	159	328	374	383	125
NO_2	1	22	38	69	104	109	110	71
CO	-							
O_3	1	44	78	117	151	152	153	120

PM_{10}:	Monitoring method(s) used:	gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	13
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Bristol

immission area: 110 km^2 population: 416 400

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	11	27	32	-	11
PM_{10}	1	21	33	80	217	465	-	69
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	2	41	111	368	690	754	-	269
NO_2	2	48	81	131	220	237	-	143
CO	1	400	700	1800	4400	5800	-	1500
O_3	1	43	63	93	155	158	-	94

PM_{10}:	Monitoring method(s) used:	TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	15
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	5

Brussels

immission area: 161 km^2 population: 1 48 491

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per day, hour [µg/m³]
SO_2	7	4	9	43		62	78	13 (daily)
PM_{10}	6	29	54	135		584	667	96 (daily)
$PM_{2,5}$	5	19	34	105		137	141	60,9 (daily)
NO	10	19	87	308		893	972	240 (1 h)
NO_2	10	39	70	146		343	371	113(1 h)
CO	7	305	533	1260		3120	3230	970 (1 h)
O_3	7	38	80	112		243	254	124 (1 h)

PM_{10}:	Monitoring method(s) used:	TEOM-FDMS (both for PM_{10} and $PM_{2,5}$)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	66
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	6

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Budapest

immission area: 525 km^2 population: 1 702 297

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	9	5	11	27	45	50	-	16
PM_{10}	11	34	74	140	257	374	-	106
$PM_{2,5}$	1	9	17	62	77	100	-	23
NO	11	21	80	187	462	477	-	196
NO_2	11	38	64	102	167	201	-	120
CO	11	598	1746	2564	4427	4875	-	2376
O_3	9	37	74	104	163	170	-	125

PM_{10}:	Monitoring method(s) used:	β-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	96
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	1

Comments:
SO2, NO, NO2, CO, O3: Max. 98 percentile per year is calculated from 1 hour mean values.
PM10: Max. 98 percentile per year is calculated from daily mean values.

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Chemnitz

immission area: 221 km^2 population: 245 700

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 99,18-Percentile per day, hour [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	3	23	39	98	318	724	947	80
$PM_{2,5}$	2	15	39	70	-	-	-	-
NO	3	28	78	145	145	145	632	214
NO_2	3	36	55	90	90	90	178	115
CO	0	-	-	-	-	-	-	-
O_3	1	46	71	112	112	112	179	118

PM_{10}:	Monitoring method(s) used:	gravimetrically (High-Volume-Sampler, micro balance)
	Correction factor for this method according to EU-directive 1999/30/EC):	1.05/1.1/1.14
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	19
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments:
The measurement of SO_2 and CO stopped on 1.1.2008

Copenhagen

immission area: 88 km^2 population: 518 574

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2			42	58		8
PM_{10}	3	31		126				73*
$PM_{2,5}$	2	11						19**
NO	-							
NO_2	3	40			206	302		126
CO	3	429		1289		6520		1414
O_3	3	41		108		140		106

PM_{10}:	Monitoring method(s) used:	Gravimetically , TEOM
	Correction factor for this method according to EU-directive 1999/30/EC):	1 /1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	59
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	n.a.

Comments: * Max. 95-Percentile, **Max. 90-Percentile

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Dornbirn

immission area: 14 km^2 population: 47 050

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	7	12	14	16	19	8
PM_{10}	1	21	37	67				58
$PM_{2,5}$	-							
NO	1	16	49	119	250	329	373	113
NO_2	1	24	47	72	110	123	113	78
CO	-							
O_3	-							

PM_{10}:	Monitoring method(s) used:	Gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	20
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comment:
The street “Stadtstraße” in Dornbirn was closed to traffic for 11 months that caused reduced immission data. It´s not allowed to use the data are for annual comparisons.

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Dresden

immission area: 328 km^2 population: 504 795

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 99,18-Percentile day, hour [µg/m³]
SO_2	1	-	7	15	27	29	30	-
PM_{10}	4	28	44	92	245	643	796	74
$PM_{2,5}$	2	16	23	52	-	-	-	-
NO	4	34	95	198	492	492	492	248
NO_2	4	36	57	87	192	192	192	114
CO	-	-	-	-	-	-	-	-
O_3	3	44	79	126	173	173	173	120

PM_{10}:	Monitoring method(s) used:	Gravimetrically (High-Volume-Sampler, micro balance)
	Correction factor for this method according to EU-directive 1999/30/EC):	1/1.05/1.1/1.14
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	35
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments:
The measurement of CO (station Dresden North) and SO_2 (station Radebeul-Wahsdorf) stopped on 1.1.2008

Edinburgh (St. Leonhards)

immission area: 262 km^2 population: 463 510

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	5	32	119	200	-	19
PM_{10}	1	15	22	47	73	99	-	41
$PM_{2,5}$*	-						-	
NO	1	15	51	166	673	714	-	105
NO_2	1	31	59	116	240	262	-	107
CO	1	200	400	900	1700	1900	-	600
O_3	1	49	81	104	125	128	-	100

PM_{10}:	Monitoring method(s) used:	TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	0
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	6

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Frankfurt (urban stations)

immission area: 248 km² population: 676 197

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	4	4	10	22	68	127	142	17
PM_{10}	5	20	29	149	725	994	1074	56
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	5	26	62	161	336	523	570	152
NO_2	5	38	58	87	129	156	190	92
CO	1	410	660	1360	2980	3380	4180	1250
O_3	4	38	81	110	214	231	241	134

PM_{10}:	Monitoring method(s) used:	ß-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	7
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Frankfurt (traffic station)

immission area: 248 km² population: 676 197

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	27,3	40,2	106,8	432,4	622,3	625,9	69,5
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	54,4	81,8	237,8	604,6	716,1	746,1	221,7
NO_2	1	60,5	71,2	125,5	259,2	297,2	304,5	131,2
CO	1	600	850	2050	4750	5430	6210	1680
O_3	-	-	-	-	-	-	-	-

PM_{10}:	Monitoring method(s) used:	ß-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	22
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	2

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Gothenburg

immission area: 198 km^2 population: 501 429

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile year [µg/m³]
SO_2	2	3	5	10	26	35	50	10
PM_{10}	1	21	29	52	112	186	189	55
$PM_{2,5}$	2	12	16	35	60	84	93	29
NO	1	8	19	109	402	653	732	82
NO_2	3	25	37	92	162	224	235	93
CO	1	186	259	463	1115	1170	1430	430
O_3	3	53	78	123	145	146	147	113

PM_{10}:	Monitoring method(s) used:	TEOM
	Correction factor for this method according to EU-directive 1999/30/EC):	+19 % + 1.15
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	4
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	1

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Graz (urban stations)

immission area: 128 km^2 population: 255 354

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2, 3] [µg/m³]	max. 1h mean value [2, 4] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	3	3	8	21	33	36	52	12
PM_{10} cont.	5	28	80	258	726	914	1061**	120
PM_{10} g.	1	33	75	220				
$PM_{2,5}$	-							
NO	4	27	111	250	482	525	547	251
NO_2	5	32	60	91	155	157	162	97
CO	2	550	1300	2200	3800	3800	3900	2200
O_3	4	49	97	130	147	150	152	126

PM_{10}:	Monitoring method(s) used:	Continuous / Gravimetric*
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3 / 1*
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	65 /60*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	-

Comment:
Max 3h-mean value = moving average, Max 1h-mean value = static average

*reference method (gravimetric analysis of dust); ** measured value: 01.01.2008 - 01:00 (New Year's Eve)

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Graz (traffically influenced Don Bosco)

immission area: 128 km^2 population: 255 354

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2, 3] [µg/m³]	max. 1h mean value [2, 4] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	11	20	32	32	34	17
PM_{10} cont.	1	35	77	255	614	846	944**	110
PM_{10} g.	1	37	77	220				
$PM_{2,5}$	1	24	57	161				
NO	1	64	150	293	555	607	715	314
NO_2	1	50	70	100	160	189	214	111
CO	1	600	1300	2400	4200	4900	5600	2100
O_3	-	-	-	-	-	-	-	-

PM_{10}:	Monitoring method(s) used:	continuous, Gravimetric*
	Correction factor for this method according to EU-directive 1999/30/EC):	1. / 1*
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	53 / 73*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	-

Comments:

*reference method (gravimetric analysis of dust); ** measured value: 01.01.2008 - 01:00 (New Year's Eve)
Max 3h-mean value = moving average, Max 1h-mean value = static average

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Hallein

immission area: 27 km^2 population: 18 900

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	3	7	44	256	381	565	11
PM_{10}	2	24	39	92	-	-	-	68
$PM_{2,5}$	0	-		-	-	-	-	-
NO	3	38	91	187	368	472	568	216
NO_2	3	38	63	93	168	177	216	112
CO	2	450	890	1540	2540	2880	3590	1490
O_3	1	63	88	121	150	152	152	122

PM_{10}:	Monitoring method(s) used:	Gravimetrically, TEOM
	Correction factor for this method according to EU-directive 1999/30/EC):	0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	13
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments:
A disturbance on 18.02.2008 in the paper mill in Hallein caused very high SO_2 values (max. HMW: 565 µg/m³)
The ozone mean values a relative high, because the measuring point stands about 200 meters above the valley floor.

Comparison of The Air Quality in 2008

immission area: 755 km^2 population: 1 769 00

Hamburg (area monitoring stations)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	7	5	12	93	291	515	741	41
PM_{10}	9	22	32	123	746	1000	1267	60
$PM_{2,5}$	3	15	23	107	540	669	963	46
NO	14	10	39	233	829	1022	1074	136
NO_2	14	25	50	87	163	195	295	92
CO	4	246	383	811	1726	1959	2205	722
O_3	6	45	81	115	181	192	193	117

PM_{10}:	Monitoring method(s) used:	TEOM (7 stations), β-absorption (2 stations)
	Correction factor for this method according to EU-directive 1999/30/EC):	TEOM: 1; Beta: 1.20, 1.32
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	7
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Hamburg (traffic stations)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	3	27	40	116	680	949	1388	70
$PM_{2,5}$	1	18	26	93	540	750	1097	49
NO	4	64	115	238	859	1012	1030	313
NO_2	4	64	92	150	259	311	315	167
CO	4	567	854	1673	5277	6474	7529	1824
O_3	-	-	-	-	-	-	-	-

PM_{10}:	Monitoring method(s) used:	Teom (2 stations) ß-Adsorption (1 station)
	Correction factor for this method according to EU-directive 1999/30/EC):	TEOM:1; Beta-Absorption: 1.26
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction	18
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	30

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Innsbruck

immission area: 105 km^2 population: 140 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	9	15	34	36	38	16
PM_{10}	2	23	33	99				51
$PM_{2,5}$	1	16	24	42				35
NO	2	34	70	212			530	180
NO_2	2	41	68	97	148		166	105
CO	1	429	787	1221	1844	2232	2684	1267
O_3	2	38	71	94	134	139	141	107

PM_{10}:	Monitoring method(s) used:	Gravimetric (Digitel HVS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	28
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Karlsruhe (urban station)

immission area: 173 km^2 population: 288 903

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [2,3] [µg/m³]
SO_2	1	4	8	21	51	83	96	
PM_{10}	2	22	32	83				
$PM_{2,5}$								
NO	2	18	47	156	315	382	465	
NO_2	2	29	46	90,5	134	154	156	
CO	1	200	400	1000	1900	2300	2500	
O_3	2	40	80	110	191	195	198	

PM_{10}:	Monitoring method(s) used:	gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	7
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

[1] arithmetic mean value of all monitoring stations of the affected area
[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Karlsruhe (traffic station)

immission area: 173 km^2 population: 288 903

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [2,3] [µg/m³]
SO_2								
PM_{10}	1	24	34	144				
$PM_{2,5}$								
NO	1	42	77	316	558	693	799	
NO_2	1	51	61	137	191	255	279	
CO	1	700	900	2600	4700	5500	6500	
O_3								

PM_{10}:	Monitoring method(s) used:	gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	10
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	3

Klagenfurt

immission area: 120 km^2 population: 93 306

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	9	14	60	75	80	17
PM_{10}	2	25	53	100	-	-	-	-
$PM_{2,5}$*	1	16	33	78	-	-	-	-
NO	2	23	79	152	315	421	462	167
NO_2	2	32	60	83	161	188	190	92
CO	2	480	860	1521	2427	2636	2726	1409
O_3	2	42	84	114	145	149	153	121

PM_{10}:	Monitoring method(s) used:	Gravimetrically (Digitel HVS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	33
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Leeds

immission area: 552 km^2 population: 761 100

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	15	54	64	-	13
PM_{10}	1	24	40	132	221	249	-	63
$PM_{2,5}$ *	-	-	-	-	-	-	-	-
NO	1	19	65	403	573	664	-	133
NO_2	1	35	58	179	281	315	-	86
CO	1	200	400	2100	4100	5600	-	800
O_3	1	43	80	115	167	170	-	108

PM_{10}:	Monitoring method(s) used:	TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	8
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	8

Leipzig

immission area: 298 km^2 population: 506 578

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 99,14-Percentile per day, hour [µg/m³]
SO_2	1	2	3	12	34	40	46	9
PM_{10}	3	28	47	109	230	902	944	95
$PM_{2,5}$	1	17	24	66	-	-	-	-
NO	3	27	53	158	158	158	450	151
NO_2	3	37	56	80	80	80	177	97
CO	-	-	-	-	-	-	-	-
O_3	1	46	72	121	121	121	178	119

PM_{10}:	Monitoring method(s) used:	Gravimetrically (High-Volume-Sampler, micro balance)
	Correction factor for this method according to EU-directive 1999/30/EC):	1 / 1.05/ 1.1 / 1.14
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	40
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments: The measurement of CO in “Leipzig Mitte” is stopped on 1.1.2008

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Leoben (Leoben, Donawitz, Göß)

immission area: 108 km^2 population: 24 999

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	3	3	7	18	44	83	102	21
PM_{10} kont.	3	27	47	108	182	277	401	89
PM_{10} g.	1	22	37	86				
NO	3	15	57	144	247	260	292	79
NO_2	3	24	46	115	179	184	195	64
CO	1	700	1200	2600	6500	11000	14800	3300
O_3	1	37	61	90	138	140	140	115

PM_{10}:	Monitoring method(s) used:	continuous, gravimetric*
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	25/12*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	-

Comment:
*reference method (gravimetric analysis of dust); ** measured value: 01.01.2008 - 01:00 (New Year's Eve)
Max 3h-mean value = moving average, Max 1h-mean value = static average

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Linz

immission area: 96 km^2 population: 189 355

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	4	3	12	49	289	487	799	37
PM_{10}	5	26	48	102	207	299	423	89
$PM_{2,5}$	1	19	32	67			67	
NO	5	29	92	193	423	619	725	233
NO_2	5	34	65	99	184	228	260	118
CO	5	430	800	2000	4000	4144	4912	1907
O_3	3	38	72	104	157	159	159	120

PM_{10}:	Monitoring method(s) used:	Continuously and gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1.2 / 1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	47
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	1

Lisbon

immission area: 85 km^2 population: 499 700

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	5	1	4	18	49	55	-	15
PM_{10}	4	30	60	122	240	289	-	96
$PM_{2,5}$	2	12	26	52	106	115	-	38
NO	7	22	96	238	637	818	-	228
NO_2	7	38	82	142	244	276	-	152
CO	7	348	964	1725	3953	5068	-	2074
O_3	4	50	75	117	176	181	-	107

PM_{10}:	Monitoring method(s) used:	no information
	Correction factor for this method according to EU-directive 1999/30/EC):	no information
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	82
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	20

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Liverpool (Speke)

immission area: 112 km^2 population: 435 500

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	7	10	20	59	85	-	24
PM_{10}	1	16	29	83	273	299	-	58
$PM_{2,5}$	-							
NO	1	8	23	174	275	311	-	56
NO_2	1	22	34	64	90	96	-	65
CO	1	100	200	500	1300	1600	-	500
O_3	1	47	68	93	143	150	-	92

PM_{10}:	Monitoring method(s) used:	TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	12
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

London

immission area: 1 572 km^2 population: 13 945 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	6	4	10	40	130	160		21
PM_{10}	6	29	58	108	179	317		98
$PM_{2,5}$	4	15	26	61	96	211		48
NO	14	35	173	354	708	713		410
NO_2	14	49	138	223	358	378		252
CO	8	400	900	1700	3000	3200		1900
O_3	9	35	71	111	164	166		110

PM_{10}:	Monitoring method(s) used:	GRAV EQ, TEOM (FDMS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	157
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	822

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Lyon (Urban site)

immission area: 954 km^2 population: 1 348 832

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year,hour [µg/m³]
SO_2	5	3		24		139		7
PM_{10}	3	30		146				89
$PM_{2,5}$	2	23		125				
NO	4	16				516		150
NO_2	4	35				190		101
CO	-							
O_3	4	41		117		173		122

PM_{10}:	Monitoring method(s) used:	FDMS
	Correction factor for this method according to EU-directive 1999/30/EC):	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	36
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Lyon (traffic site)

immission area: 954 km^2 population: 1 348 832

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-							
PM_{10}	4	36		183				116
$PM_{2,5}$	1	30		107				
NO	6	58				836		371
NO_2	6	61				408		182
CO	5	520						1577
O_3	-							

PM_{10}:	Monitoring method(s) used:	FDMS
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	79
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	66

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Madrid immission area: 604 km^2 population: 3 213 271

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]*	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year** [µg/m³]
SO_2	25	11	29	59	122	158	-	55
PM_{10}	24	27	50	134	316	575	-	116
$PM_{2,5}$	7	14	26	68	142	180	-	62
NO	25	26	102	298	702	945	-	229
NO_2	25	55	93	186	437	555	-	180
CO	23	400	800	2400	6000	8300	-	1800
O_3	24	39	84	118	194	201	-	130

PM_{10}:	Monitoring method(s) used:	Oscillating microbalance
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	65 (LUCA DE TENA,ES0119A,28079009) P90.4=59
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	119 (MARAÑON, ES0116A, 28079006) P99.8=340

Comments:

* *Static average (not moving average)*

** *Maximum 98 percentile of 1-hour values*

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Mannheim (urban station)

immission area: 145 km^2 population: 310 329

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	8	29	57	85	102	
PM_{10}	2	20	32	92				
$PM_{2,5}$								
NO	3	15	50	234	528	610	651	
NO_2	3	29	47	104	160	185	196	
CO	1	200	360	1100	2000	2300	2600	
O_3	3	39	79	101	174	185	197	

PM_{10}:	Monitoring method(s) used:	Gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Mannheim (traffic station)

immission area: 145 km^2 population: 310 329

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1*	6	11	70	415	1069	1299	
PM_{10}	1	25	34	87				
$PM_{2,5}$								
NO	1	39	70	180	318	380	409	
NO_2	1	51	64	105	162	190	246	
CO	1	600	940	1600	3400	3700	4000	
O_3								

PM_{10}:	Monitoring method(s) used:	Gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	12
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments: *SO_2 emitter is near the measurement station MA-Nord

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Milan

immission area: 182 km^2 population: 1 304 183

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	9	15	37	55	-	14
PM_{10}	3	44	92	184	488	590	-	143
$PM_{2,5}$	1	32	73	160	169	169	-	103
NO	6	45	138	365	787	866	-	317
NO_2	6	59	107	280	553	600	-	170
CO	4	700	2300	4500	6500	13500	-	3700
O_3	2	45	95	145	269	276	-	155

PM_{10}:	Monitoring method(s) used:	TEOM
	Correction factor for this method according to EU-directive 1999/30/EC):	n.a
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	115
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	241

Munich

immission area: 310 km^2 population: 1 365 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	4	8	13	19	23	27	12
PM_{10}	6	26	54	119	286	441	717	116
$PM_{2,5}$	0							
NO	7	45	143	266	526	732	772	360
NO_2	7	57	94	142	291	328	346	181
CO	5	500	900	1800	3700	4100	5500	1800
O_3	3	37	64	86	142	148	151	111

PM_{10}:	Monitoring method(s) used:	β-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.25
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	60
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	56

Comment: PM_{10}: The value from 01.01.2008 is not in the analysis, because fireworks in the New Year's Eve cause very high single data.

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Prague immission area: 496 km^2 population: 1 223 368

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	10	4	9	25	n.a.	264	n.a.	14
PM_{10}	19	28	58	155	n.a.	241	n.a.	85
$PM_{2,5}$	6	18	36	111	n.a.	155	n.a.	52
NO	15	21	92	243	n.a.	661	n.a.	196
NO_2	21	41	109	291	n.a.	280	n.a.	122
CO	12	553	1519	2992	n.a.	5050	n.a.	1948
O_3	8	40	75	115	n.a.	176	n.a.	95

PM_{10}:	Monitoring method(s) used:	Gravimetry, radiometry
	Correction factor for this method according to EU-directive 1999/30/EC):	Correction factor for measured data from the database = 1. Correction factor built in the PM_{10} analyzer (beta absorption) is set to the value 1.3.
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	84
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	106*

Comments:

1) max.1h mean value [µg/m³] – not used measurement with daily values only (gravimetry)
2) Max.98 – Percentile per year [µg/m³] – used daily mean

* The only station in the Czech Republic exceeding the 1-h mean standard of 200 µg/m³ (NO_2).

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Riga (traffic station)

immission area: 307 km^2 population: 717 371

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	2	46	80	173	268	365	365	153
$PM_{2,5}$	1	30	34	60				54
NO	1	84	122	175	336	461	575	233
NO_2	1	44	62	103	153	159	179	94
CO	1	500	700	1000	1700	2100	2500	1300
O_3	1	16	29	46	67	72	73	47

PM_{10}:	Monitoring method(s) used:	beta absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	126
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments:
98-percentiles: SO_2, NO_2, PM_{10}, CO, Ozone: 98%-value of the hour's means
98-percentiles: $PM_{2,5}$: 98%-value of the daily means

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Riga (urban station)

immission area: 307 km^2 population: 717 371

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	3	4	11	14	19	37	41	11
PM_{10}	1	24	33	95	-	-	-	57
$PM_{2,5}$	1	19	24	56	-	-	-	39
NO	-	-	-	-	-	-	-	-
NO_2	3	21	41	78	152	200	211	80
CO	-	-	-	-	-	-	-	-
O_3	3	47	78	99	122	126	164	98

PM_{10}:	Monitoring method(s) used:	beta absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	1.0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	0
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comment:
98-percentiles: SO_2-, NO_2, CO, Ozone: 98%-value of the hour's means
98-percentiles: PM_{10} , $PM_{2,5}$: 98%-value of the daily means

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Rhine / Ruhr area

immission area: 5 770 km^2 population: 8 213 872

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	7	10	25	116	-	291	458	97
PM_{10}	31	25	46	248	-	-	-	-
$PM_{2,5}$	4	18	25	94	-	-	-	-
NO	18	14	58	223	-	681	710	187
NO_2	18	30	48	93	-	181	243	85
CO	0	-	-	-	-	-	-	-
O_3	14	36	74	118	-	236	240	119

PM_{10}:	Monitoring method(s) used:	1) Beta-absorption 2) Oscillating micro balance 3) Gravimetric
	Correction factor for this method according to EU-directive 1999/30/EC):	1) 1.24 2)1.27 3) 1.00
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	68
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Comments: Traffic stations are not included in the calculation

Rotterdam - Rijnmond

immission area: 803 km^2 population: 1 186 434

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	7	12	15	25	n.a.	50	n.a.	27
PM_{10}	3	26	33	179	n.a.	868	n.a.	61
$PM_{2,5}$	2	18	25	152	n.a.	491	n.a.	51
NO	3	17	38	164	n.a.	465	n.a.	101
NO_2	3	37	49	93	n.a.	149	n.a.	82
CO	2	454	595	1654	n.a.	5004	n.a.	1058
O_3	3	39	66	94	n.a.	163	n.a.	105

PM_{10}:	Monitoring method(s) used:	TEOM (SES)
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	12
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Salzburg

immission area: 66 km^2 population: 149 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	2	4	8	34	54	81	9
PM_{10}	3	24	47	91	-	-	-	67
$PM_{2,5}$	2	17	30	78	-	-	-	53
NO	3	32	111	202	379	487	499	249
NO_2	3	39	78	103	182	219	244	138
CO	2	430	840	1450	2290	2440	2700	1430
O_3	2	41	68	94	143	145	147	113

PM_{10}:	Monitoring method(s) used:	Gravimetrically, TEOM
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	34
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	2

Sofia

immission area: 1 311 km^2 population: 1 356 877

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	4	13	-	175	-	385	-	82
PM_{10}	6	67	-	613	-	-	-	-
$PM_{2,5}$	1	41	-	443	-	-	-	-
NO	4	-	-	-	-	-	-	-
NO_2	4	41	-	257	-	430	-	196
CO	2	1300	-	-	-		-	-
O_3	3	43	-	107	-	188	-	121

PM_{10}:	Monitoring method(s) used:	EN12341 and ISO 10473
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	199
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	155

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Immission area: 108 km^2 population: 51 500

St. Pölten, urban station (Eybnerstrasse)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	4	13	18	18	18	14
PM_{10}	1	26	40	97	117	133	136	102
$PM_{2,5}$	1	21	26	55	75	78	90	63
NO	1	8	16	70	193	316	345	89
NO_2	1	23	37	56	98	123	124	81
CO	-	-	-	-	-	-	-	-
O_3	1	43	69	95	159	165	167	135

PM_{10}:	Monitoring method(s) used:	oscillating micro balance
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	19
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

St. Pölten, traffically influenced (Europaplatz)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	---	---	---	---	---	---	---
PM_{10}	1	26	39	92	122	278	293	102
$PM_{2,5}$	1	---	---	---	---	---	---	---
NO	1	41	63	186	333	551	563	265
NO_2	1	42	50	81	143	204	211	120
CO	1	440	620	1120	2320	3340	3420	1510
O_3	-	---	---	---	---	---	---	---

PM_{10}:	Monitoring method(s) used:	oscillating micro balance
	Correction factor for this method according to EU-directive 1999/30/EC):	1.3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	20
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	1

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Stockholm

immission area: 48 km^2 population: 296 323

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per hour [µg/m³]
SO_2	1	0,8	1					
PM_{10}	4	33	59	174		367		
$PM_{2,5}$	3	11	14	43		83		
NO								
NO_2	4	40	60	95		205		109
CO	1	400	500	900		4200		
O_3	1	51	77	113		135		

PM_{10}:	Monitoring method(s) used:	TEOM
	Correction factor for this method according to EU-directive 1999/30/EC):	1.2
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	77
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	1

Comment:
All stations are situated in the inner city of Stockholm
SO_2: roof level, Diffusive samplers -only per month
PM10, NO_2, CO: street level, O_3: roof level

Stuttgart (urban station)

immission area: 207 km^2 population: 597 596

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	7	13	18	22	25	-
PM_{10}	2	20	34	112	-	-	-	-
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	2	25	70	178	390	477	537	-
NO_2	2	38	59	102	168	183	206	-
CO	1	300	500	1300	1700	1800	2200	-
O_3	2	38	71	97	171	177	179	-

PM_{10}:	Monitoring method(s) used:	gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Stuttgart (traffic station)

immission area: 207 km^2 population: 597 596

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	27	39	125	-	-	-	-
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	65	105	217	386	415	465	-
NO_2	1	74	92	130	214	227	260	-
CO	1	700	1000	1600	2300	2600	2800	-
O_3	-	-	-	-	-	-	-	-

PM_{10}:	Monitoring method(s) used:	gravimetrically
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	14
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	9

Thessaloniki

immission area: 129 km^2 population: 794 330

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per hour [µg/m³]
SO_2	4	7		48		128		45
PM_{10}	4	47		139				145
$PM_{2,5}$								
NO	7	21				774		324
NO_2	7	33				202		101
CO	4	700				6500		2900
O_3	6	67				247		179

PM_{10}:	Monitoring method(s) used:	β-attenuation
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	155
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	1

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Vienna

immission area: 415 km^2 population: 1 687 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 99,9 Percentile 3h-mean value [2] [µg/m³]	max. 99,9 Percentile 1h-mean value [2] [µg/m³]	max. 99,9 Percentile 1/2h-mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	10	3	11	46	59	66	70	26
PM_{10}	13	24	45	107	139	159	161	81
$PM_{2,5}$	2	19	30	72				
NO	17	17	135	302	548	579	615	364
NO_2	17	32	80	140	196	211	219	166
CO	4	460	720	1430	1960	2140	2200	1400
O_3	5	52	92	121	154	162	161	128

PM_{10}:	Monitoring method(s) used:	8 Stations gravimetric, 5 Stations continuous (including correction factor)
	Correction factor for this method according to EU-directive 1999/30/EC):	depending on station and quarter
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	39
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	17

Comments:
PM10: The used station factors k * x + d vary depending on station and quarter:
k [0.90 … 1.56], d [-3.30 … 4.97] for 2008 for the not-gravimetric-station

The values (max. and short-time percentile of PM_{10} and $PM_{2,5}$ (99,9% HMW, MW1 and MW3 and 98% HMW) are from continues measure. All other particulates values (JMW, max. MMW and max. TMW) are from gravimetric and continuous monitoring.

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Villach

immission area: 135 km^2 population: 59 004

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	3	7	11	12	13	5
PM_{10}	1	23	36	73				
$PM_{2,5}$	0							
NO	1	26	65	198	336	367	389	131
NO_2	1	32	49	72	132	155	188	78
CO	1	509	969	1647	2755	2903	4368	1465
O_3	1	32	62	102	130	131	133	106

PM_{10}:	Monitoring method(s) used:	Gravimetrically (Digitel HVS)
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	9
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Warsaw

immission area: 517 km^2 population: 1 706 624

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per day [µg/m³]
SO_2	9	8	20	61	-	136	-	31
PM_{10}	11	31	62	257	-	411	-	104
$PM_{2,5}$	2	21	27	72	-	-	-	49
NO	9	16	98	233	-	548	-	172
NO_2	9	29	74	132	-	178	-	104
CO	5	641	1214	3609	-	6951	-	1820
O_3	4	41	79	108	-	158	-	89

[1]

PM_{10}:	Monitoring method(s) used:	automatic TEOM + FDMS, manual gravimetric method
	Correction factor for this method according to EU-directive 1999/30/EC):	automatic TEOM+FDMS – factor 1.0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	**133** traffic station, TEOM+FDMS automatic
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	**0**

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Wiesbaden (urban stations)

immission area: 204 km^2 population: 275 482

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	5	10	19	26	29	9
PM_{10}	1	19	26	93	385	436	533	55
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	19	44	145	257	333	379	127
NO_2	1	35	55	91	148	156	169	89
CO	-	-	-	-	-	-	-	-
O_3	1	41	82	121	201	225	230	130

[1]

PM_{10}:	Monitoring method(s) used:	ß-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2005 (measured values **including** correction factor):	3
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2005:	0

Wiesbaden (traffic station)

immission area: 204 km^2 population: 275 482

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	23	31	122	605	1009	1195	60
$PM_{2,5}$	1	14	18	105	550	798	1031	38
NO	1	65	105	227	505	661	725	265
NO_2	1	54	69	107	172	210	227	115
CO	1	730	1110	1890	3900	5850	6360	2200
O_3	-	-	-	-	-	-	-	-

[1]

PM_{10}:	Monitoring method(s) used:	ß-absorption
	Correction factor for this method according to EU-directive 1999/30/EC):	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2005 (measured values **including** correction factor):	8
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2005:	1

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area

Comparison of The Air Quality in 2008

Zagreb

immission area: 641 km^2 population: 779 145

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	6	1,5	7	31		25		13
PM_{10}	6	38	80	242				130
$PM_{2,5}$	1	24	55	127				80
NO	-							
NO_2	5	42	59	117		148		84
CO	-							
O_3	5	29	63	123				99

[1]

PM_{10}:	Monitoring method(s) used:	gravimetric
	Correction factor for this method according to EU-directive 1999/30/EC):	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	116
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

Zurich

immission area: 1 086 km^2 population: 111 090

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	8	19	30	35	42	24
PM_{10}	1	20	33	85	181	332	365	89
$PM_{2,5}$	1	15	27	75	-	-	-	-
NO	1	12	29	106	217	251	266	156
NO_2	1	33	49	85	107	111	136	103
CO	1	360	525	995	1530	1700	1878	1291
O_3	1	45	77	110	156	161	161	144

PM_{10}:	Monitoring method(s) used:	β-meter-measurement, calibrated with gravimetrical measurements every 4 days
	Correction factor for this method according to EU-directive 1999/30/EC):	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2008 (measured values **including** correction factor):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2008:	0

[1] arithmetic mean value of all monitoring stations of the affected area

[2] max. value of all monitoring stations of the affected area