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Air Quality Data in 2002

The Comparison of Cities and Regions in Europe

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Nature + Environment

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Luftgütedaten 2002
Nationaler und europäischer Städtevergleich

Einführung

Die Bekämpfung der Luftverschmutzung war in den letzten Jahren und 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.

Um überhaupt den Erfolg von Sanierungsmaßnahmen nachweisen zu können, ist die Beobachtung der Schadstoffkonzentrationen mit Hilfe von Luftmessnetzen sinnvoll. Mittlerweile sind in den meisten Messgebieten Luftmessnetze seit mehr als 2 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 2002
The Comparison of Cities and Regions in Europe

Introduction

The fight against air-pollution was one of the major topics to deal with of all organisations concerned with environmental affairs, such as national and local authorities. In the form of regional or national air-cleaning programmes it is tried to get air pollution under control as well as to increase the air quality step by step.

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 air-monitoring areas monitoring station networks have been installed already for more than 2 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 Amt für Natur- und Umweltschutz bereits seit mehreren 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 2002 wurden weiters Städte bzw. Regionen aus Deutschland, England, Frankreich, Belgien, Niederlande, Dänemark, Schweden, Italien, Schweiz, Spanien, Portugal, Polen, Bulgarien, Lettland, Luxemburg und Kroatien mit einbezogen. Die Daten aus Athen, Thessaloniki und Debrecen trafen in den letzten Jahren zu spät ein, so dass sie auch für *diesen* Bericht nicht mehr berücksichtigt werden konnten. Diese Daten werden jedoch im Städtevergleich des kommenden Jahres in Form von Zeitreihen mit berücksichtigt werden.	Comparisons of the air quality have been carried out by our organization already for a couple 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 2002 comprised cities and regions of Austria, Germany, cities from England, France, Belgium, Netherlands, Denmark, Sweden, Italy, Switzerland, Spain, Portugal, Poland, Bulgaria, Latvia, Luxemburg and Croatia. The data from Athens, Thessalonica and Debrecen were delivered too lately during the last years, so they could not be taken into account for *this* report as well. However those data will be taken into consideration for the report 2003 in terms of a time series.
Leider wurden uns bis zum heutigen Tag keine Daten aus Bukarest und Budapest zur Verfügung gestellt.	Unfortunately up to the present day no data of Bucharest and Budapest were placed to our disposal.
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 12 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:	**Critical remarks** Over and over again there is critically remarked that a comparison of the pollutant stress between monitoring areas is not 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 12 and the subsequent graphics), 2. the density of distribution of the monitoring stations is different, 3. the location of the monitoring station not always is comparable (for that reason in some cities the network services distinguished 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. 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 werden. 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 oben bemerkt, unterscheiden einige Städte zwischen verkehrsbelasteten und 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, wurden 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 (ausgenommen Athen, Thessaloniki und Debrecen, für die eine Zeitreihe im nächsten Bericht mit aufgenommen werden wird).

1. The kind of measurement of air pollutants is carried out by the same ore similar technical methods. This means that 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 measured 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 above, some cities distinguish between traffic-stressed and non-traffic-influenced monitoring stations.

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 immissions.
   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 that only have been participating the comparison since a couple of years, have been updated far as back as possible (except Athens, Thessalonica and Debrecen, which will be integrated in the next report of 2003).

Verglichene Immissionskenngrößen

In der vorliegenden Studie wurden verschiedene Immissionskenngrößen miteinander verglichen:

- ∉ 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

Von den einzelnen Messnetzbetreibern wurden die gewünschten Immissionsdaten in sehr unterschiedlicher Vollständigkeit zur Verfügung gestellt. Insbesondere betrifft dies die Percentil-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 Percentilgrößen (z. B. 95-Percentil) gebildet. Die meisten Messnetzbetreiber berechnen die Percentile aus den Halbstunden-Mittelwerten eines Jahres, manchmal werden jedoch auch die Tagesmittelwerte dafür herangezogen.

Aus diesem Grund wurde nur die Auswertung „max. 98-Percentil“ in grafischer Form durchgeführt. Im Kapitel „Luftgütekennzahlen“ der einzelnen Vergleichsregionen sind sämtliche dem Amt für Natur- und Umweltschutz übermittelten Perzentilwerte aufgelistet. Die Art der Percentilbildung ist - soweit bekannt - in den Tabellen jeweils vermerkt.

Immission reference values compared

The present study compares various Immission reference values, 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

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.

This was the reason that only „max. 98-percentile“ was graphically evaluated. Within the chapter „Air quality reference numbers“ of each compared region all percentile-values the monitoring network services supported us with are mentioned. If known the kind of formation of percentiles is remarked in the tables.

Verglichene Luftschadstoffe

Folgende Luftschadstoffe wurden miteinander verglichen:
SO_2, Staub (TSP), CO, NO, NO_2, O_3,
Feinstaub (PM_{10})

Pollutants compared

The following air pollutants have been compared:
SO_2, particulates (TSP), CO, NO, NO_2, O_3,
fine particulates (PM_{10})

Mehrjahresvergleich

Ein gutes Bild über die Entwicklung der Luftbelastung geben die Grafiken wieder. Dabei wurden von den am Luftgütevergleich teilnehmenden Städte die Entwicklung der Immissionsbelastung von 1993 bis 2002 aufgetragen.

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

1. Einige Städte und Regionen haben ein sehr 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 sichtbare Besserung der Immissionssituation eingetreten ist, während in Städten mit niedriger Immissionsbelastung im Vergleich dazu nahezu keine Änderung der Luftbelastung eingetreten ist.
4. Es zeigt sich, dass in immer mehr Städten und Regionen die Schwebstaub (TSP)-Messungen abgeschaltet werden. TSP wird nur mehr bei weniger als der Hälfte der Teilnehmer am Luftgütevergleich gemessen. Andererseits werden diese Messungen immer mehr durch Feinstaub (PM_{10}-Messungen abgelöst).
5. Entwicklung der Langzeitbelastung (Jahresmittelwerte) gegenüber 1993:

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 2002 are plotted.

The following statements can be given in analysing the data:

1. Some cities and regions have - according to the area - a very 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 1992 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. It can be seen that more and more cities and regions do not monitor TSP any more. Less than half of the participants of the comparison of the air quality are still measuring TSP. On the other hand the percentage of monitoring networks including the pollutant PM_{10} increasing rapidly.
5. Development of the air pollution stress in comparison with 1993:

SO_2: Nahezu alle Regionen *geringer* belastet	SO_2: Nearly all regions *less* stressed
Staub: Nahezu alle Regionen *geringer* belastet	TSP: Nearly all regions *less* stressed
PM_{10}: Erst seit 2001 abgefragt, Trend seitdem: *uneinheitlich*	PM_{10}: only queried since 2001, trend since this year: *nonuniform*
NO: Nahezu alle Regionen *höher* belastet	NO: Nearly all regions *higher* stressed
NO_2: tendenziell *gleichbleibend*	NO_2: trend *constant*
CO: uneinheitlich, tendenziell *gleichbleibend*	CO: non-uniform, trend *constant*
O_3: uneinheitlich	O_3: non-uniform

Übersicht über die Entwicklung der Schadstoffbelastungen 1993 -2002

Beurteilungsbasis: Jahresmittelwerte über alle Stationen einer Region

Overview over the development of the stress of air pollutants from 1993 through 2002

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

Austrian Towns, Cities and Regions

	SO_2			TSP			NO			NO_2			CO			O_3		
	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002
Linz		×			==			Ù			Ù			×			Ù	
Bludenz		×			==		-	==			==		-	-	-	-	Ù	
Dornbirn		×			×	-	-	==			Ù		-	×		-	?	-
Graz		==			==		-	č			Ù			==			č	
Hallein		×			==	-	-	-	-		Ù			Ď			==	
Innsbruck		Ď			Ù			==			==			Ď			==	
Klagenfurt		Ď			×			==			==			×			Ù	
Leoben/Göß/ Donawitz		×			×			č			Ù			==			Ù	
Salzburg		==			×	-	-	?	-		Ù			Ď			×	
St. Pölten		Ù		-	Ď		-	==		-	×		-	Ď		-	==	
Vienna		×			×			==			×			==			==	
Villach		Ď			×			==			==			Ď			==	

European Cities and Regions

	SO_2			TSP			NO			NO_2			CO			O_3		
	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002
Barcelona	-	Ď		-	==	-	-	×		-	==		-	Ď		-	==	
Basel		==			-	-		==			×			×	-		==	
Belfast		Ď		-	-	-		==			×			×			==	
Berlin		×			×	-		Ď			×			×			==	
Birmingham		Ď		-	-	-		×			×			×			==	
Bristol		×		-	-	-		Ď			×			×			==	
Brussels	-	×		-	-	-	-	Ď		-	×		-	×		-	==	
Chemnitz		Ď			×	-	-	×			×			×			==	
Copenhagen		==		-	×	-	-	×		-	==		-	==		-	==	
Debrecen		×	-		Ď	-	-	Ď	-		==	-		?	-		?	-
Dresden		Ď			Ď	-		==			==			==			==	
Edinburgh		==		-	-	-		==			==			×			==	
Frankfurt		×			×	-		×			==			×			Ù	
Gothenburg	-	×		-	?	-		×			==			Ď			Ù	
Hamburg		==			==			Ù			==			Ù			==	
Karlsruhe		×			×	-		==			==			==			==	
Leeds		×		-	-	-		==			×			×			Ù	
Leipzig		×			==	-		Ù			==			==			==	
Liverpool		Ď		-	-	-		==			==			==			Ù	
London		×		-	-	-		Ď			×			×			==	
Luxemburg	-	Ď		-	==		-	×		-	==		-	×		-	==	

	SO_2			TSP			NO			NO_2			CO			O_3		
	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002	Stress in 1993	Tendency last 5 years	Stress in 2002
Lyon-Agglomeration		Ď		-	-	-		Ù			==		-	×		-	==	
Madrid	-	Ď		-	-	-	-	×		-	×		-	Ď		-	Ù	
Mannheim		Ď			×	-		==			×			==			==	
Milan	-	×		-	Ù		-	×		-	×		-	Ď		-	==	
Munich		×			×	-		×			==			×			==	
Rhine/Ruhr Area		×			×			==			×			×			Ù	
Rotterdam	-	==		-	==		-	==		-	==		-	?	-	-	Ù	
Stockholm		==		-	-	-	-	Ď	-	-	==		-	==			==	
Warsaw	-	==		-	-		-	×		-	==		-	==		-	Ù	
Wiesbaden		×			==	-		==			==			×			==	
Zagreb		==			Ď		-	-	-	-	==		-	?	-	-	Ù	
Zurich - Town Centre		Ď			-	-		×			×			×			==	

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
- ? no evaluation possible

×	slight stress decrease	==	constant stress
Ď	strong stress decrease	Ù	slight stress increase
ĎĎ	very strong stress decrease	č	strong stress increase

	PM10		
	Stress in 2001	Ten-dency	Stress in 2002
Linz		Ù	
Bludenz	-	?	-
Dornbirn	-	?	
Graz		Ù	
Hallein	-	?	
Innsbruck		?	
Klagenfurt	-	?	
Leoben/Göß/ Donawitz	-	?	-
Salzburg	-	?	
St. Pölten	-	?	
Vienna	-	?	
Villach	-	?	
Barcelona		==	
Basel		Ù	
Belfast		×	
Berlin		Ù	
Birmingham		×	
Bristol		Ù	
Brussels		č	
Chemnitz		×	
Copenhagen		Ù	
Debrecen	-	?	-
Dresden		×	
Edinburgh		Ù	

	PM10		
	Stress in 2001	Ten-dency	Stress in 2002
Frankfurt		Ù	
Gothenburg		==	
Hamburg		×	
Karlsruhe			
Leeds		==	
Leipzig		×	
Lisbon		×	
Liverpool		×	
London		==	
Luxemburg		==	
Lyon-Agglomera-tion		==	
Madrid		==	
Mannheim		Ù	
Milan		==	
Munich		Ù	
Riga		==	
Rhine-/Ruhr Area		×	
Rotterdam		==	
Stockholm		==	
Warsaw		č	
Wiesbaden		Ù	
Zagreb		==	
Zurich - Town Centre		Ù	

Legend:

- slightly stressed (PM_{10} < 20 µg/m³)
- Medium stressed (PM_{10} < 40 µg/m³)
- Highly stressed (PM_{10} > 40 µg/m³)
- \- missing data
- ? no evaluation possible

×	slight stress decrease	==	constant stress
Ď	strong stress decrease	Ù	slight stress increase
ĎĎ	very strong stress decrease	č	strong stress increase

Anzahl der Tage mit Überschreitungen des PM_{10}-Tagesmittelwertes von 50 µg/m³ in den Jahren 2001 und 2002[1]

Beurteilungsbasis: Anzahl der Überschreitungen an der höchstbelasteten Station eines Messgebietes

Number of days with exceedences of the PM_{10} daily mean of 50 µg/m³ in 2001 and 2002[2]
based on the number of exceedences at the peak stressed monitoring station of a region

	PM_{10} number of days > 50 µg/m³	
	2001	2002
Linz	88	79
Bludenz	-	-
Dornbirn	1[4]	0
Graz	65 (159)[3]	99 (131)[3]
Hallein	-	28
Innsbruck	-	50
Klagenfurt	36	58
Leoben/Göß/ Donawitz	26	7[4]
Salzburg	-	34
St. Pölten	-	
Vienna	-	57
Villach	11[4]	24
Barcelona	-	86
Basel	11	22
Belfast	16	
Berlin	60	91
Birmingham	2	1
Bristol	7	1
Brussels	52	153
Chemnitz	41	20
Copenhagen	-	-
Debrecen	-	-
Dresden	53	36
Edinburgh	3	8

	PM_{10} number of days > 50 µg/m³	
	2001	2002
Frankfurt	42	44
Gothenburg	1	10
Hamburg	22 (33)[3]	33 (43)[3]
Karlsruhe	6	27 (33)[3]
Leeds	3	
Leipzig	109	63
Liverpool	4	2
Lisbon	230	222
London	28	29
Luxemburg	1	4
Lyon-Agglomeration	-	83
Madrid	-	98
Mannheim	25	33 (44)[3]
Milan	148	177
Munich	64	75
Rhine-/Ruhr Area	40	48
Riga	57	74
Rotterdam	98	103
Stockholm	101	113
Warsaw	-	-
Wiesbaden	15	35
Zagreb	-	-
Zurich - Kaserne	18	23

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

[2] For the number of exceedences the correction factors already have been considered. One can refer to the tables at the end of the report.

[3] Peak stressed traffic station

[4] Evaluation only for second half of the year

Anzahl der Messstellen *Number of monitoring stations*

Country	Monitored Area	SO_2	TSP	PM_{10}	NO	NO_2	CO	O_3
Austria	Bludenz	1	1	-	1	1	-	1
	Dornbirn	1	-	1	1	1	1	-
	Graz	3	3	4	6	6	3	4
	Hallein	2	-	1	-	2	1	1
	Innsbruck	1	2	2	2	2	1	2
	Klagenfurt	2	2	1	2	2	2	2
	Leoben/Göß/Donawitz	3	2	1	3	3	1	1
	Linz	9	8	7	10	10	9	4
	Salzburg	3	-	3	-	3	2	3
	St. Pölten	1	1	1	1	1	1	1
	Vienna	17	15	2	17	17	4	5
	Villach	1	1	1	1	1	1	1
Belgium	Brussels	8	-	6	10	10	7	7
Bulgaria	Sofia	8	4	-	-	-	8	-
Croatia	Zagreb	6	5	1	-	5	-	5
Denmark	Copenhagen	1	-	3	3	3	3	2
France	Lyon	15	-	8	11	11	4	7
Germany	Berlin	10	-	12	21	21	13	10
	Chemnitz	1	2	2	2	2	1	2
	Dresden	2	-	2	2	2	2	2
	Frankfurt	5	-	5	5	5	4	5
	Hamburg	13	3	9	17	17	9	6
	Karlsruhe	2	-	4	4	4	4	3
	Leipzig	2	-	3	2	2	1	2
	Mannheim	3	-	4	4	4	4	3
	Munich	4	-	7	8	8	8	3
	Rhine/Ruhr Area	21	24	24	37	37	5	23
	Wiesbaden	1	-	1	1	1	1	1
Italy	Milan	5	1	1	10	10	5	3
Latvia	Riga	4	-	1	-	4	1	4
Luxemburg	Luxemburg	2	-	1	2	2	1	2
Netherlands	Rotterdam	9	5	3	3	3	-	3
Poland	Warsaw	16	1	5	3	15	3	2
Portugal	Lisbon	5	-	3	8	8	8	4

Anzahl der Messstellen Number of monitoring stations

Country	Monitored Area	SO_2	TSP	PM_{10}	NO	NO_2	CO	O_3
Spain	Barcelona	2	-	1	4	4	4	4
	Madrid	24	-	23	24	24	24	24
Switzerland	Basel	1	-	1	1	1	-	1
	Zurich	1	-	1	1	1	1	1
Sweden	Gothenburg	3	-	1	2	3	1	3
	Stockholm	1	-	2	-	3	2	1
U.K.	Belfast	2	-	2	2	2	2	2
	Birmingham	2	-	2	2	2	2	2
	Bristol	1	-	1	1	1	2	1
	Edinburgh	1	-	1	1	1	1	1
	Leeds	1	-	1	1	1	1	1
	Liverpool	1	-	1	1	1	1	1
	London	14	-	11	22	22	16	14

Quellen für die Immissionsdaten Sources for the immission-data

Austria, **Bludenz, Dornbirn**	Umweltinstitut des Landes Vorarlberg Montfortstraße 4 A-6901 Bregenz Austria e-mail: *vumi@vlr.gv.at* Homepage: http://www.vorarlberg.at/vorarlberg/umwelt_zukunft/umwelt/umweltinstitut
Austria, ***Graz, Leoben, Donawitz***	Amt der Steiermärkischen Landesregierung Fachabt. Ia (Ref. für Luftgüteüberwachung) Landhausgasse 7 A-8010 Graz e-mail: *fa17c@stmk.gv.at* Homepage: *http://www.umwelt.steiermark.at/*
Austria, ***Innsbruck***	Amt der Tiroler Landesregierung Abt. Waldschutz-Luftgüte Bürgerstrasse 36 A-6020 Innsbruck Austria e-mail: *an.weber@tirol.gv.at* Homepage: -
Austria, ***Linz***	Amt der oö. Landesregierung Abt. Umwelt- und Anlagentechnik Goethestraße 86 A-4020 Linz Austria e-mail: elisabeth.danninger@ooe.gv.at Homepage: *http://www.ooe.gv.at/umwelt/*
Austria, **Salzburg**	Amt der Salzburger Landesregierung, Abt. 16 Postfach 527 A-5010 Salzburg e-mail: *alexander.kranabetter@salzburg.gv.at* Homepage: *http://www.salzburg.gv.at/*
Austria, ***St. Pölten***	Magistrat der Landeshauptstadt St. Pölten Abteilung XIII Roßmarkt 6 A-3100 St. Pölten Austria e-mail: *marktamt@st-poelten.gv.at* Homepage: http://www.noe.gv.at/Umwelt/Luft.htm

Austria, ***Vienna***	Magistrat der Stadt Wien, MA 22 Ebendorferstraße 4 A-1082 Wien Austria e-mail: *scg@m22.magwien.gv.at* Homepage: *http://www.wien.gv.at/ma22/luftgue.html*
Austria, ***Klagenfurt, Villach***	Amt der Kärntner Landesregierung Abt. 15 (Umweltschutz und Technik) Flatschacher Straße 70 A-9020 Klagenfurt e-mail: *abt15.Luftimmission@ktn.gv.at* Homepage: http://www.ktn.gv.at
Belgium ***Brussels***	CELINE-IRCEL Avenue des Arts, 10-11 B-1210 – Bruxelles Belgium e-mail: *rasse@irceline.be* Homepage: http://www.irceline.be/
Bulgaria ***Sofia***	Executive Environmental Agency 136 Tzar Boris III 6 Lvd. BG-1618 Sofia Bulgaria e-mail: *Serafimov@nfp-bg.eionet.eu.int* Homepage: -
Croatia ***Zagreb***	Institute of Medical Research and Occupational Health Ksaverska cesta 2 HR-10000 Zagreb Croatia e-mail: *vadic@imi.hr* Homepage: -
Denmark ***Copenhagen***	National Environmental Research Institute Atmospheric Environment Frederiksborvej 399 DK-4000 Roskide Denmark e-mail: *kke@dmu.dk* Homepage: *http://www.dmu.dk/forside_en.asp*

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Homepage: *http://www.lfu.baden-wuerttemberg.de*

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Greece ***Athens, Thessalonica***	Hellenic Ministry of Environment, City Planning And Public Works Patission 147 GR-11251 Athens Greece e-mail: - Homepage: -
Hungary, ***Budapest***	Institute of State Public Health and Medical Officer Service VACI UT 172 H-1138 Budapest Hungary e-mail: *gclabor@antszfov.hu* Homepage: -
Hungary, ***Debrecen***	Debrecen Megyei Jogú Város Polgármesteri Hivatal Városfejlesztési Osztály Piac u. 20 H-4024 Debrecen Hungary e-mail: *koros.csaba@ph.debrecen.hu* Homepage: -
Italy ***Milan***	Agenzia Regionale per la Protezione dell'Ambiente della Lombardia Sede ARPA Milano Città Via Filippo Juvara 22 I-20129 Milano Italy e-mail: *cop@provincia.milano.it* Homepage: *http://www.provincia.milano.it*

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Luxemburg ***Luxemburg***	Administration de l´Environnement, Dèpartement Air/Bruit 16, rue Eugène RUPPERT L-2453 Luxemburg e-mail: *Serge.solagna@aev.etat.lu* Homepage: -
Netherlands ***Rotterdam***	DCMR- Environmental Protection Agency ´s-Gravelandseweg 565, Postbox 843 NL- 3100 AV Schiedam The Netherlands e-mail: *jne@dcmr.nl* Homepage: *http://www.dcmr.nl*
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Portugal ***Lisbon***	*Direcção Regional do Ambiente – Lisboa* *Rua Antero de Quental, 44* *Lisboa- 1169-171* *Portugal* *e-mail: joao_quaresma@drarn-lvt.pt* *Homepage: http://www.drarn-lvt.pt*
Romania ***Bucharest***	Agentia de Protectia Mediului Bucuresti Bd. Regina Elisabeta nr. 47, et. 3, cam. 330, sector 5 RO-Bucuresti Romania e-mail: *bucur@mappm.ro* e-mail: *apmbuc@automation.ipa.ro* Homepage: -

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Switzerland ***Basel, Zurich***	Bundesamt für Umwelt, Wald und Landschaft Abteilung Luftreinhaltung CH-3003 Bern Switzerland e-mail: *rudolf.weber@buwal.admin.ch* Homepage: *http://www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_luft/luftbelastung/index.html*
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Luftgütevergleich

2002

Jahresmittelwert (Gebietsmittel)

Comparison of The Air Quality

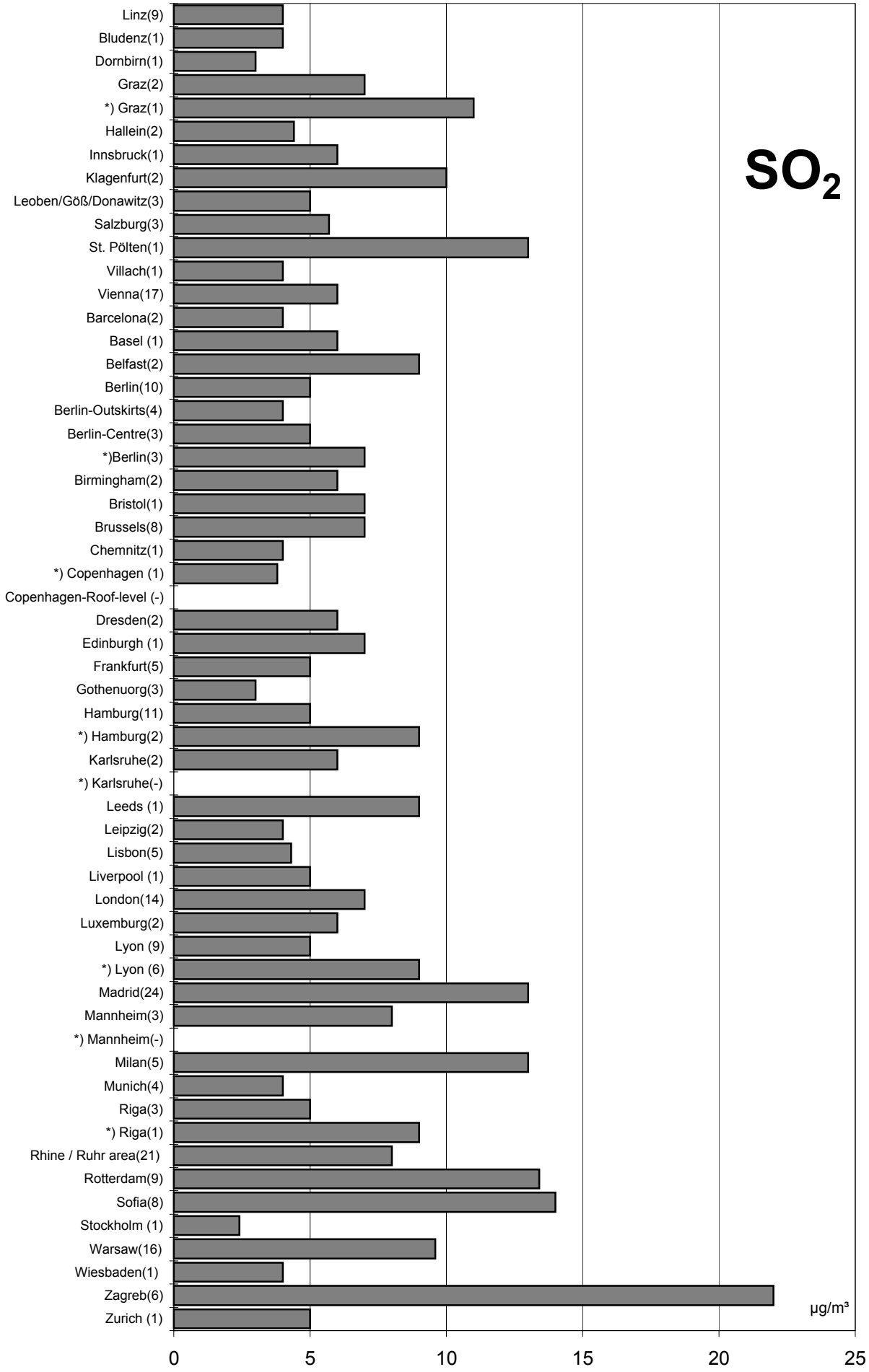
2002

Annual Mean Values

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)



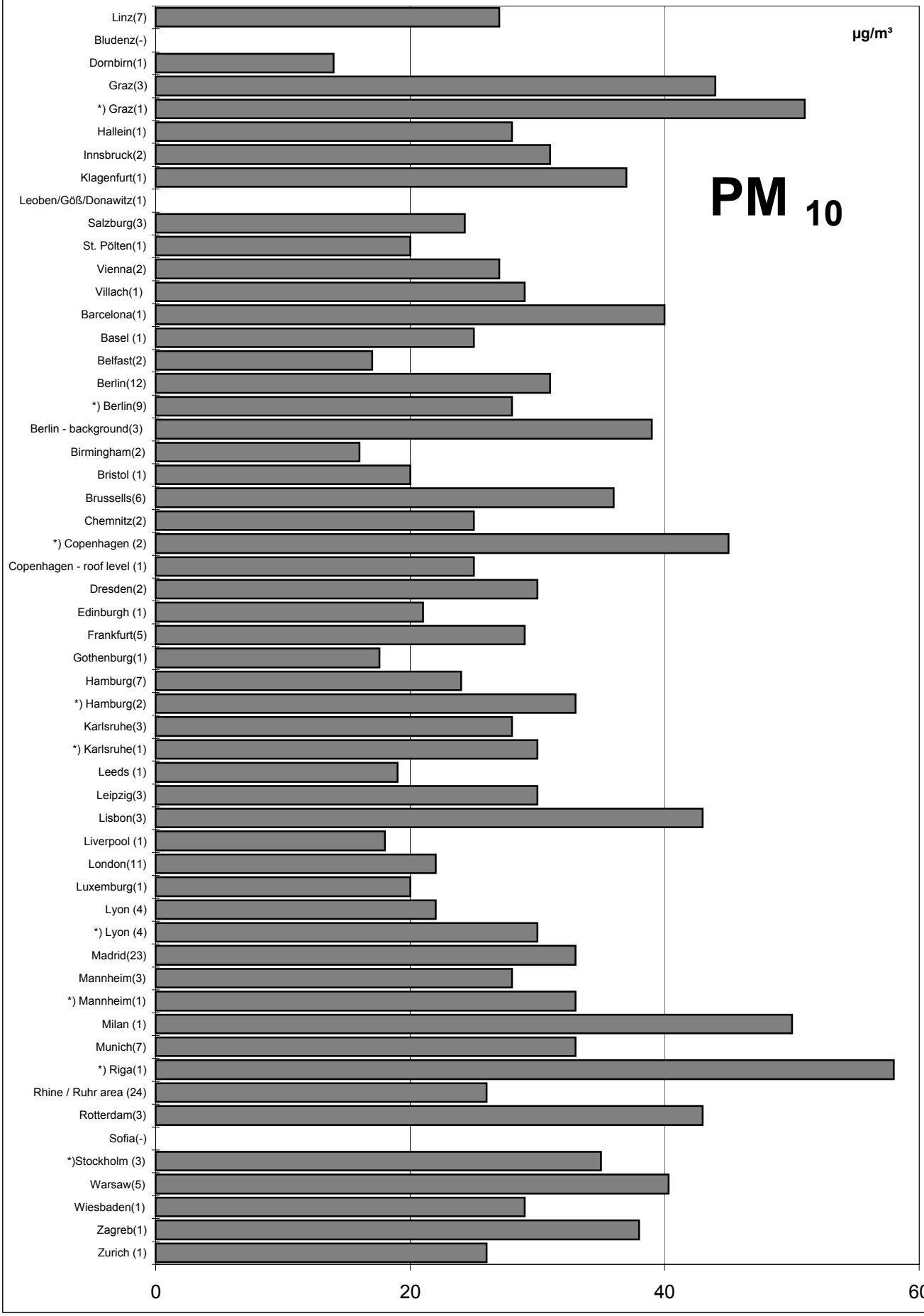
*) traffic-influenced monitoring stations

**) no data

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)

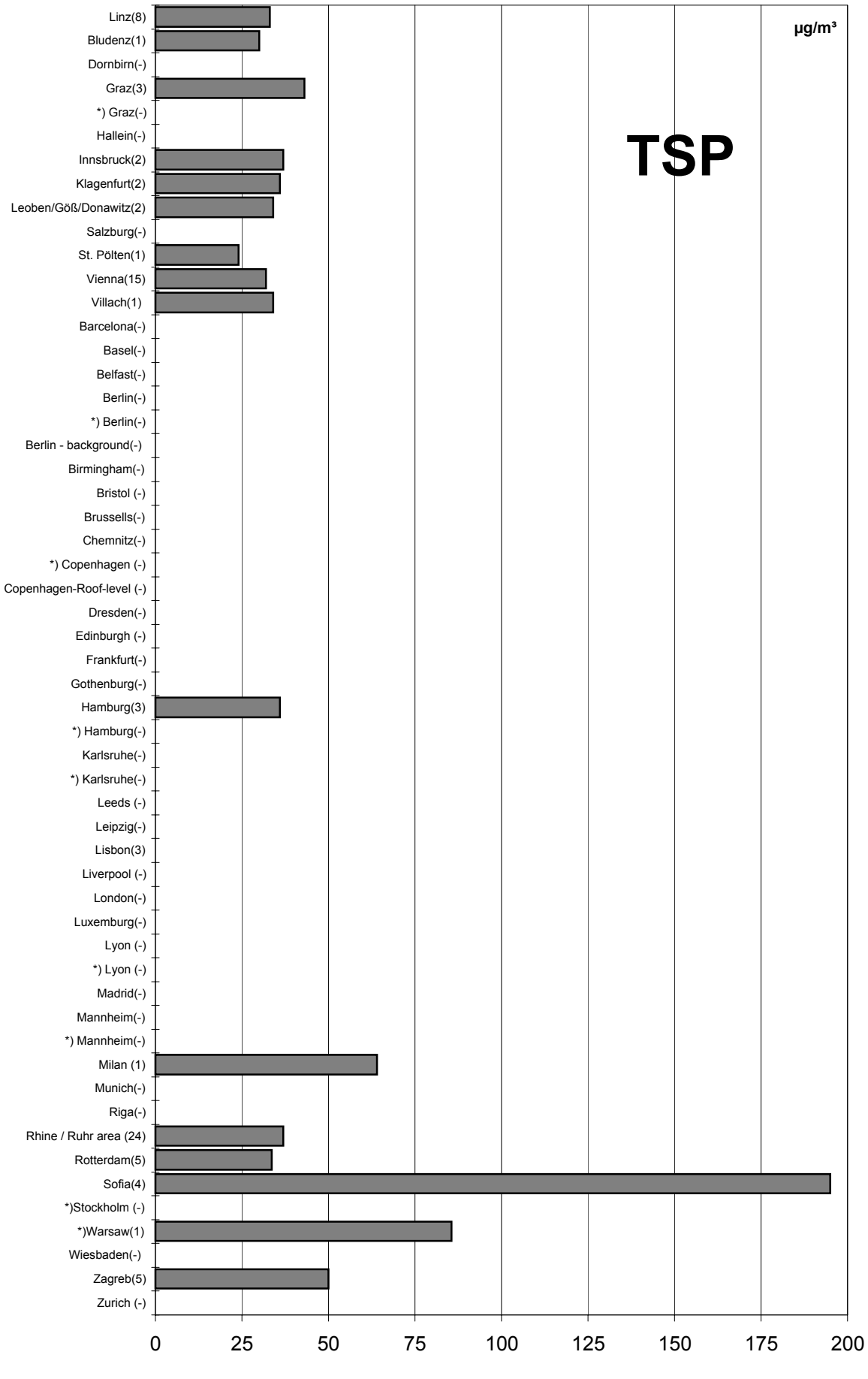


*) traffic-influenced monitoring stations
**) no data

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)

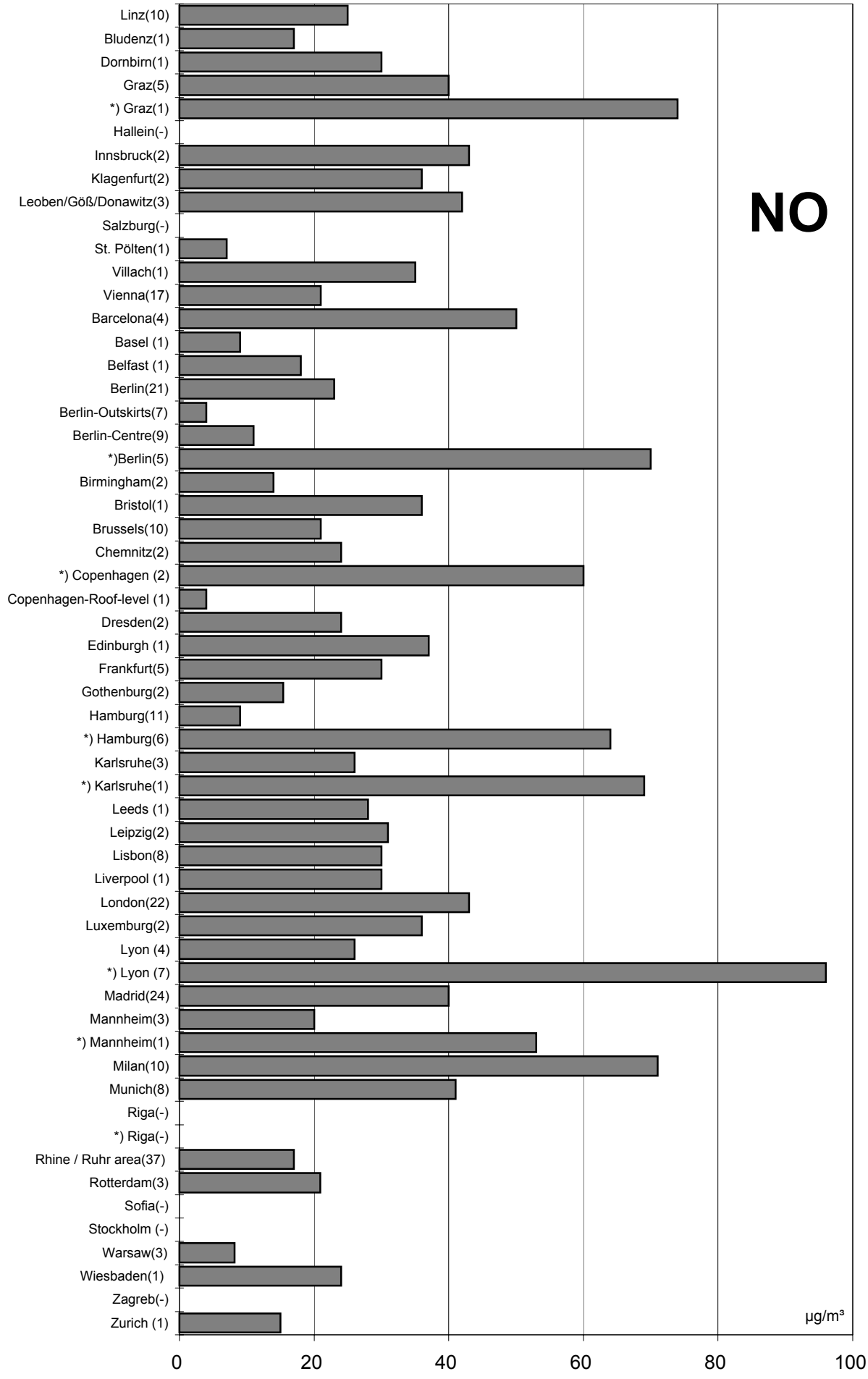


*)traffic-ininfluenced monitoring station
**)no data

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)



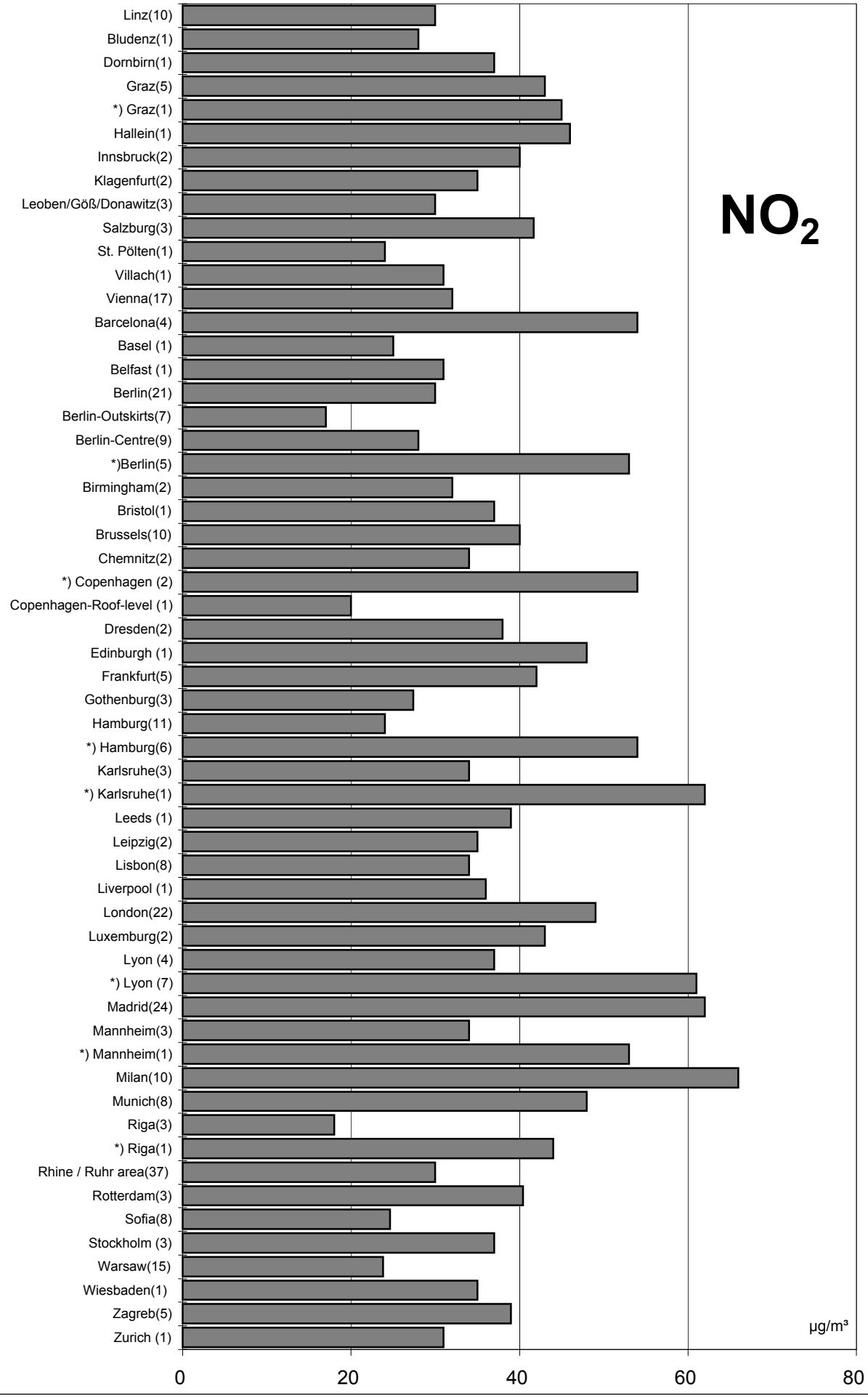
*) traffic-influenced monitoring stations

**) no data

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)

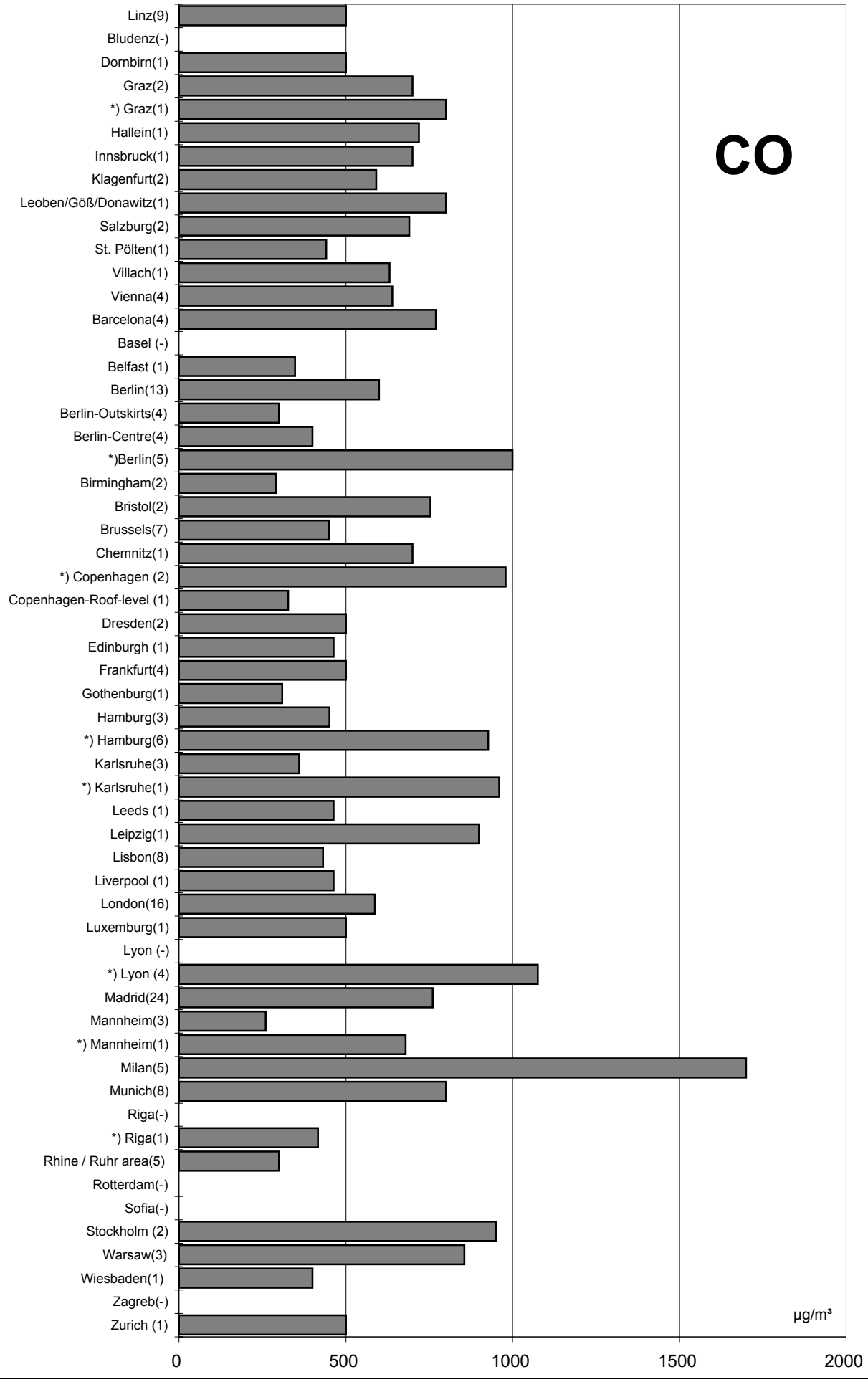


*) traffic-influenced monitoring stations
**) no data

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)



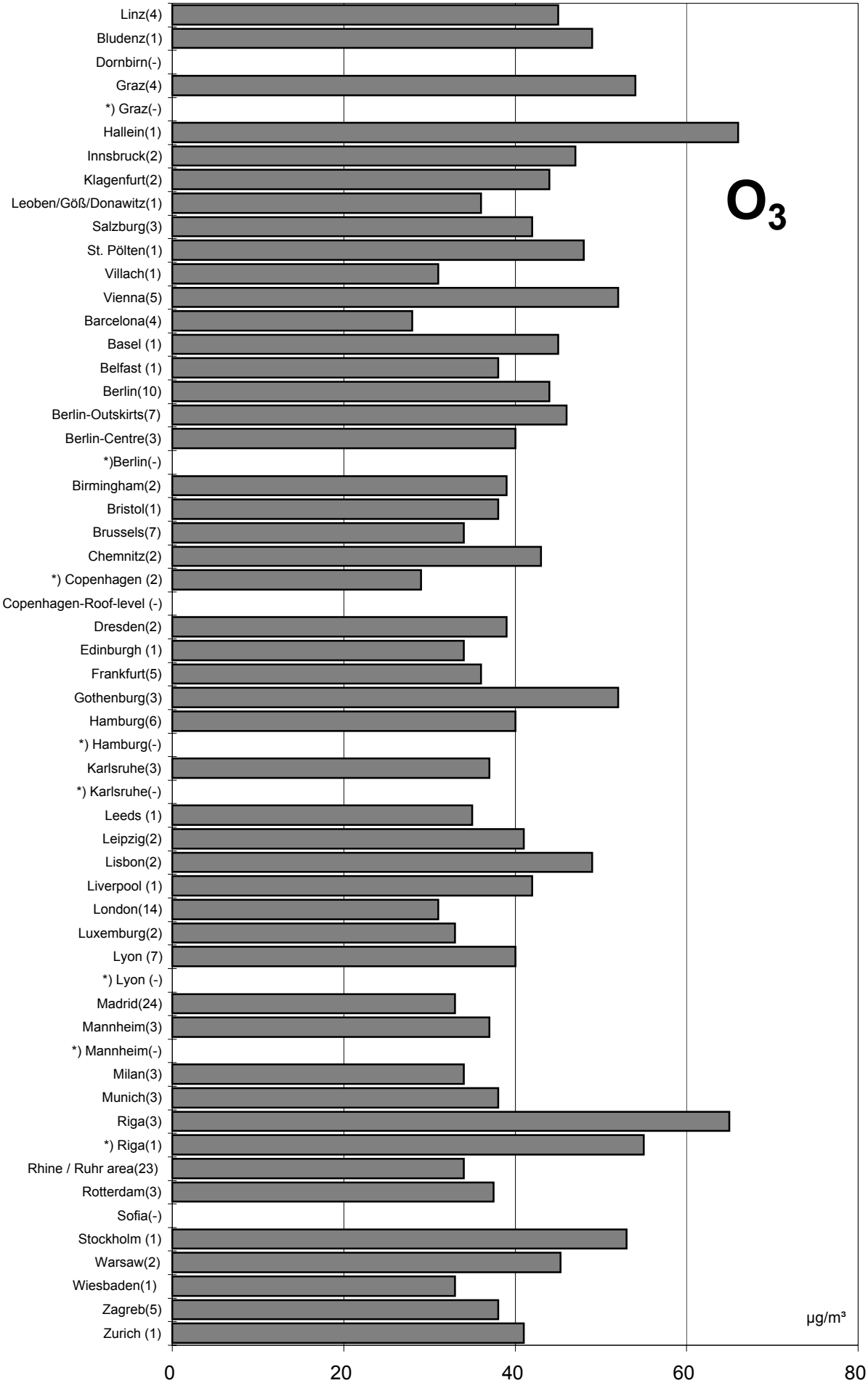
*) traffic-influenced monitoring stations

**) no data

Comparison of The Air Quality in 2002

annual mean values

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

**) no data

Luftgütevergleich

2002

max. Monatsmittelwert

Comparison of The Air Quality

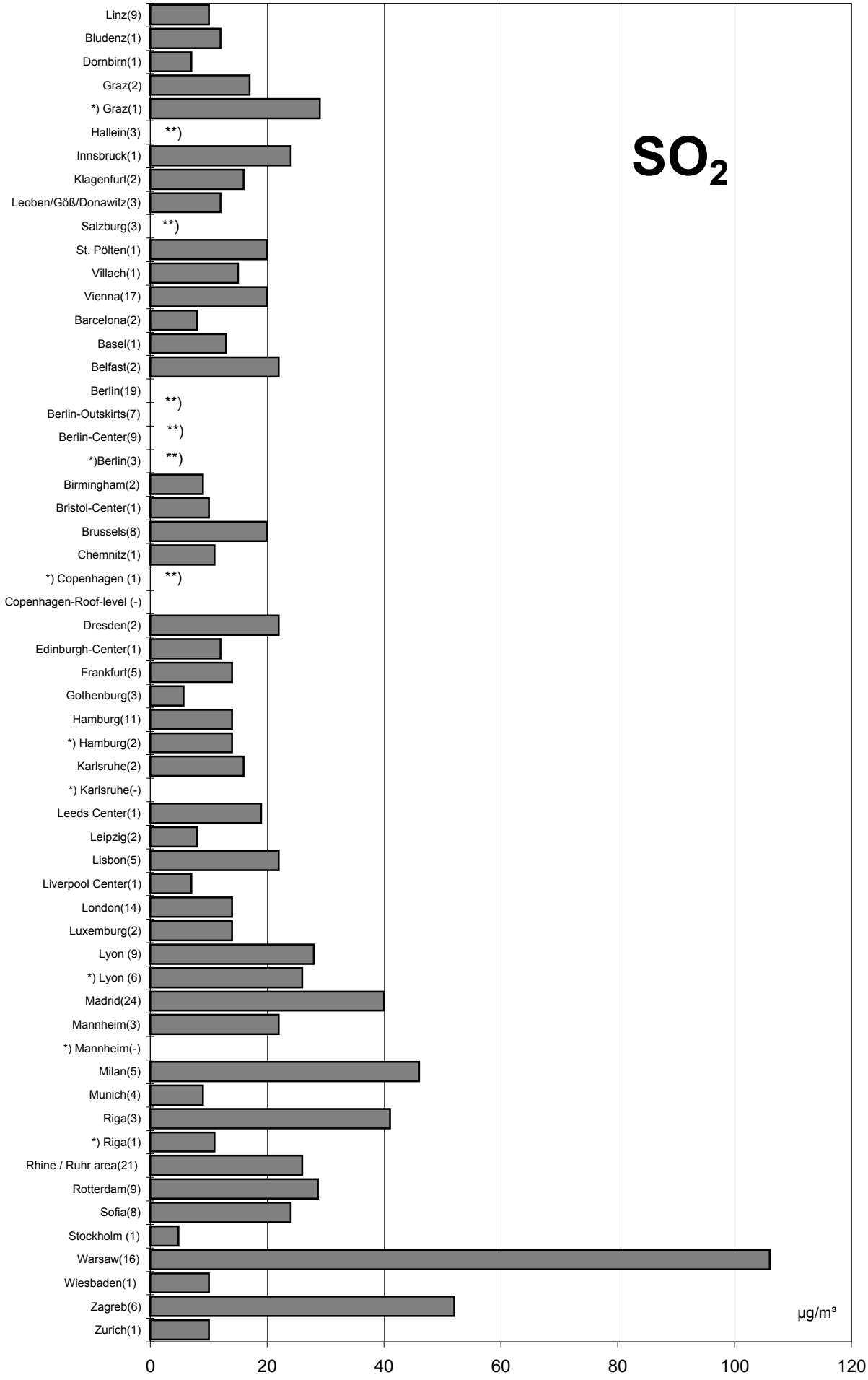
2002

Max. Monthly Mean Values

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

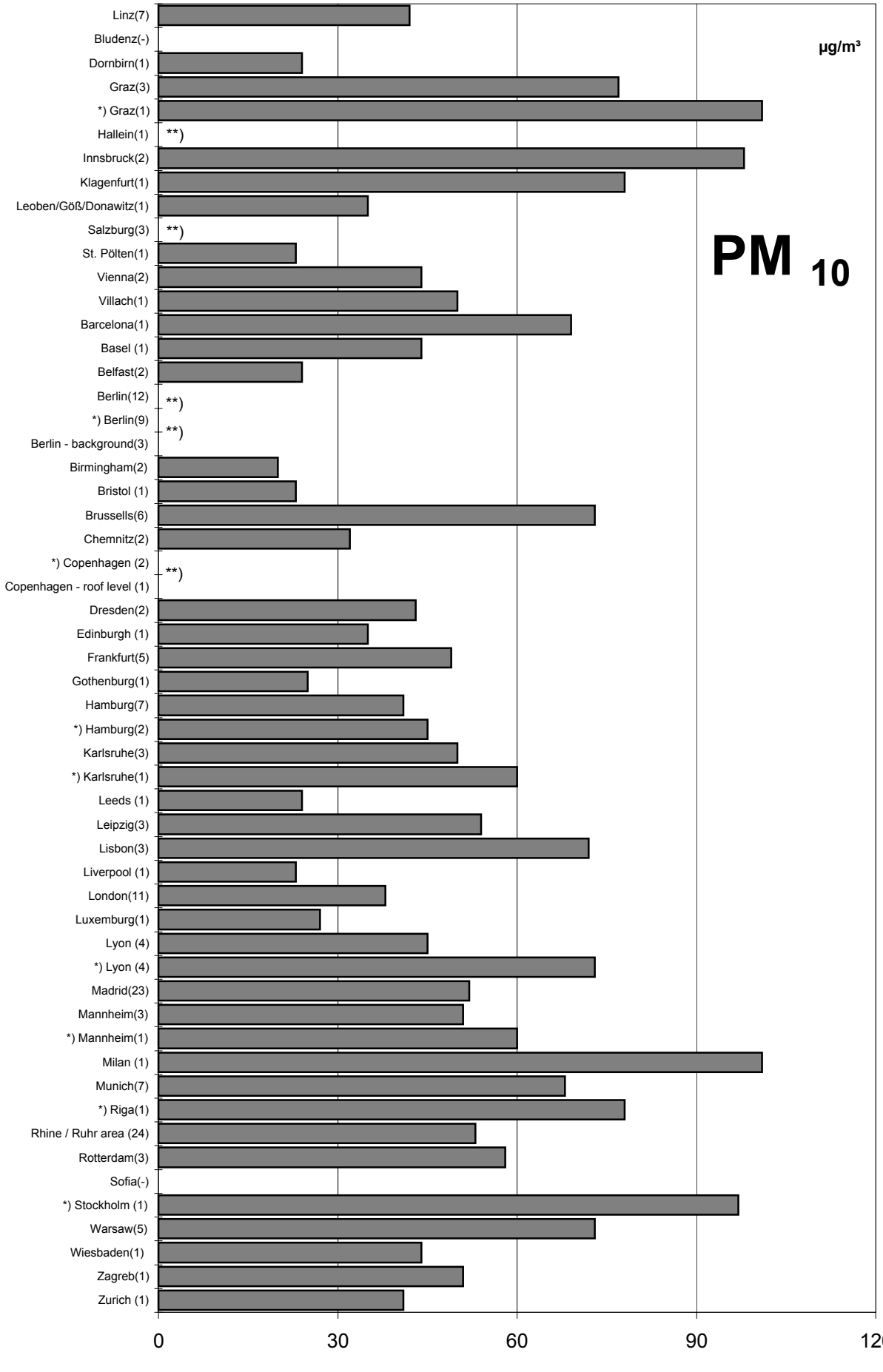


*) traffic-influenced monitoring stations
**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



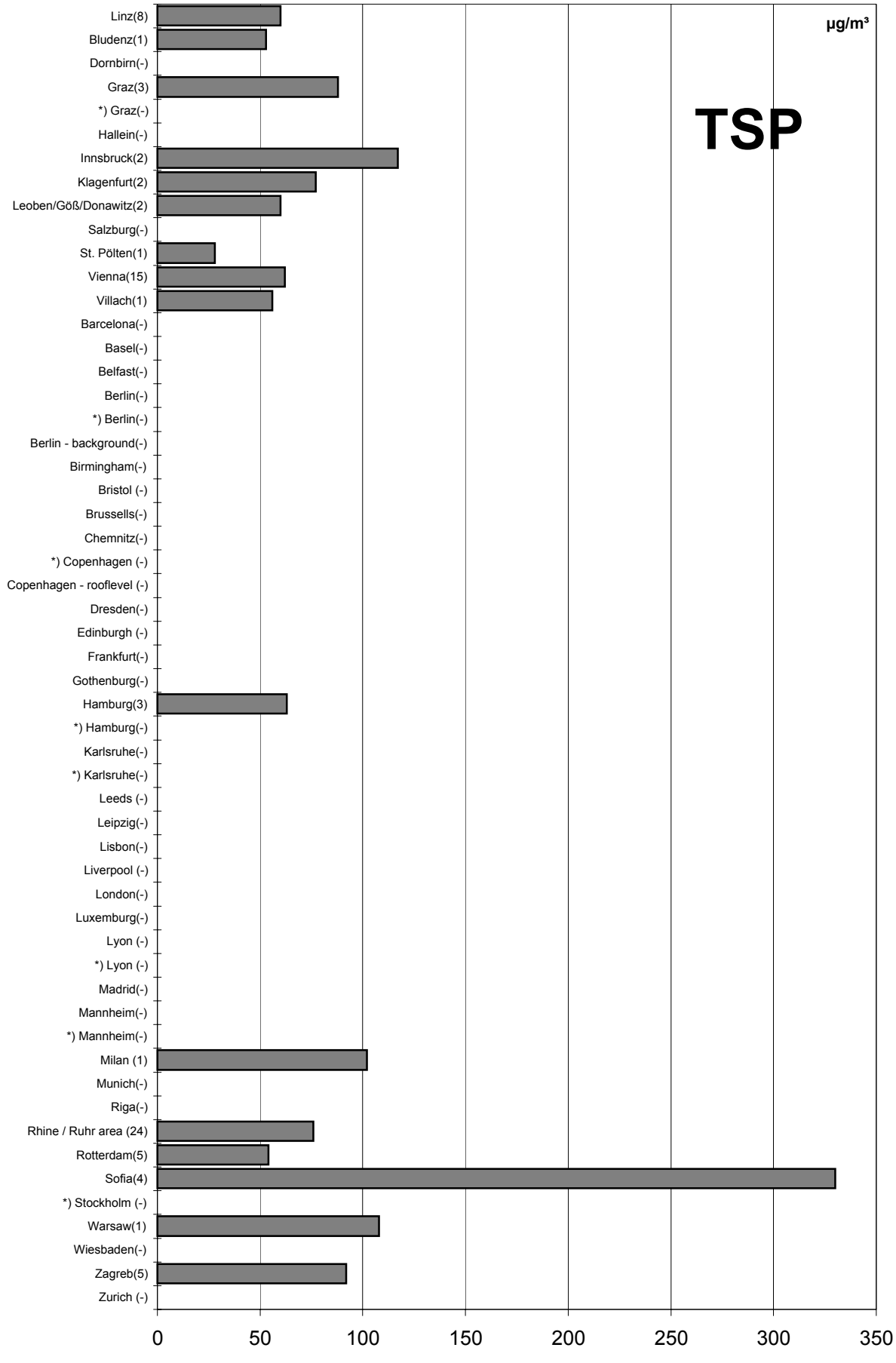
*) traffic-influenced monitoring stations

**) no data

Comparison of The Air Quality 2002

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

(in parentheses: number of monitoring stations)



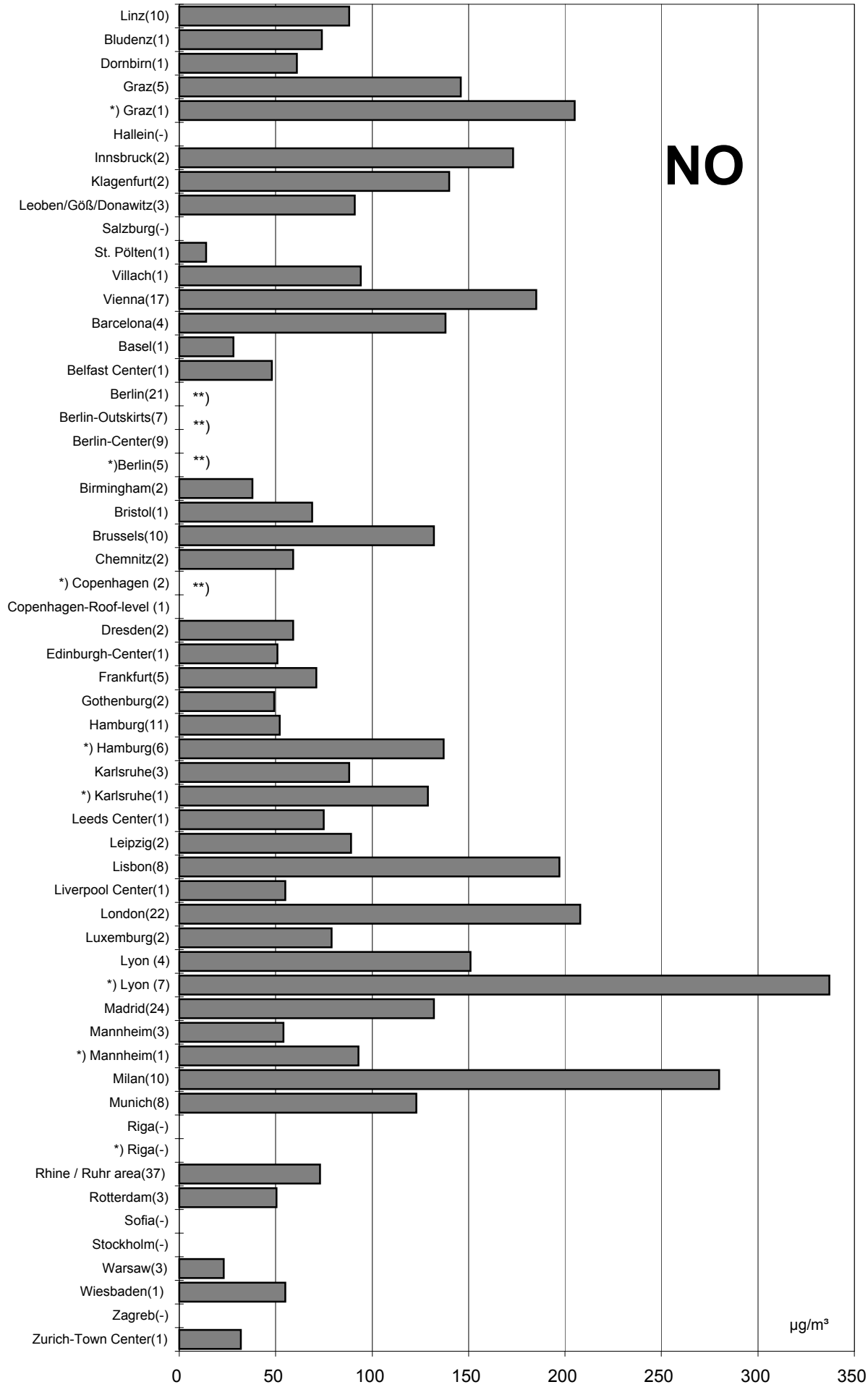
*)traffic-ininfluenced monitoring station

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



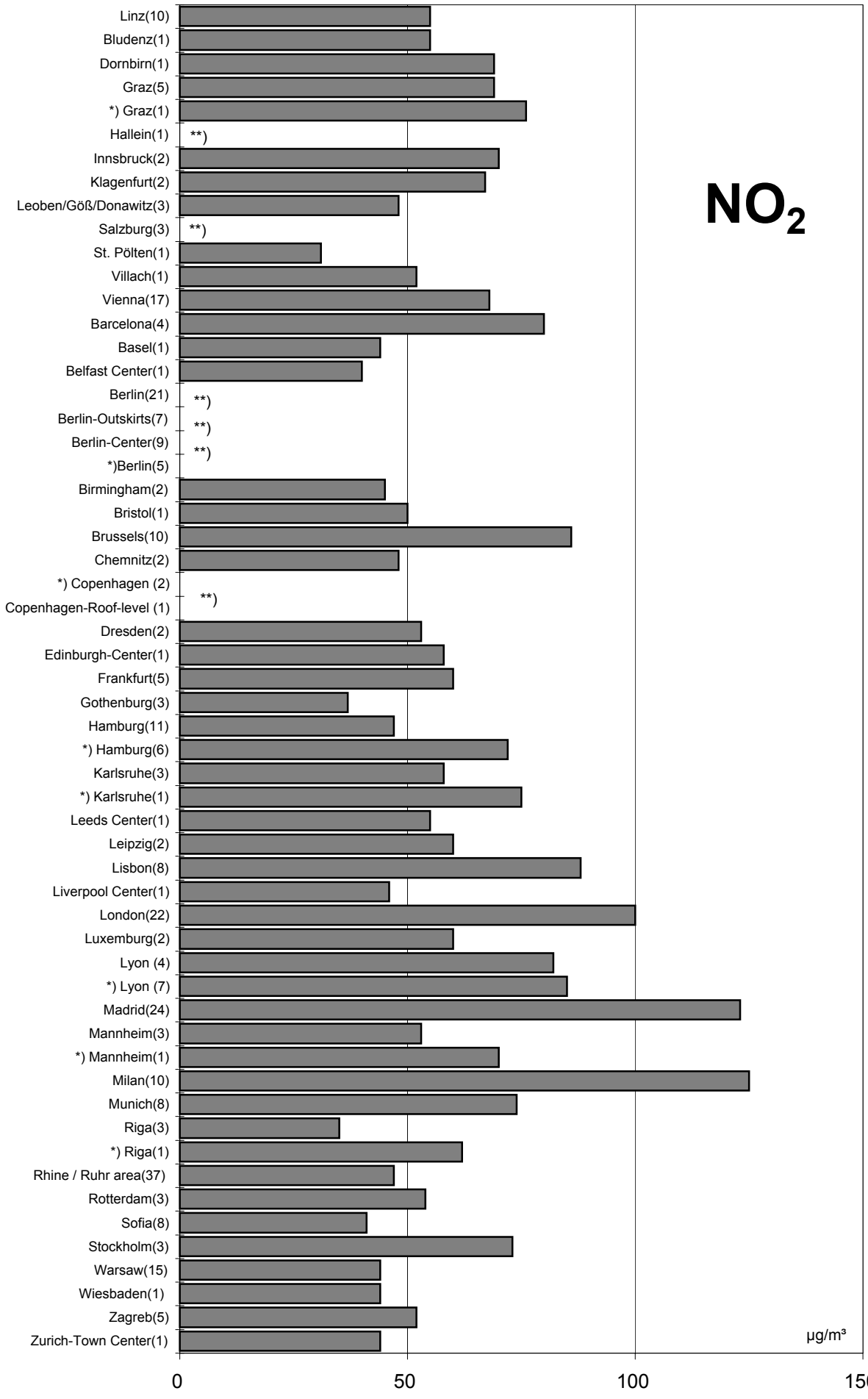
*) traffic-influenced monitoring stations

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



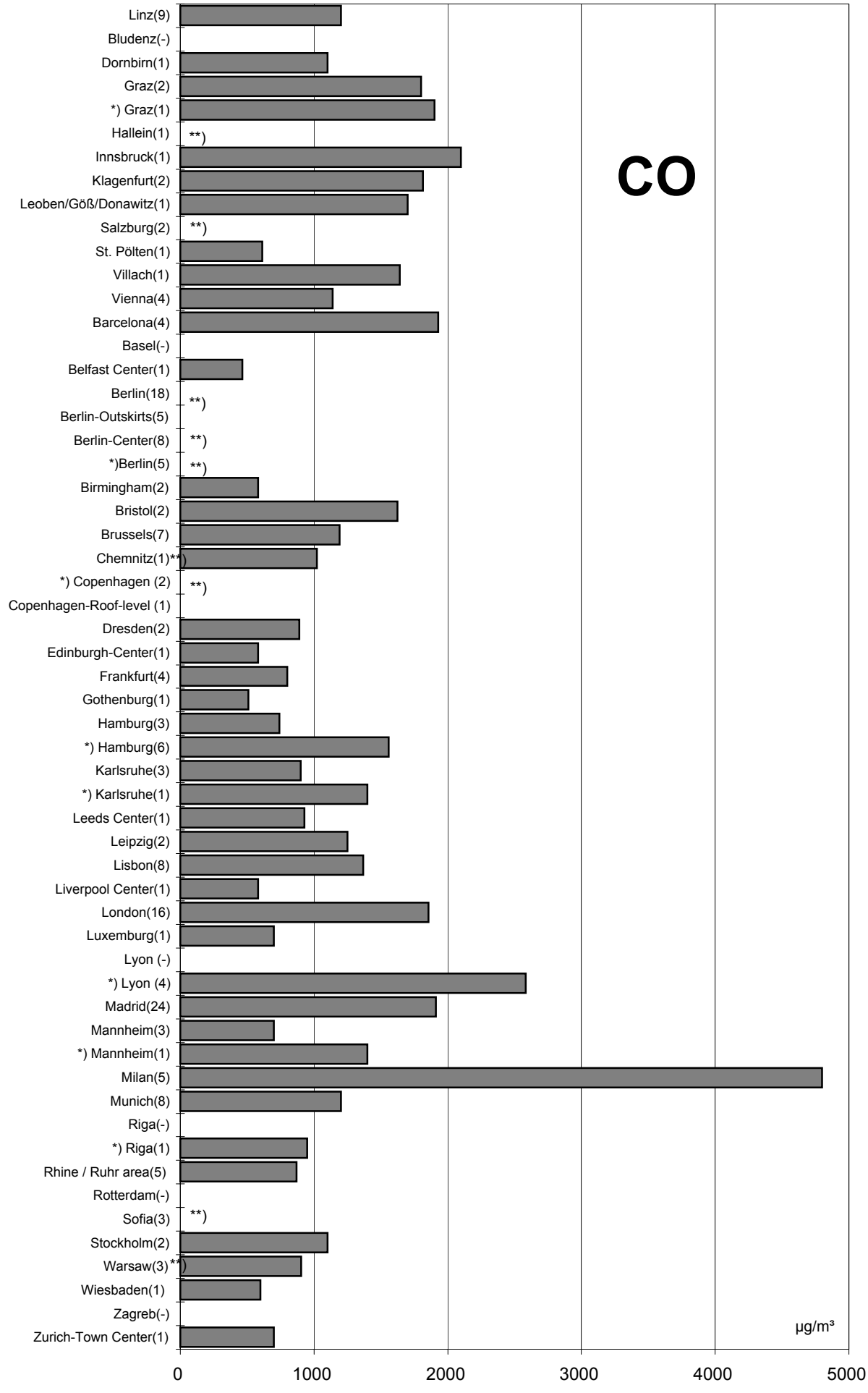
*) traffic-influenced monitoring stations

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



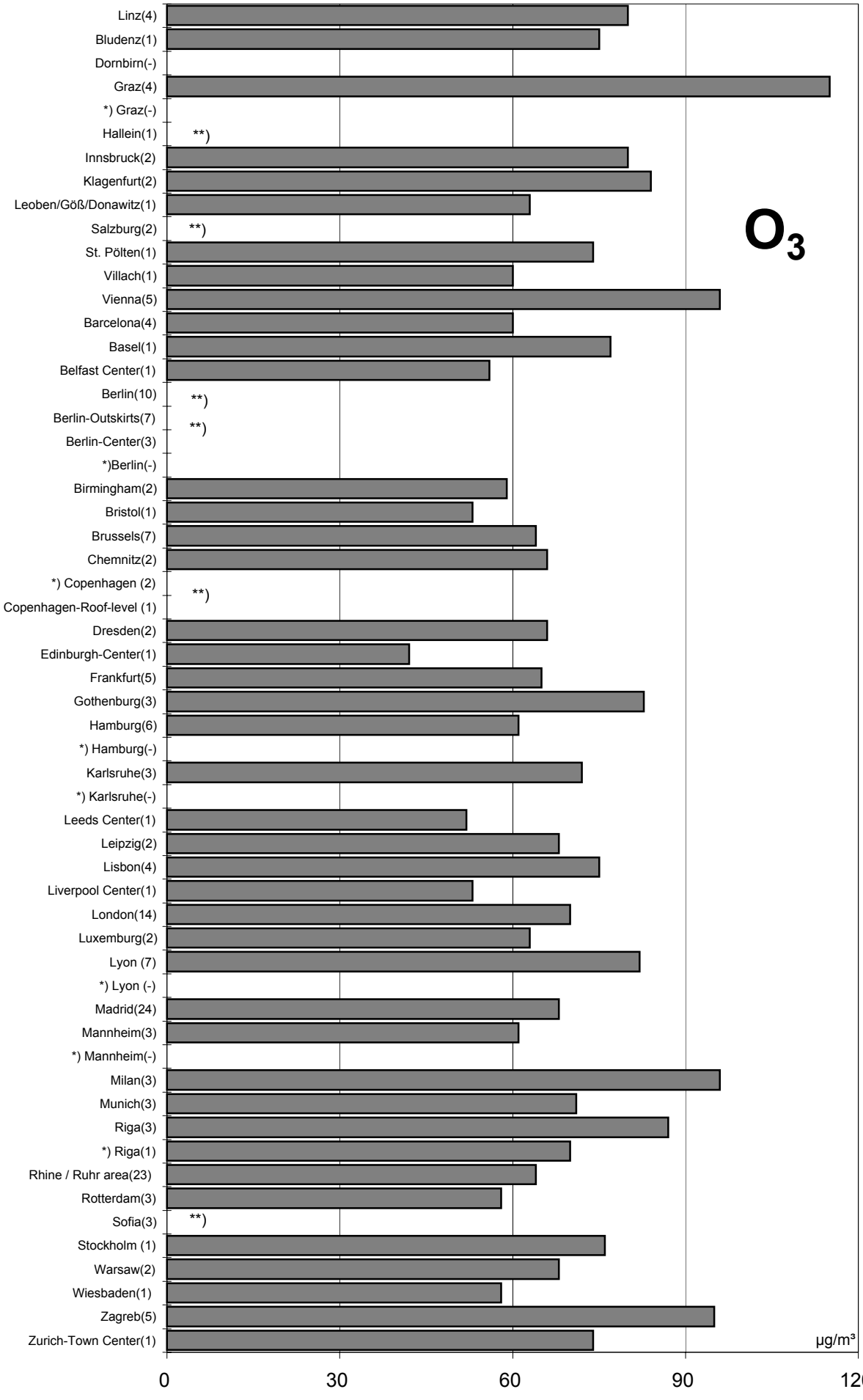
*) traffic-influenced monitoring stations

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

**) no data

Luftgütevergleich

2002

max. Tagesmittelwert

Comparison of The Air Quality

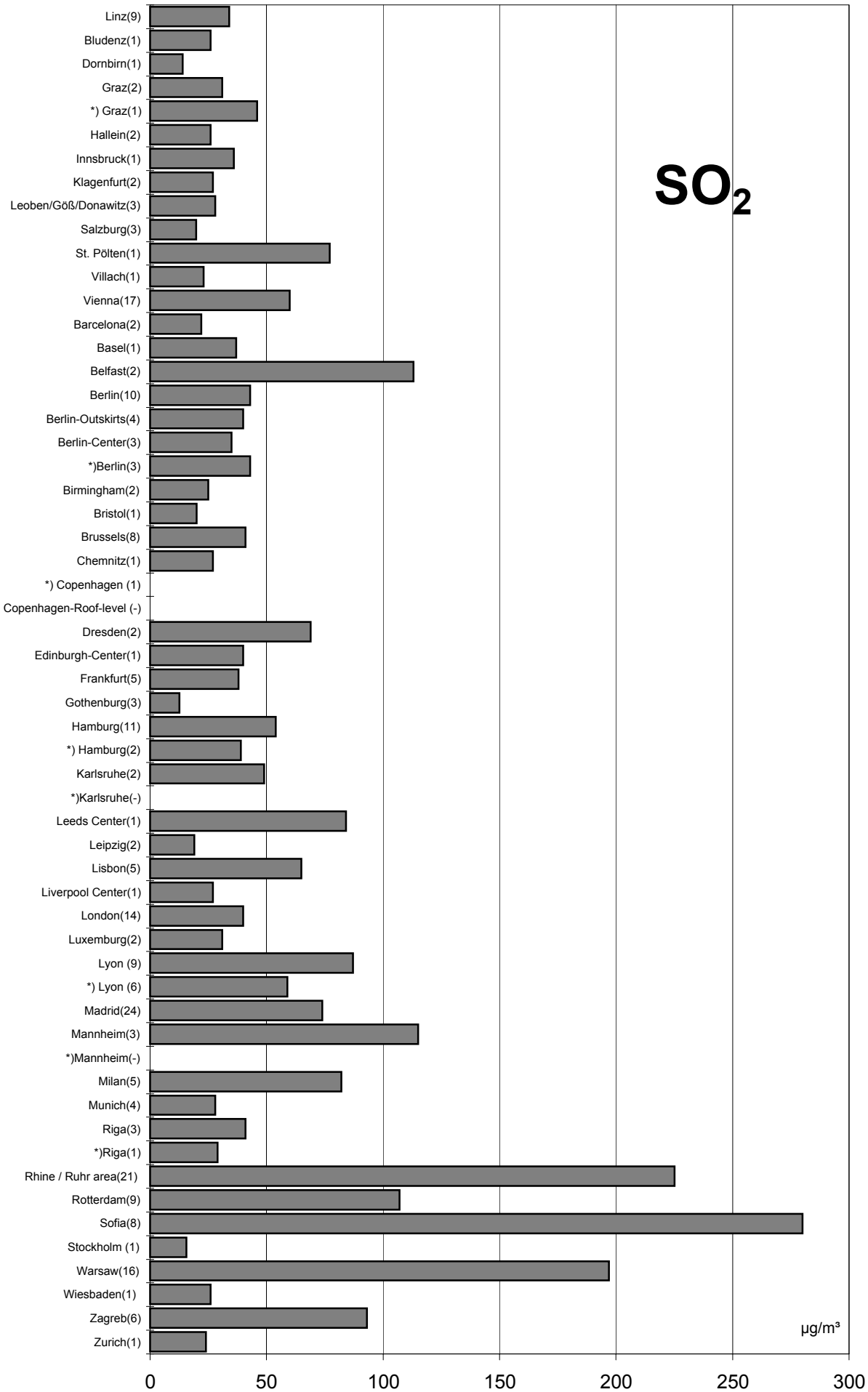
2002

Max. Daily Mean Values

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



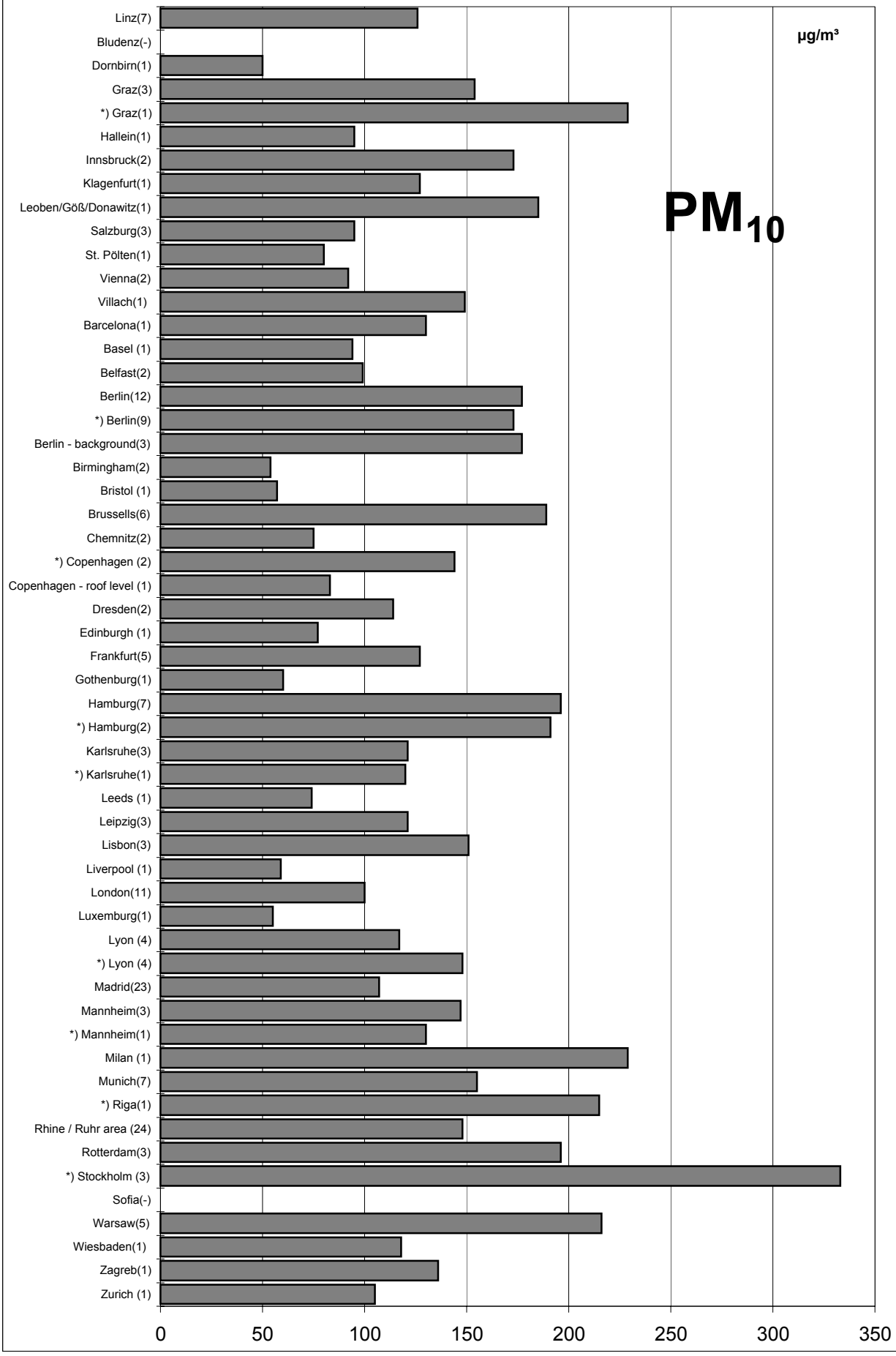
*) traffic-influenced monitoring stations

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



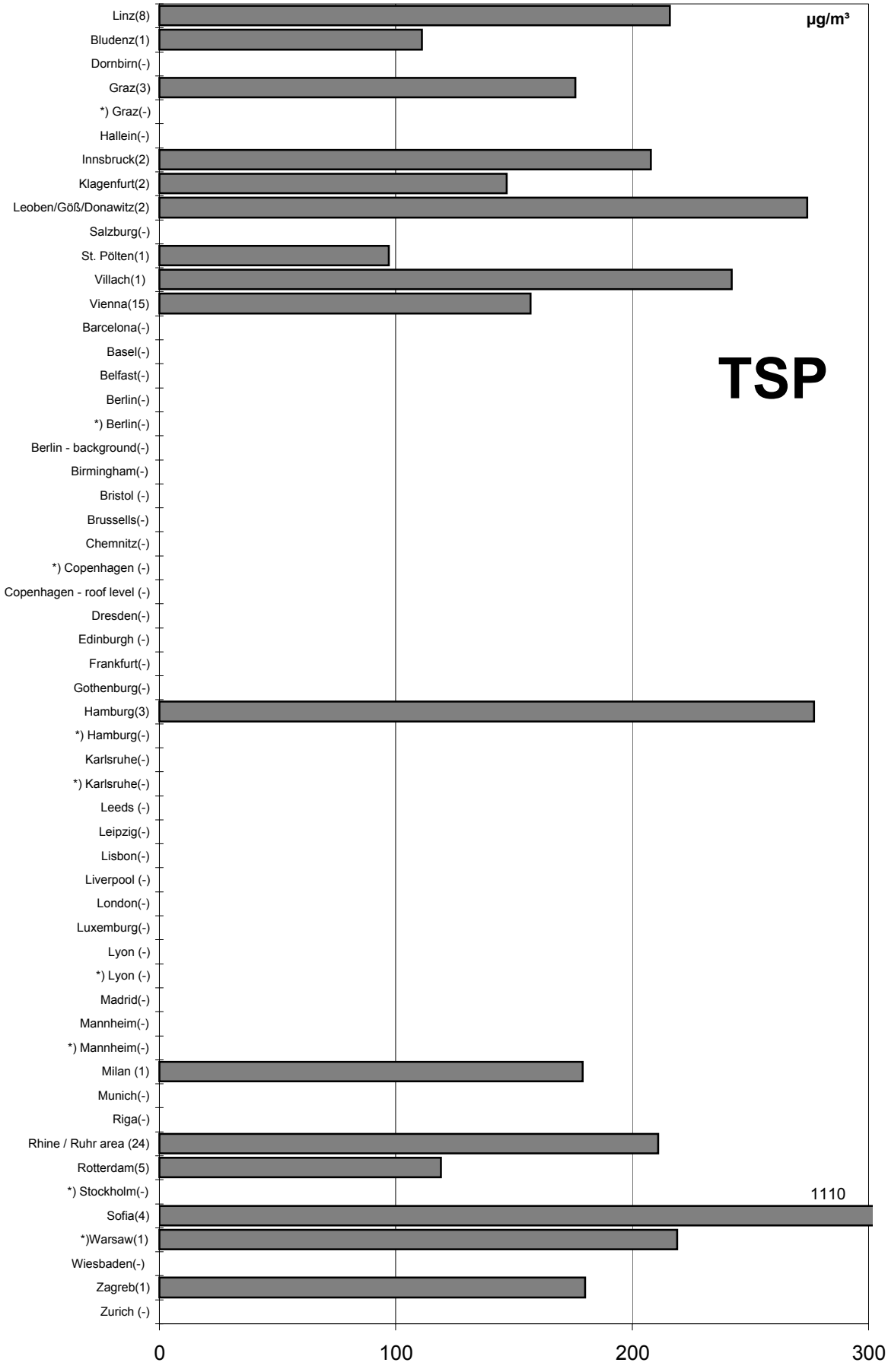
*) traffic-influenced monitoring stations

**) no data

Comparison of The Air Quality 2002

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

(in parentheses: number of monitoring stations)



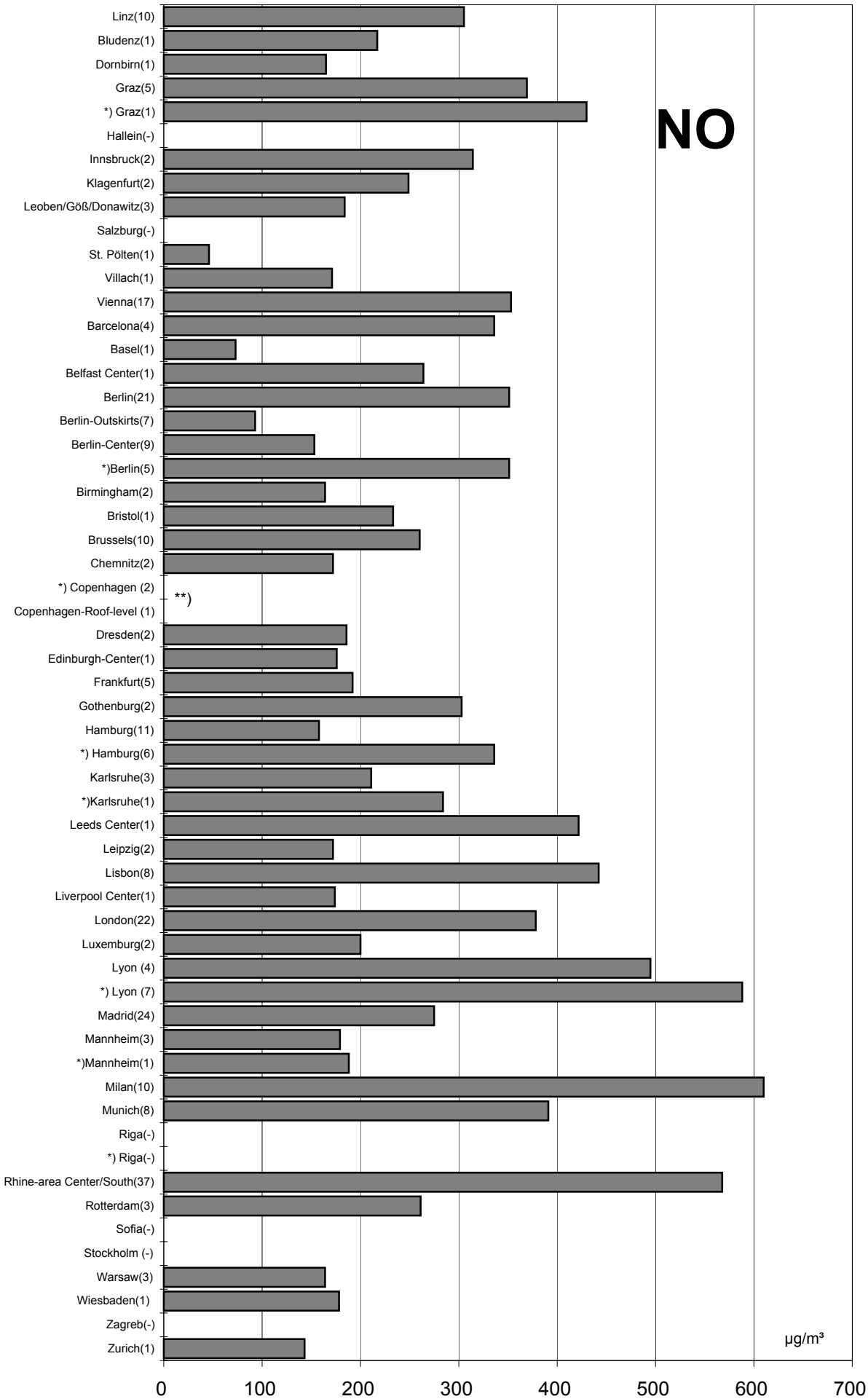
*)traffic-ininfluenced monitoring station

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

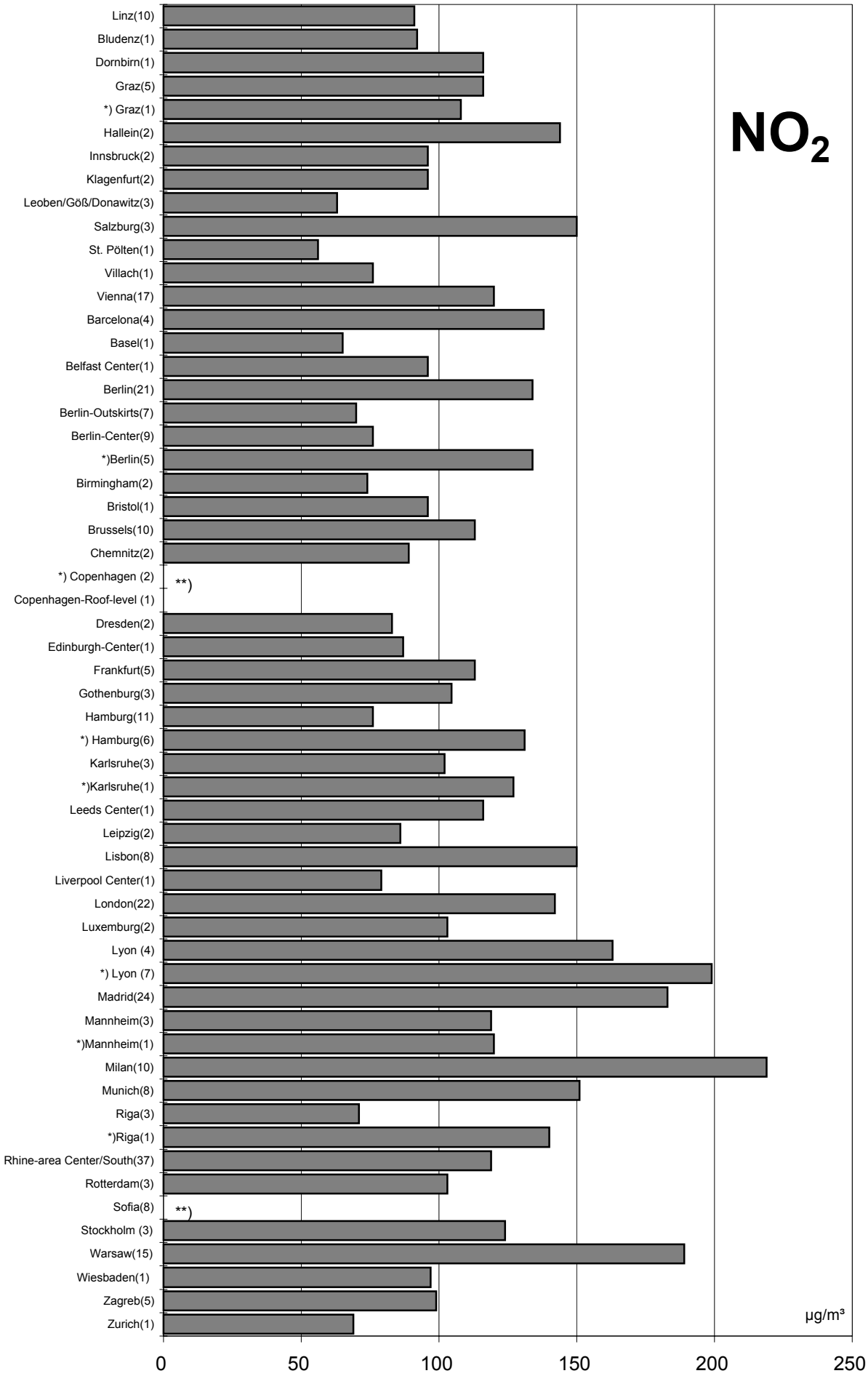


*) traffic-influenced monitoring stations
**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



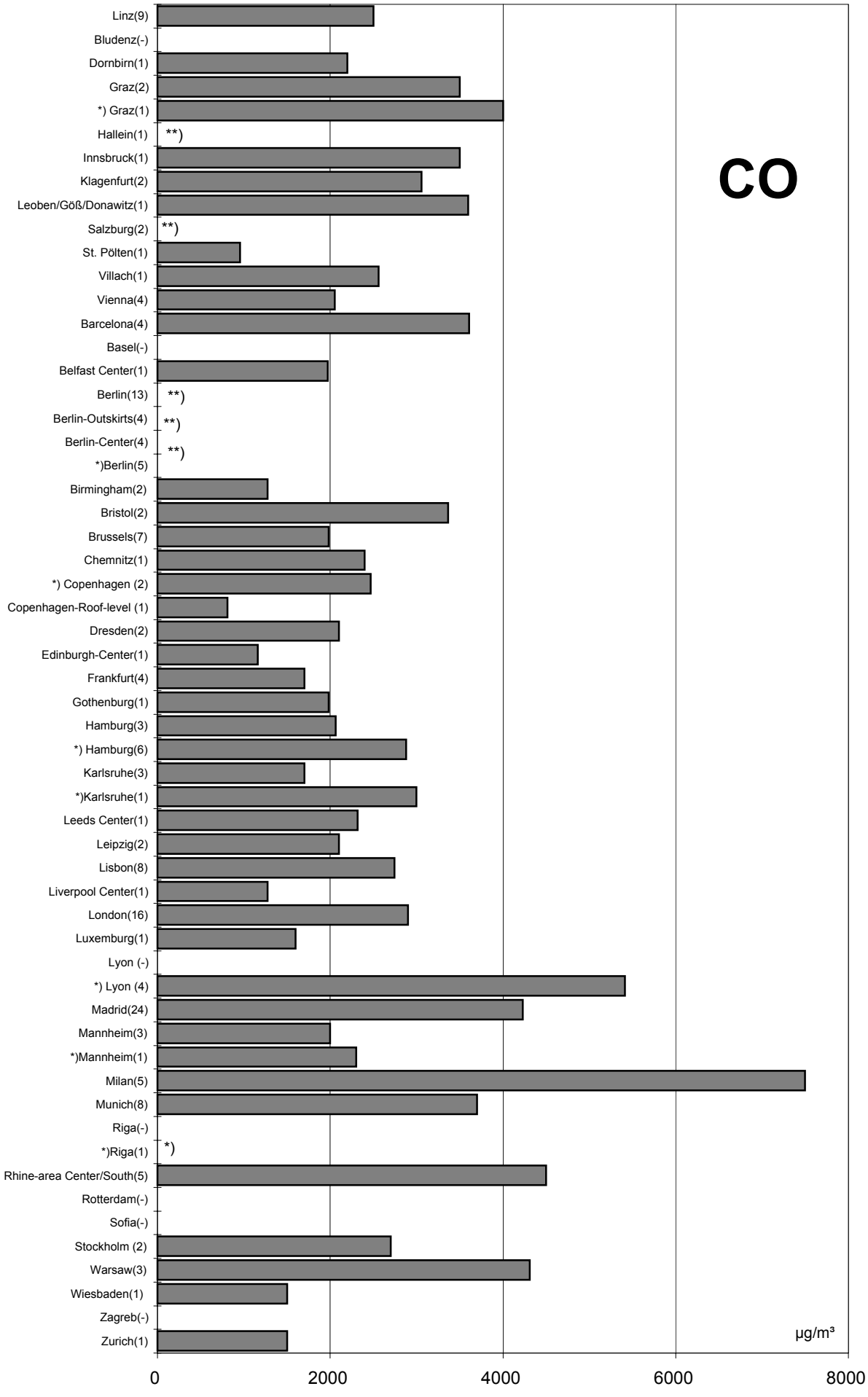
*) traffic-influenced monitoring stations

**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

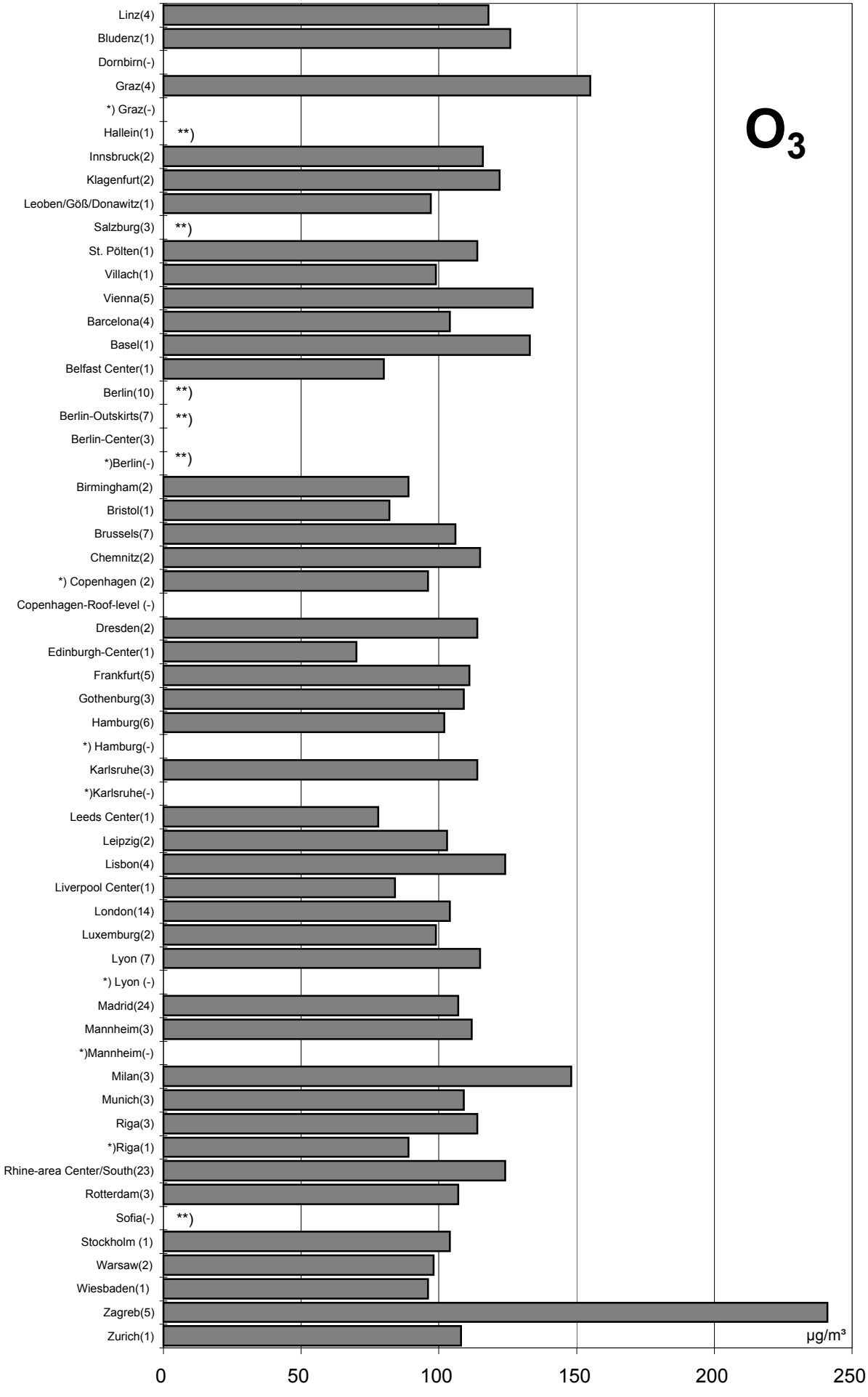


*) traffic-influenced monitoring stations
**)no data

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations
**)no data

Luftgütevergleich

2002

max. 3h-Mittelwerte

Comparison of The Air Quality

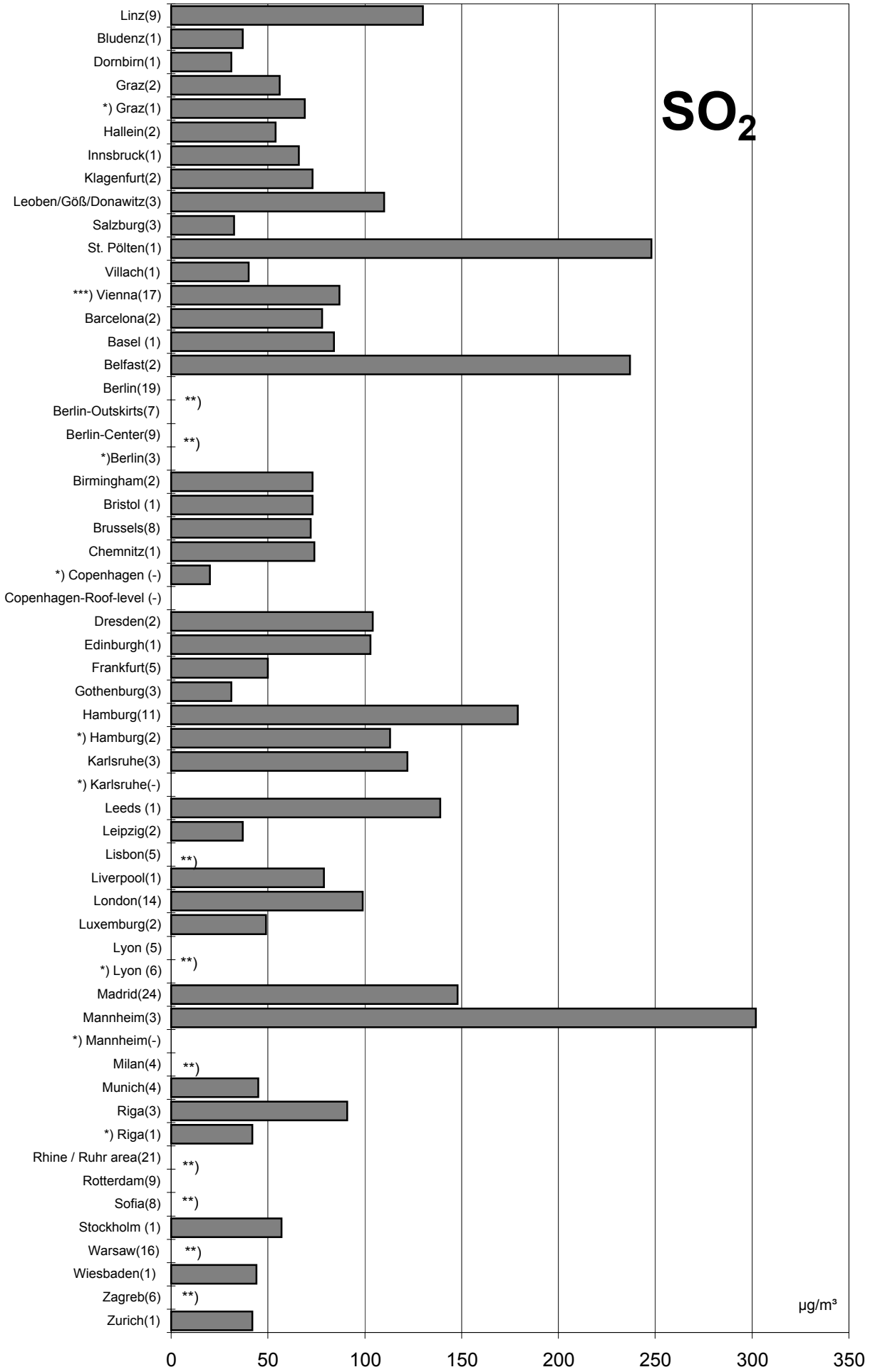
2002

Max. 3h- Mean Values

Comparison of The Air Quality in 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

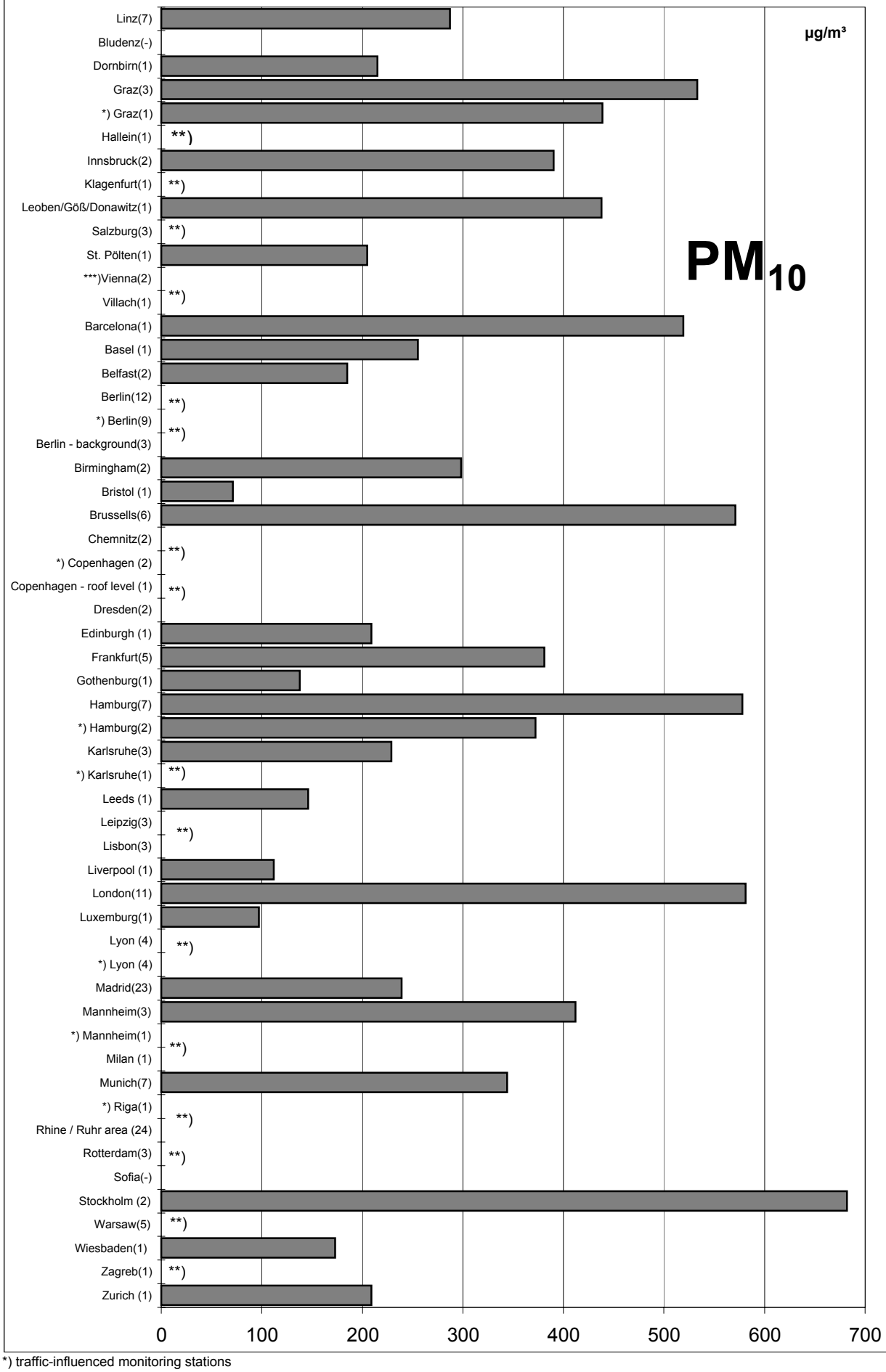


*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

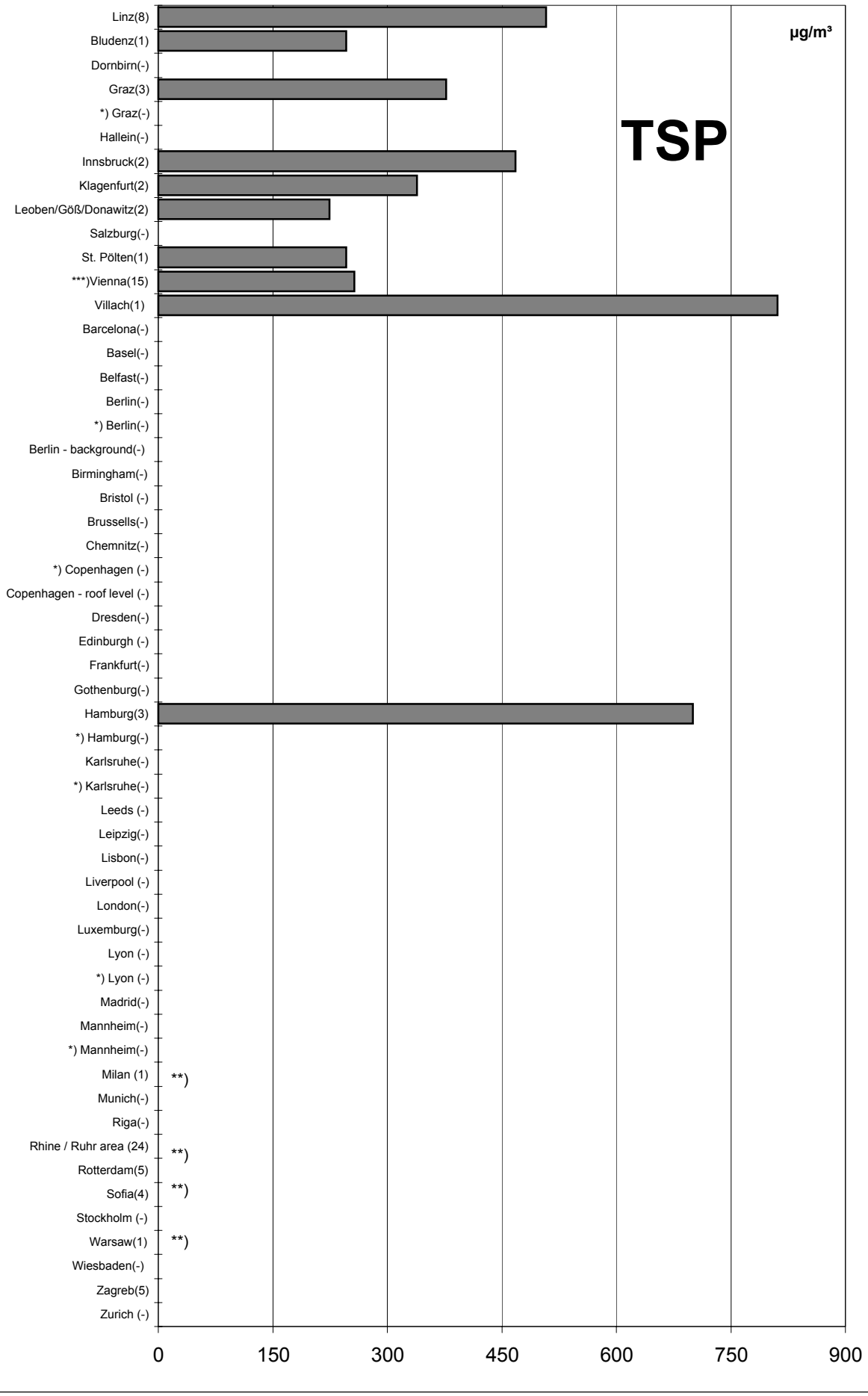
**) no data

***)max. 99,9 Percentile

Comparison of The Air Quality 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

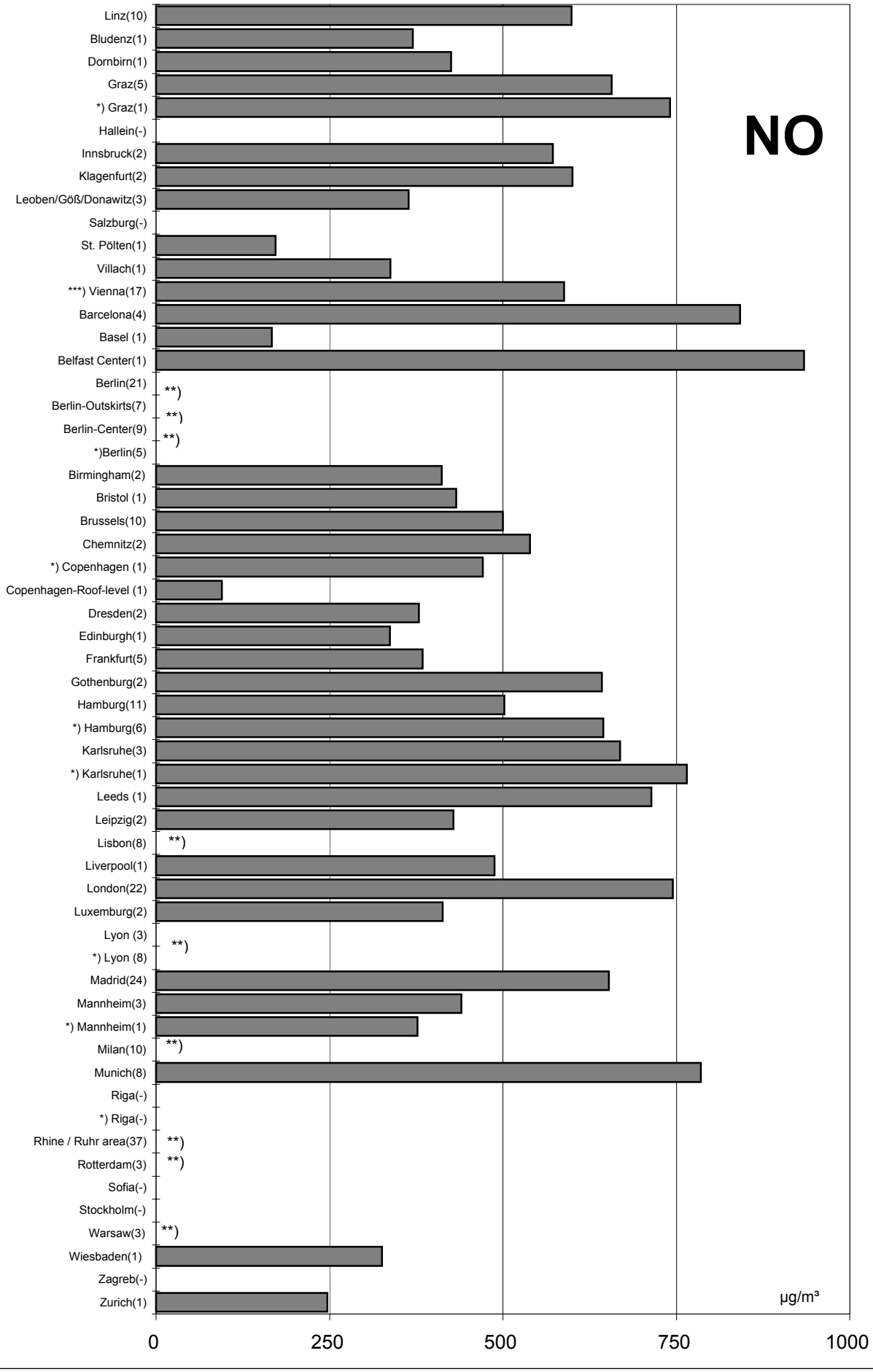


*)traffic-ininfluenced monitoring station
**)no data
***)max. 99,9 Percentile

Comparison of The Air Quality in 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

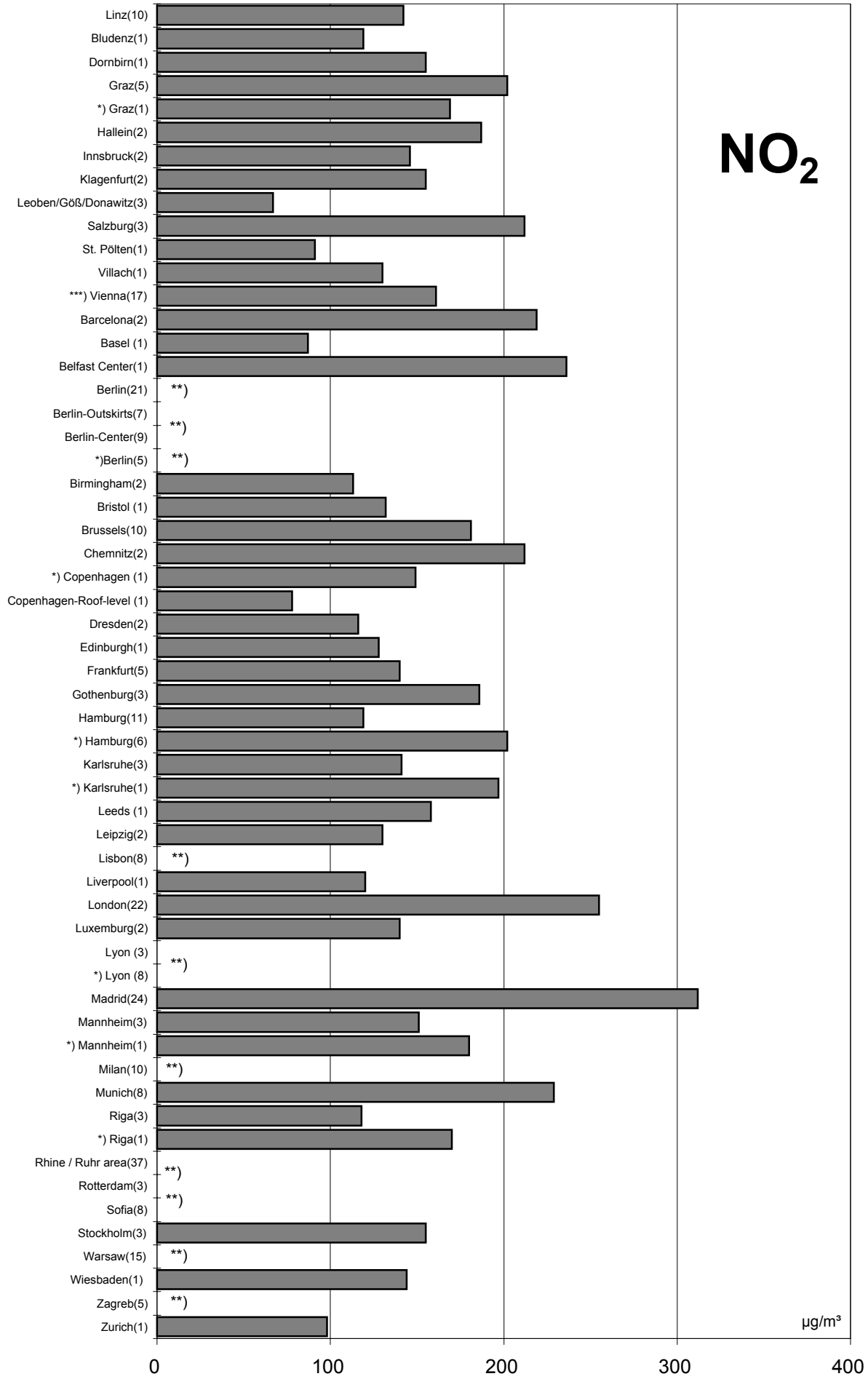
**)no data

***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

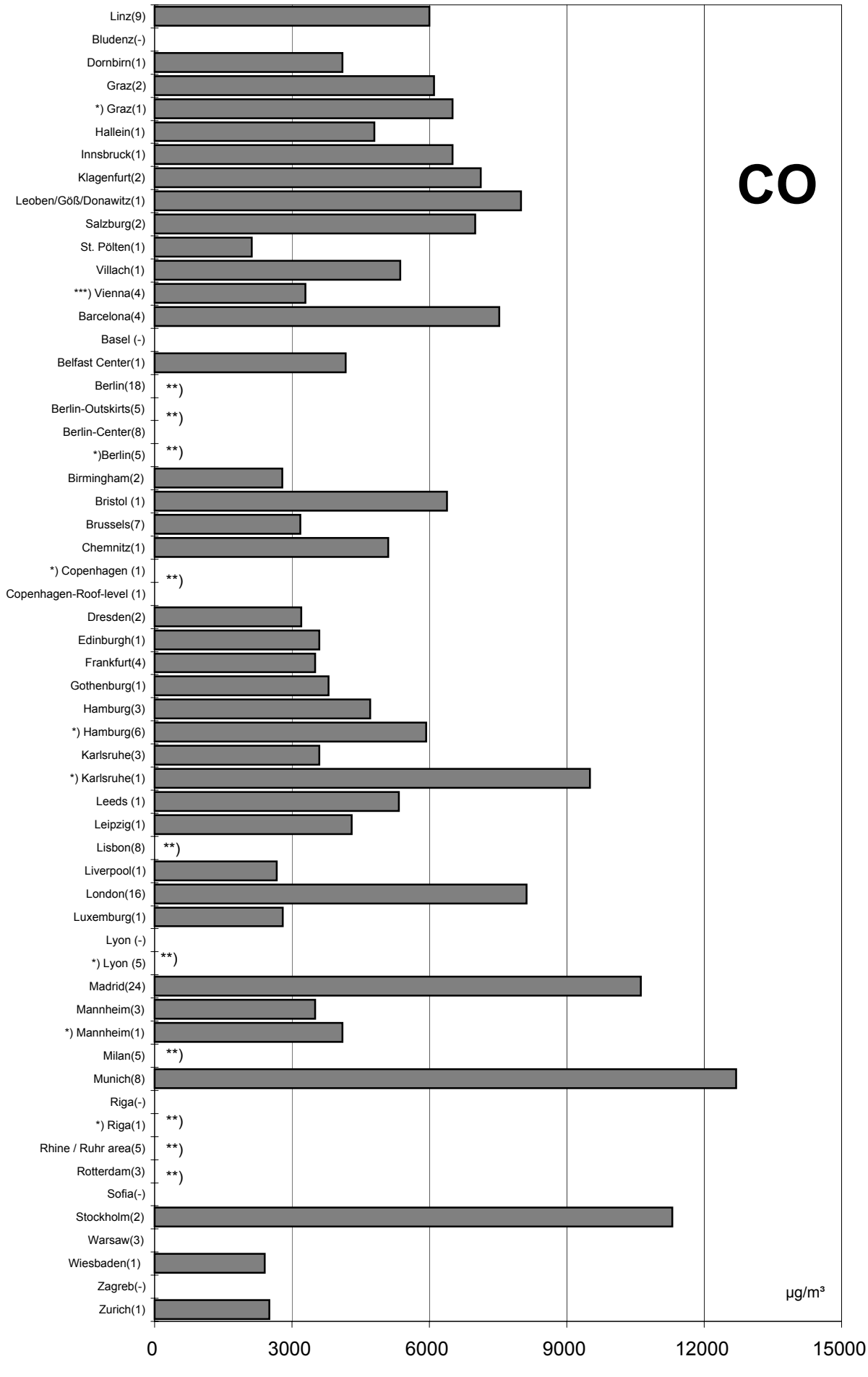
**)no data

***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

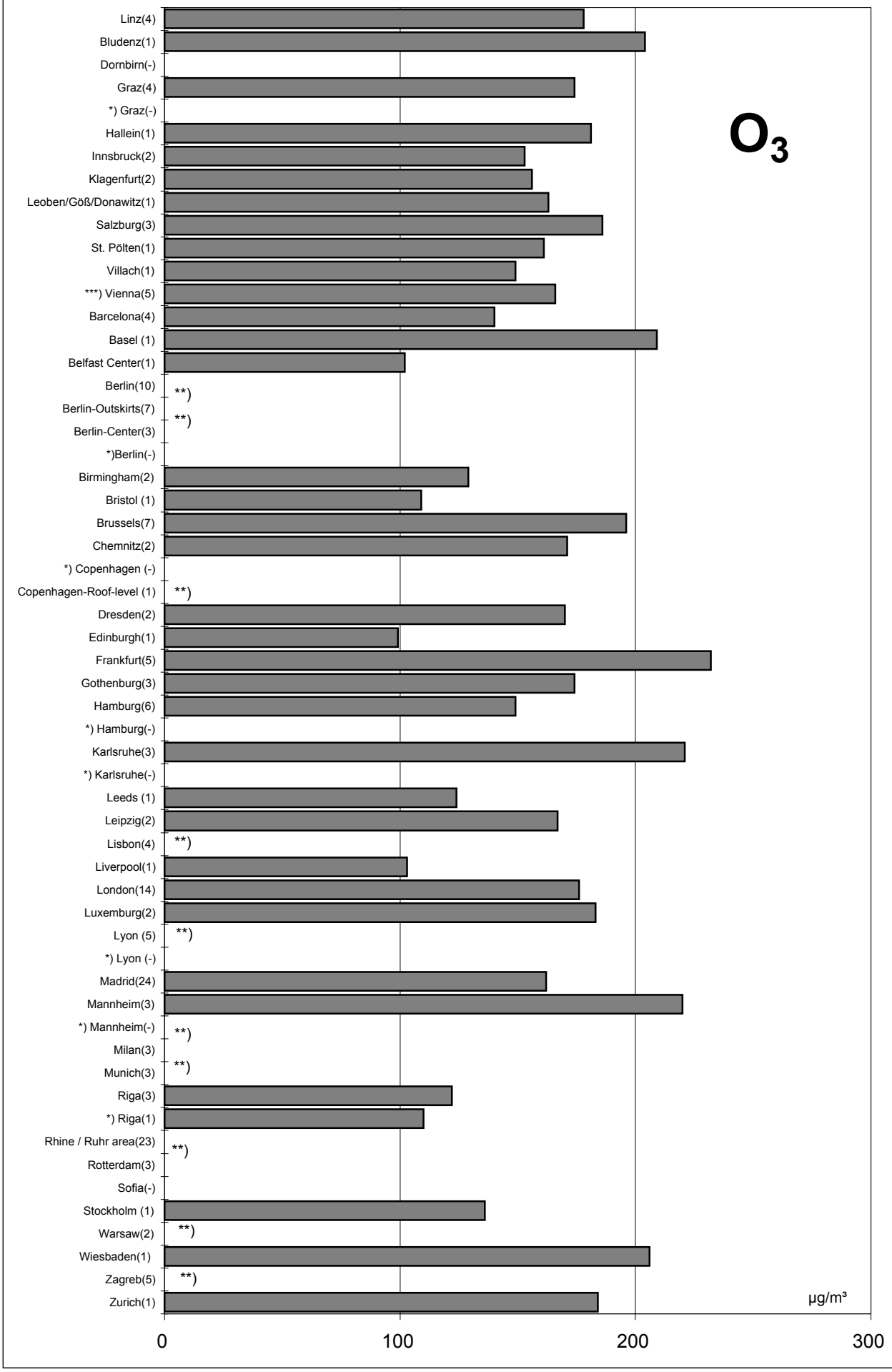


*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 3h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

**)no data

***)max. 99,9-Percentile

Luftgütevergleich

2002

max. 1h-Mittelwerte

Comparison of The Air Quality

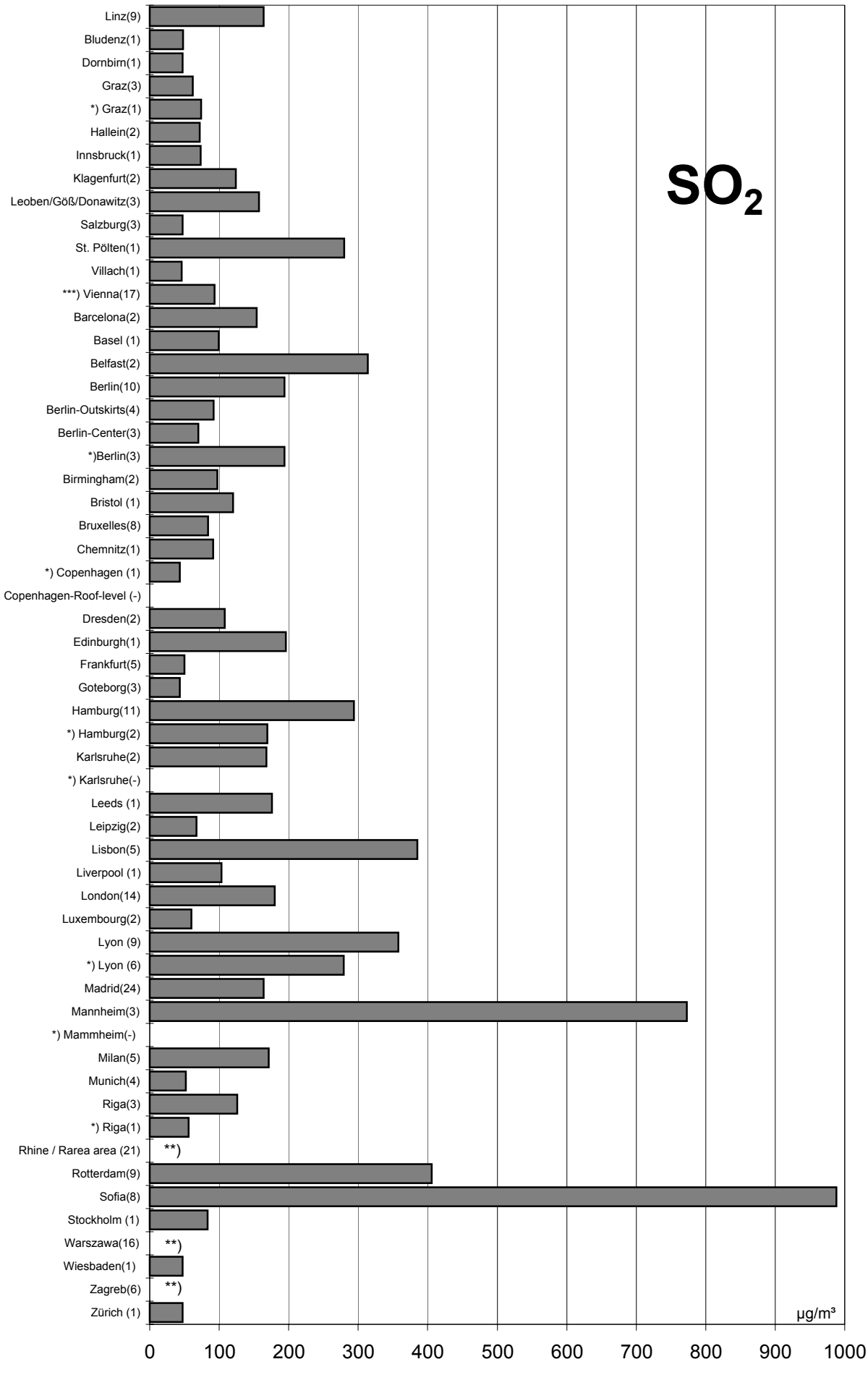
2002

Max. 1h-Mean Values

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

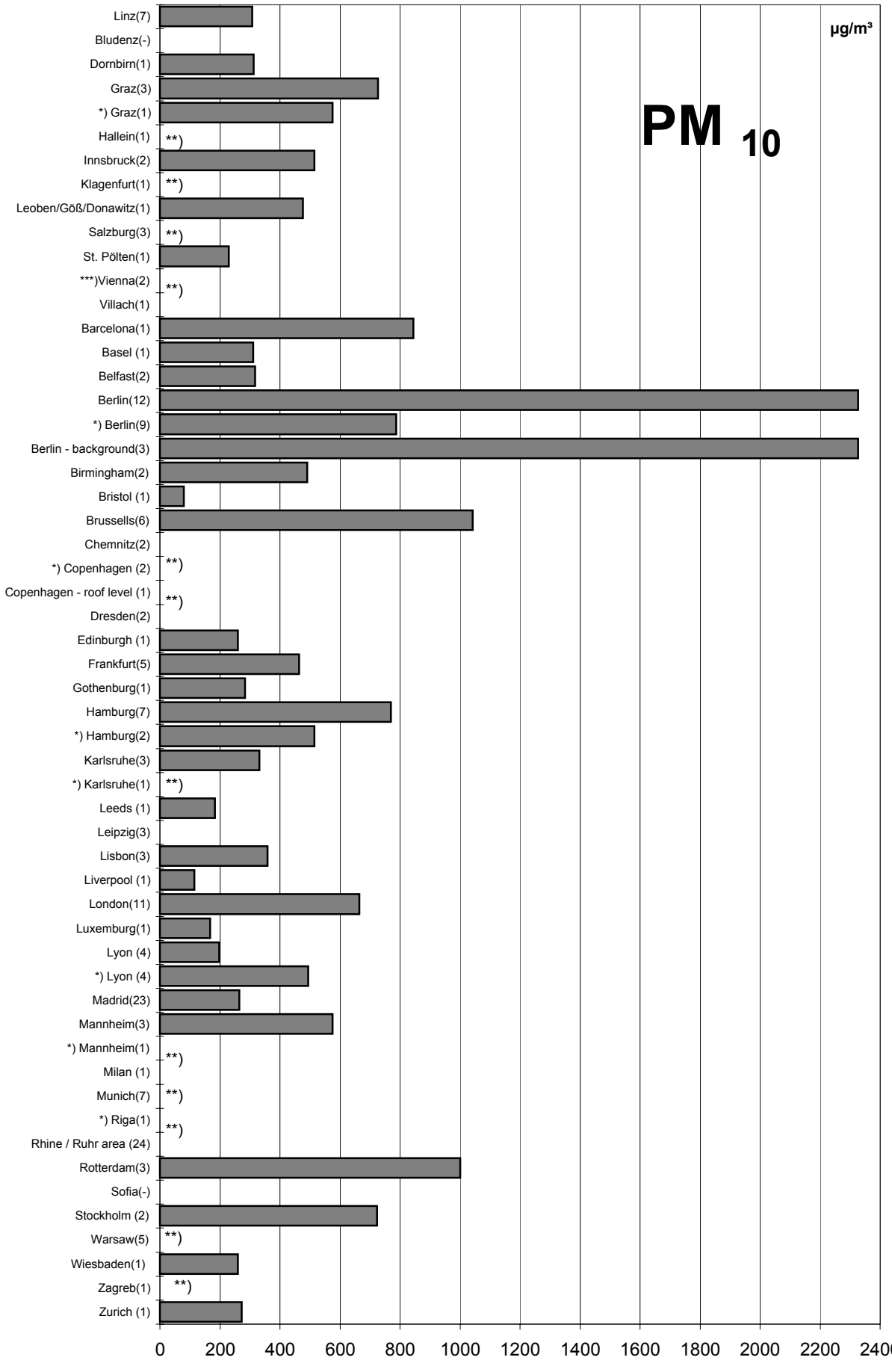


*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

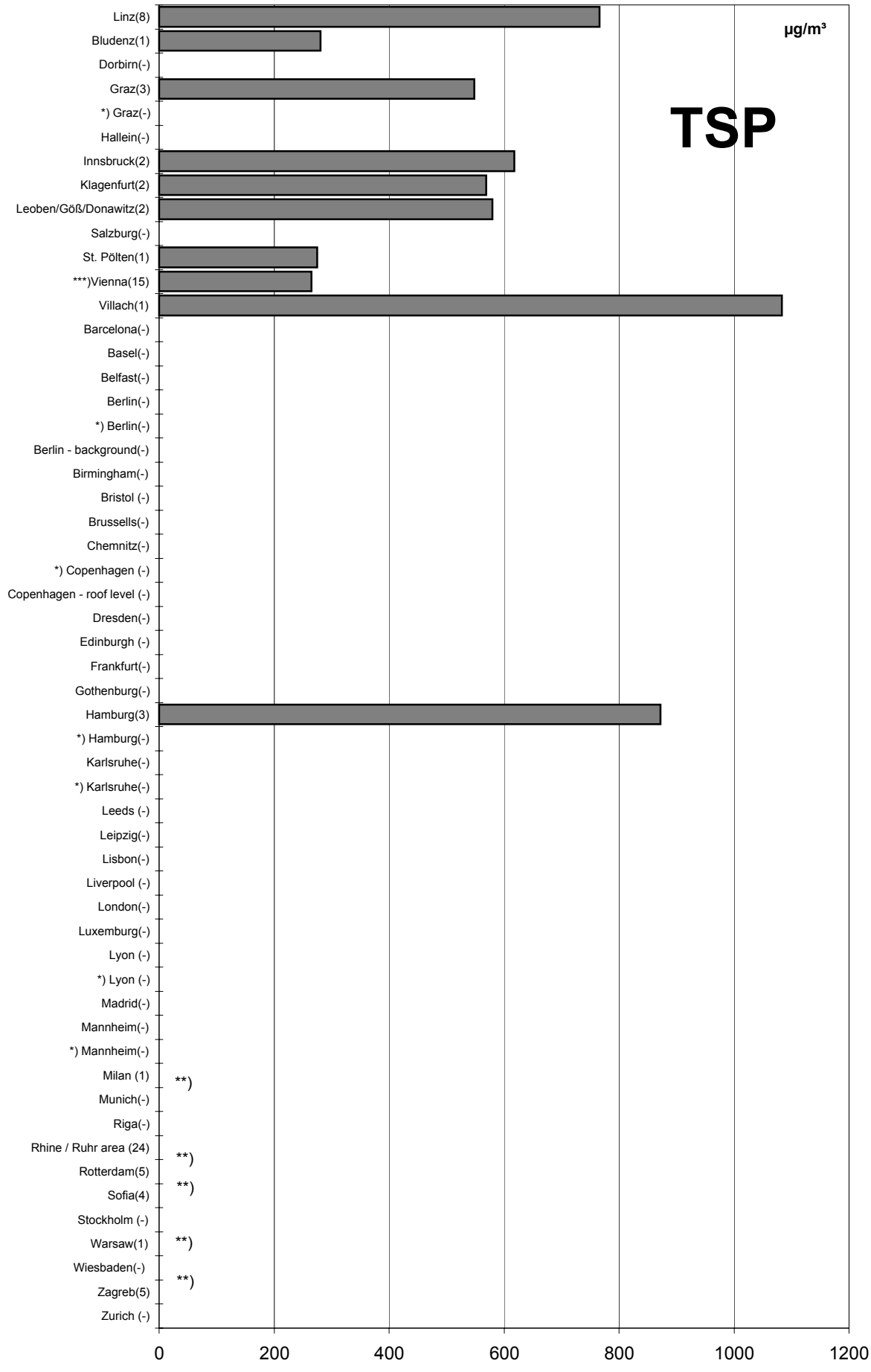


*)traffic-ininfluenced monitoring station
**)no data
***) max. 99,9 Percentile

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



*)traffic-ininfluenced monitoring station

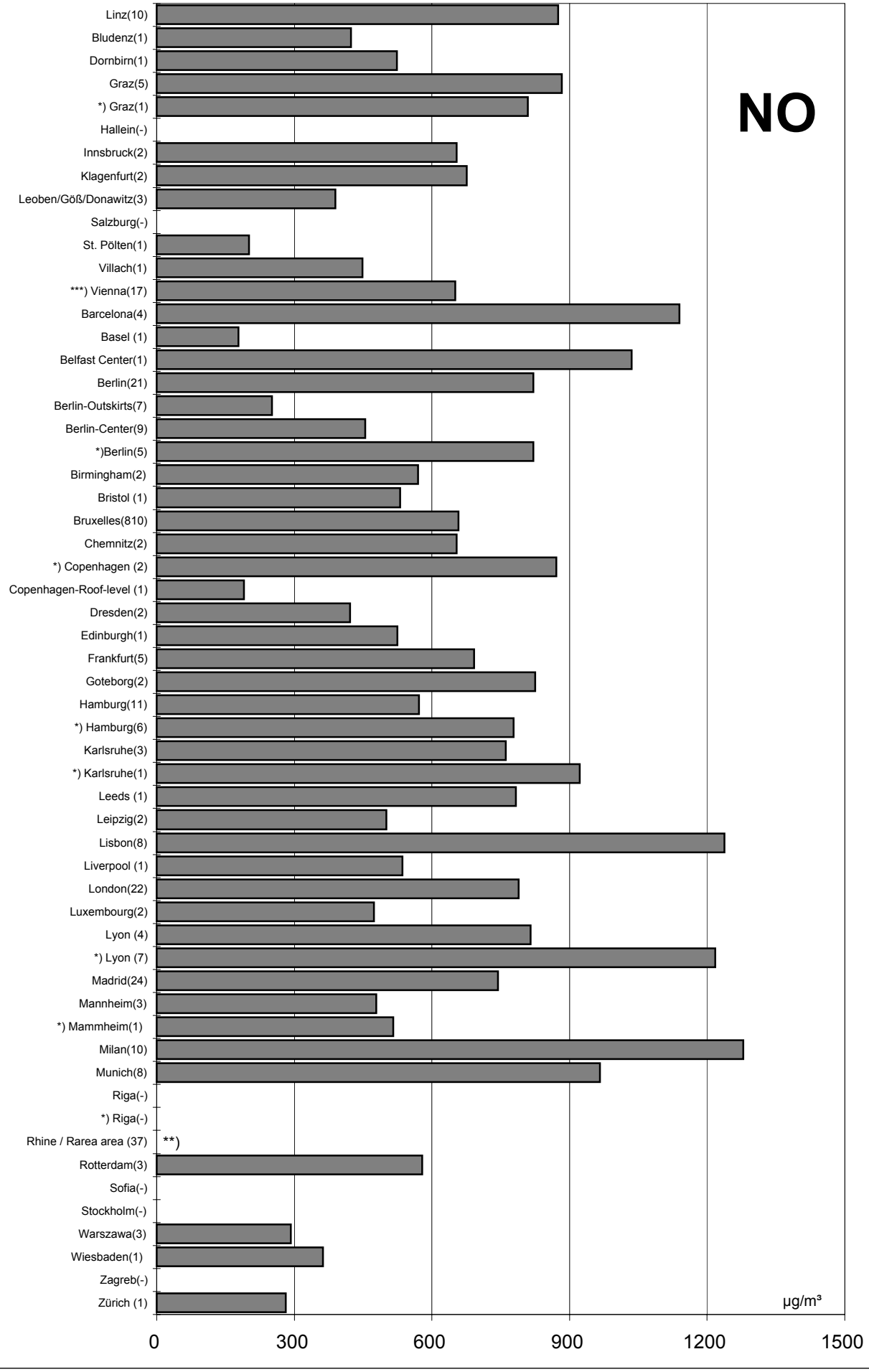
**)no data

***) max. 99,9 Percentile

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

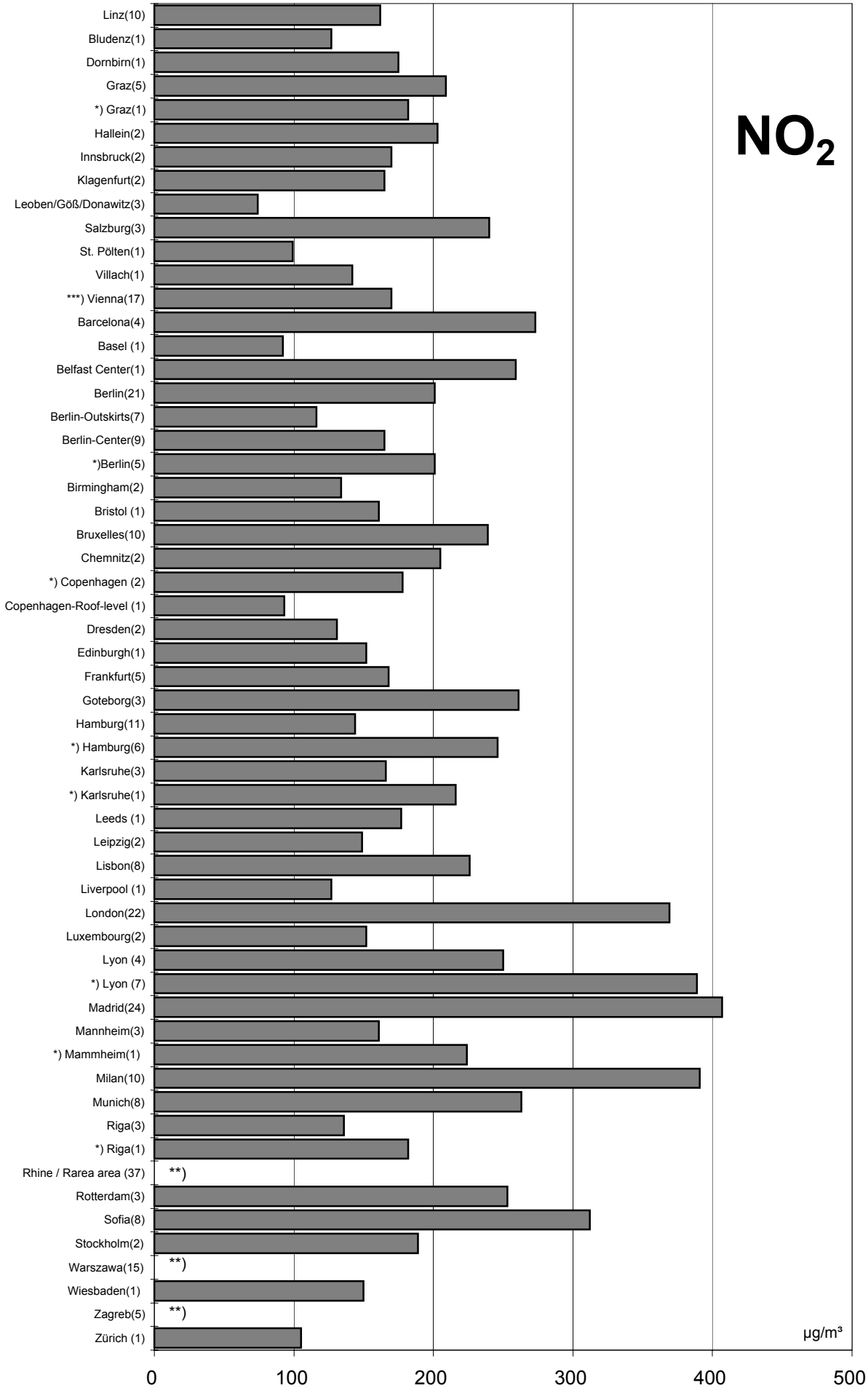
**)no data

***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

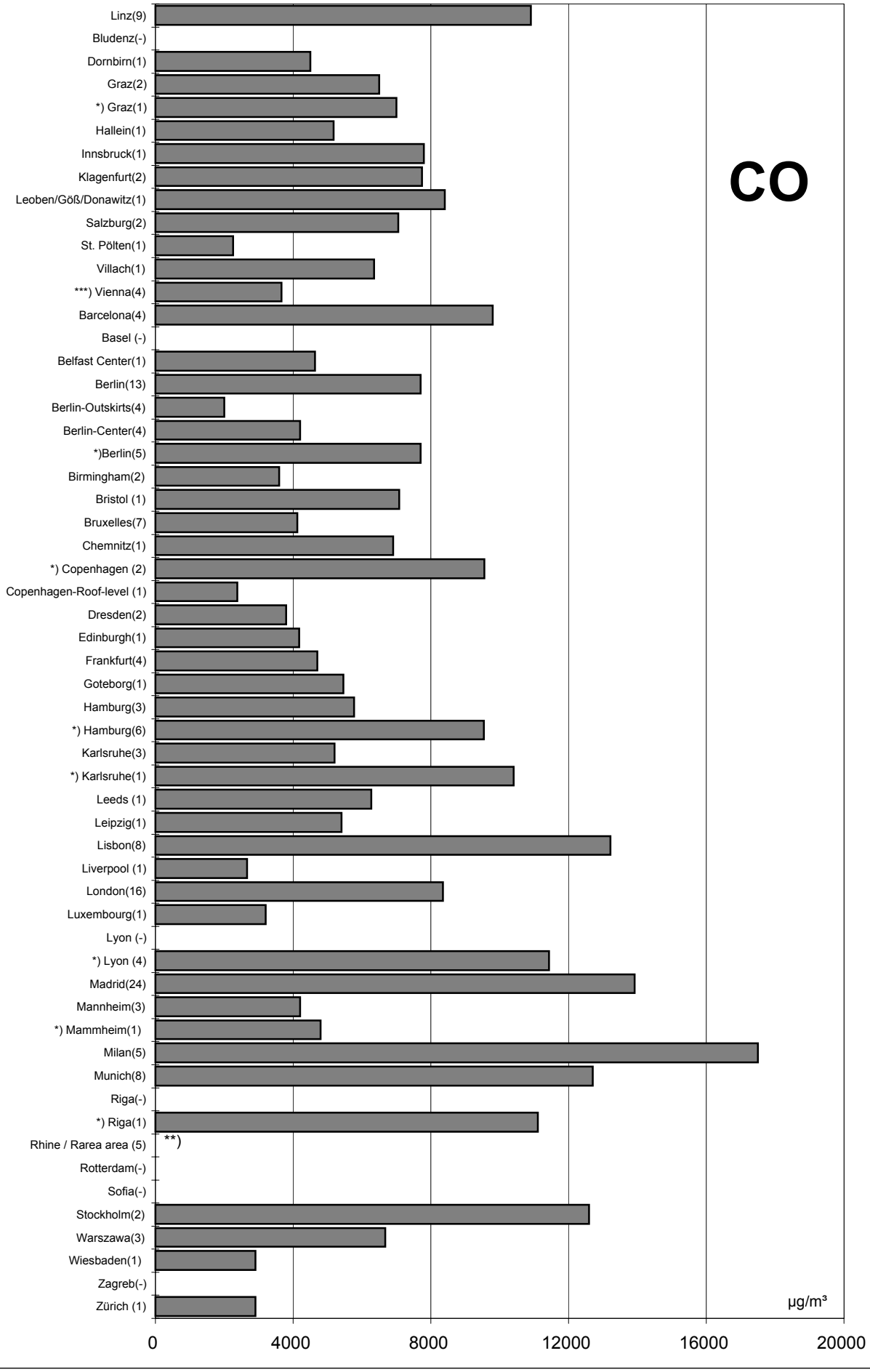


*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations)

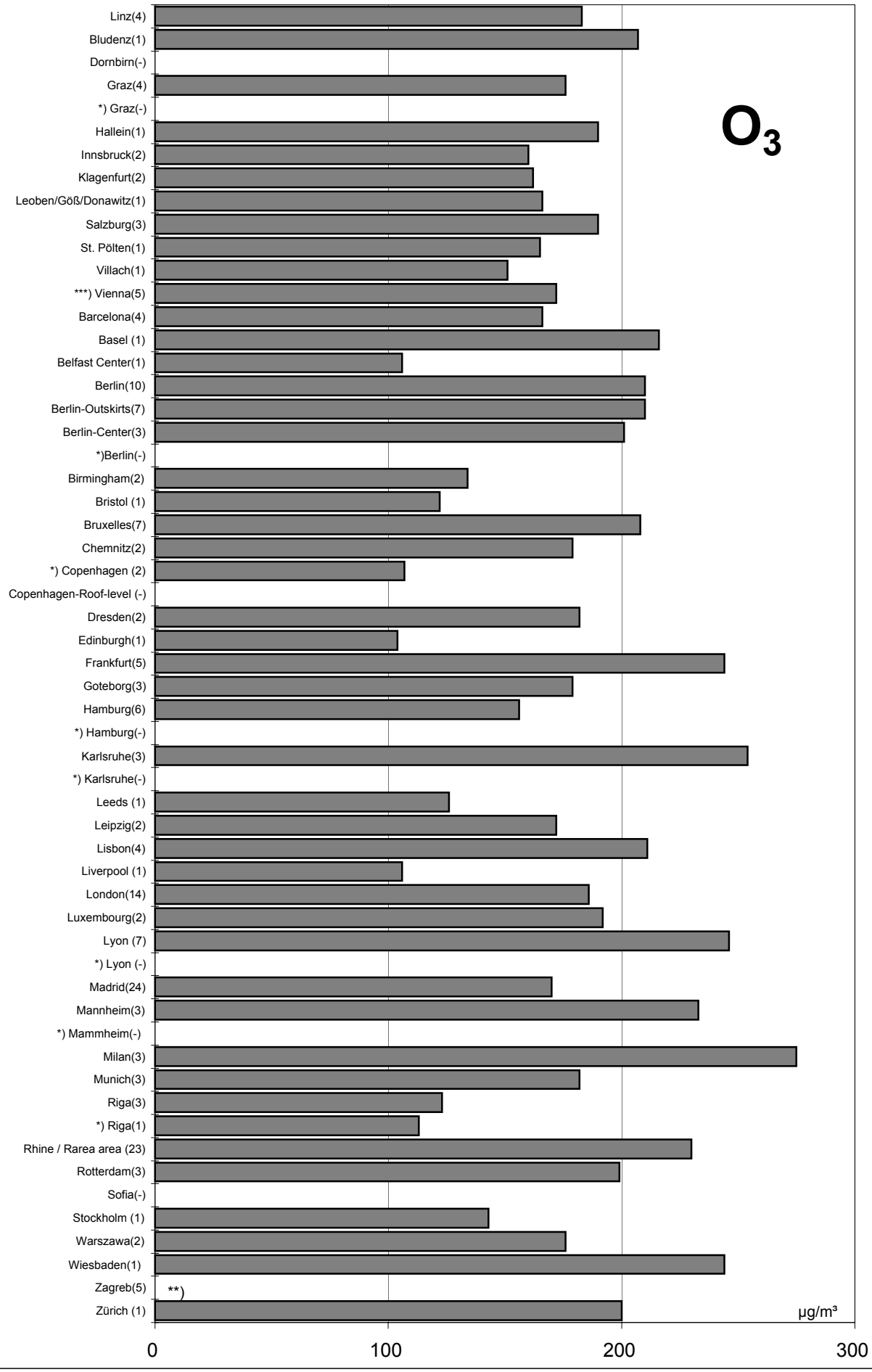


*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

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

(in parentheses: number of monitoring stations



*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Luftgütevergleich

2002

max. Halbstunden-Mittelwerte

Comparison of The Air Quality

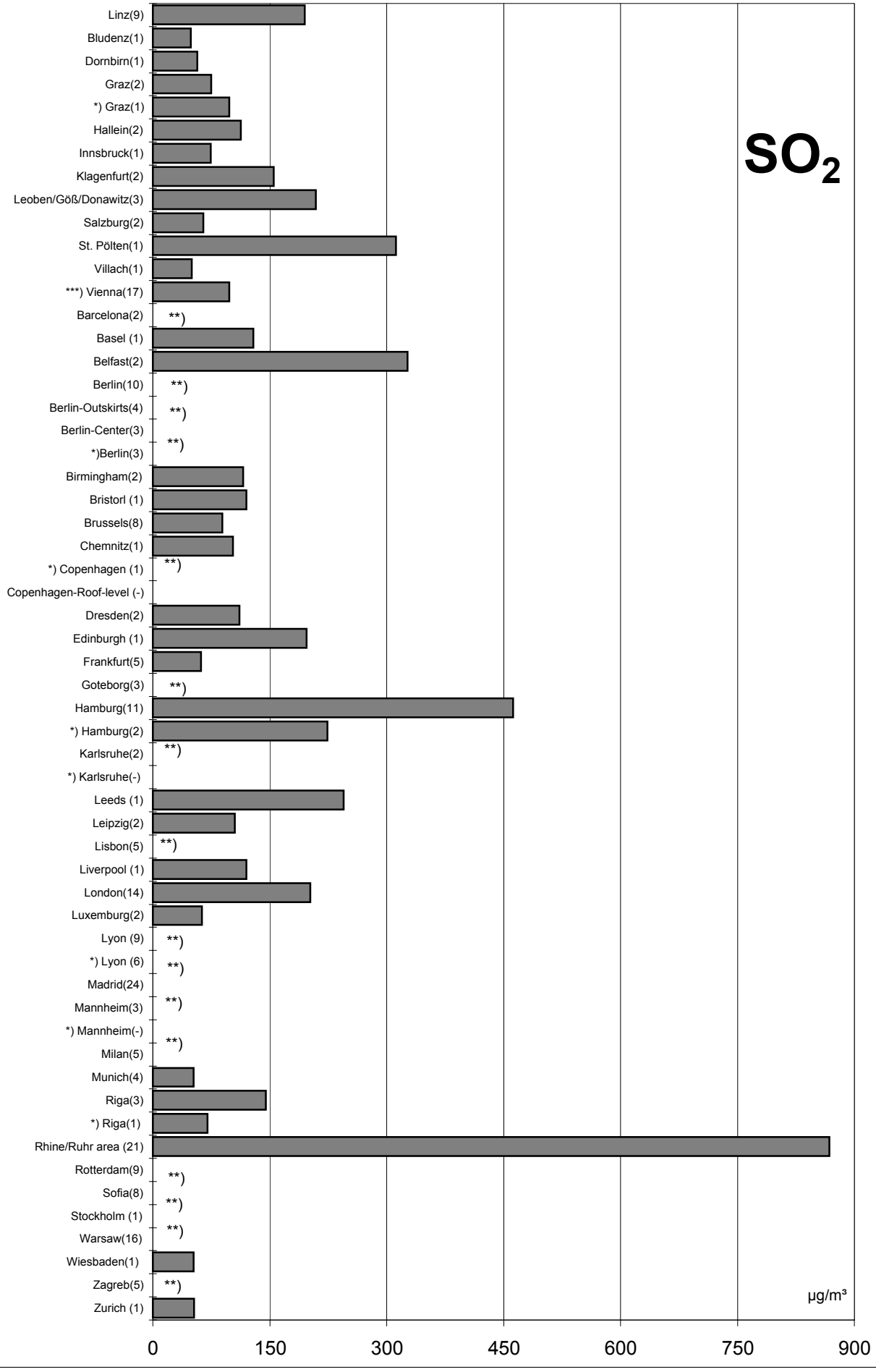
2002

Max. 1/2h-Mean Values

Comparison of The Air Quality in 2002

max. 1/2-h mean values (max. stressed monitoring station)

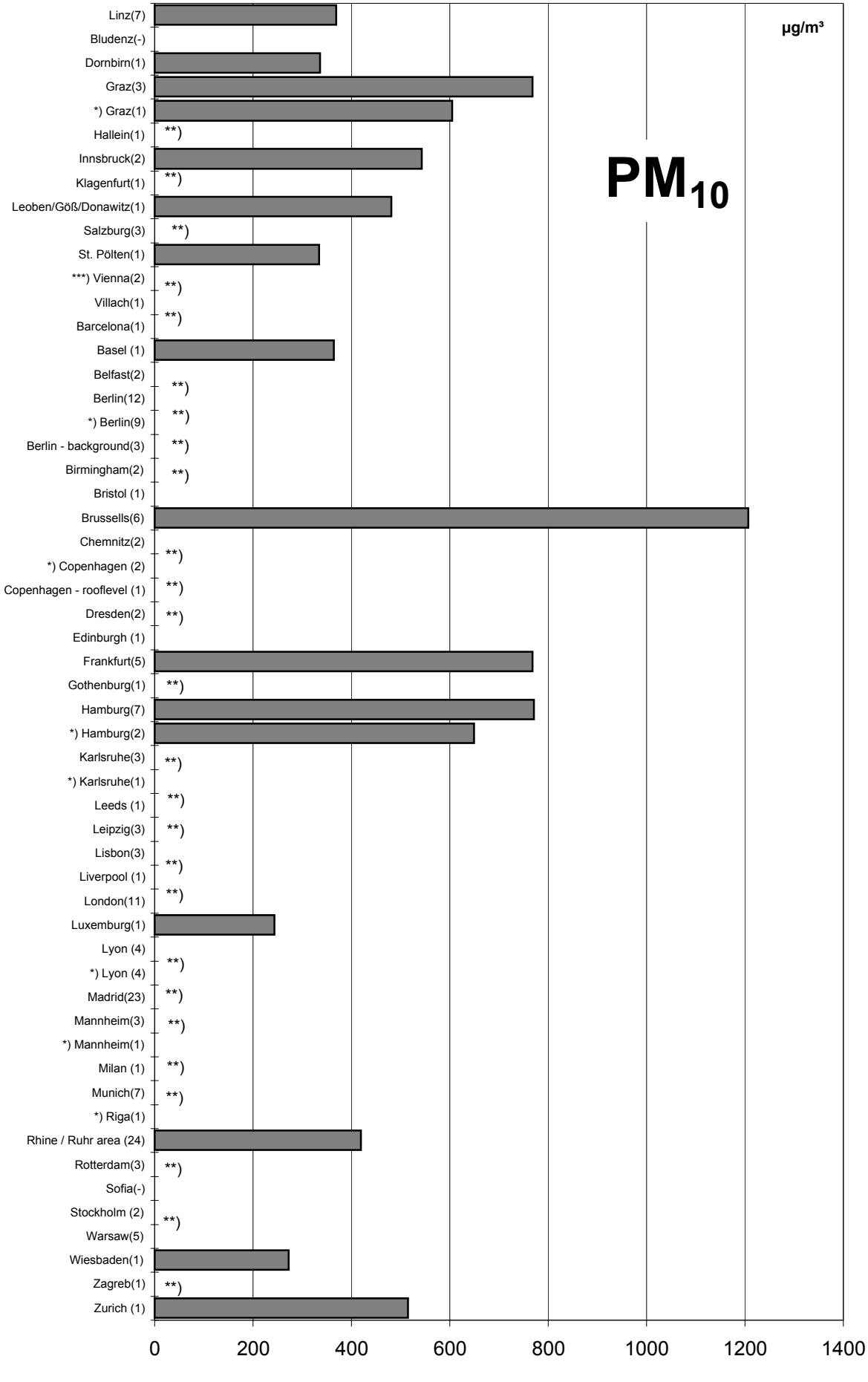
(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality 2002

max. 1/2-h mean values (max. stressed monitoring station)

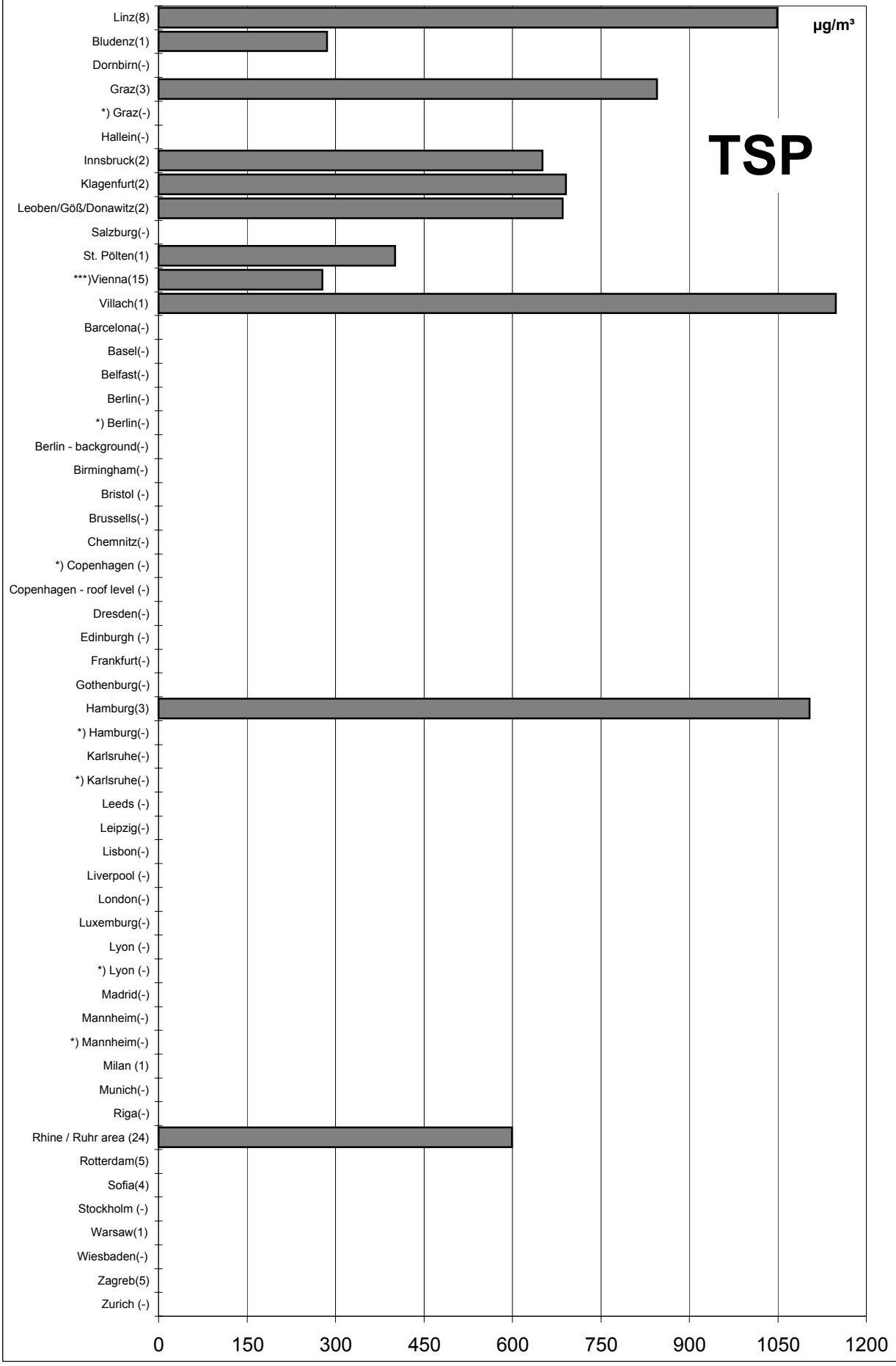


*)traffic-ininfluenced monitoring station
**)no data
***)max. 99,9 Percentile

Comparison of The Air Quality in 2002

max. 1/2-h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



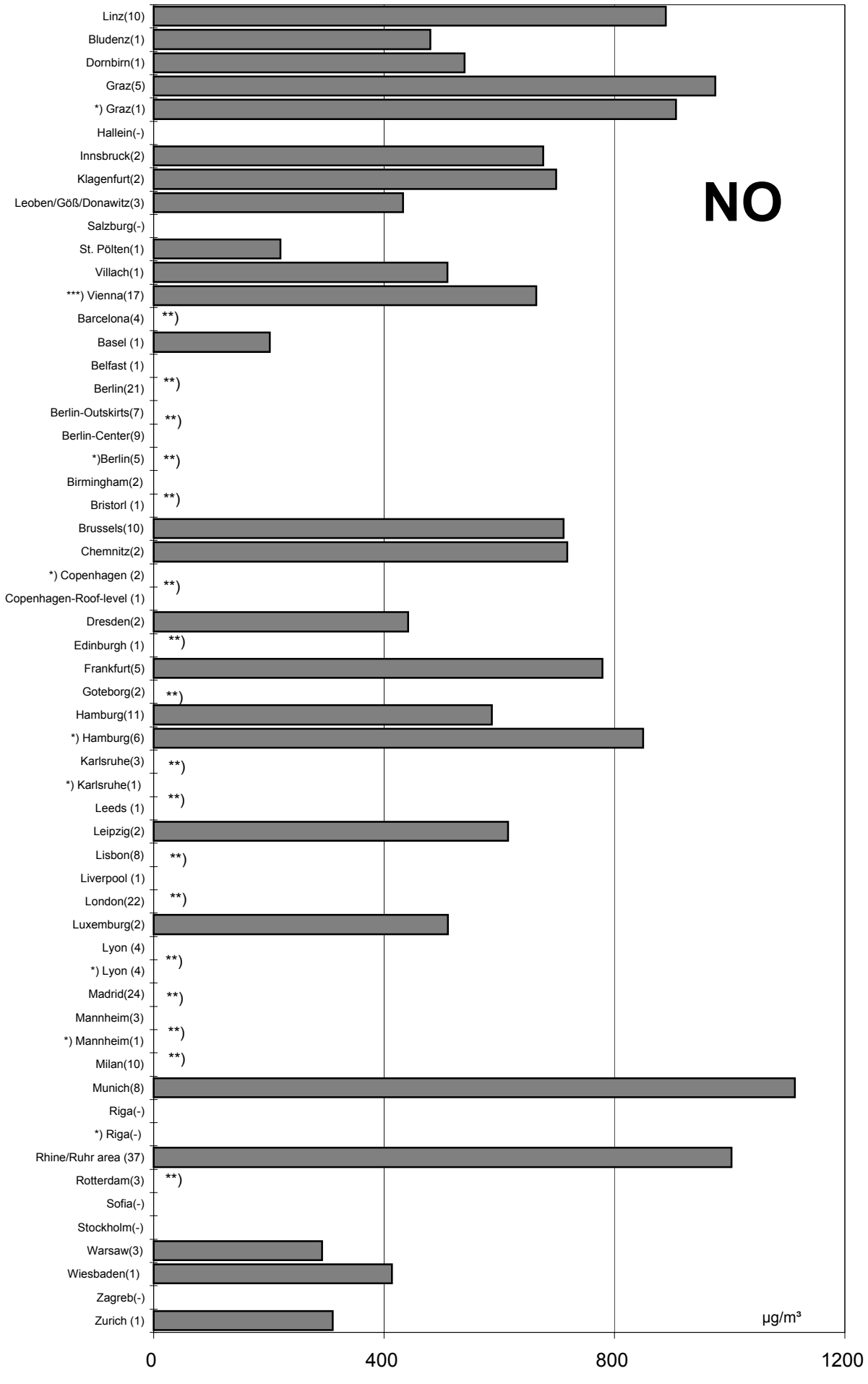
*) traffic-influenced monitoring stations

***)max. 99,9 Percentile

Comparison of The Air Quality in 2002

max. 1/2-h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

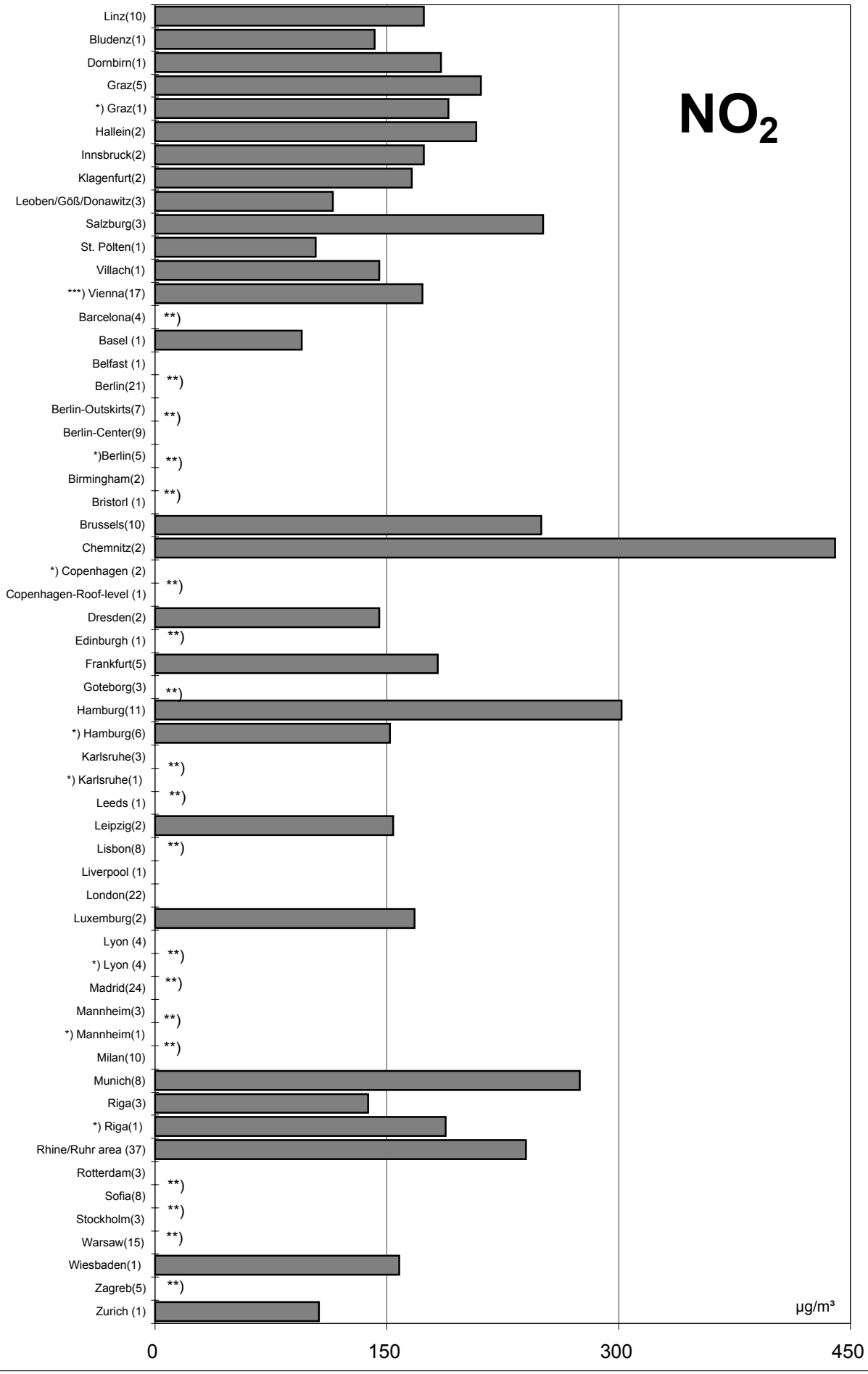
**)no data

***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 1/2-h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

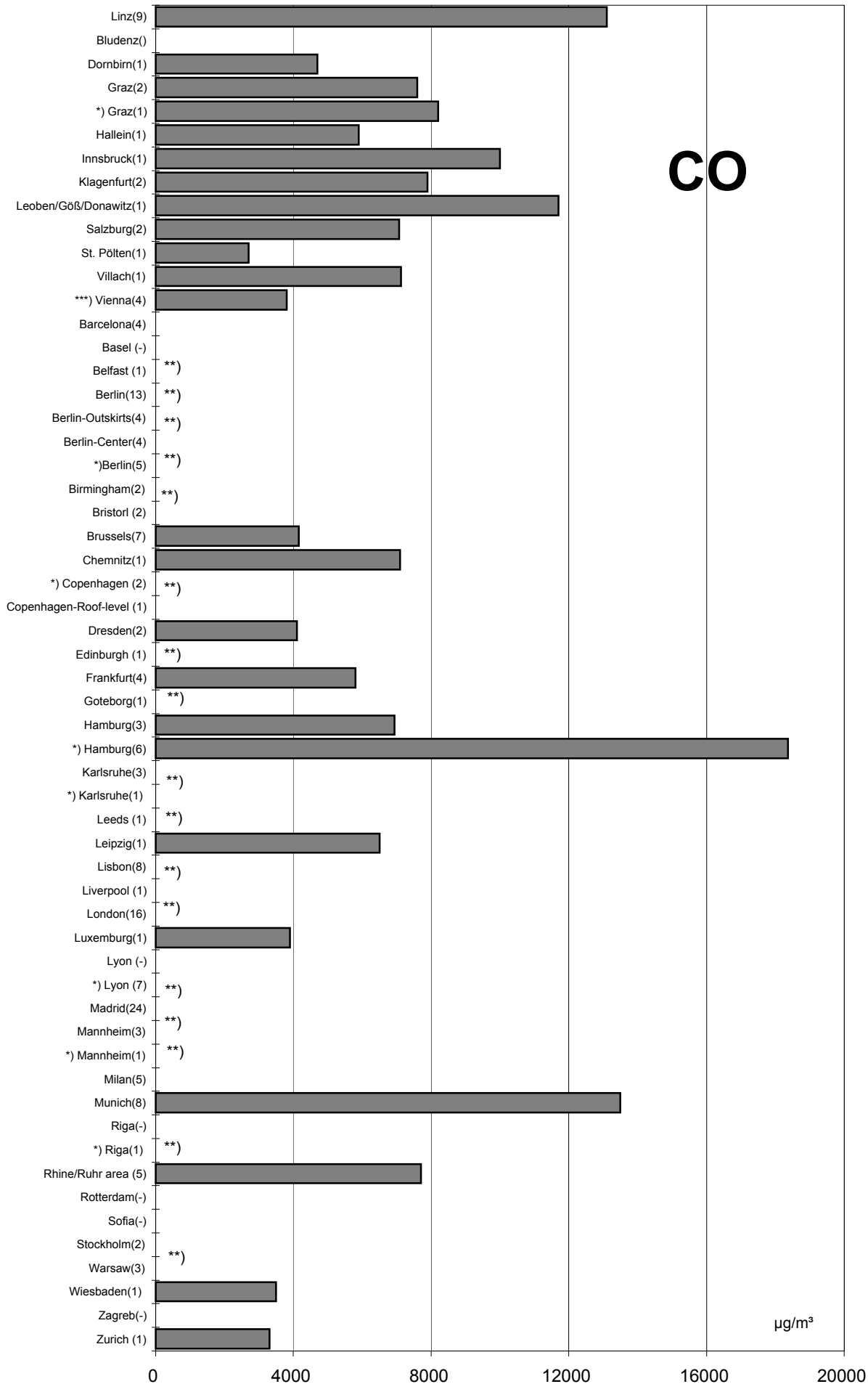


*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 1/2-h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

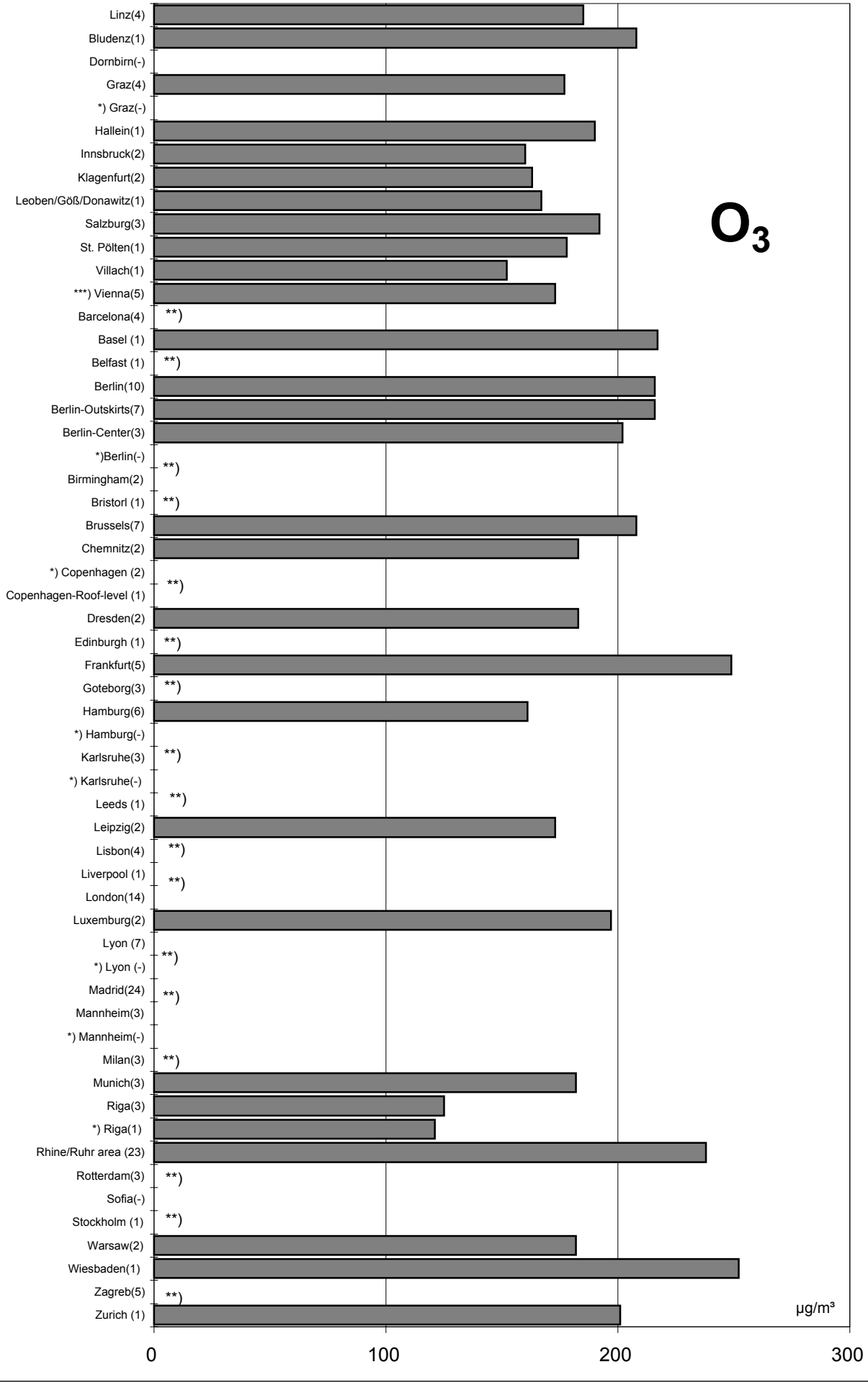
**)no data

***)max. 99,9-Percentile

Comparison of The Air Quality in 2002

max. 1/2-h mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations
**)no data
***)max. 99,9-Percentile

Luftgütevergleich

2002

max. 98-Percentil/Jahr

Comparison of The Air Quality

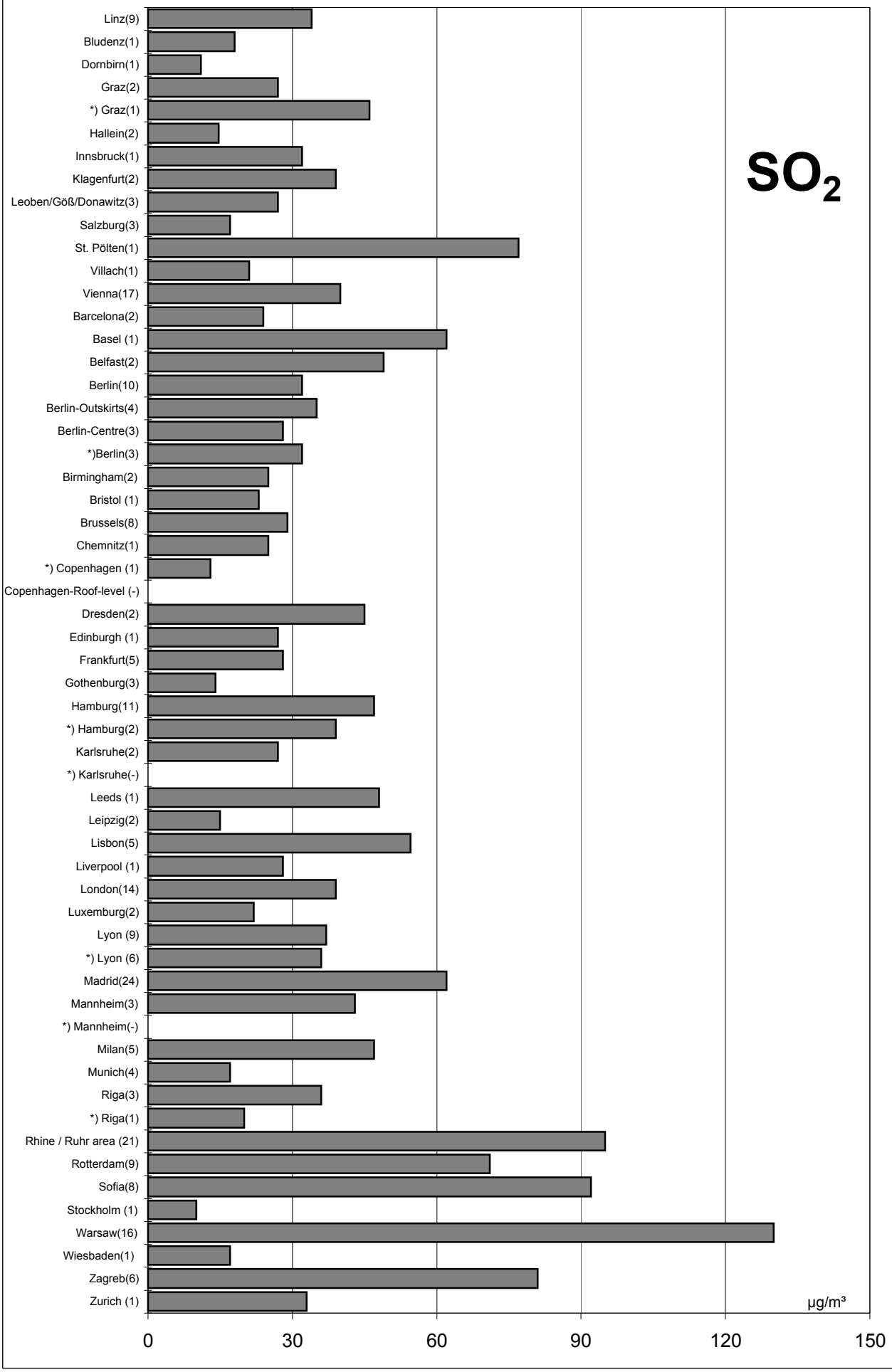
2002

Max. 98-Percentile per Year

Comparison of The Air Quality in 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

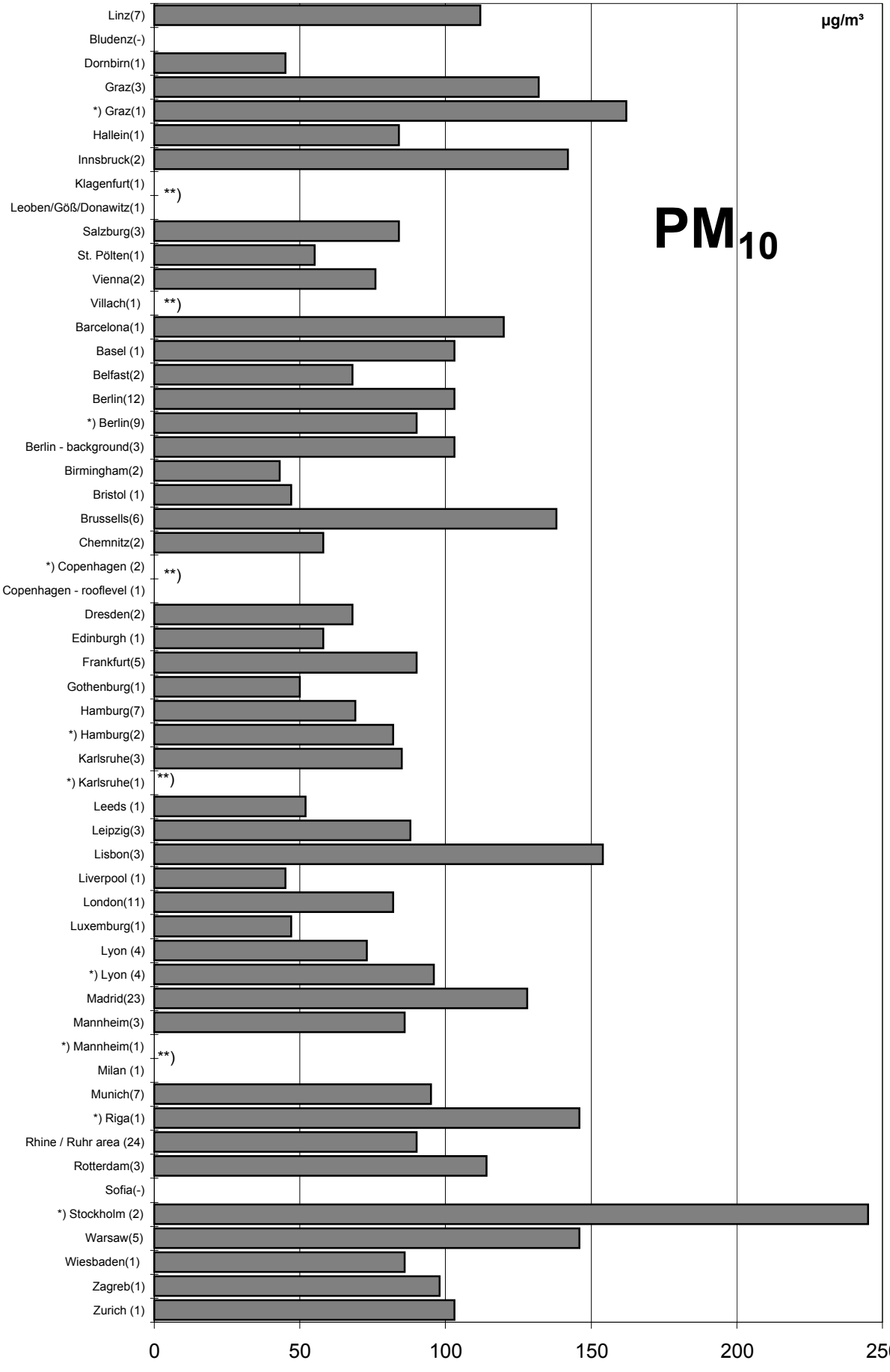


*) traffic-influenced monitoring stations
**)no data

Comparison of The Air Quality in 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



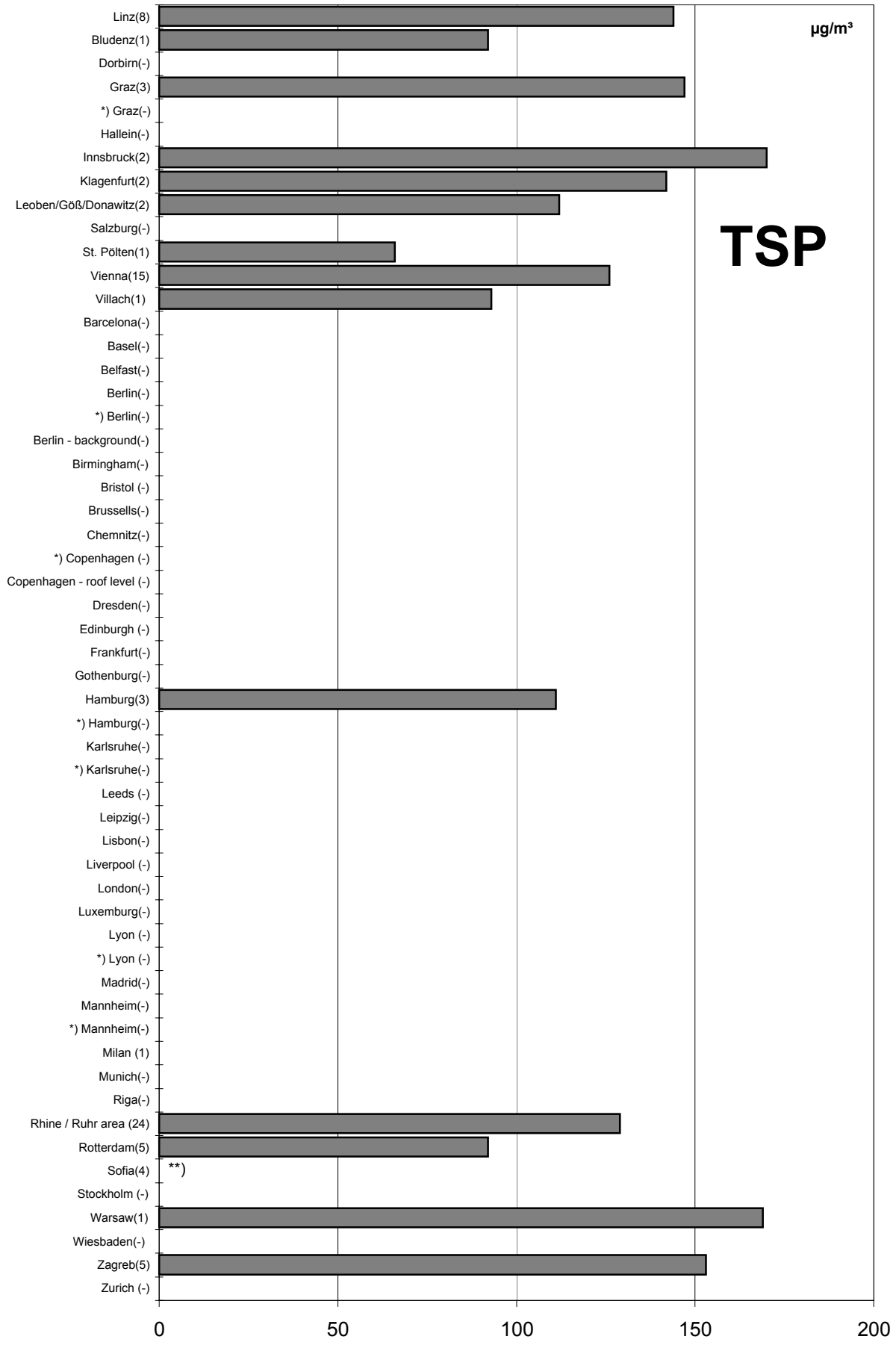
*) traffic-influenced monitoring stations

**) no data

Comparison of The Air Quality 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



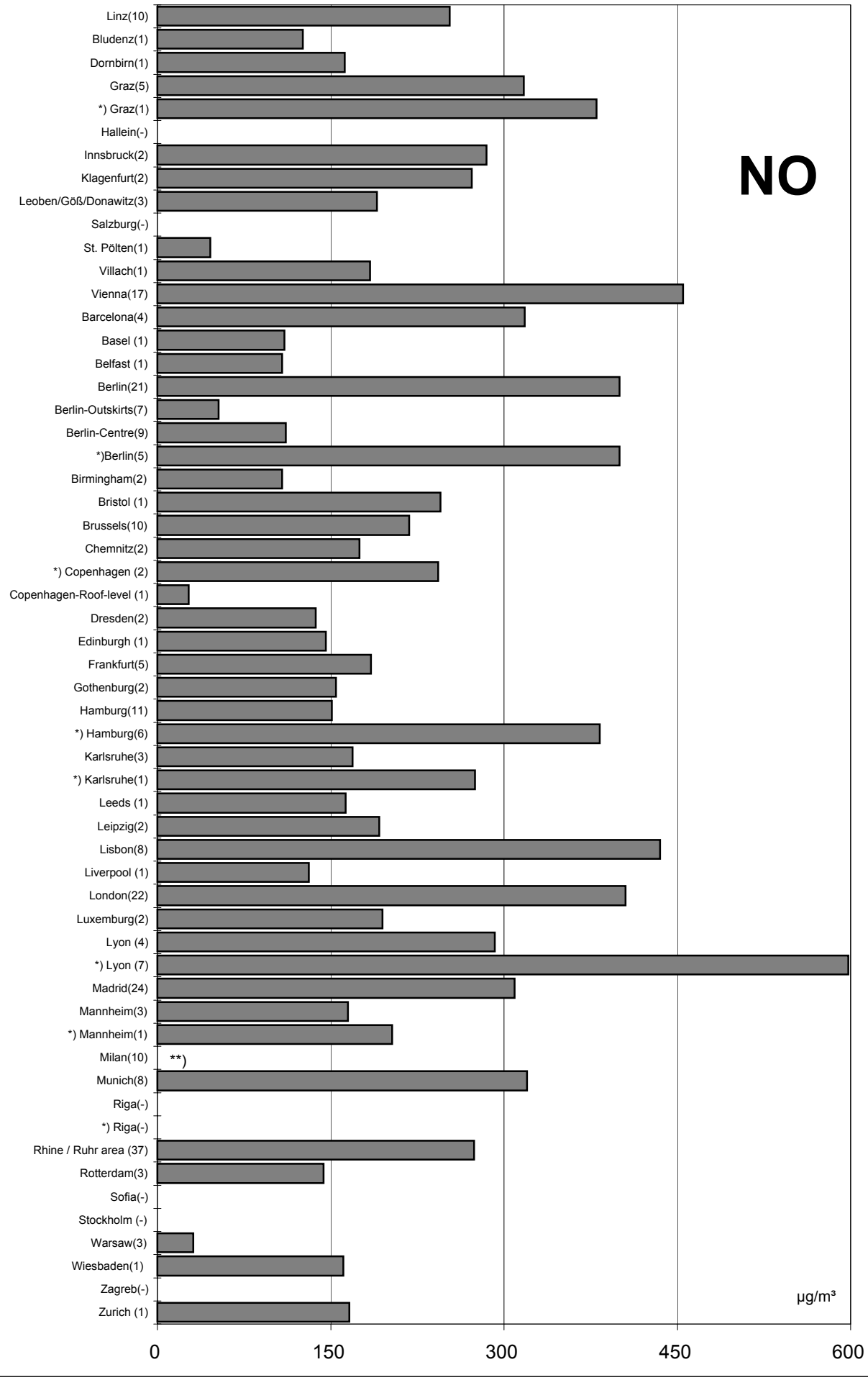
*)traffic-ininfluenced monitoring station

**)no data

Comparison of The Air Quality in 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

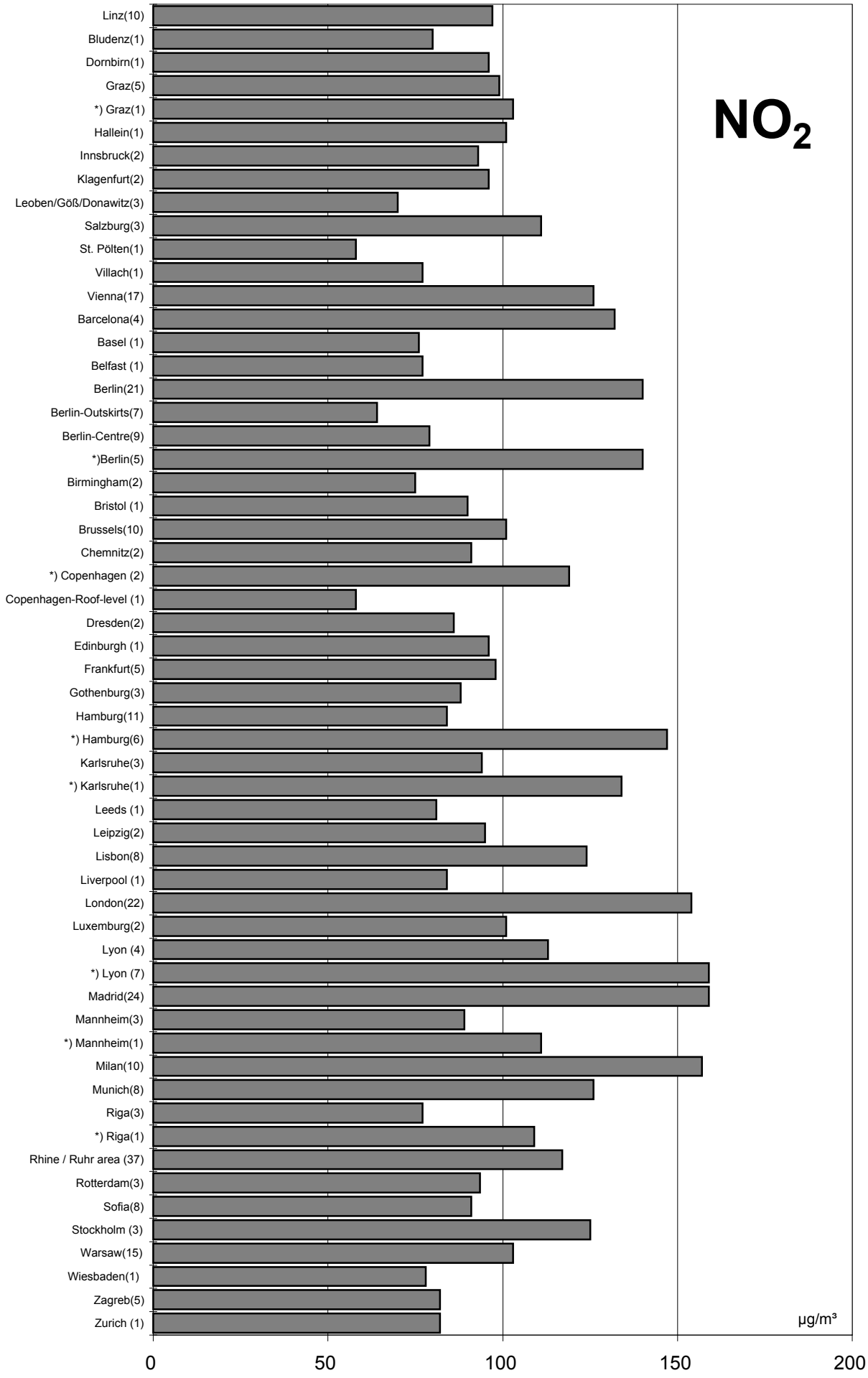


*) traffic-influenced monitoring stations
**)no data

Comparison of The Air Quality in 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)

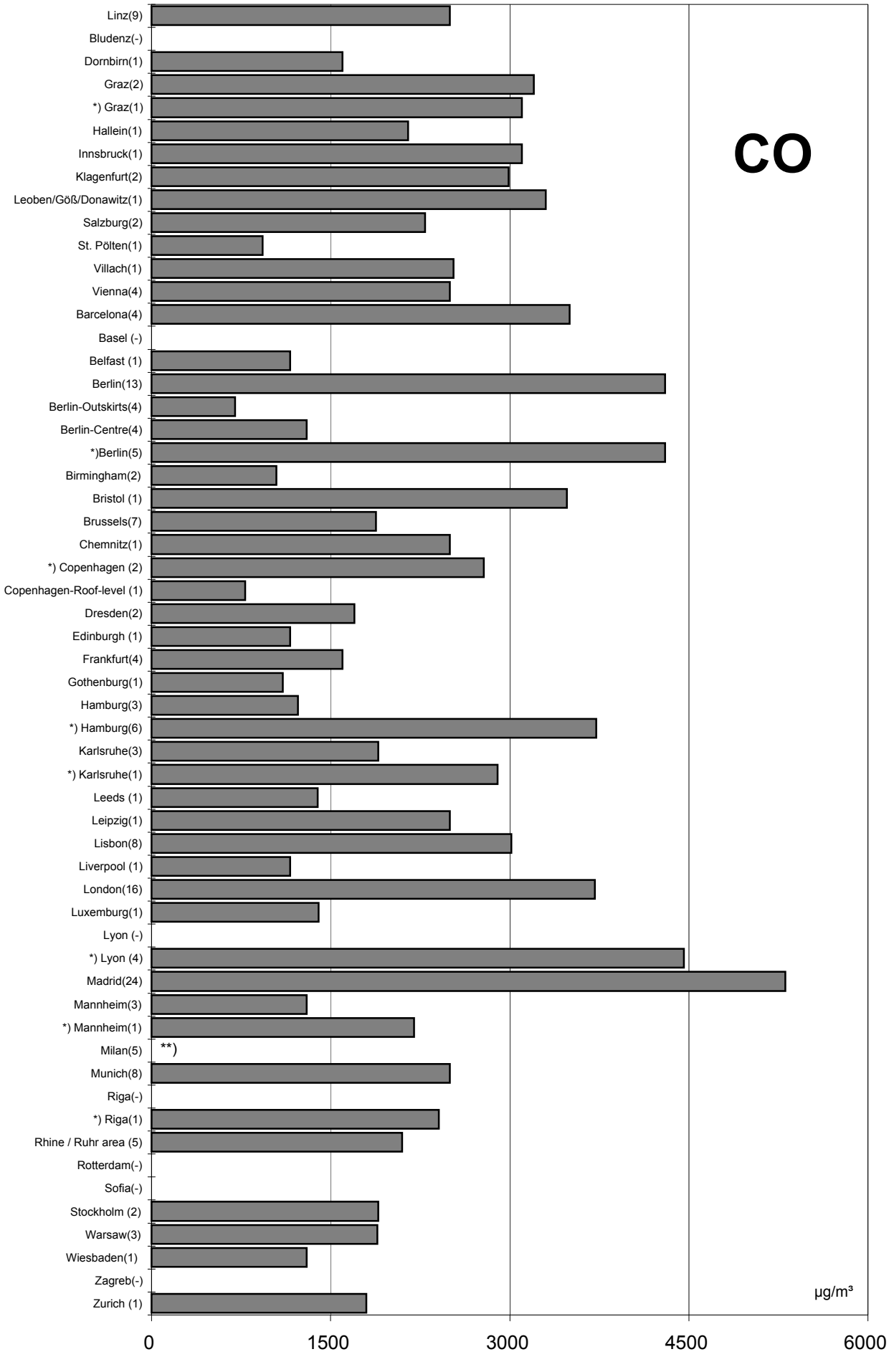


*) traffic-influenced monitoring stations
**)no data

Comparison of The Air Quality in 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



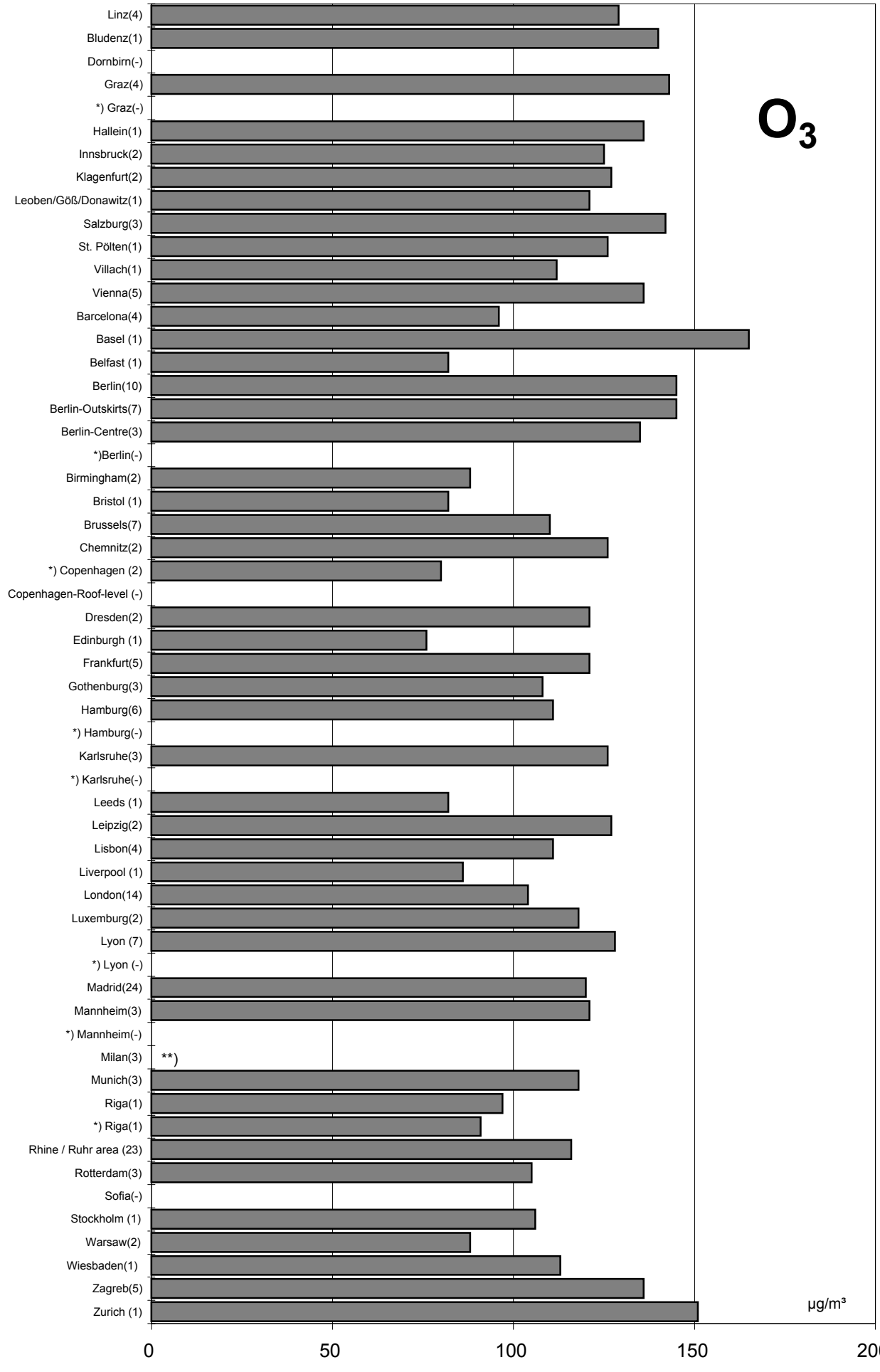
*) traffic-influenced monitoring stations

**)no data

Comparison of The Air Quality in 2002

max. 98-Percentile (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



*) traffic-influenced monitoring stations

**)no data

Jahresvergleich

1992 - 2002

Jahresmittelwerte

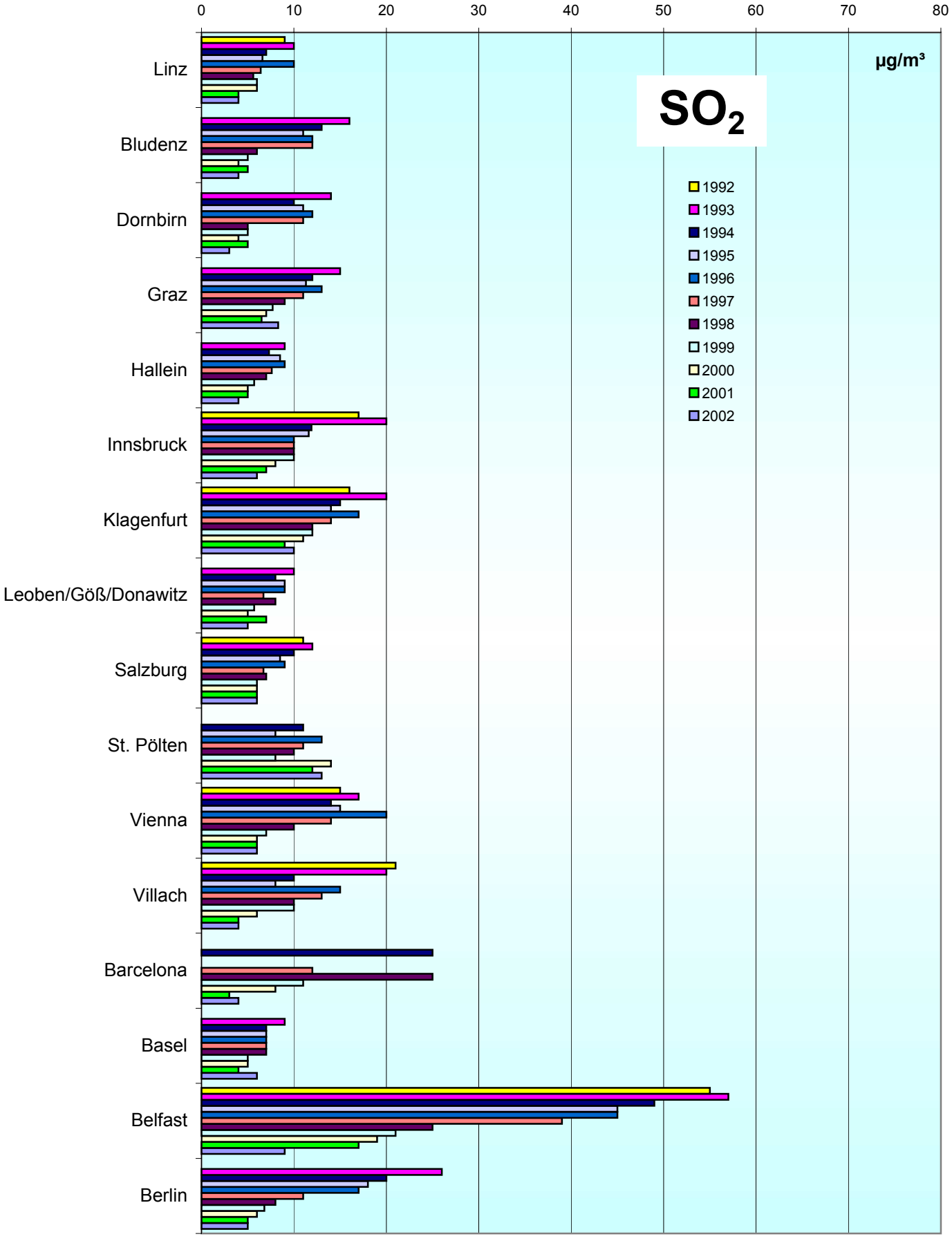
Comparison of The Air Quality Over The Years

1992 - 2002

Annual Mean Values

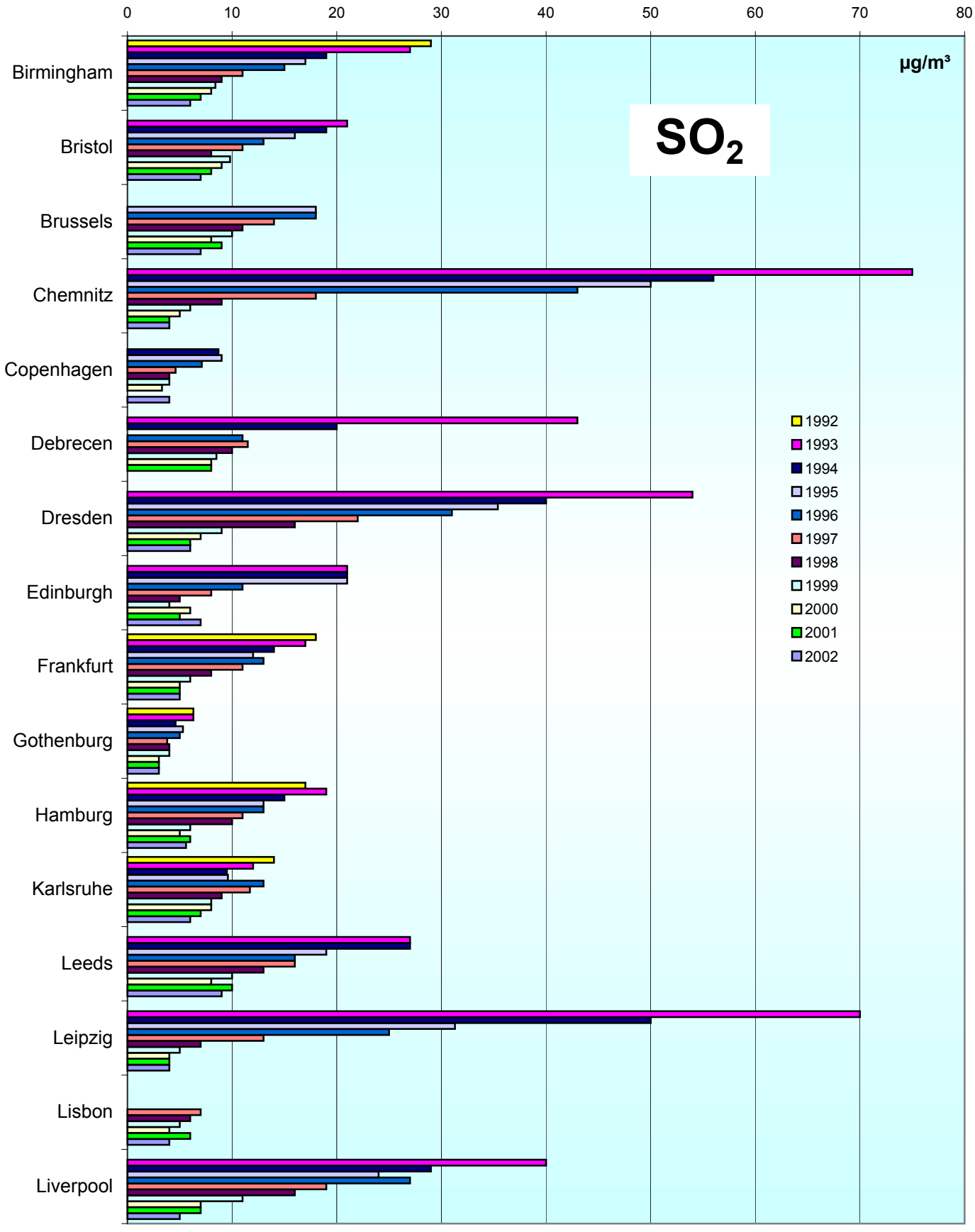
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



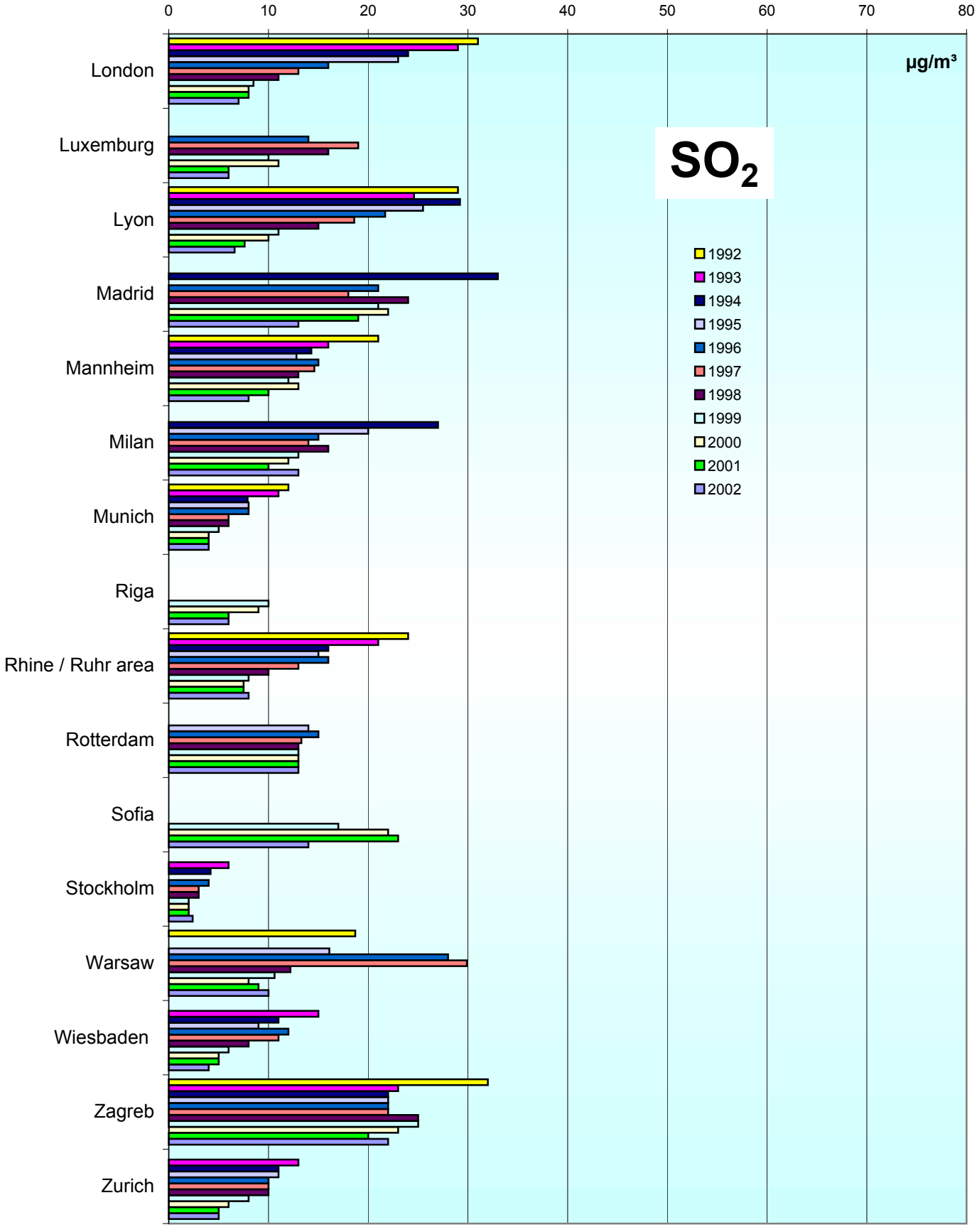
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



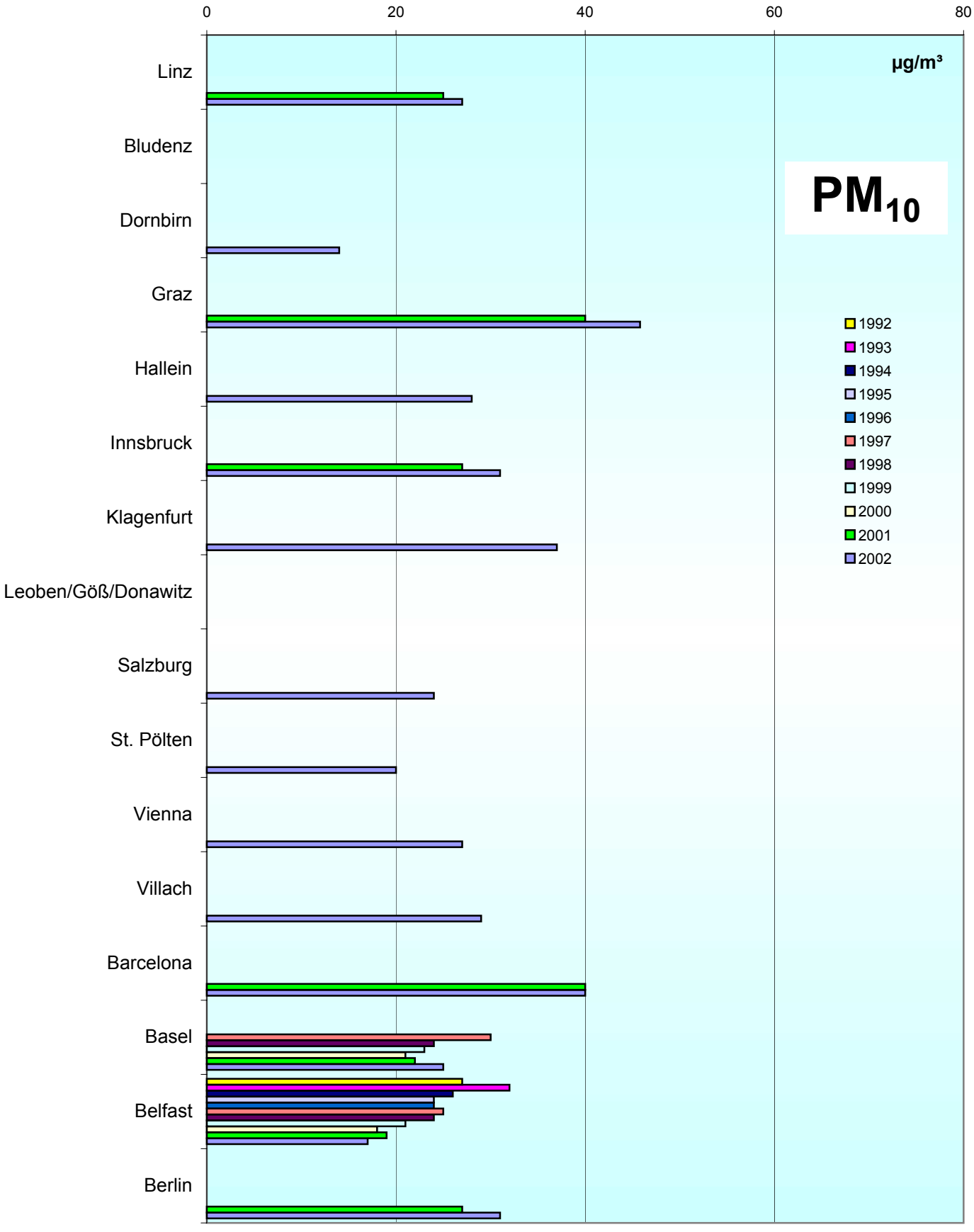
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2002

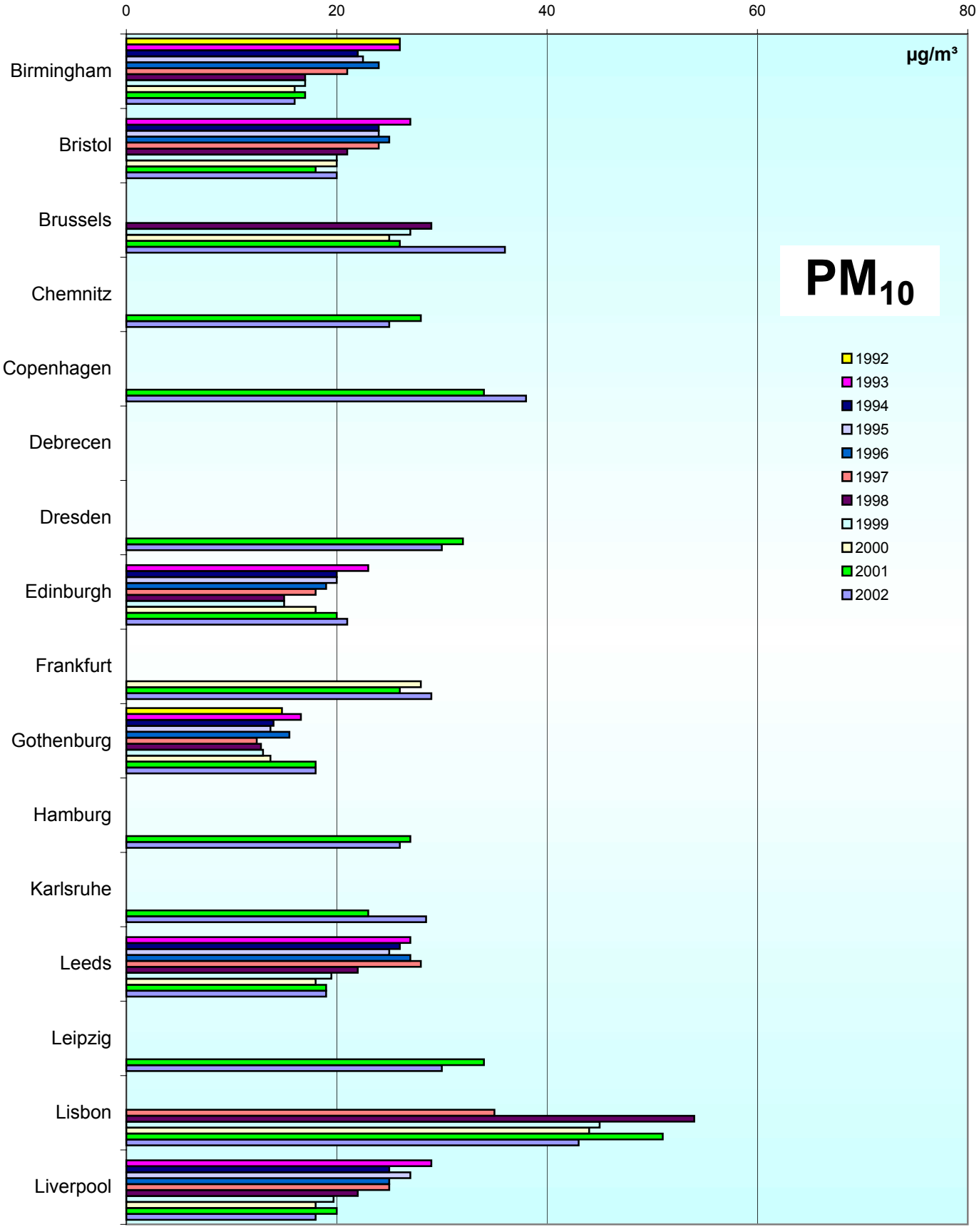
Annual mean values
(mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2002

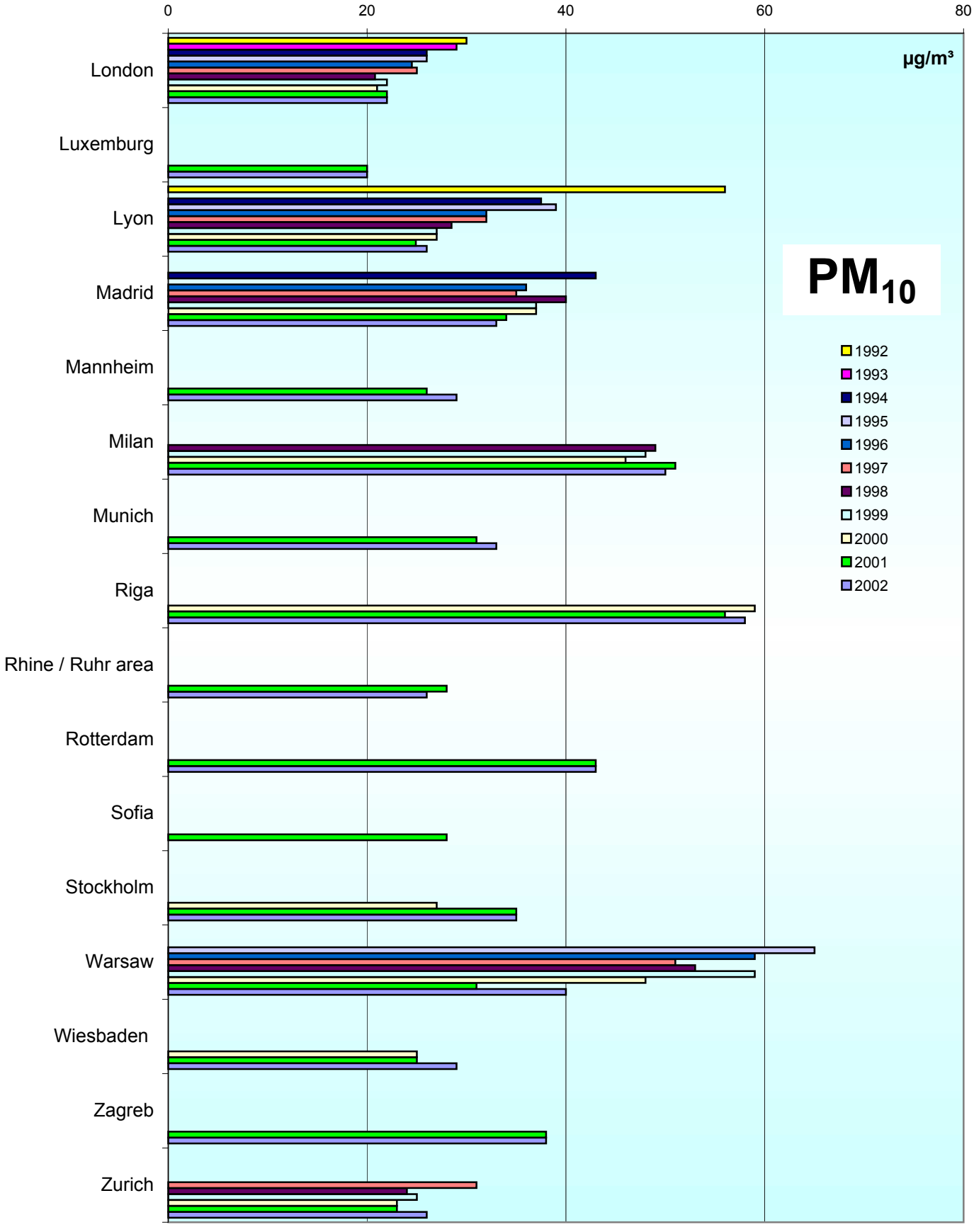
Annual mean values

(mean of all monitoring stations)



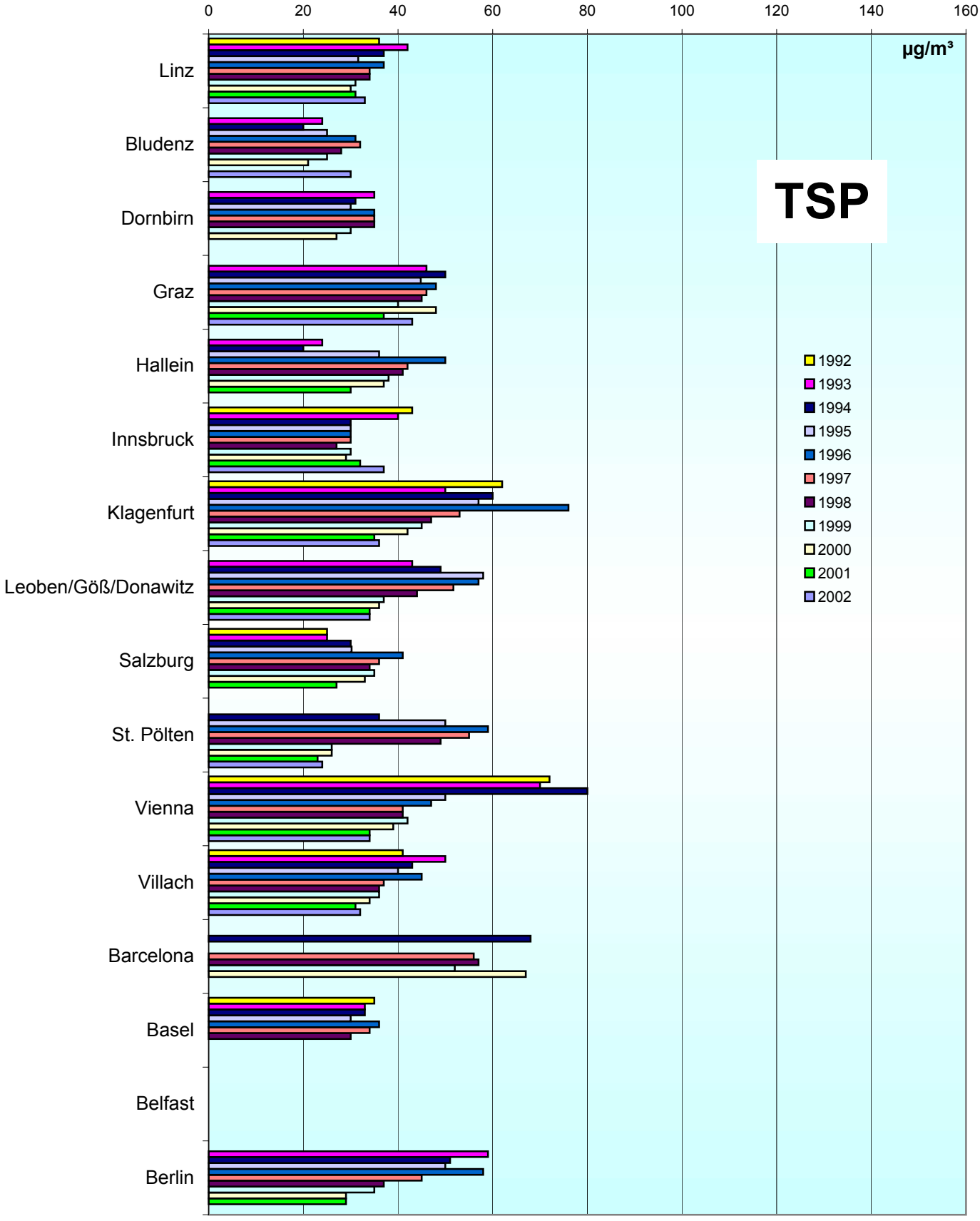
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



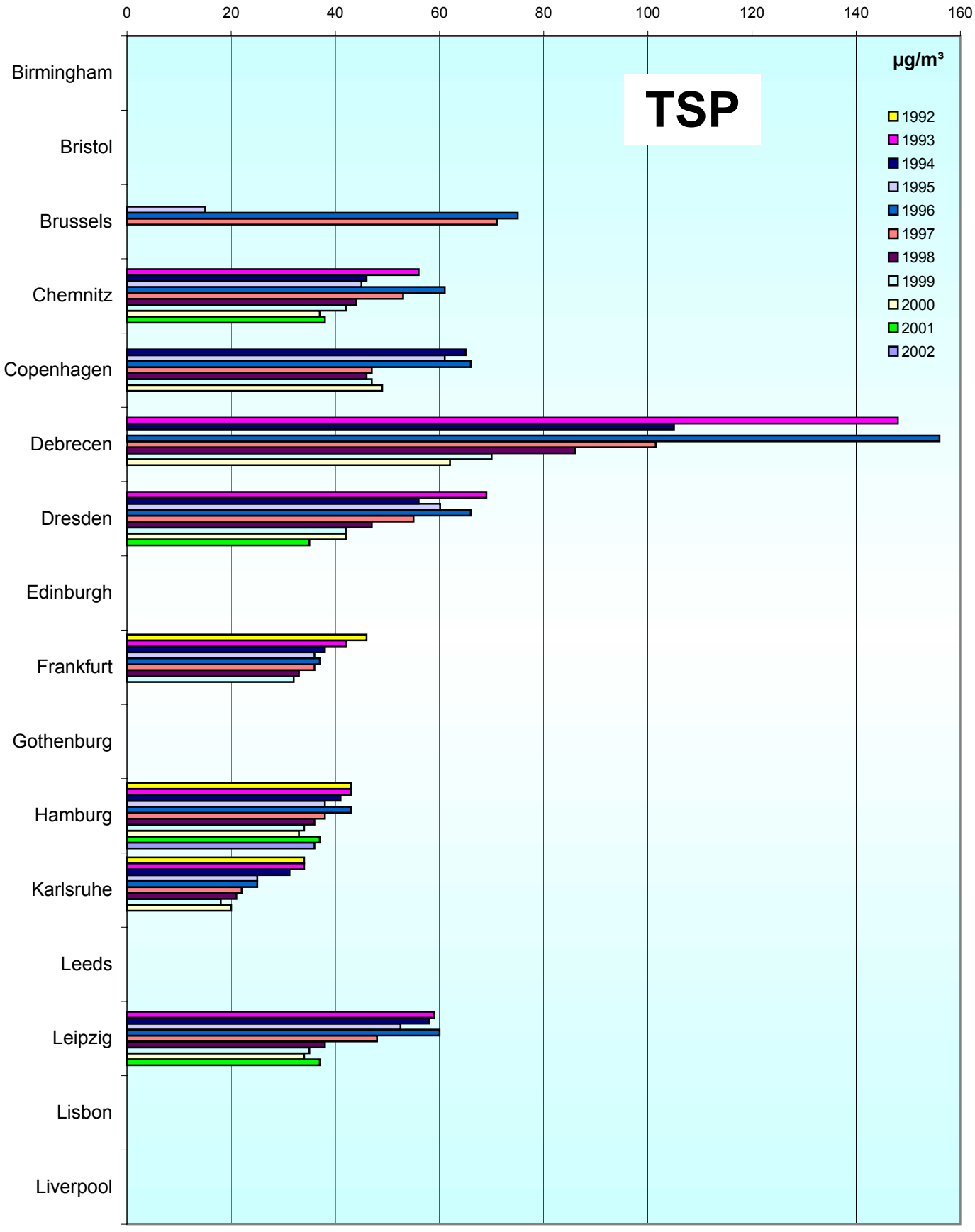
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



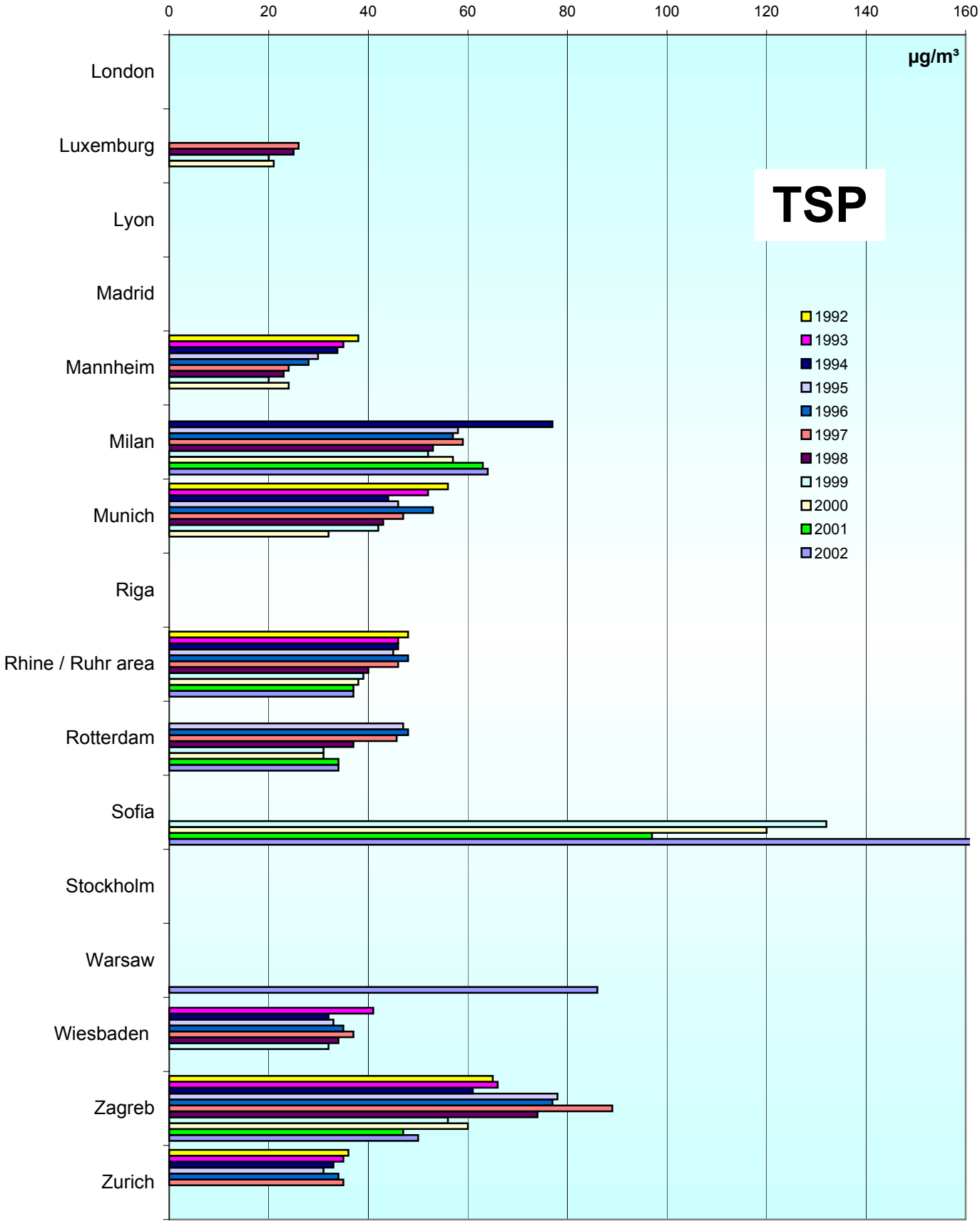
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



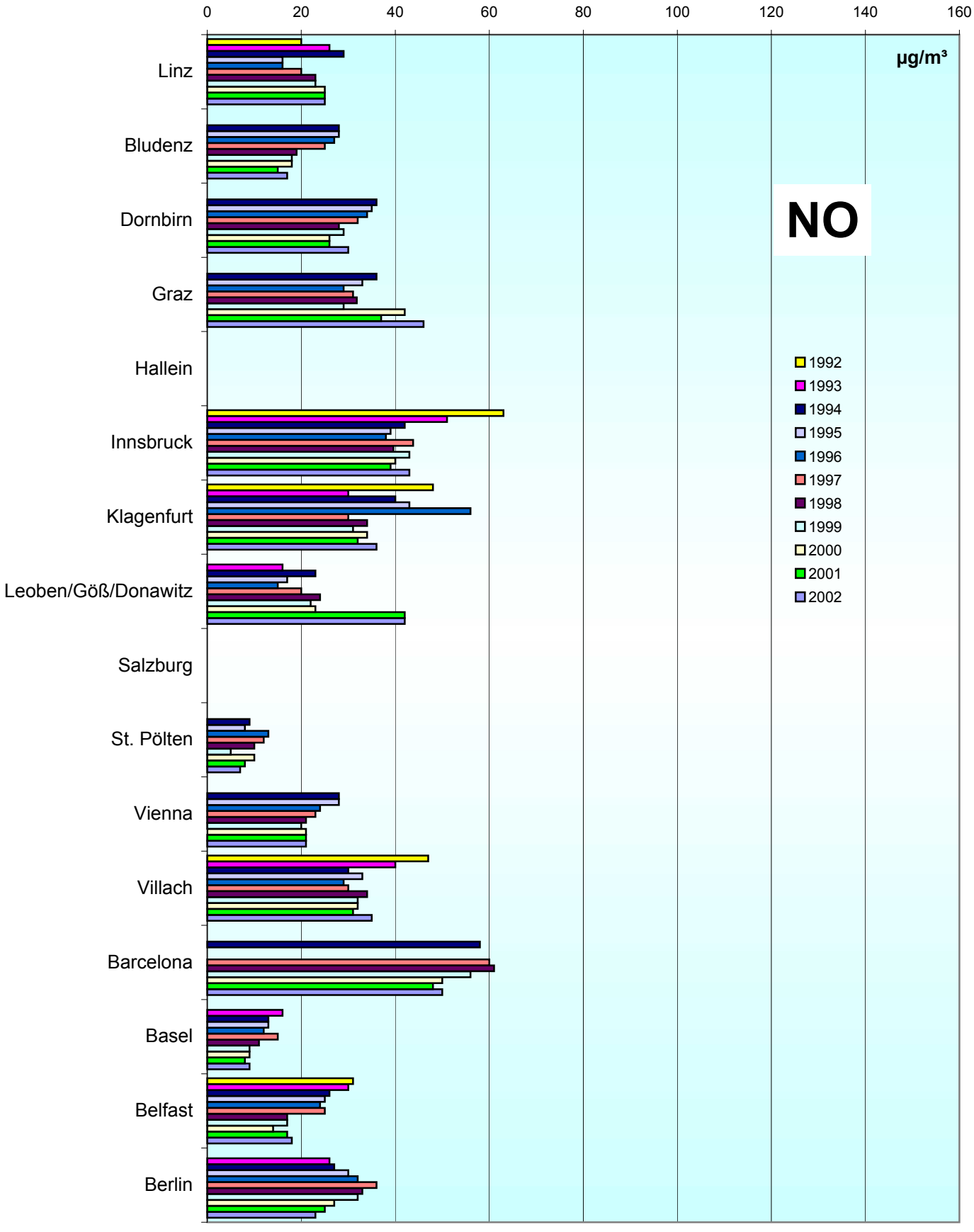
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



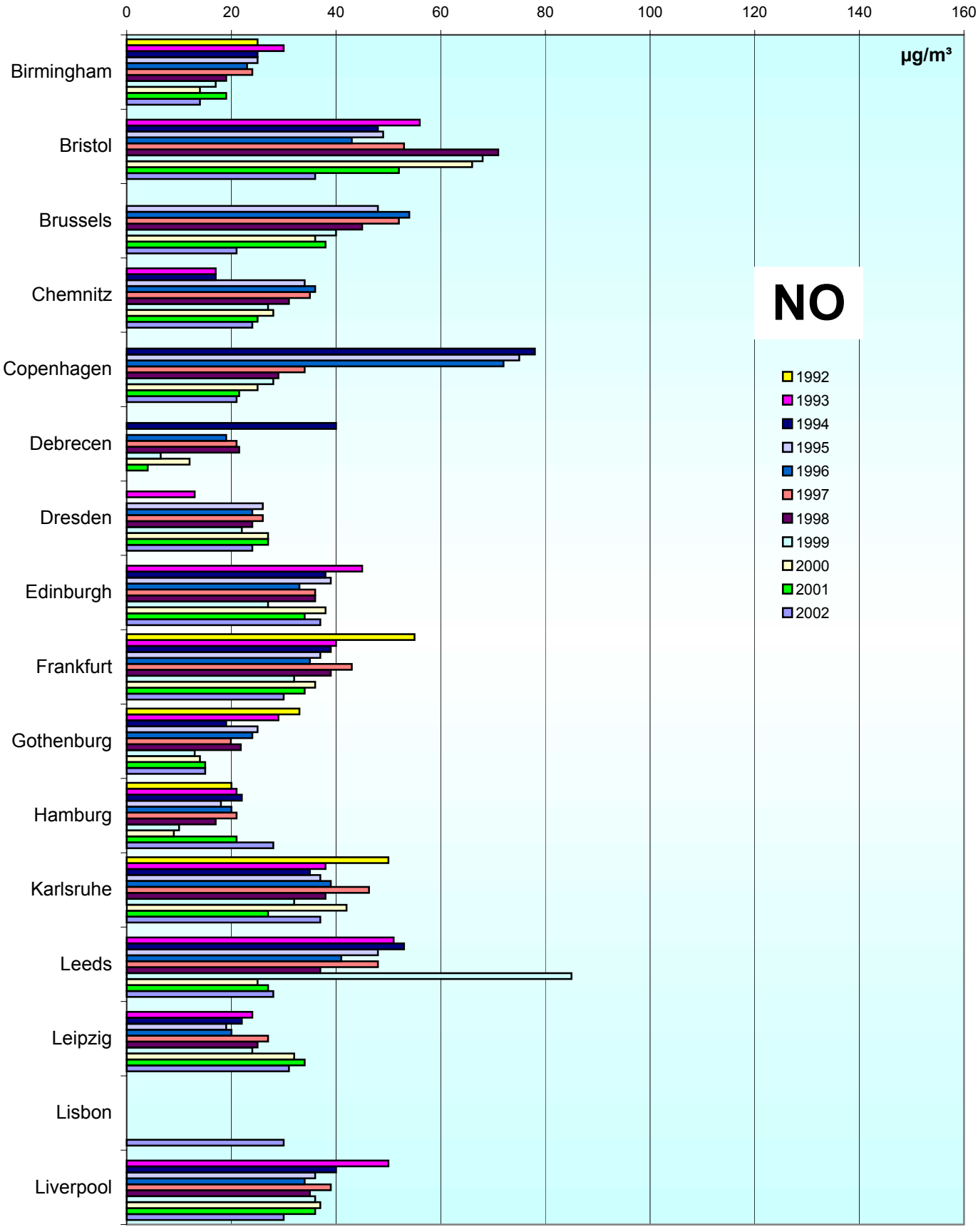
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



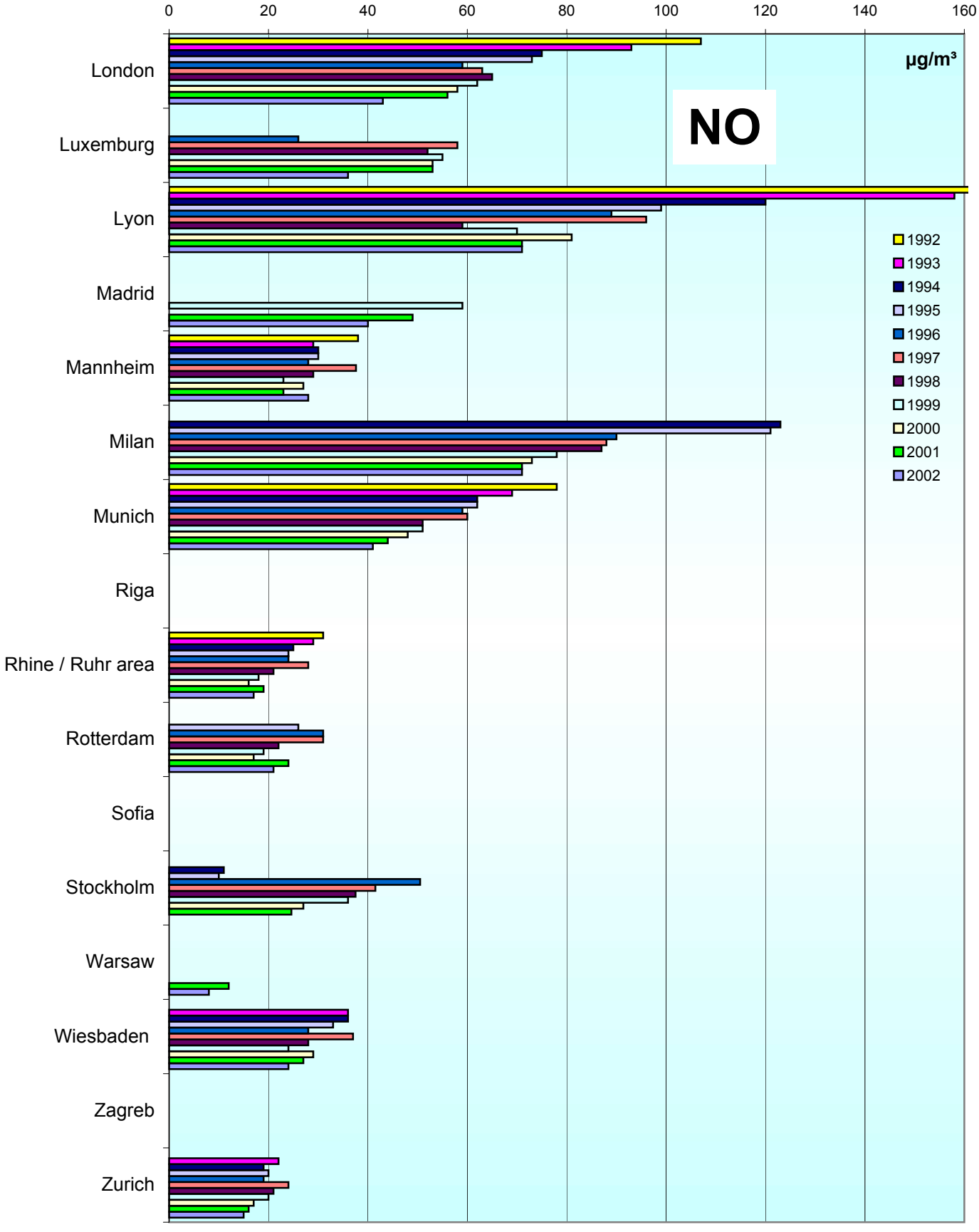
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



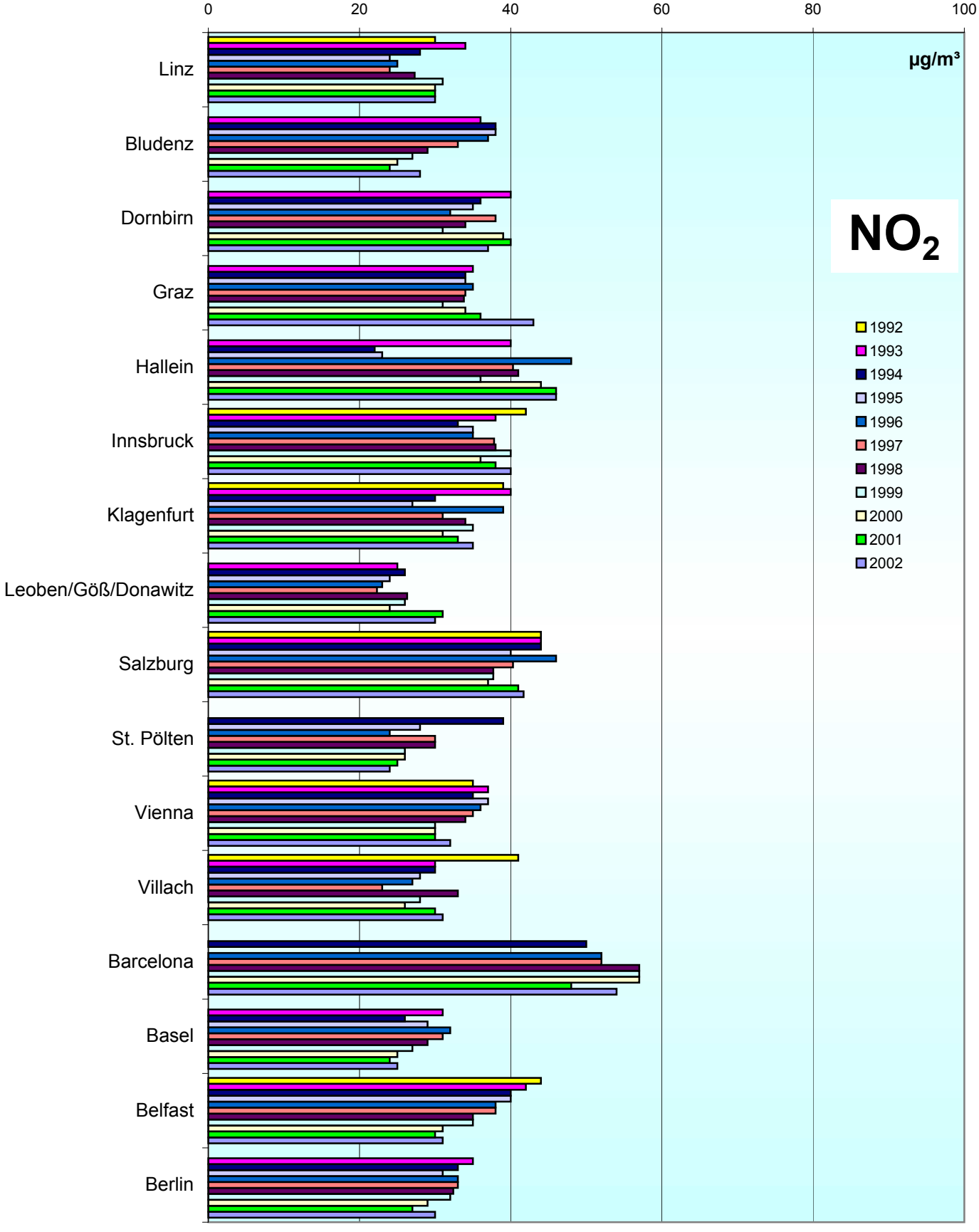
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



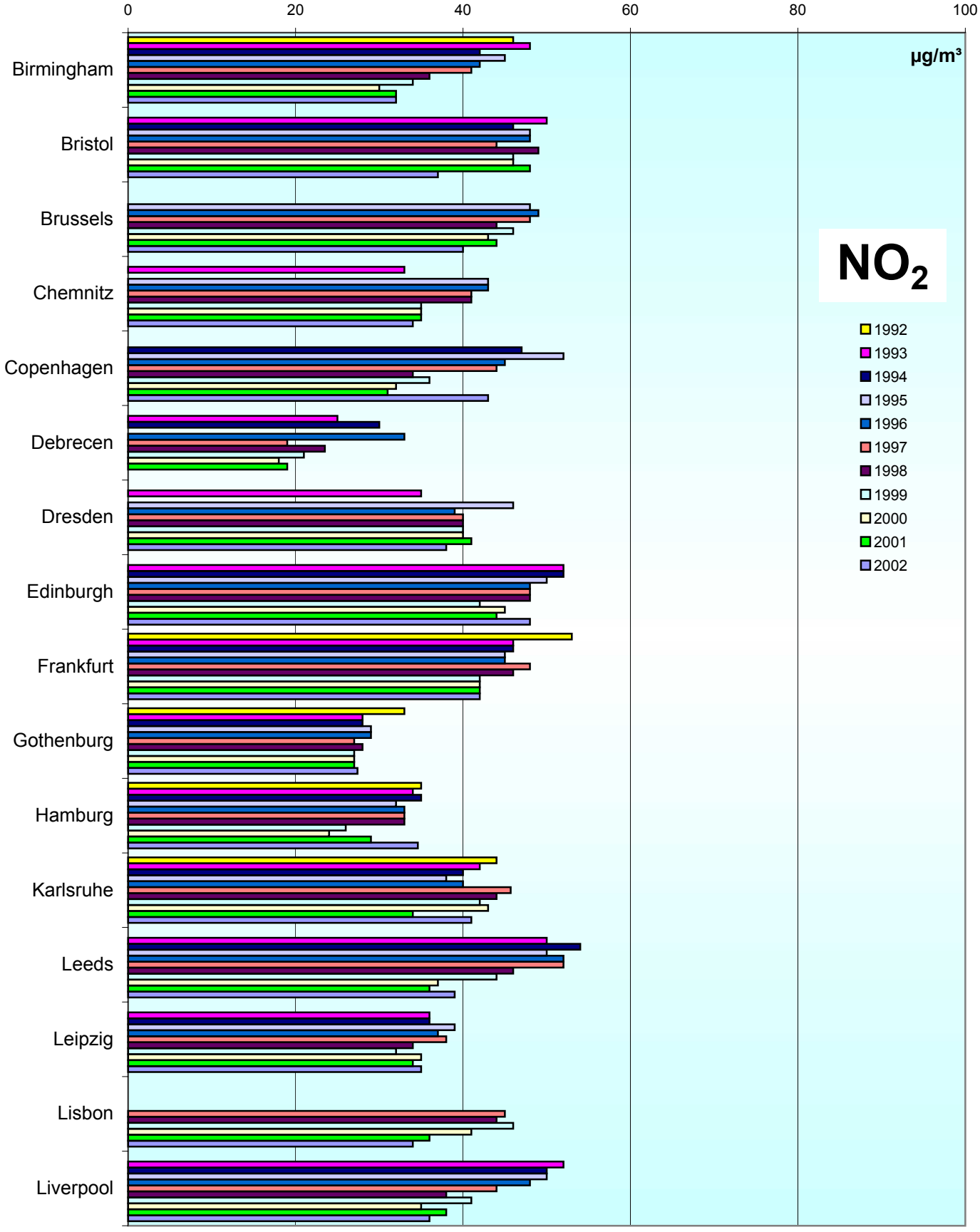
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



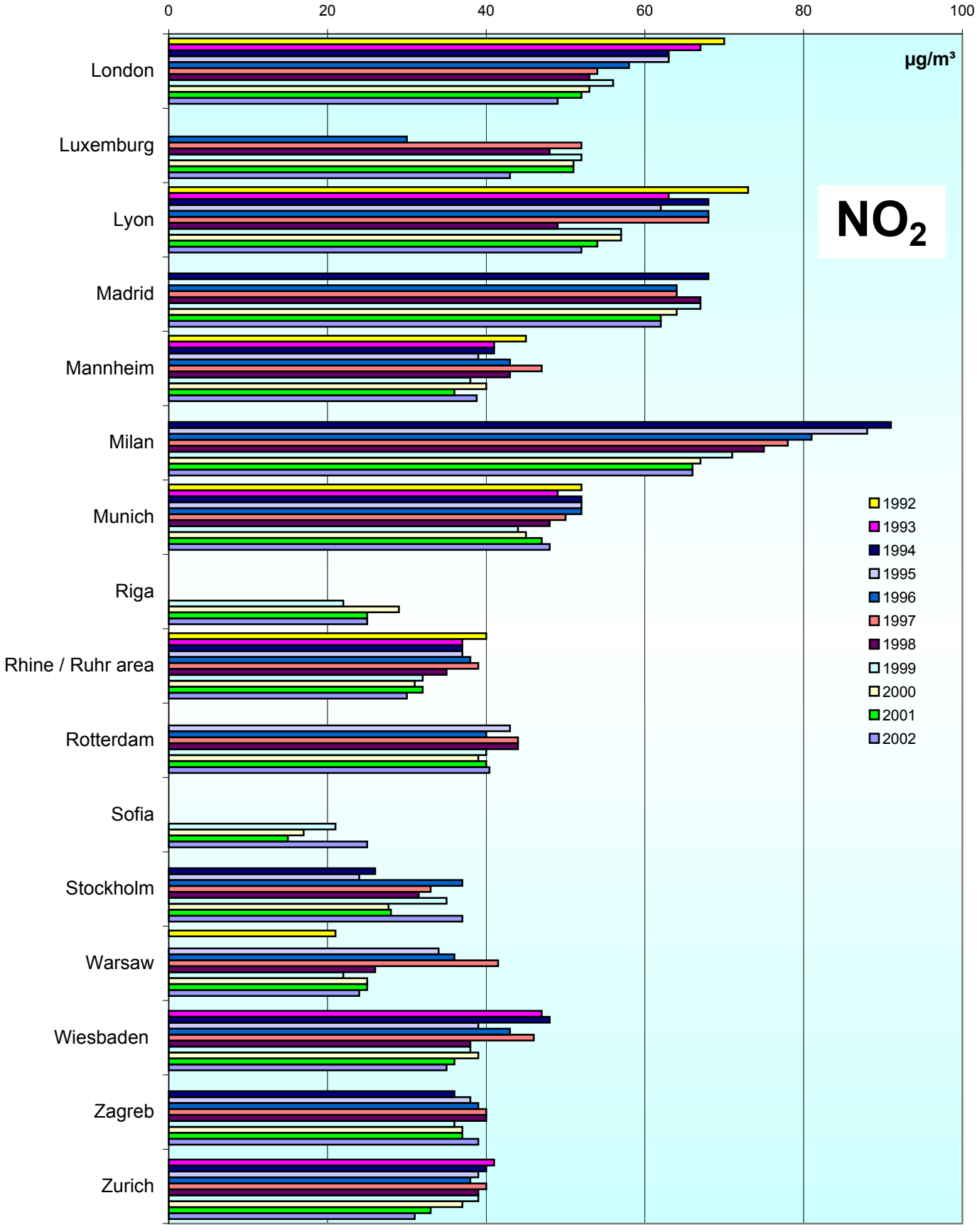
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



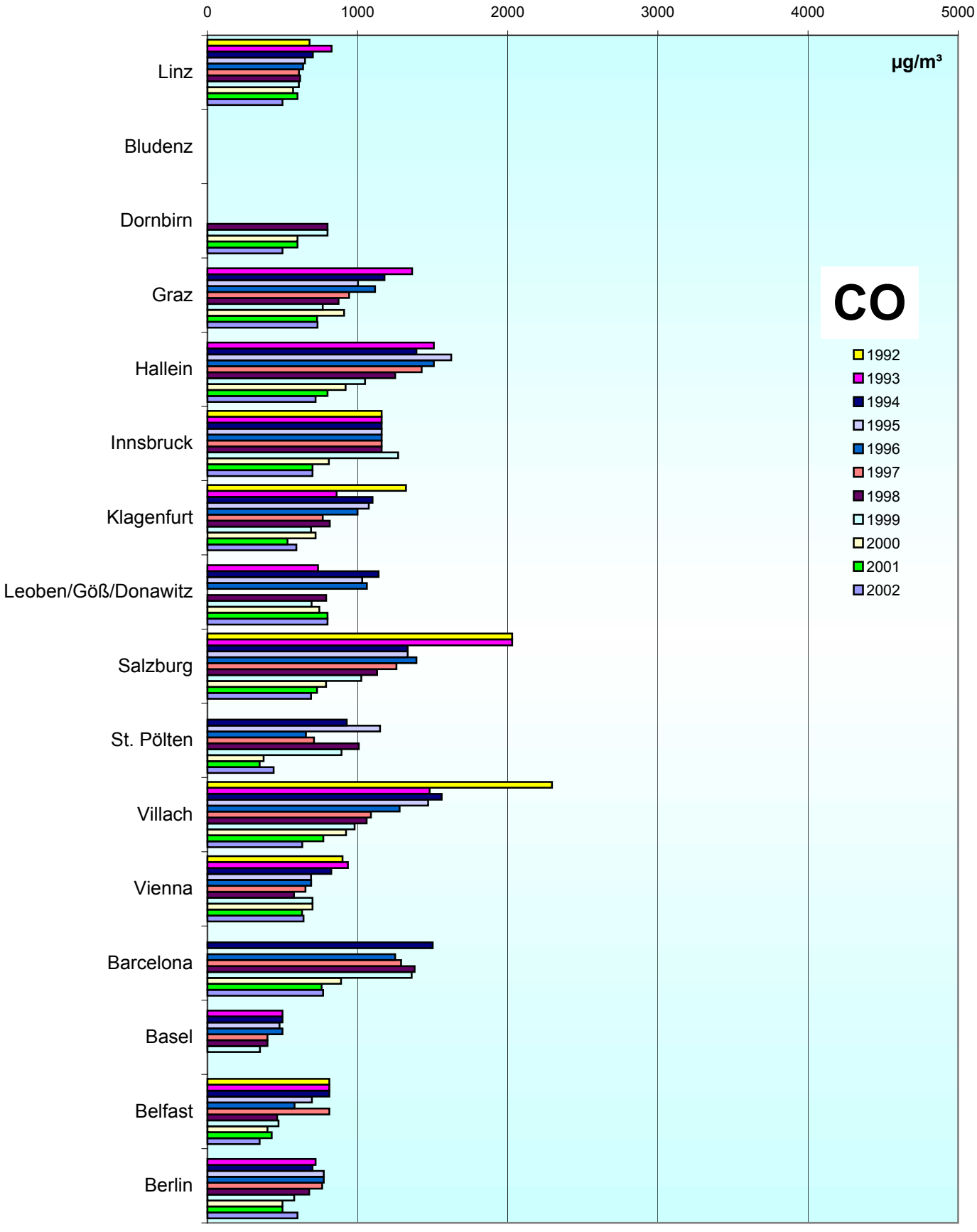
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



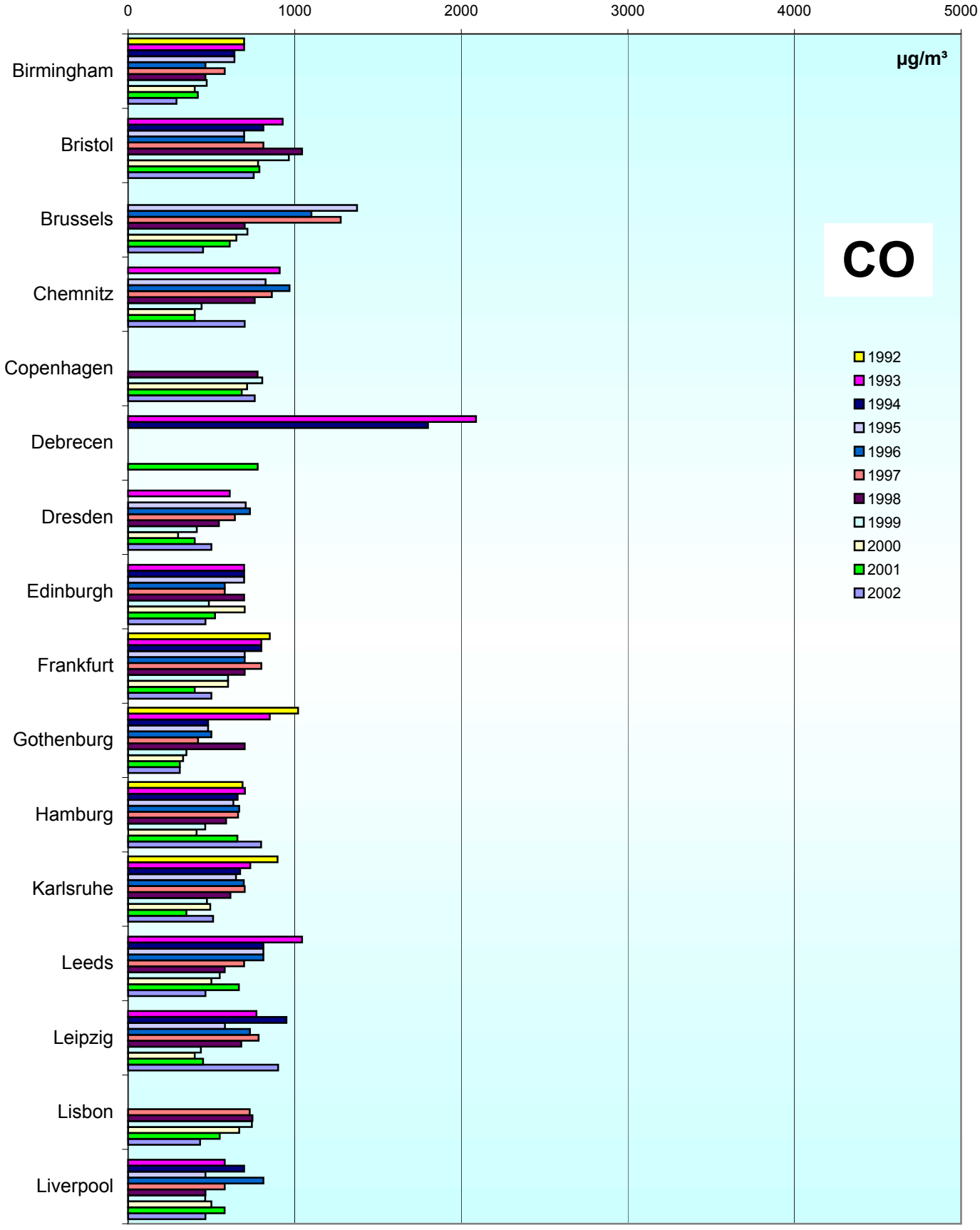
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



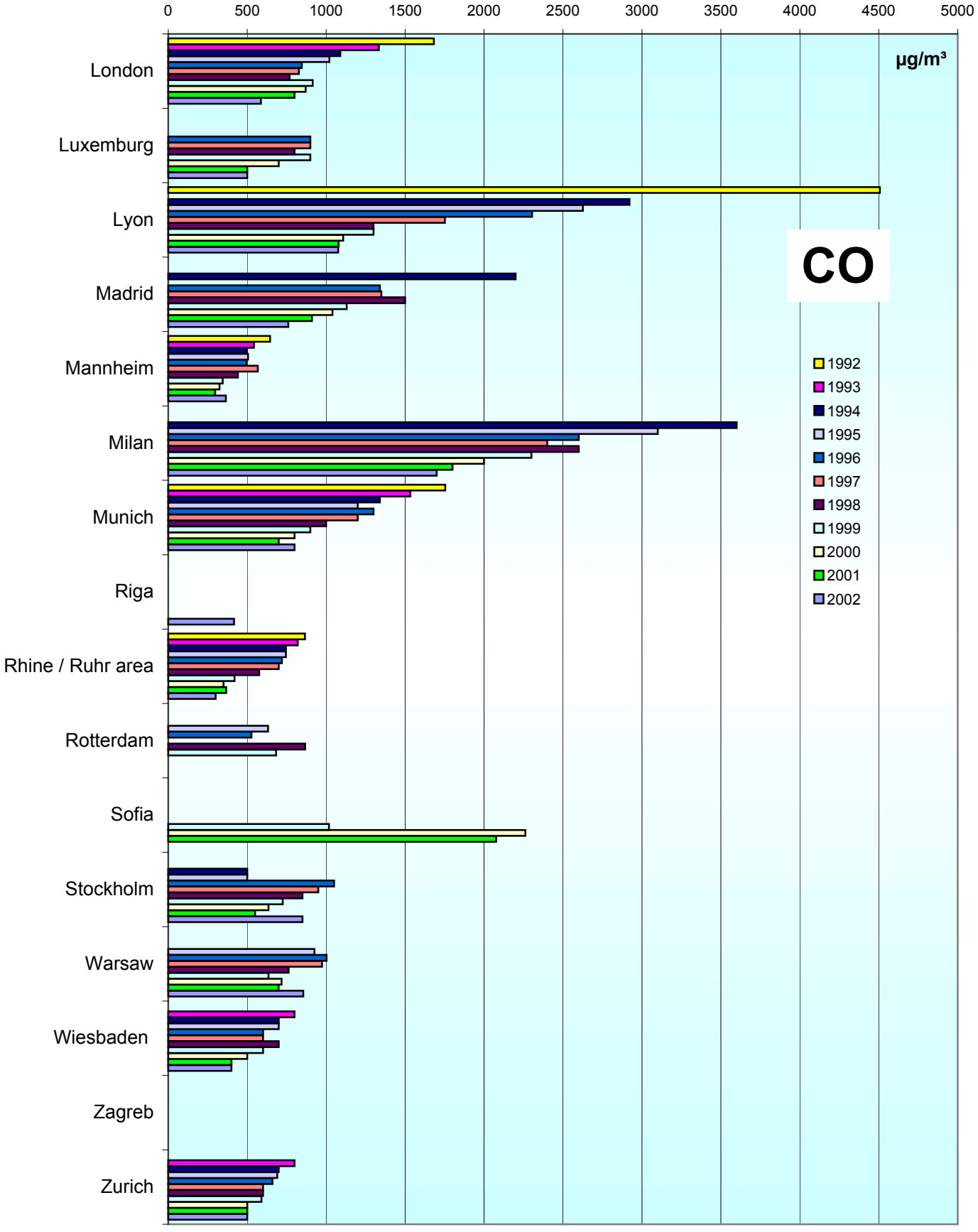
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



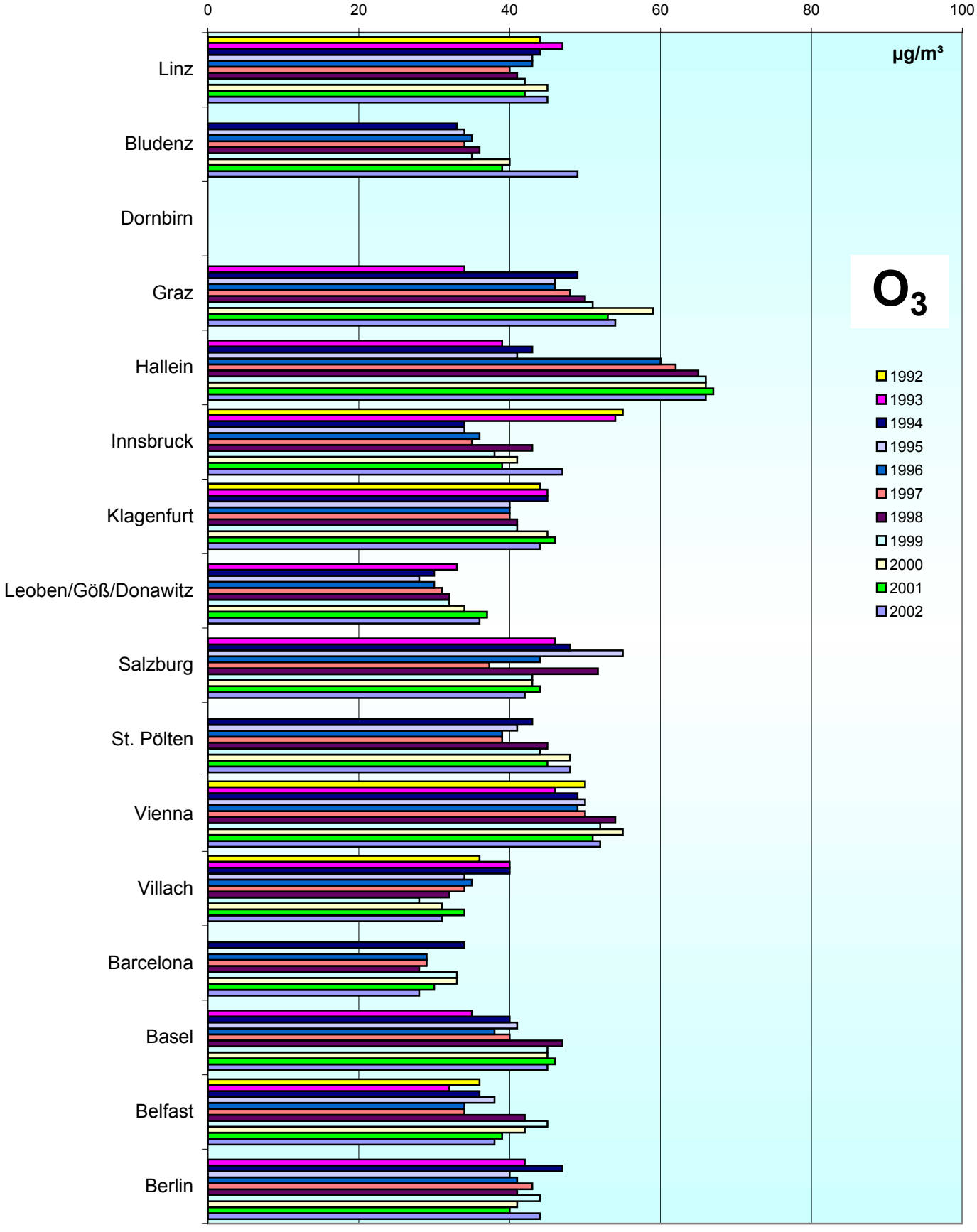
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



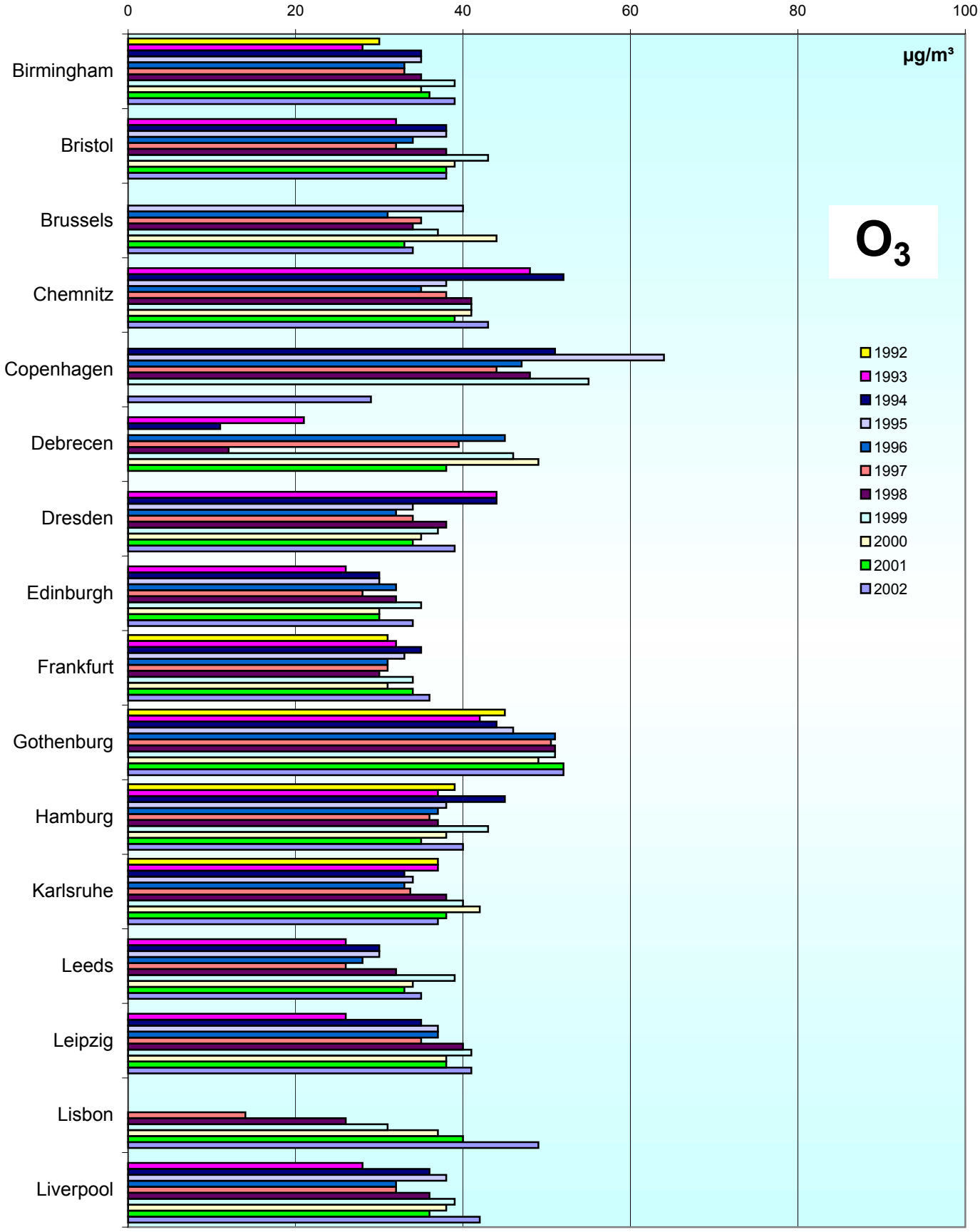
Comparison of The Air Quality 1992 - 2002

Annual mean values
(mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2002

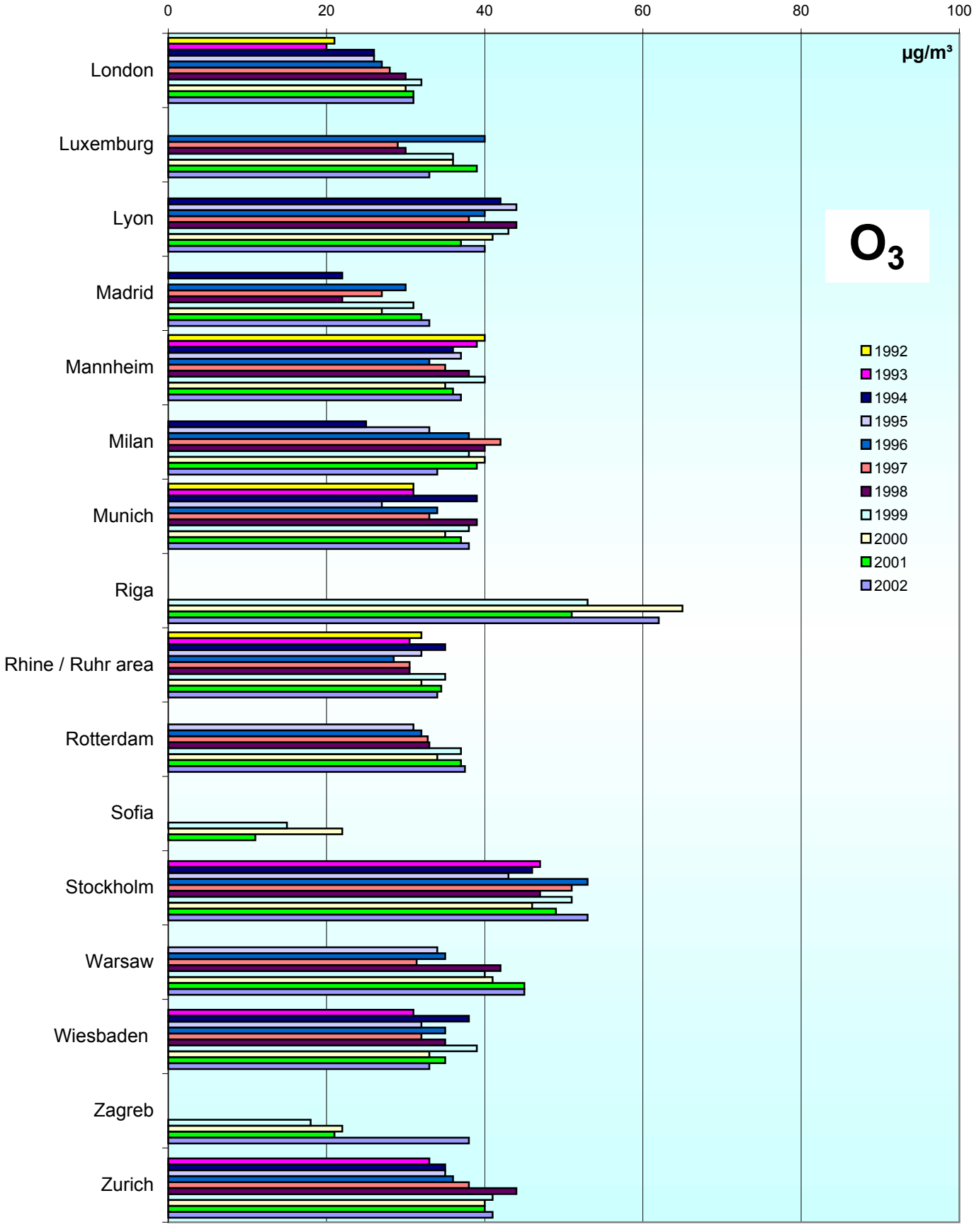
Annual mean values
(mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2002

Annual mean values

(mean of all monitoring stations)



Jahresvergleich

1992 - 2002

max. Tagesmittelwerte

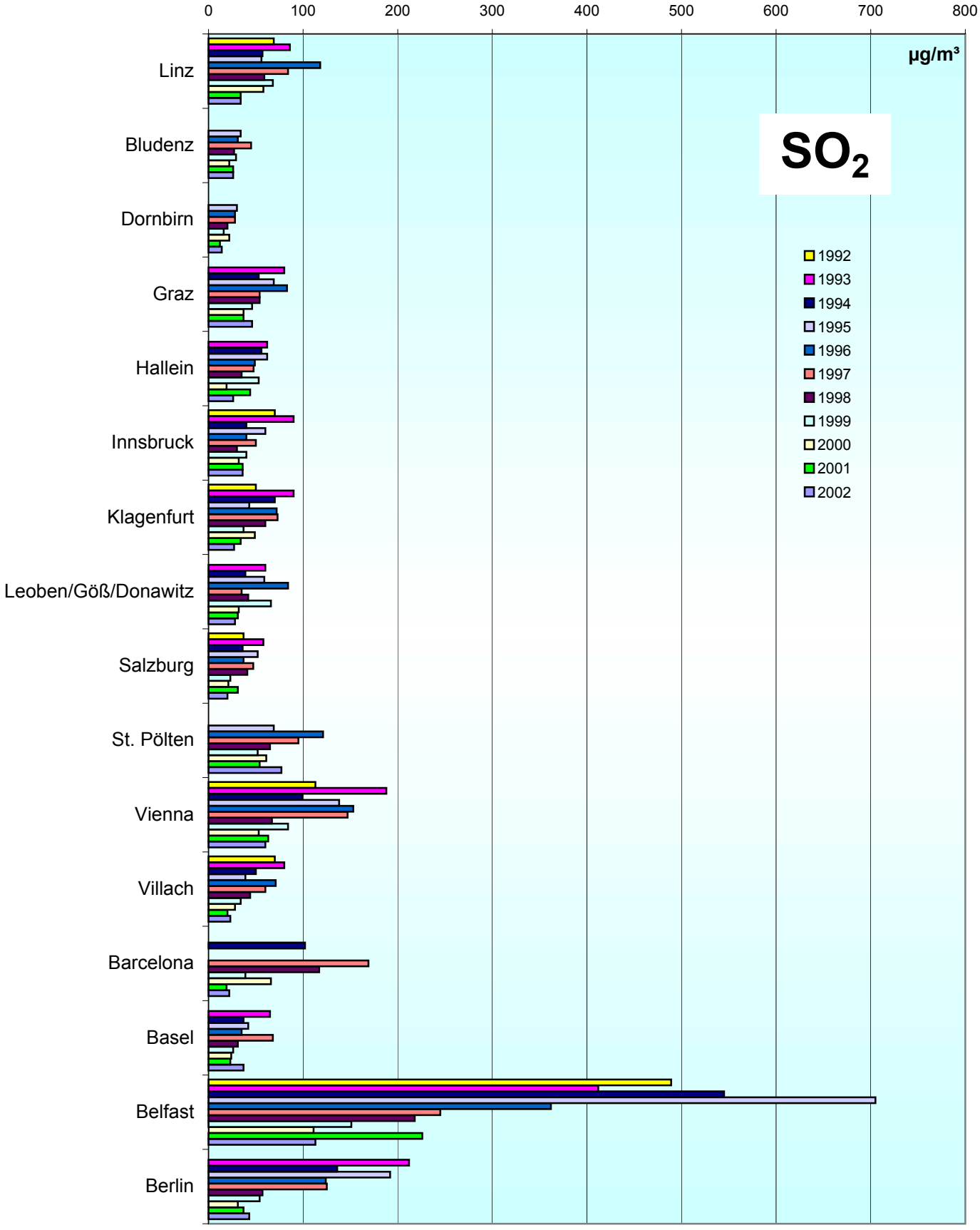
Comparison of The Air Quality Over The Years

1992 - 2002

Max. Daily Mean Values

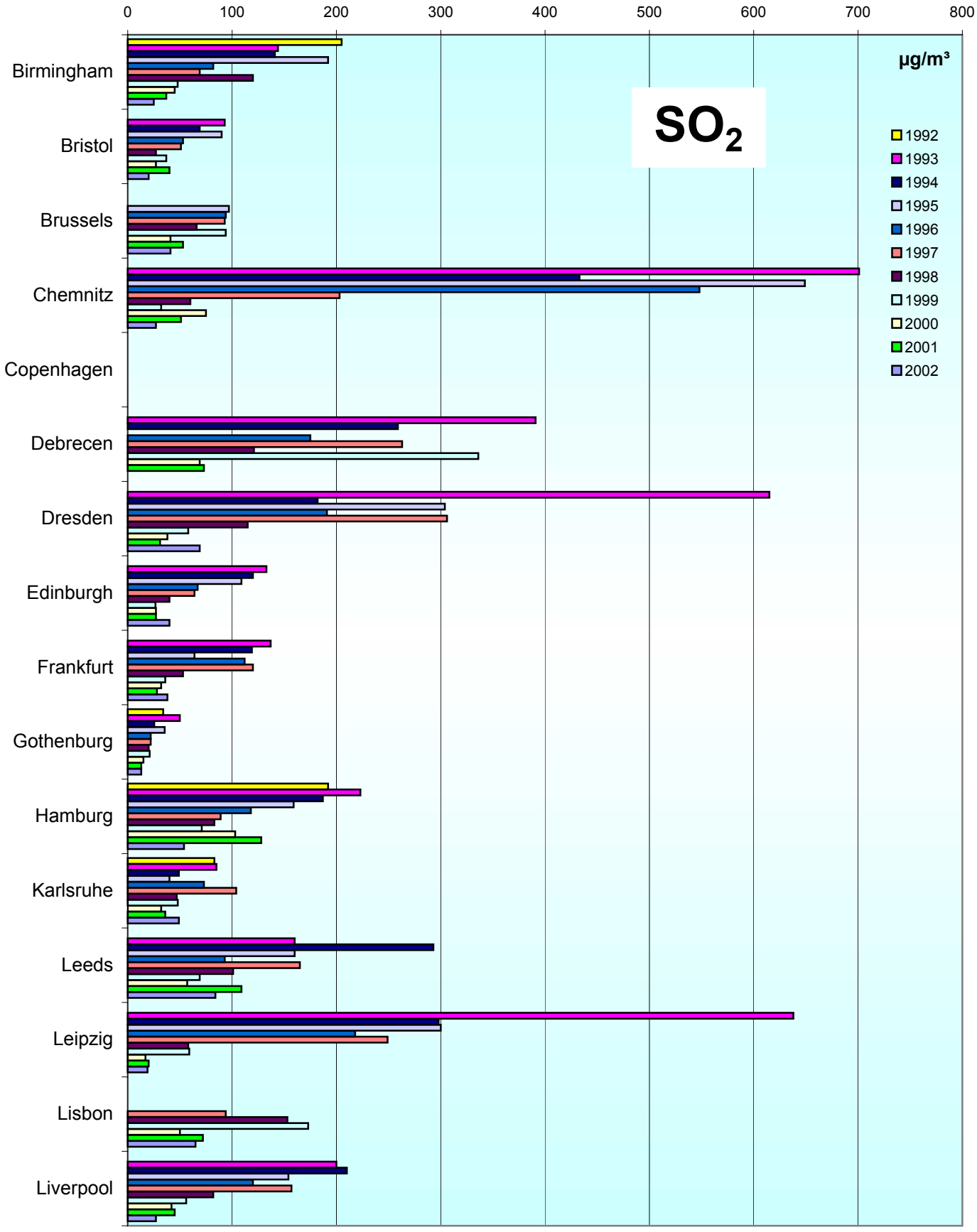
Comparison of The Air Quality 1992 - 2002

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



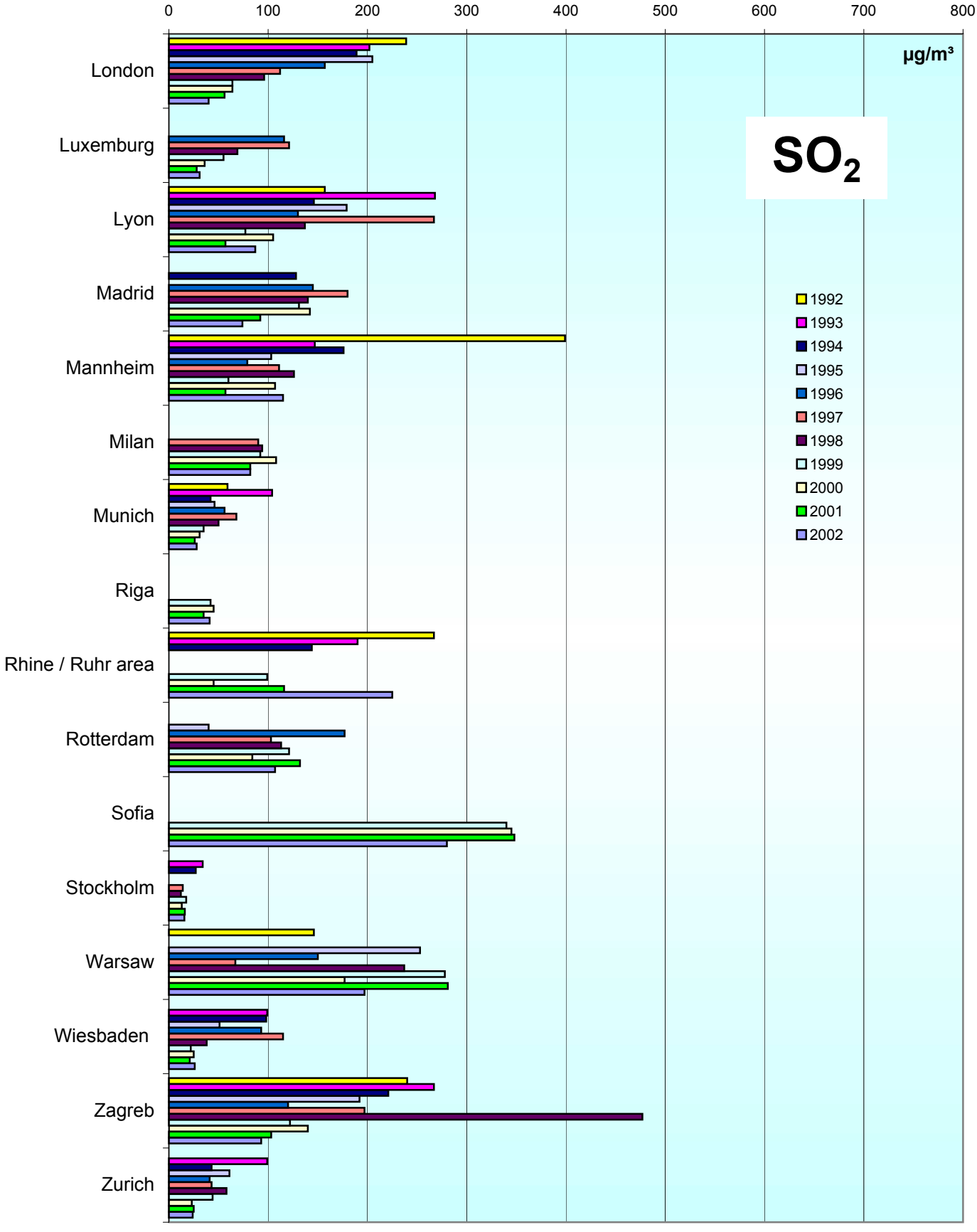
Comparison of The Air Quality 1992 - 2002

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



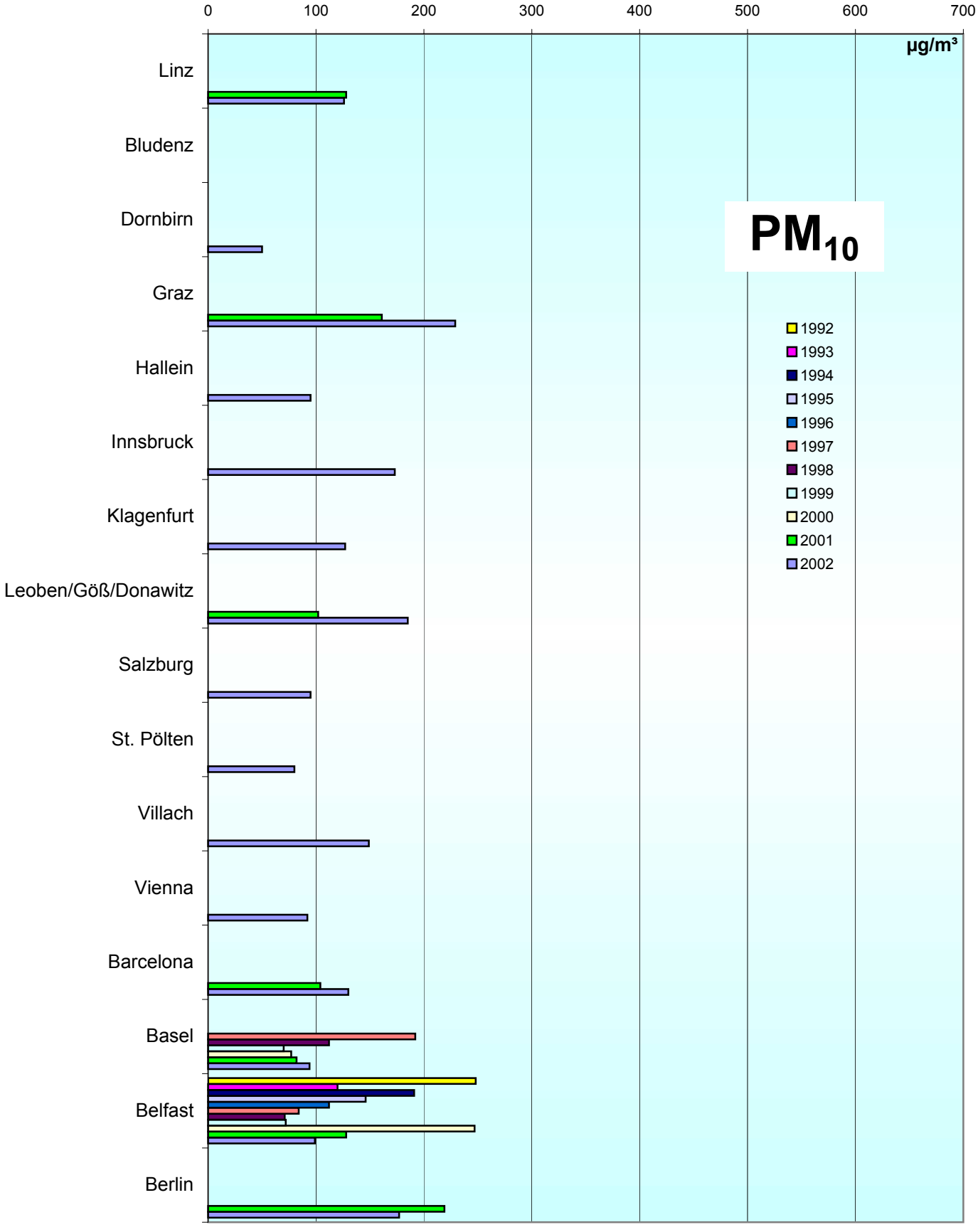
Comparison of The Air Quality 1992 - 2002

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



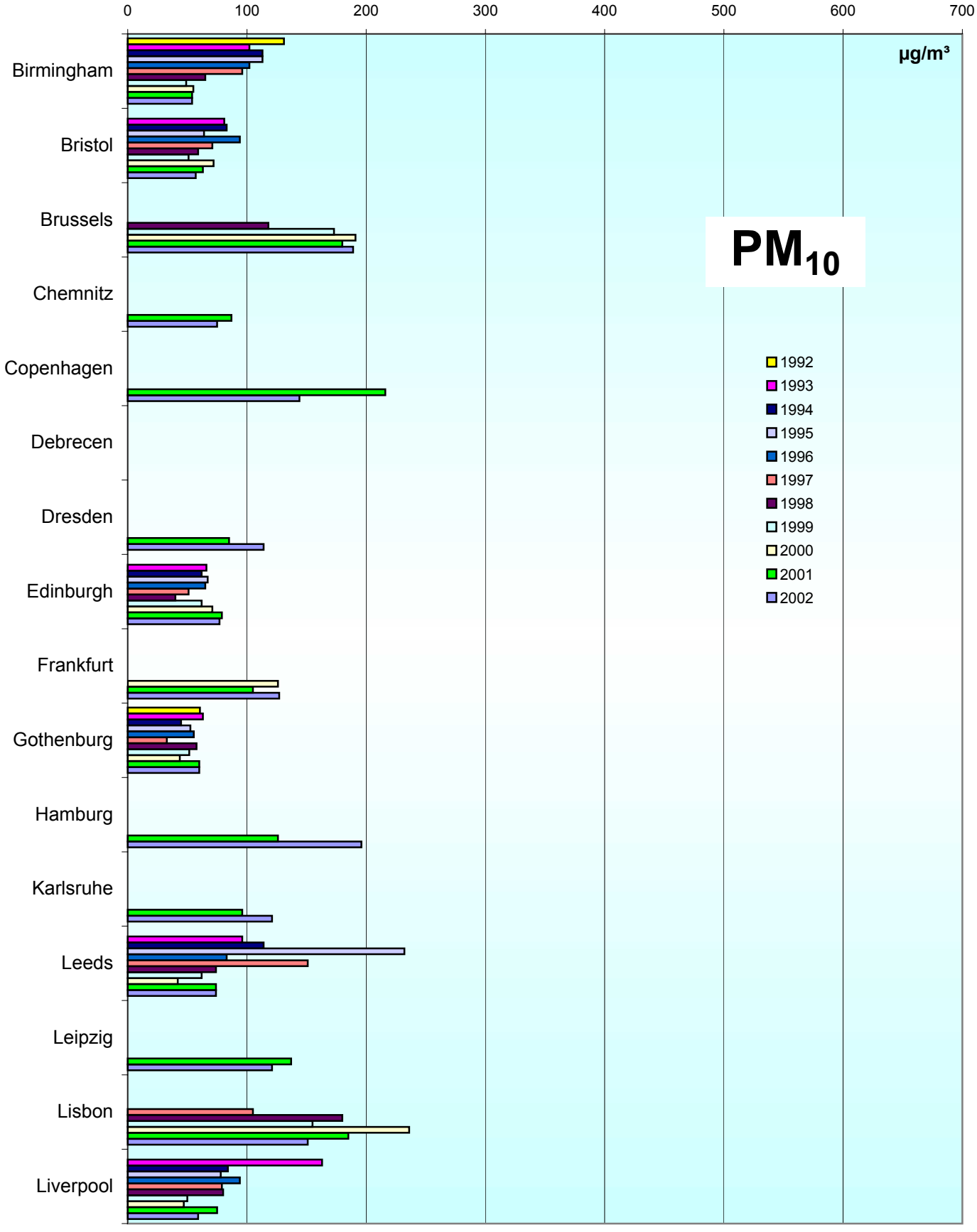
Comparison of The Air Quality 1992 - 2002

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



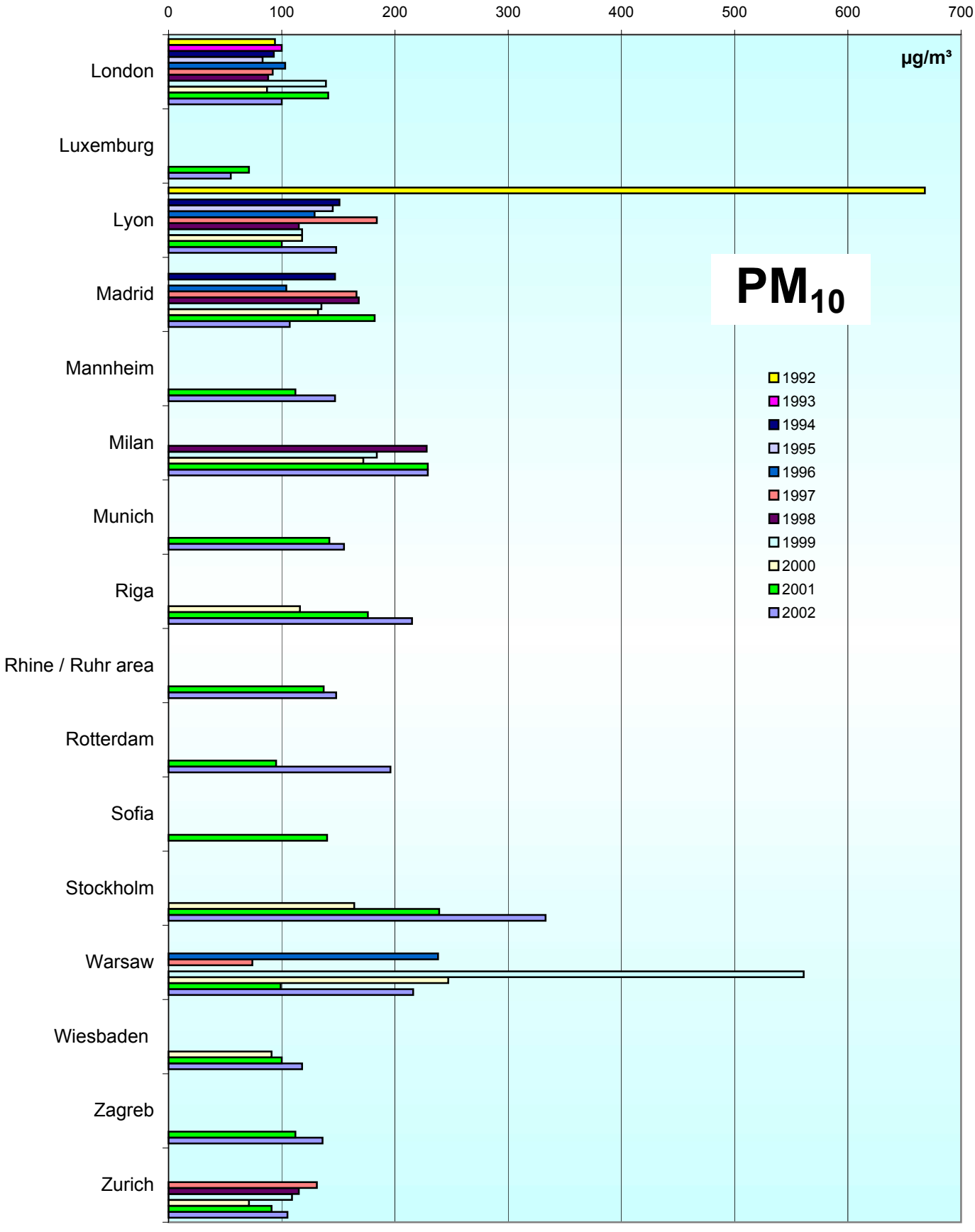
Comparison of The Air Quality 1992 - 2002

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



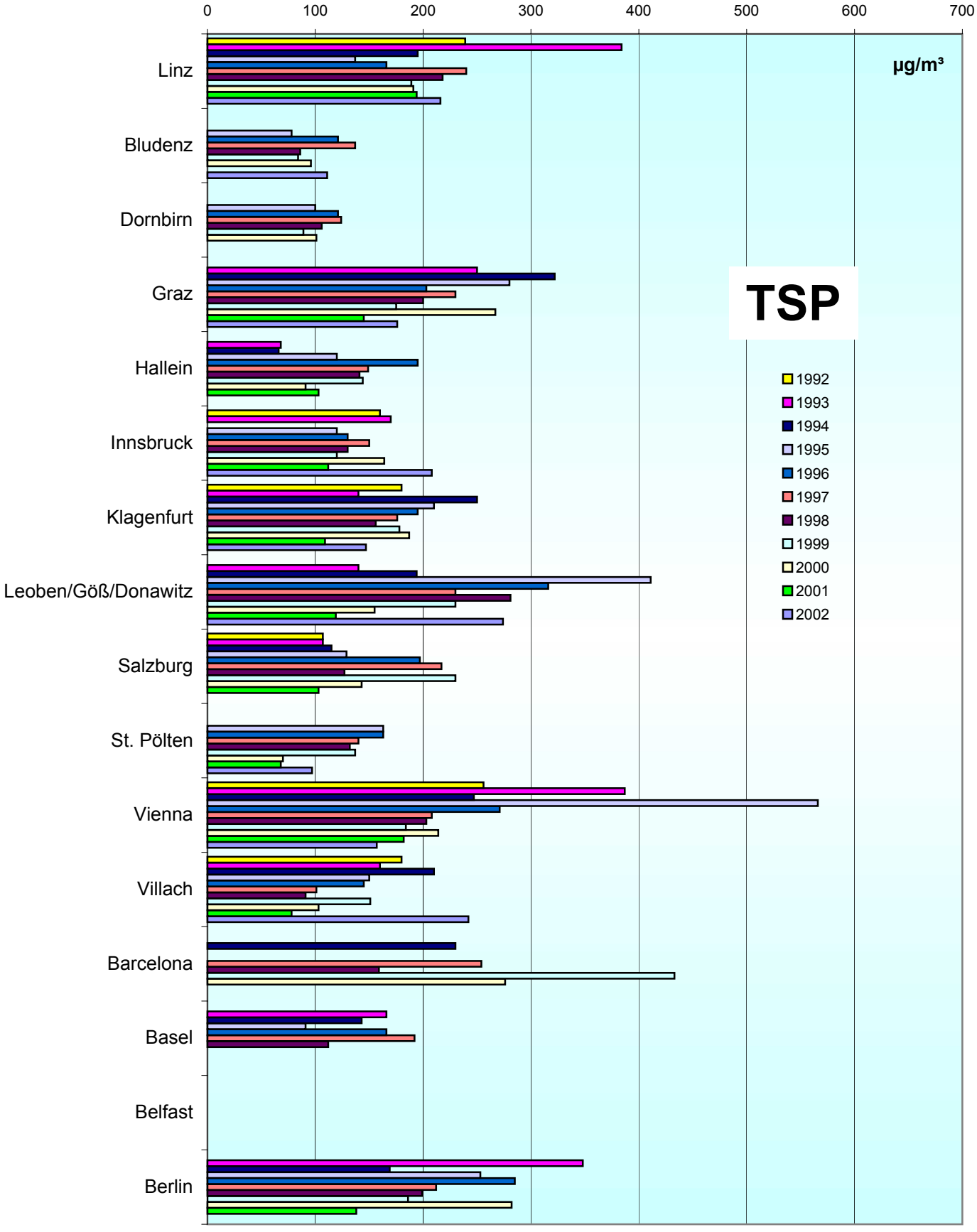
Comparison of The Air Quality 1992 - 2002

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



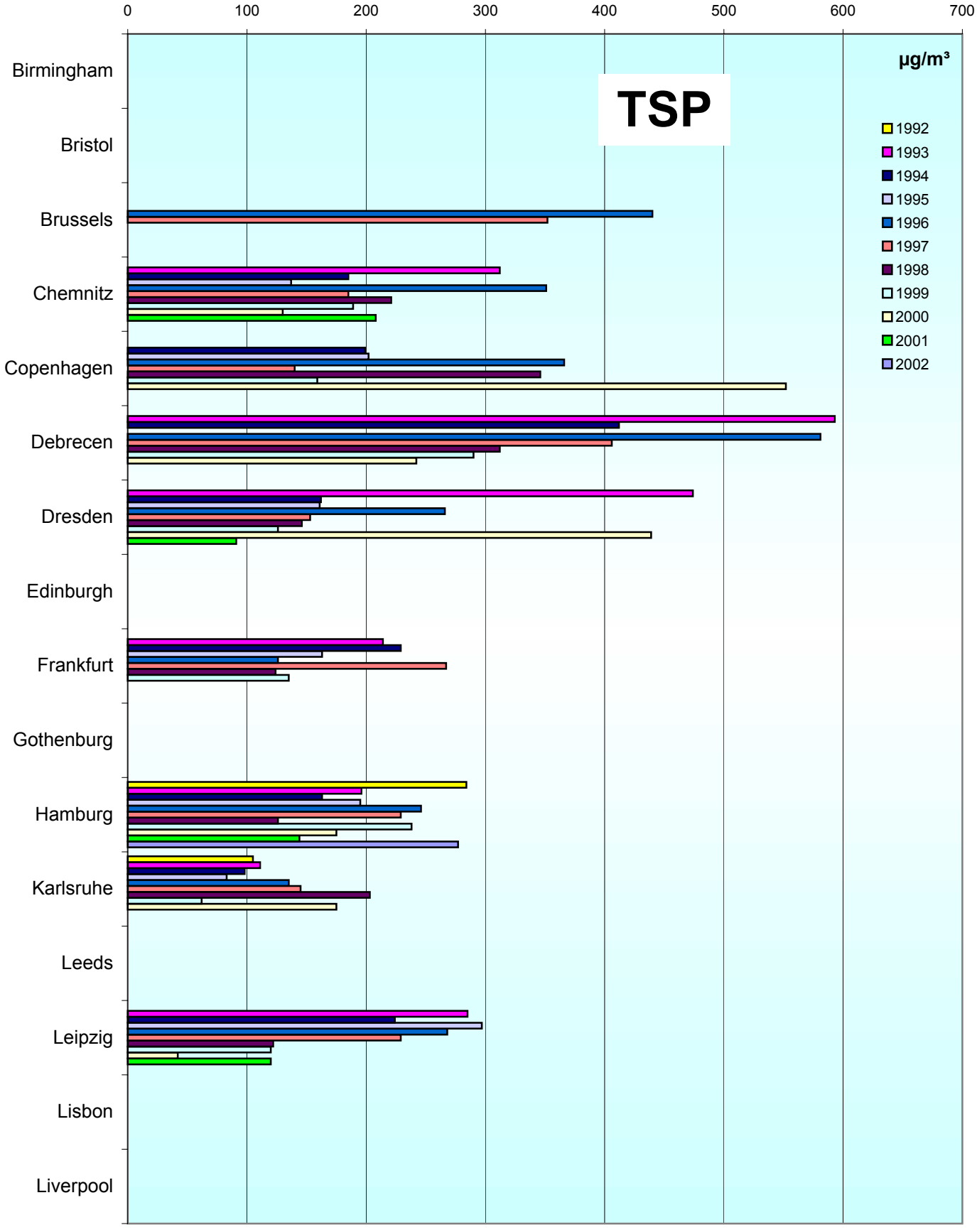
Comparison of The Air Quality 1992 - 2002

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



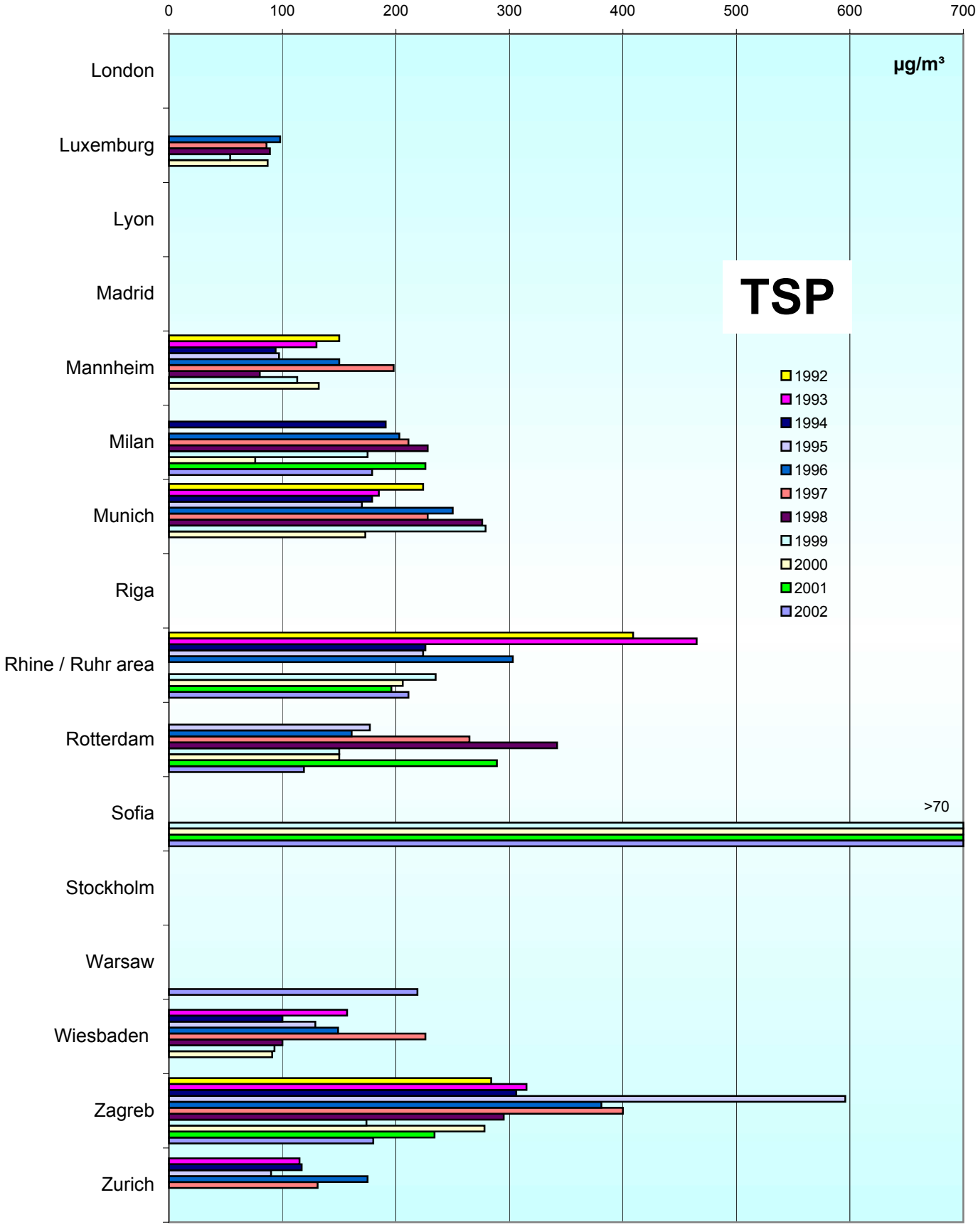
Comparison of The Air Quality 1992 - 2002

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



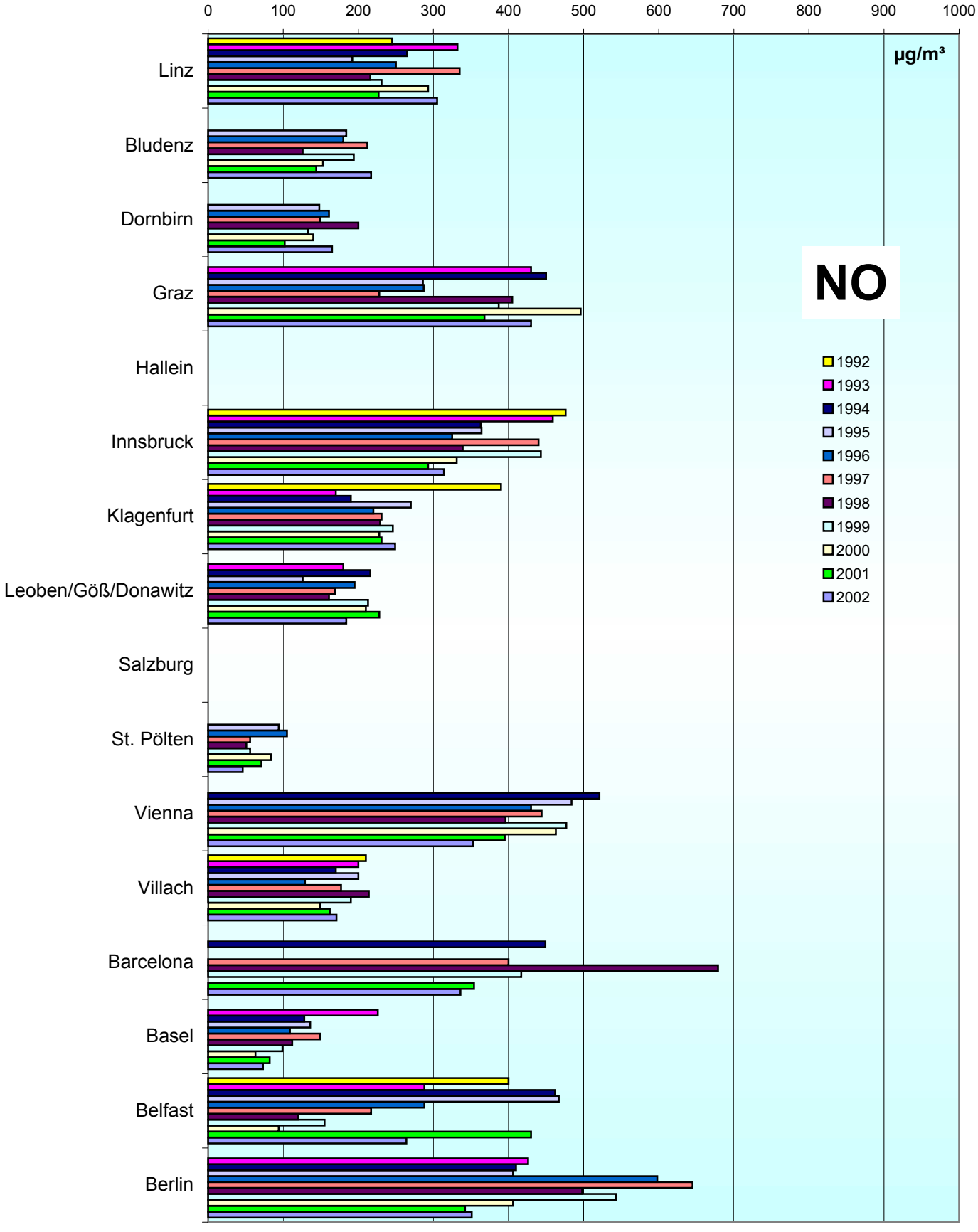
Comparison of The Air Quality 1992 - 2002

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



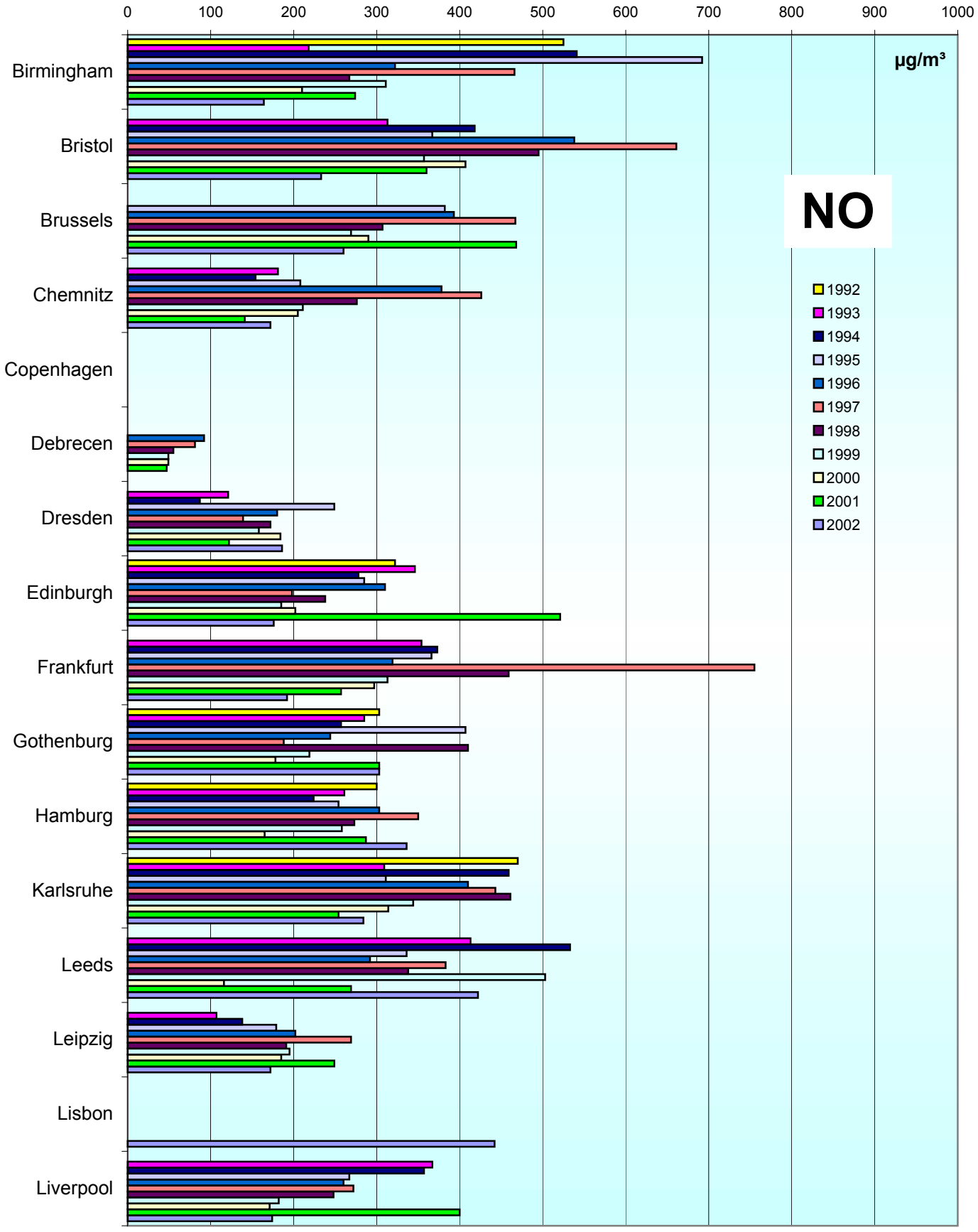
Comparison of The Air Quality 1992 - 2002

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



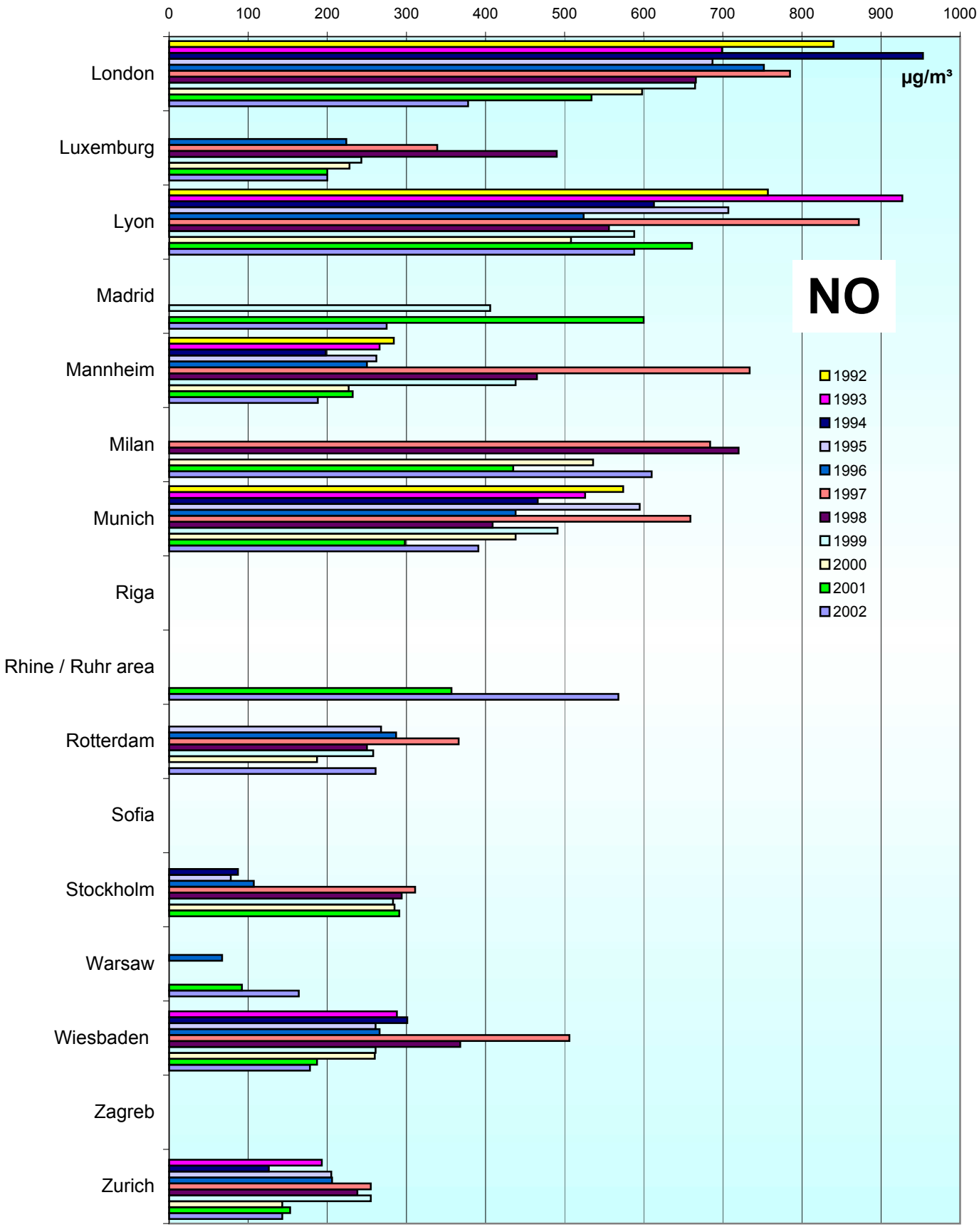
Comparison of The Air Quality 1992 - 2002

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



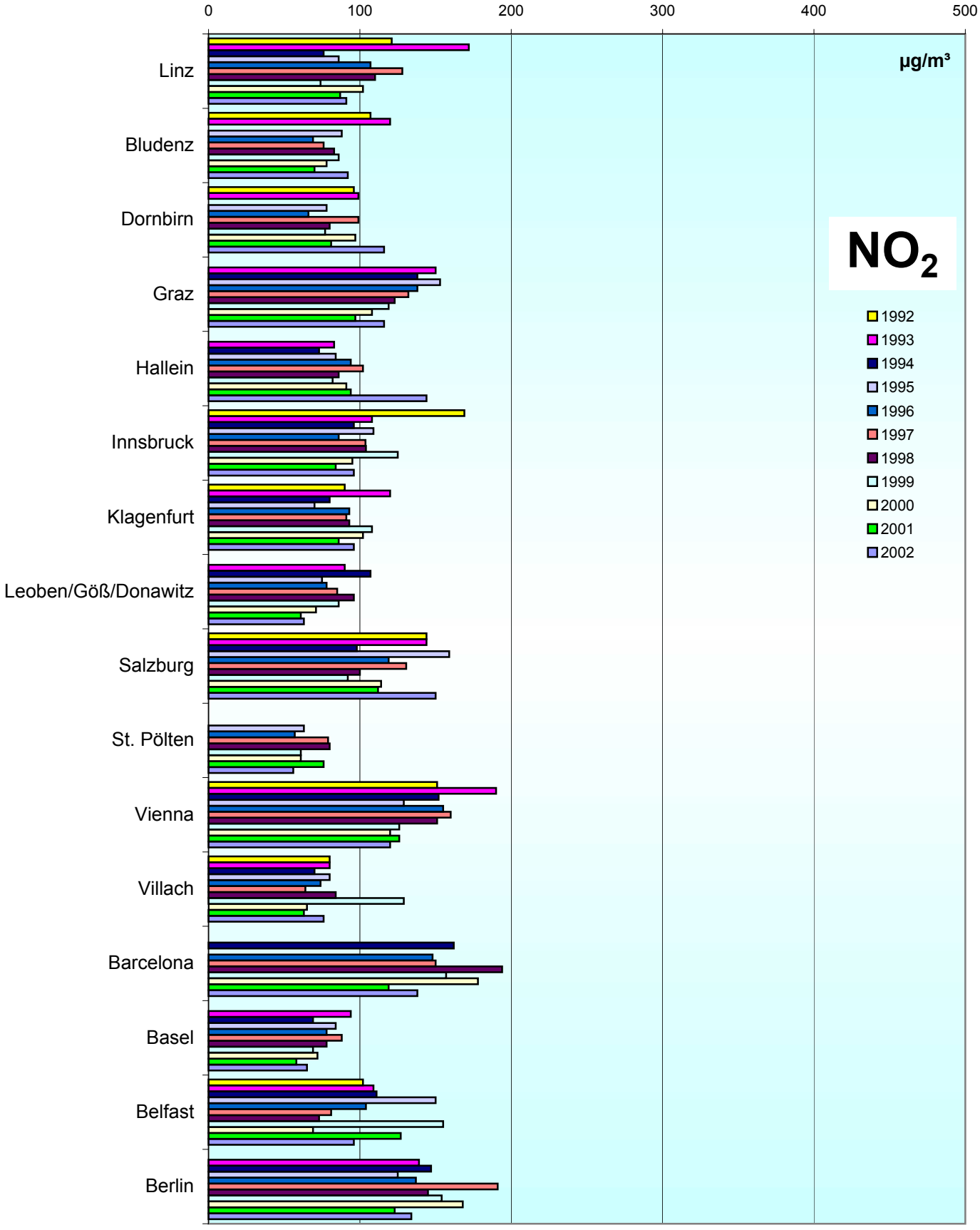
Comparison of The Air Quality 1992 - 2002

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



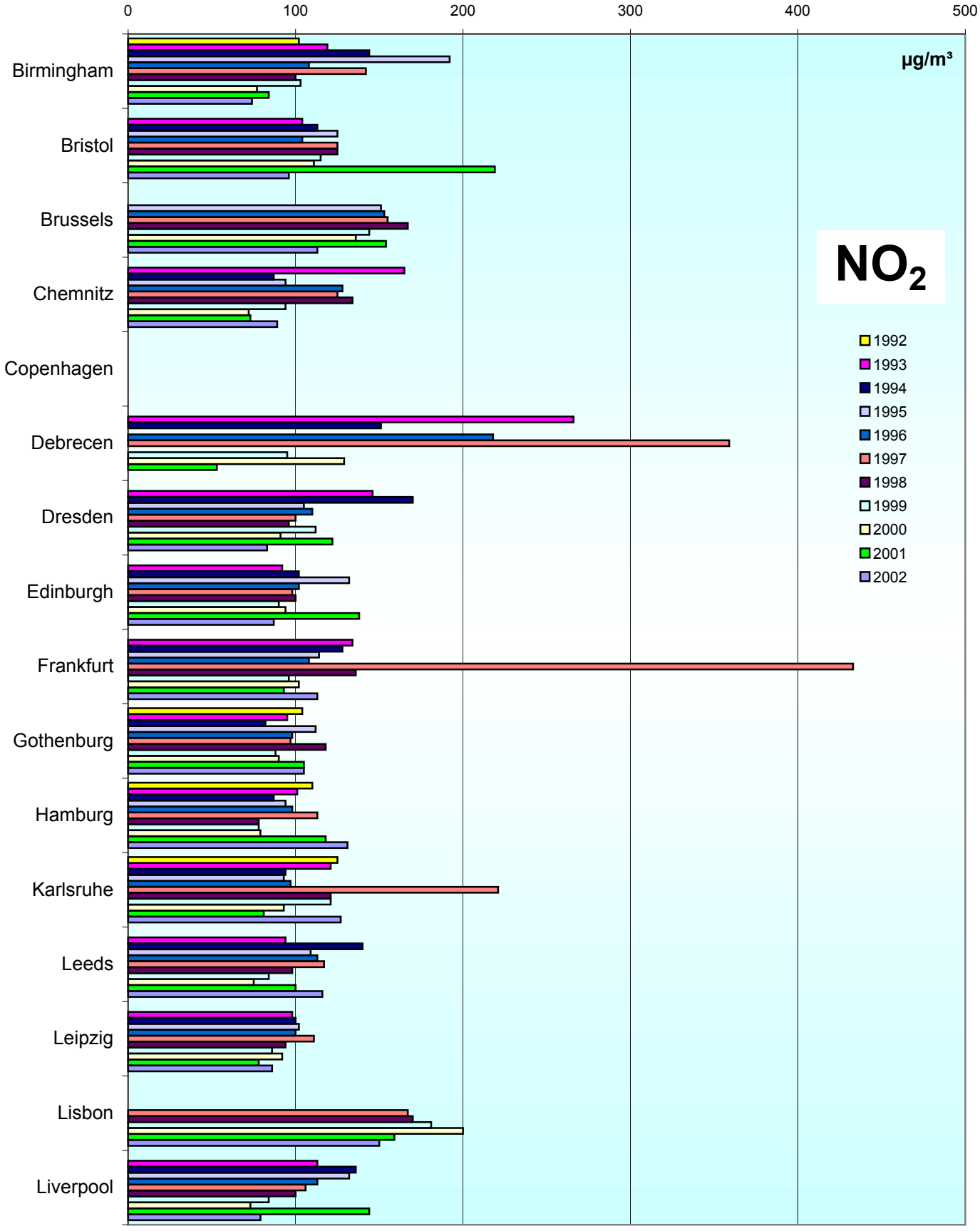
Comparison of The Air Quality 1992 - 2002

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



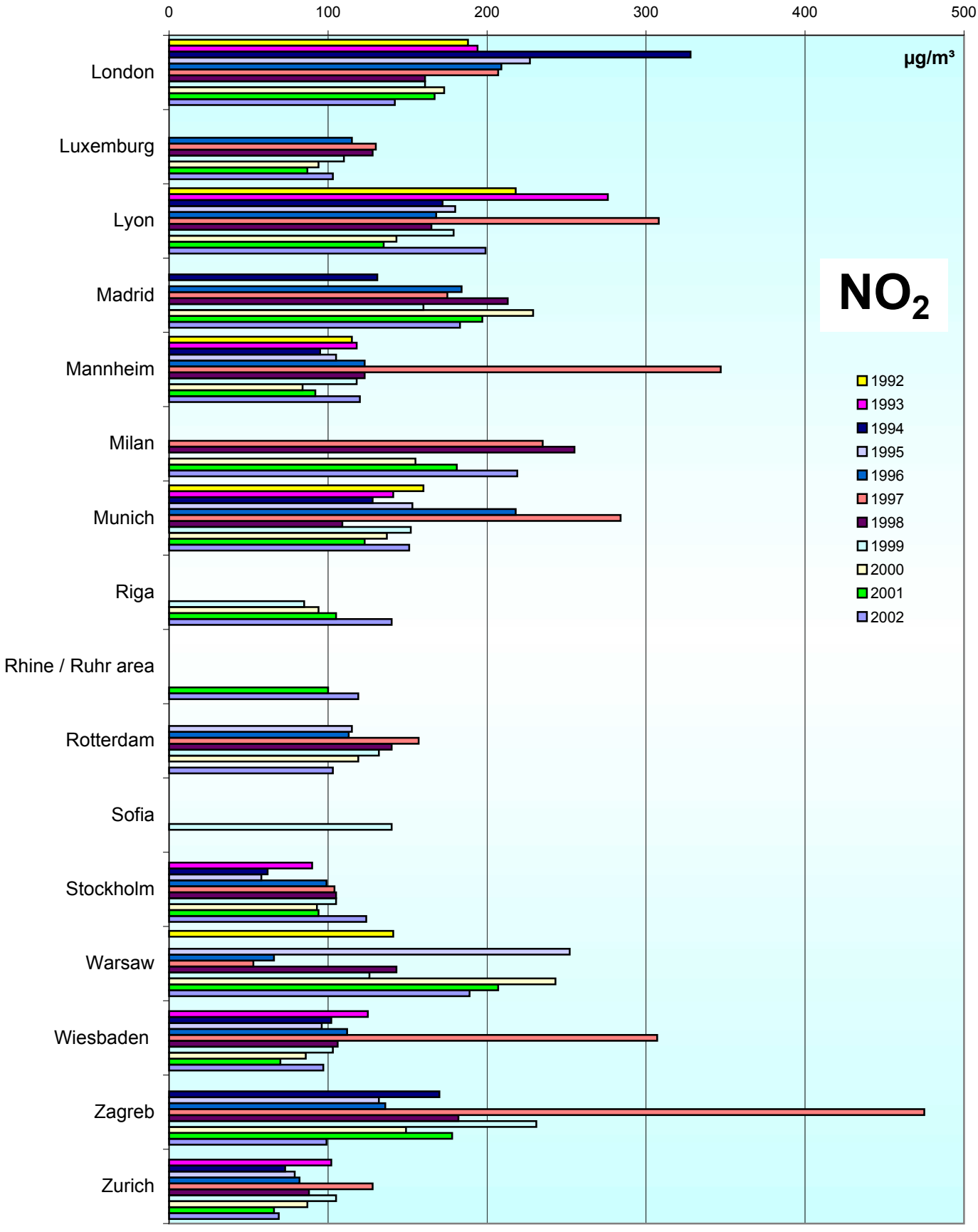
Comparison of The Air Quality 1992 - 2002

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



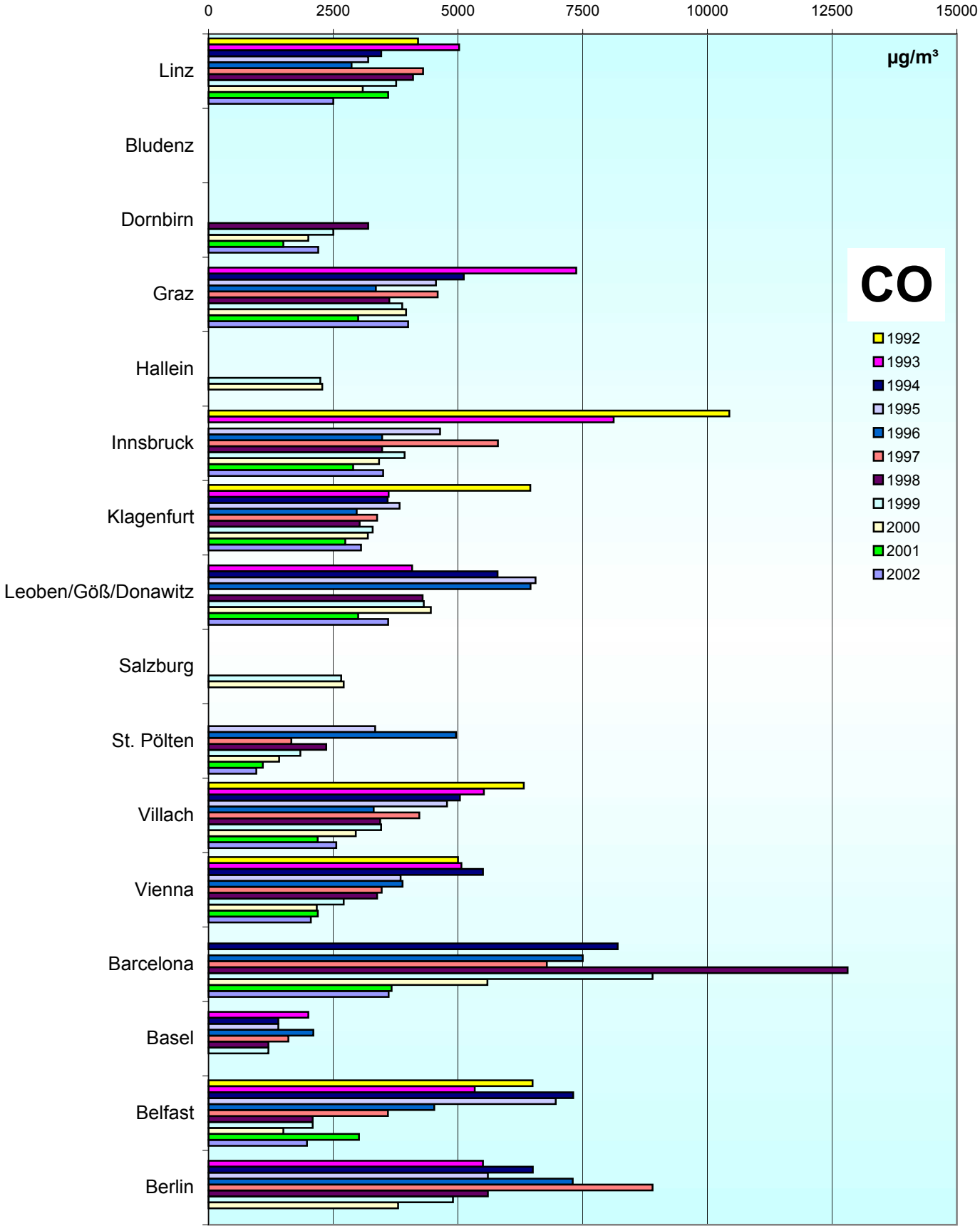
Comparison of The Air Quality 1992 - 2002

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



Comparison of The Air Quality 1992 - 2002

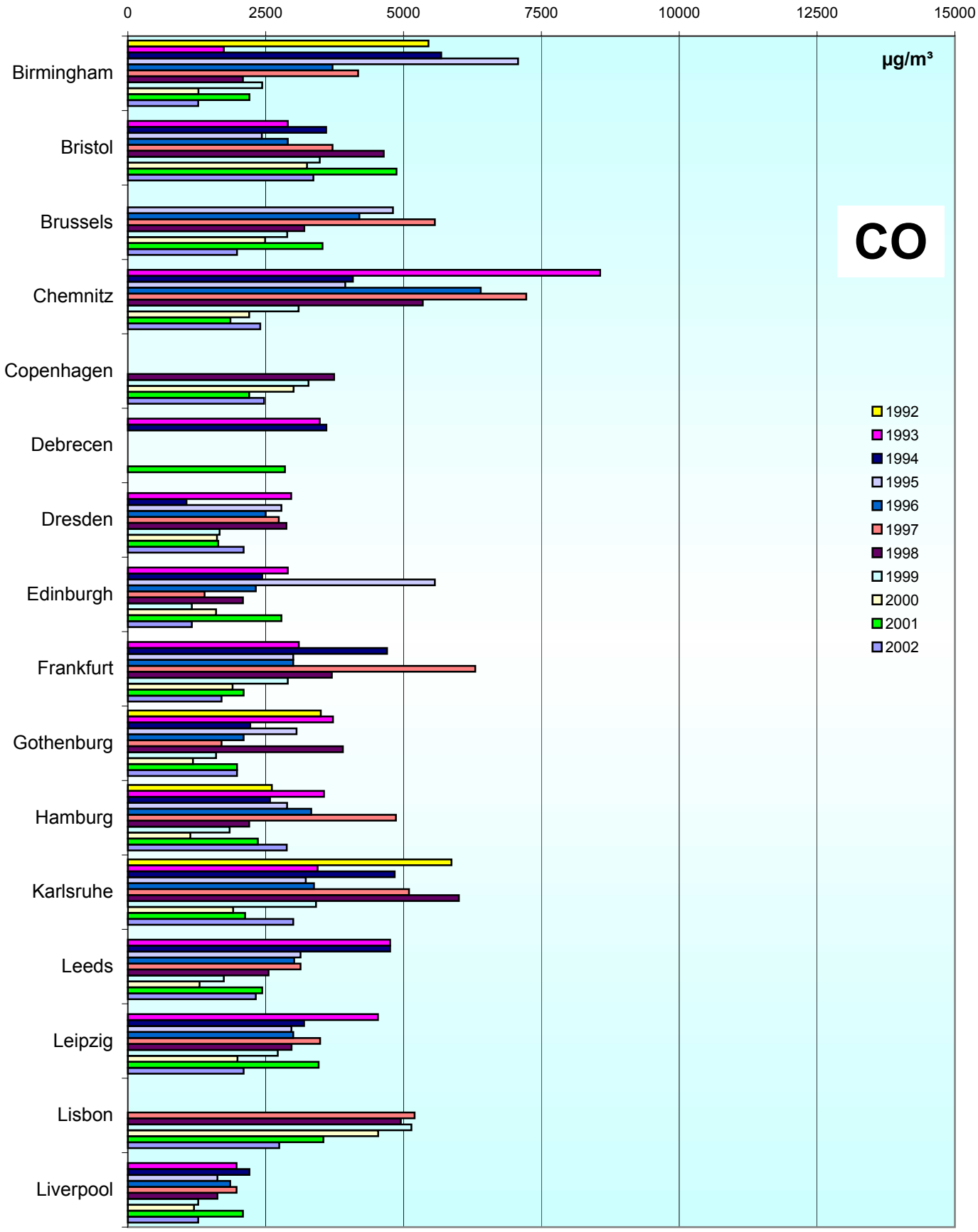
max. daily mean values
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

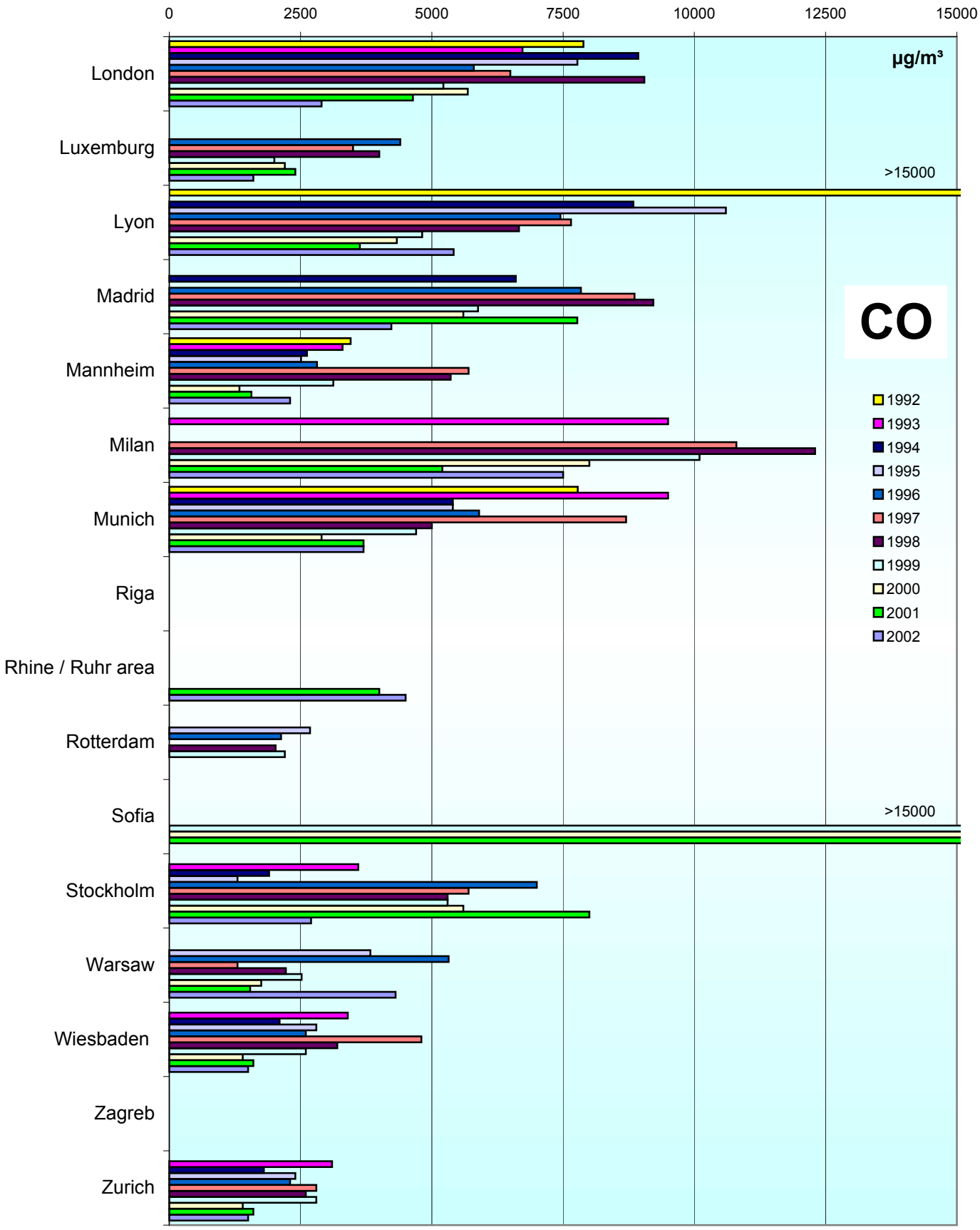
max. daily mean values

(peak-stressed monitoring station)



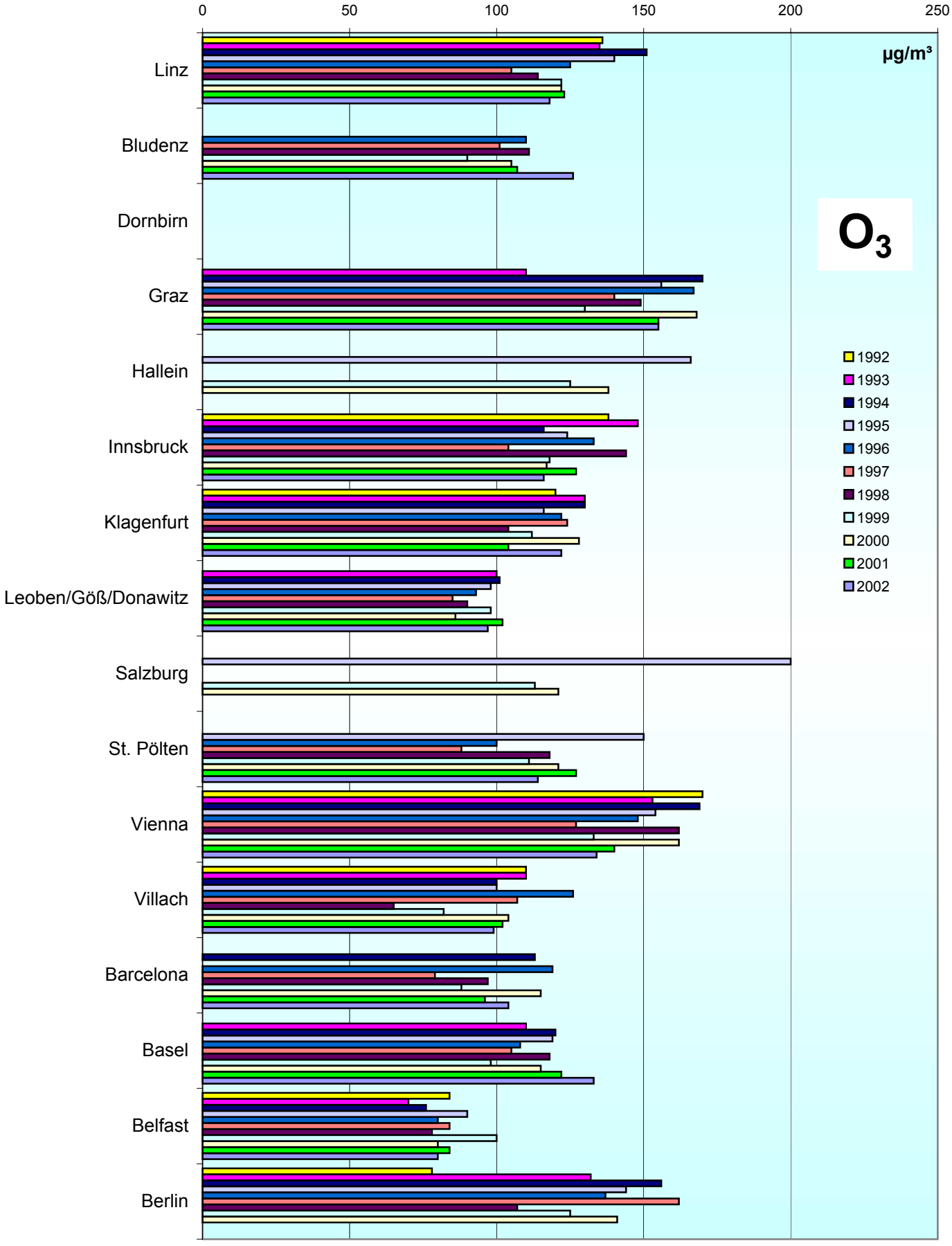
Comparison of The Air Quality 1992 - 2002

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



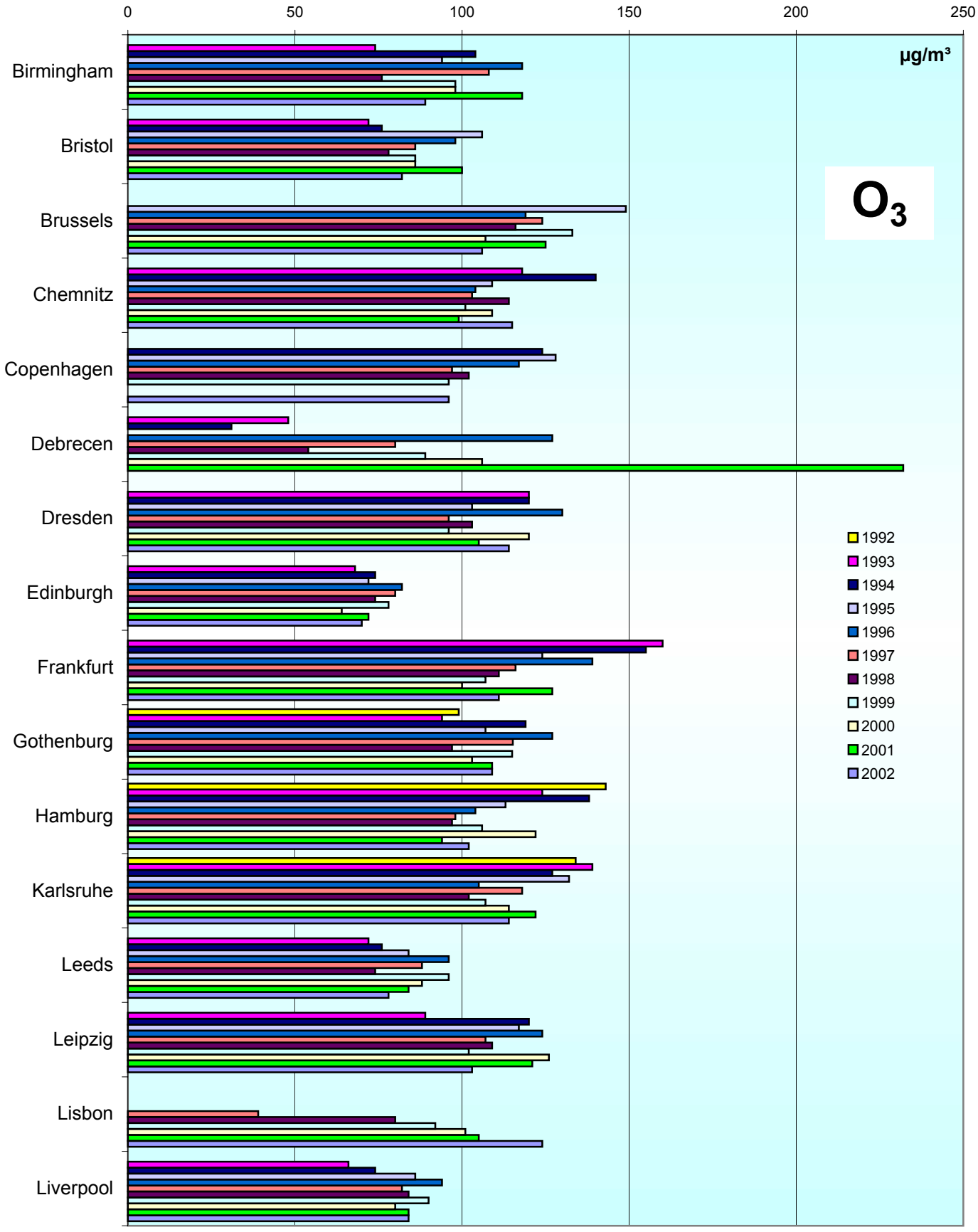
Comparison of The Air Quality 1992 - 2002

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



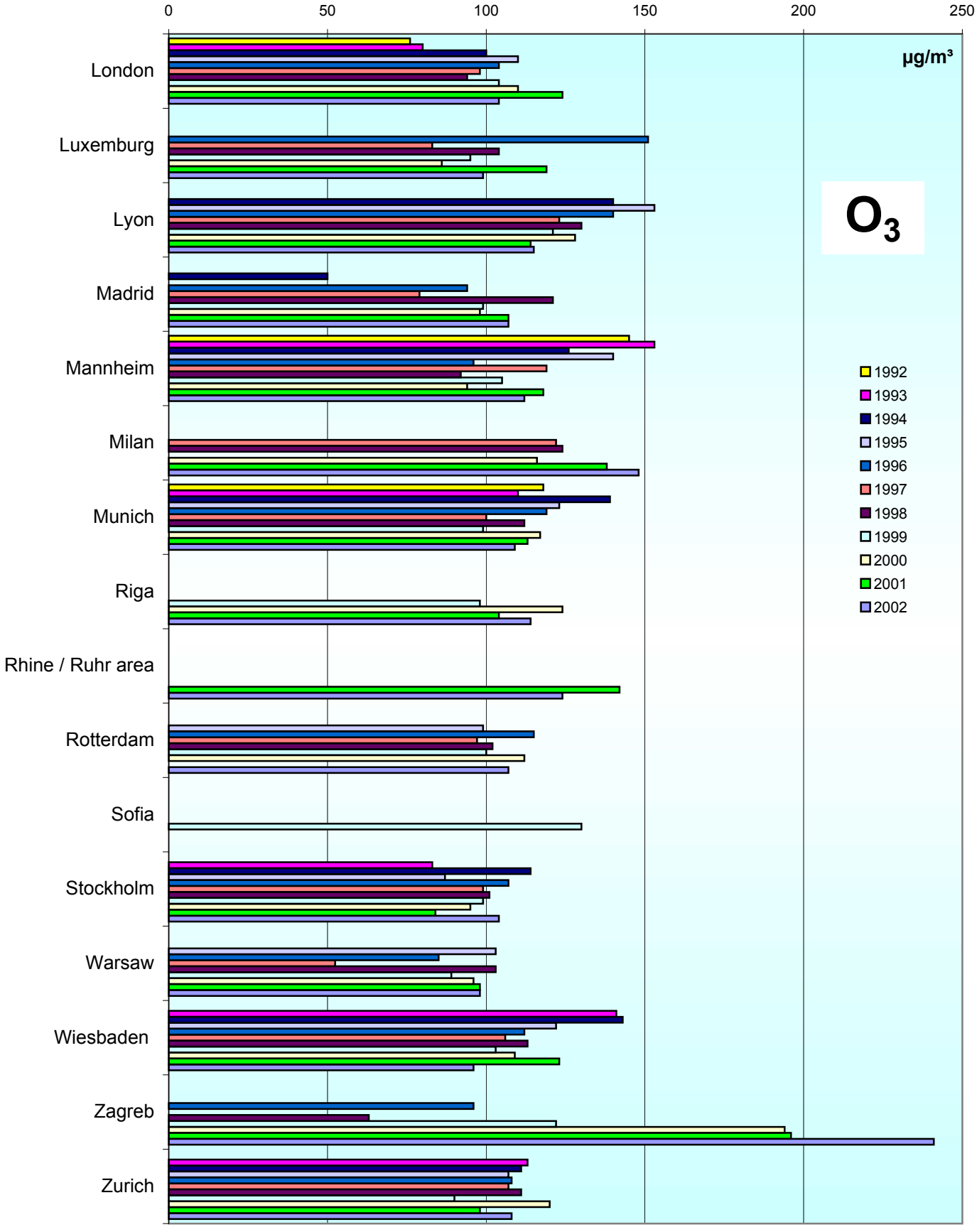
Comparison of The Air Quality 1992 - 2002

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



Comparison of The Air Quality 1992 - 2002

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



Jahresvergleich

1992 - 2002

max. 98-Percentile

Comparison of The Air Quality Over The Years

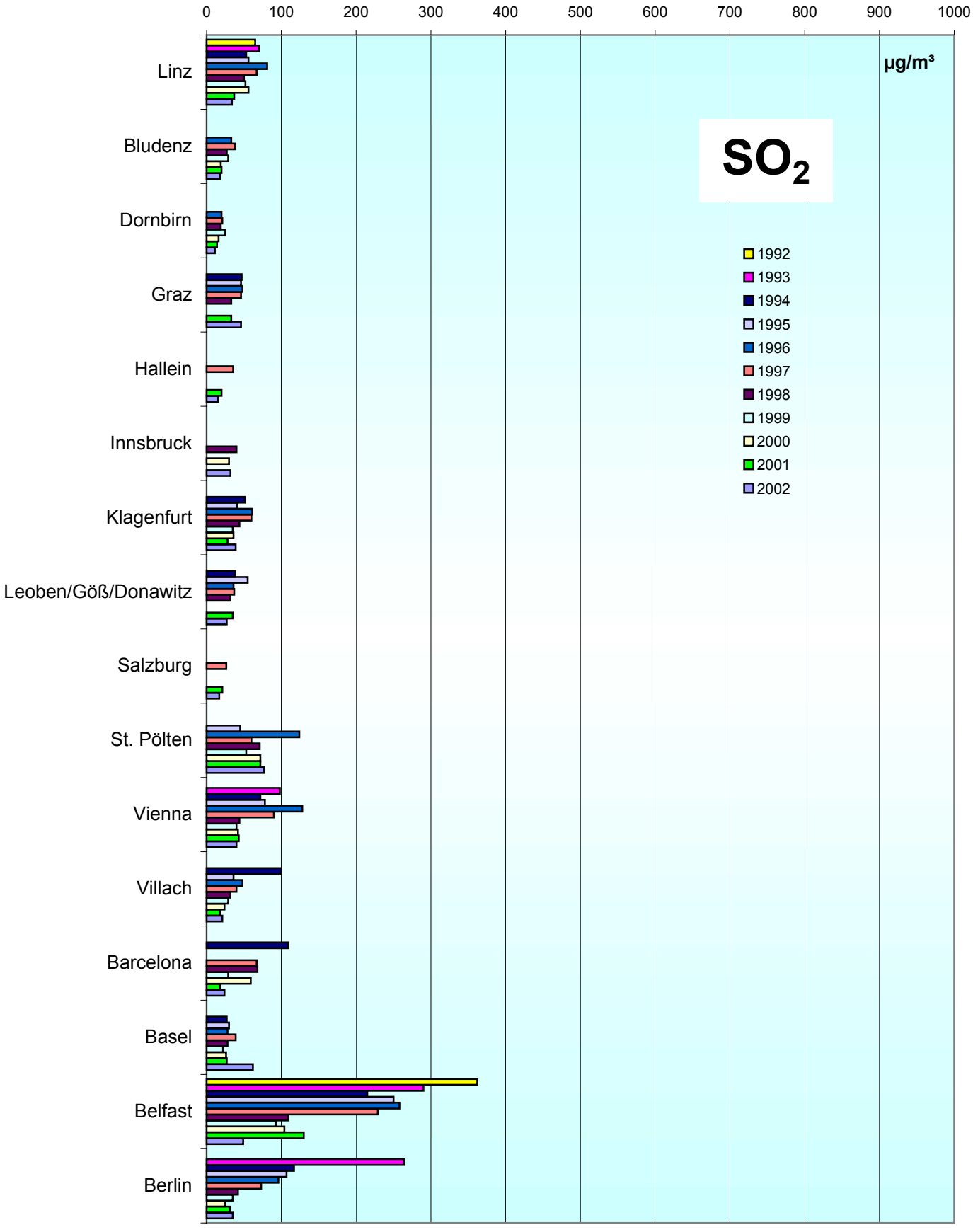
1992 - 2002

Max. 98-Percentiles

Comparison of The Air Quality 1992 - 2002

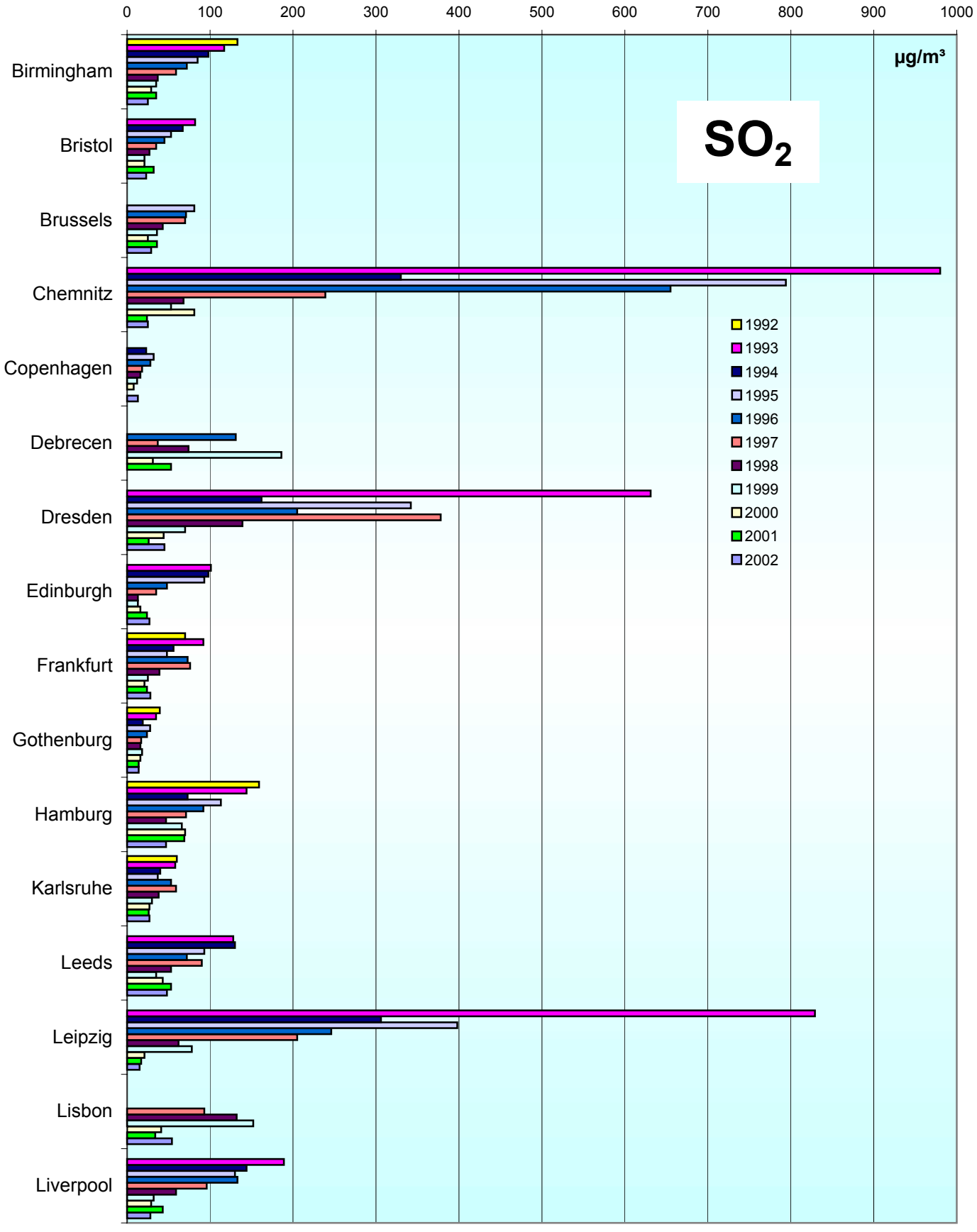
max. 98 percentile

(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

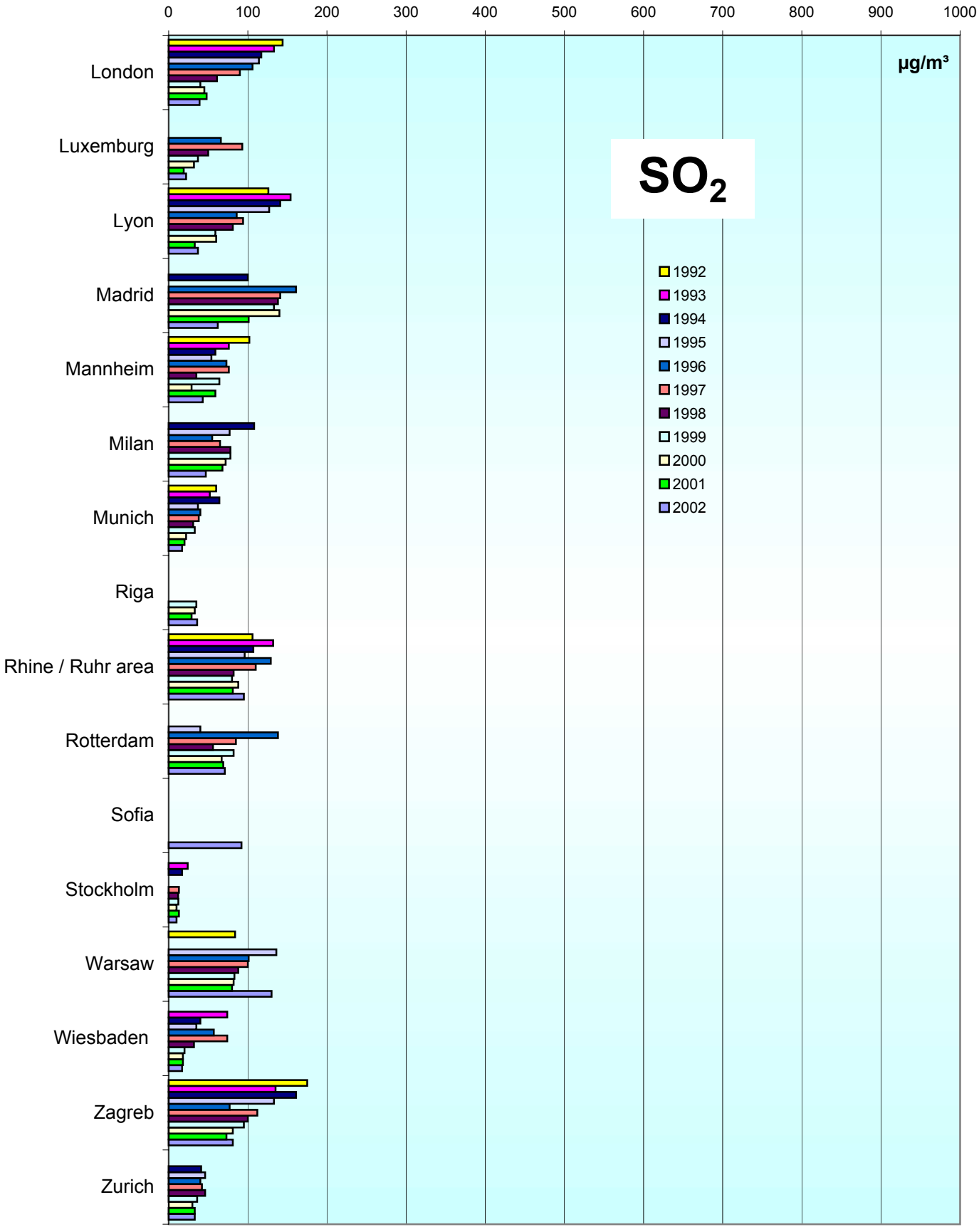
max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

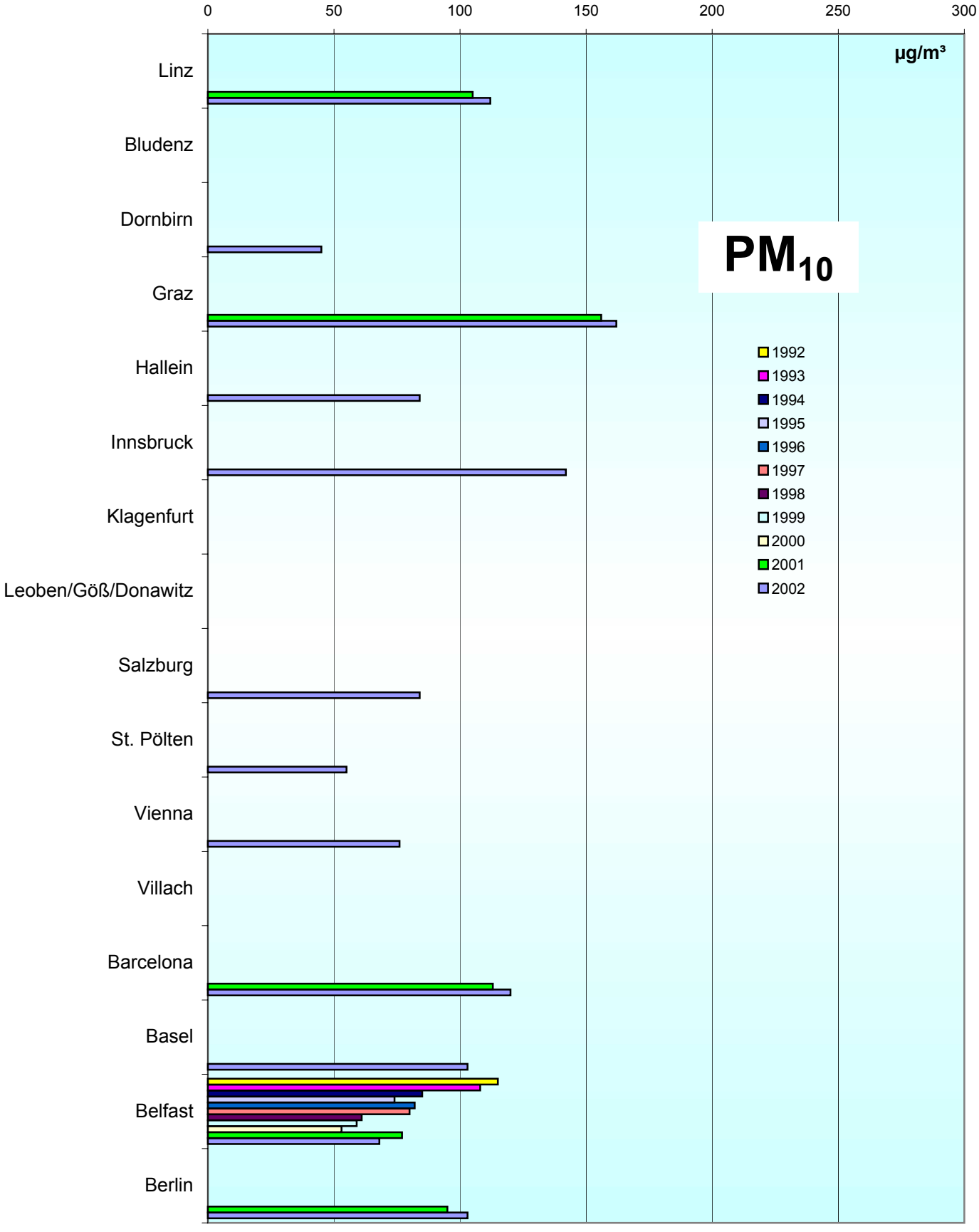
max. 98 percentile

(peak-stressed monitoring station)



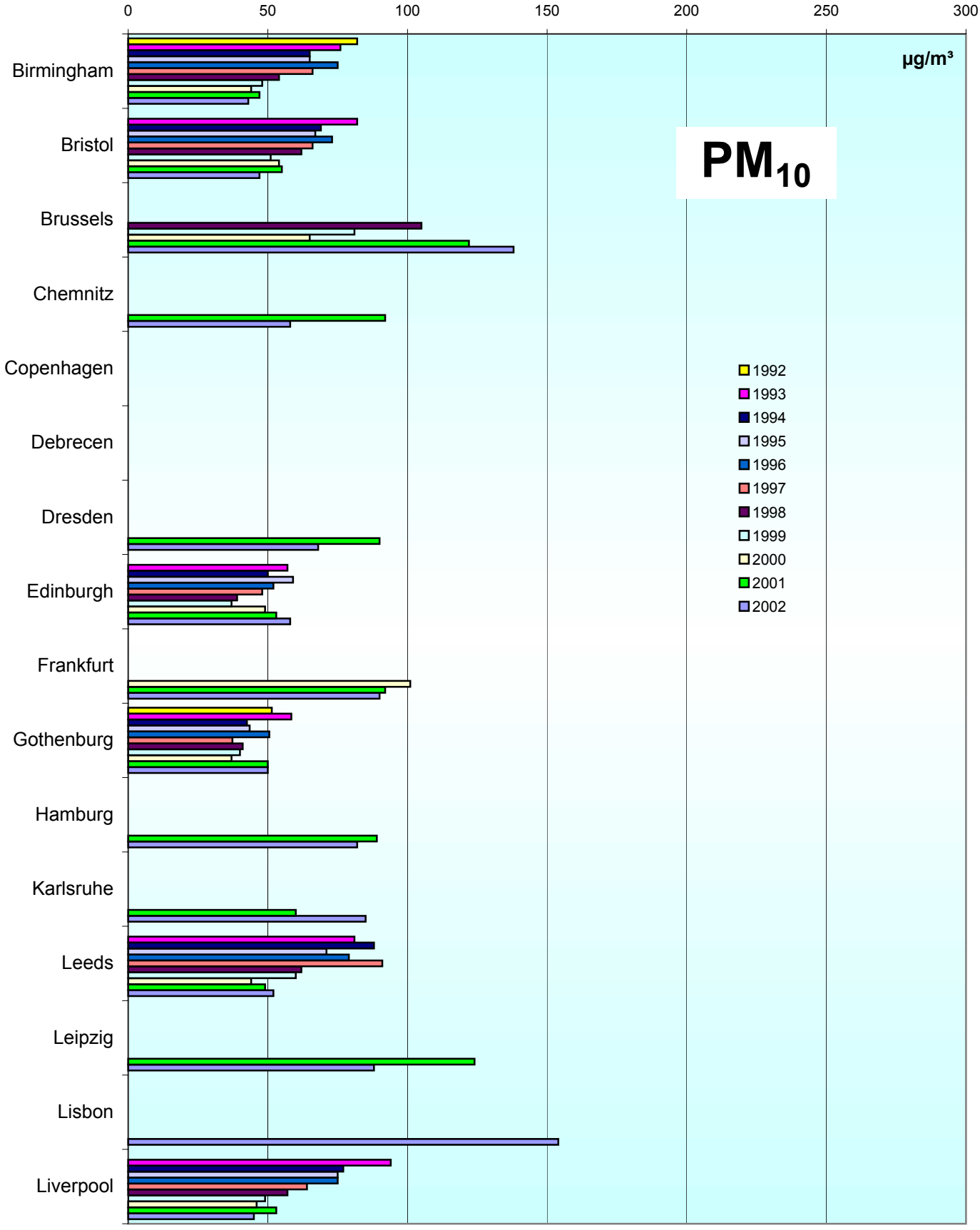
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



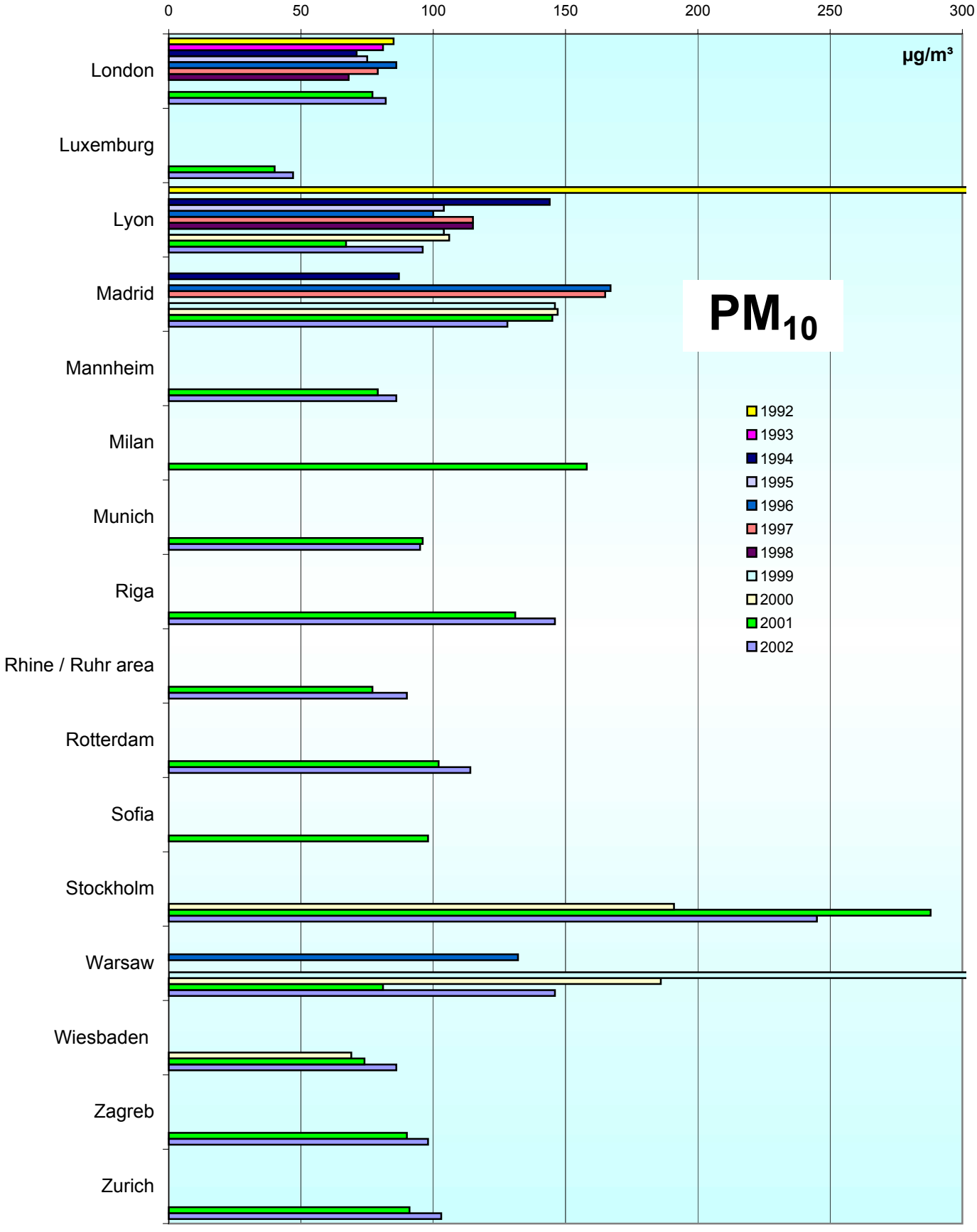
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



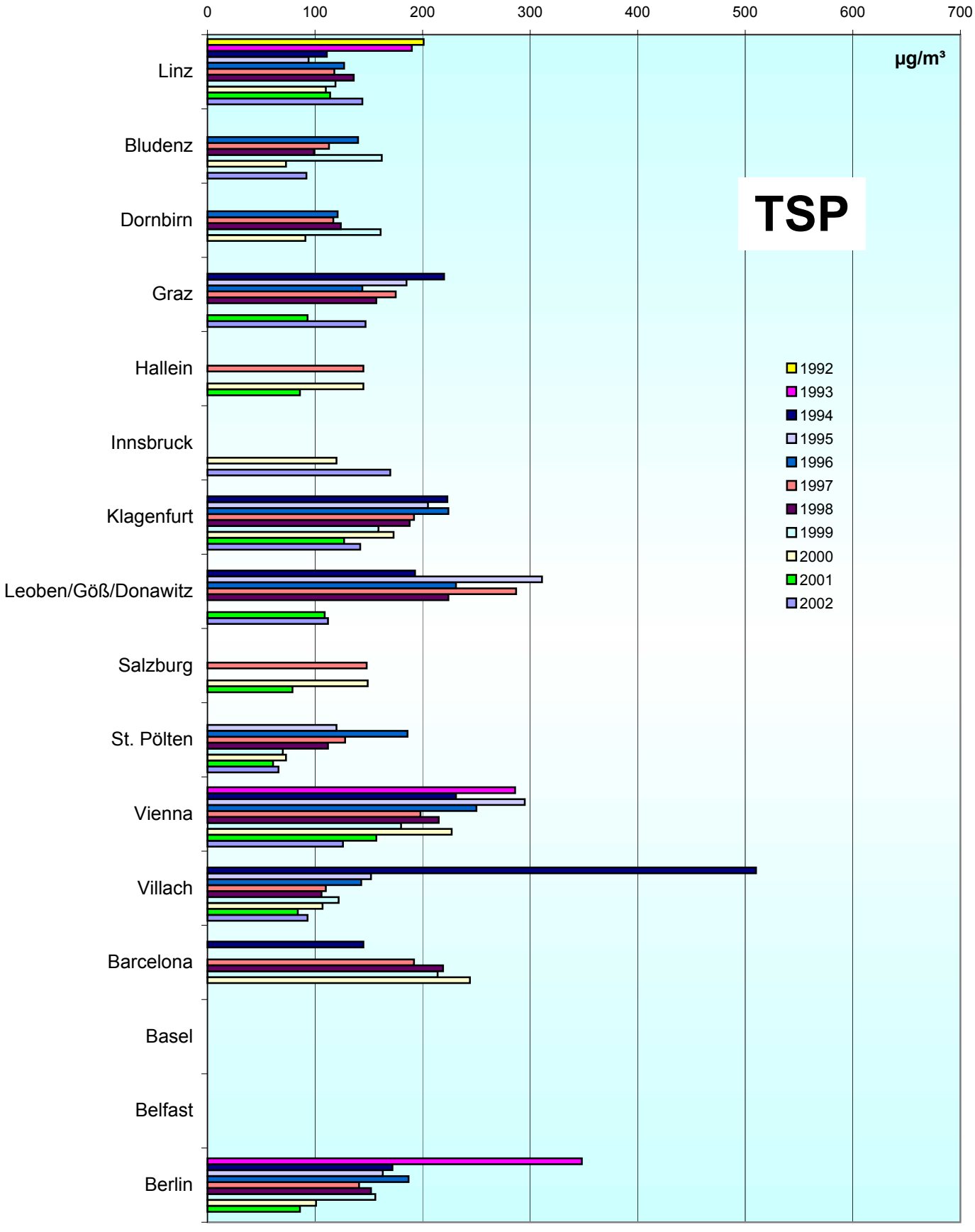
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



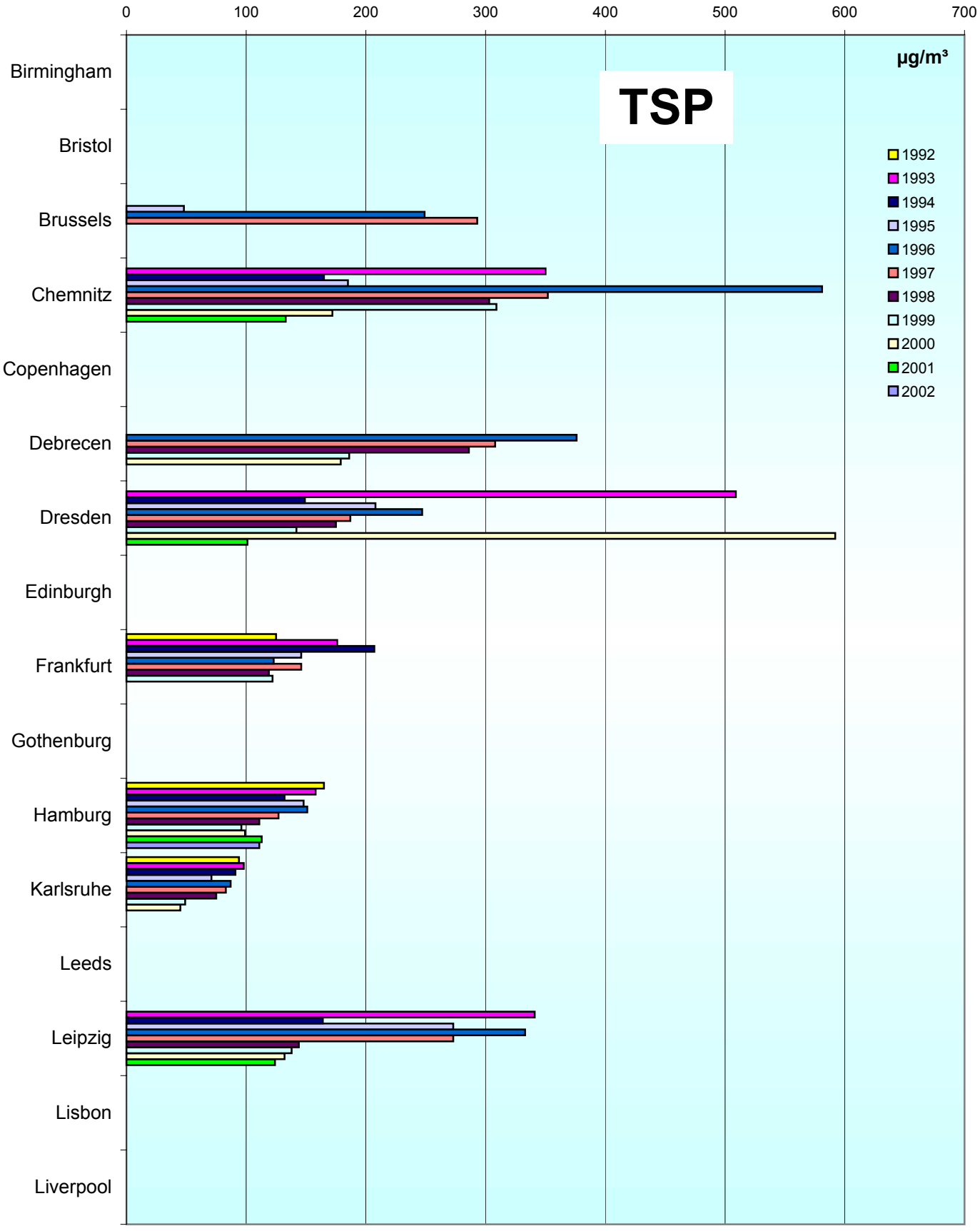
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

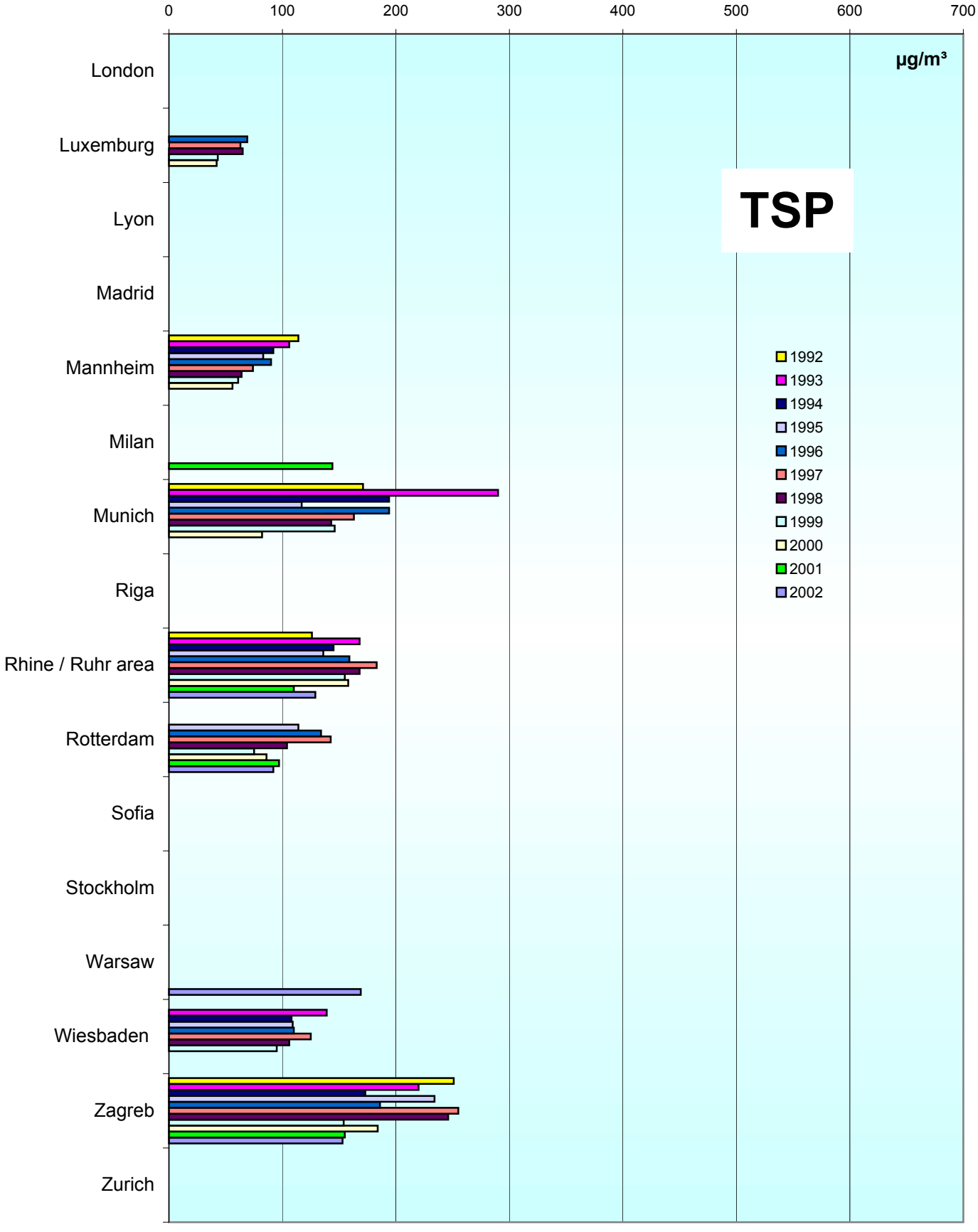
max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

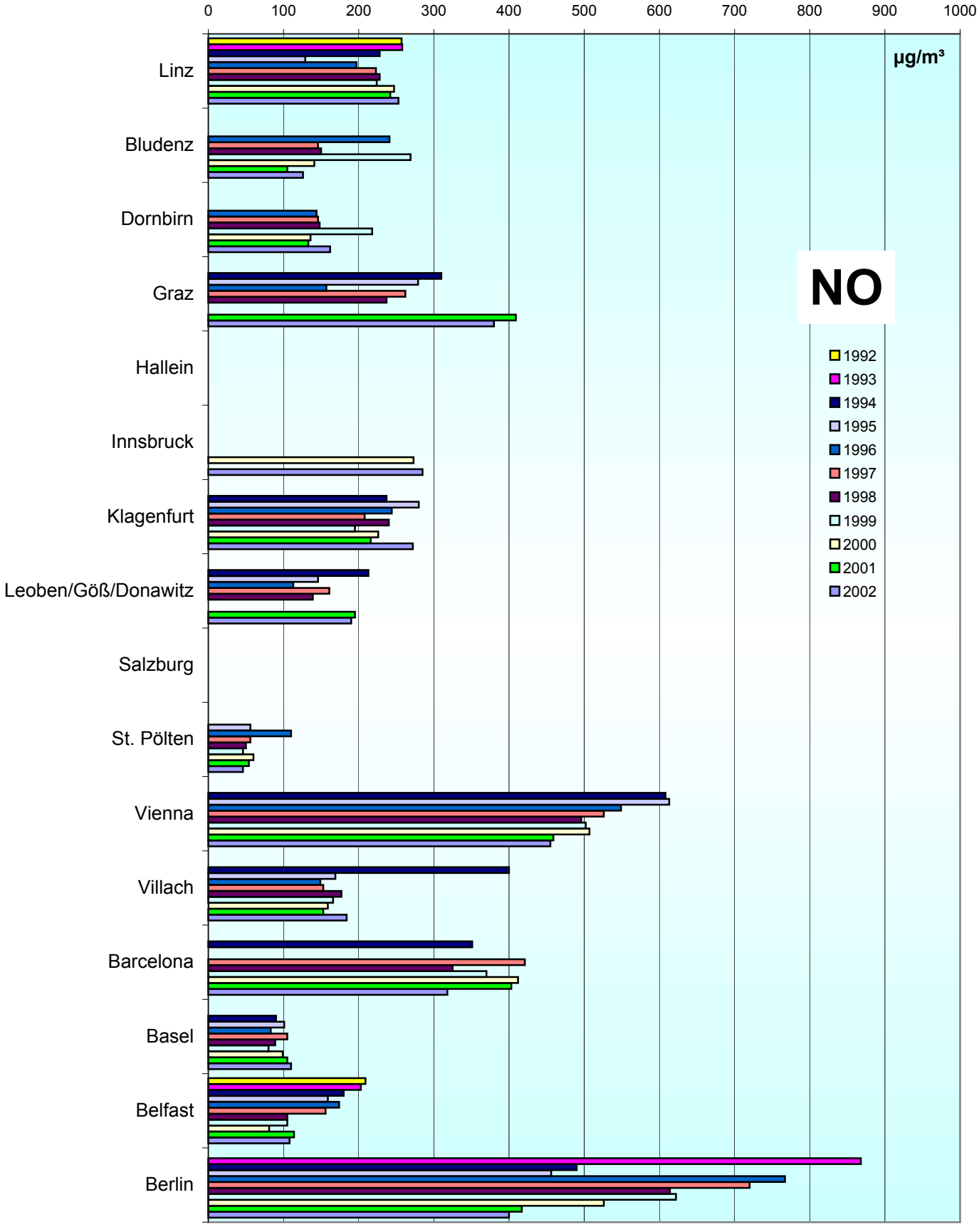
max. 98 percentile

(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

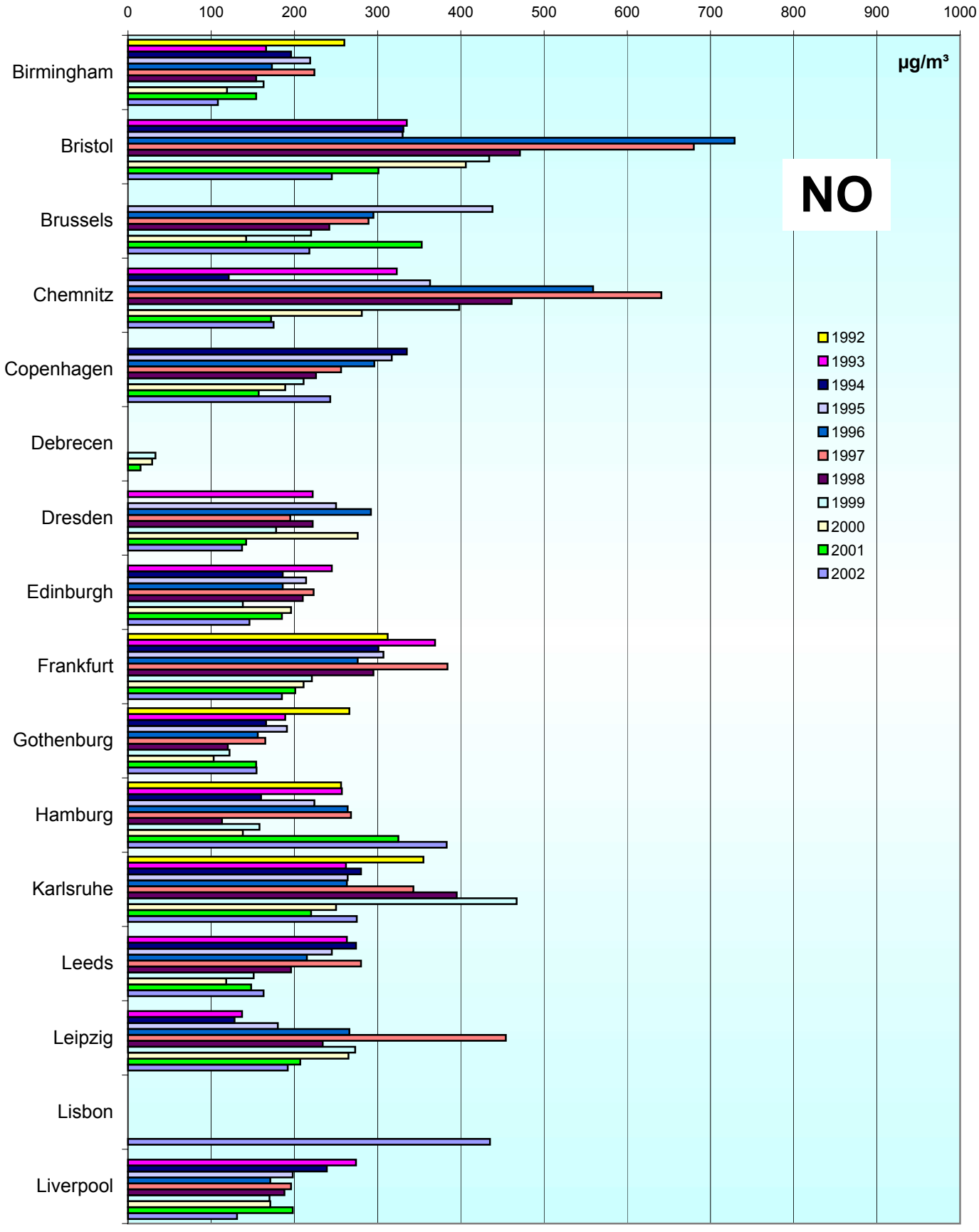
max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

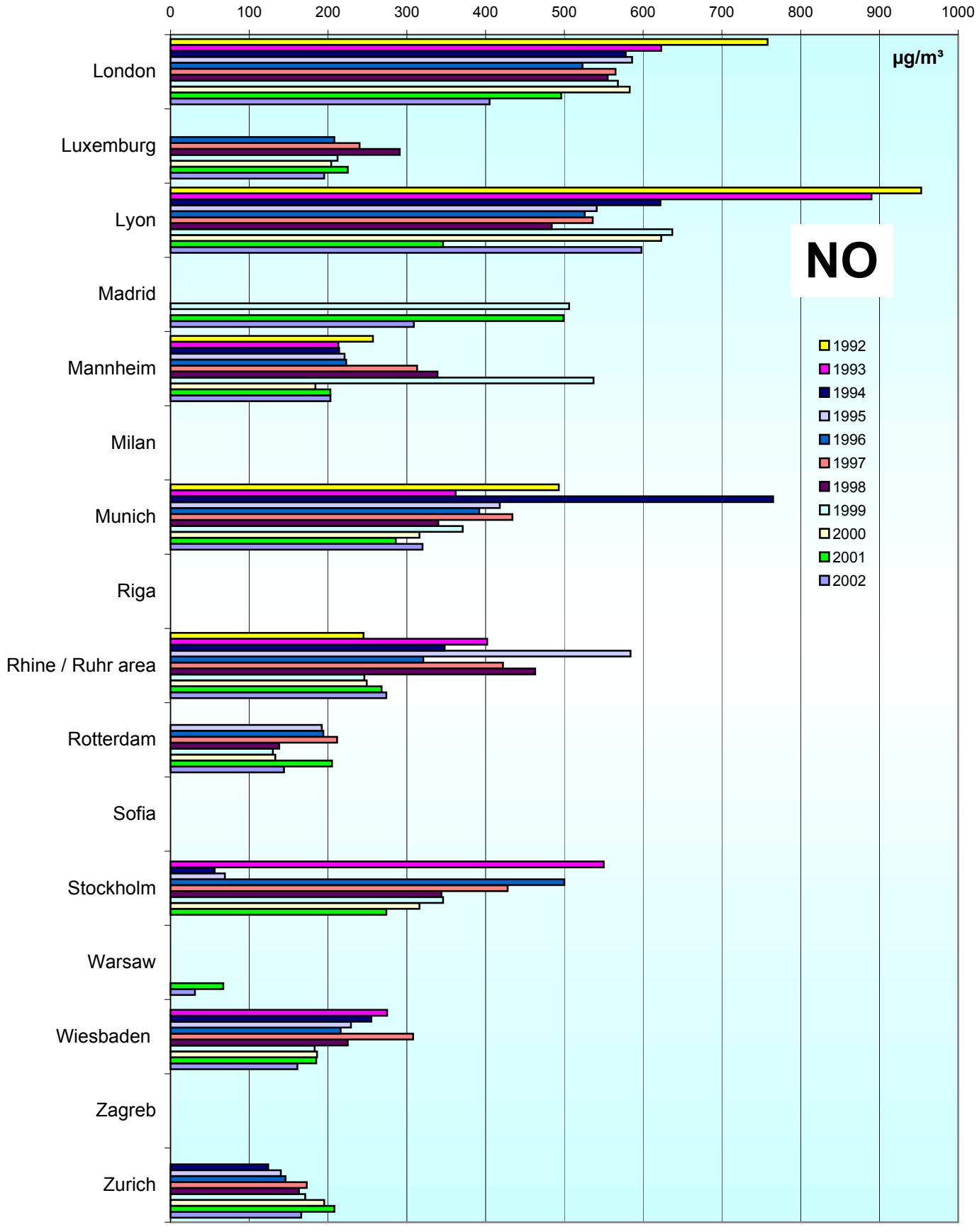
max. 98 percentile

(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

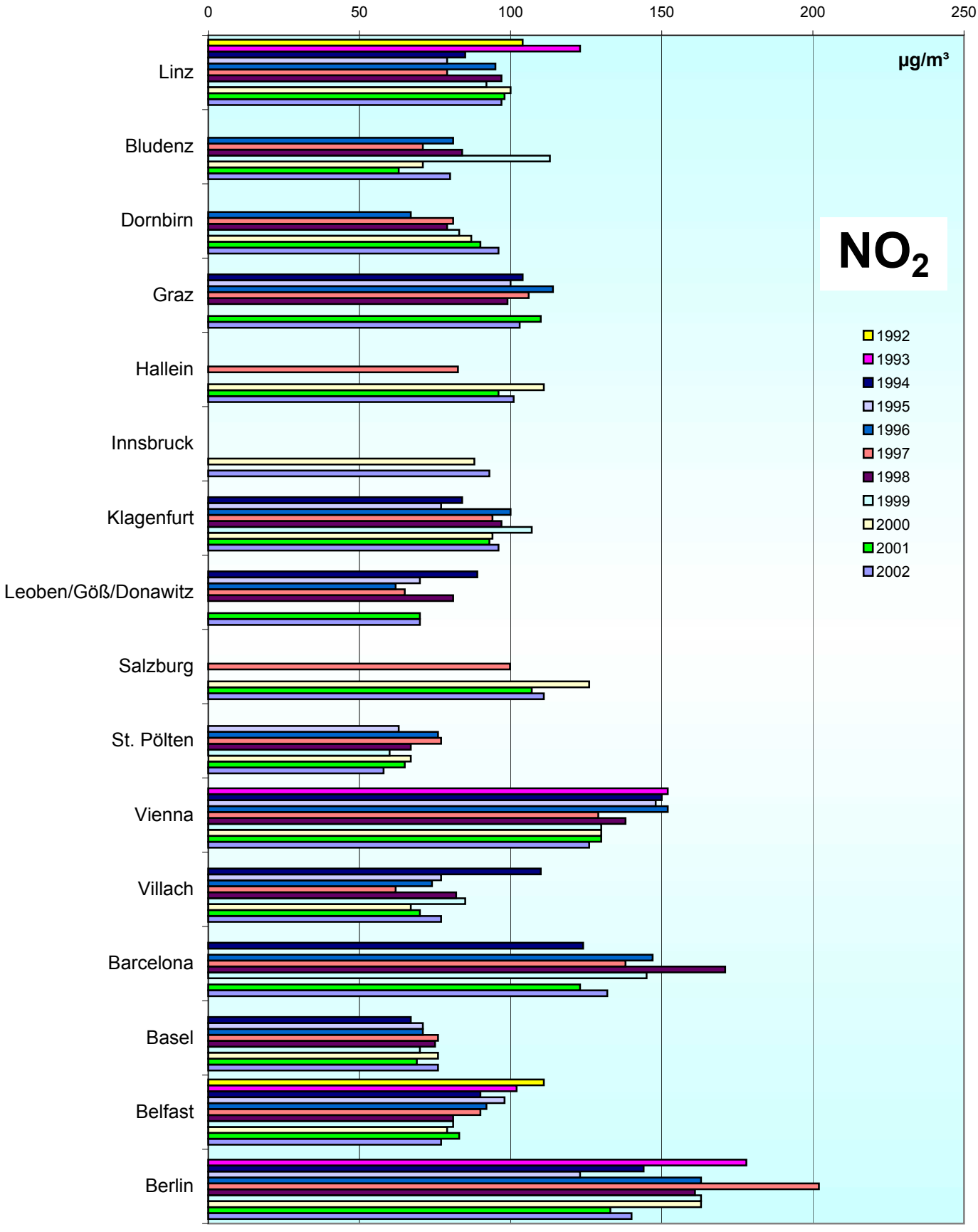
max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

max. 98 percentile

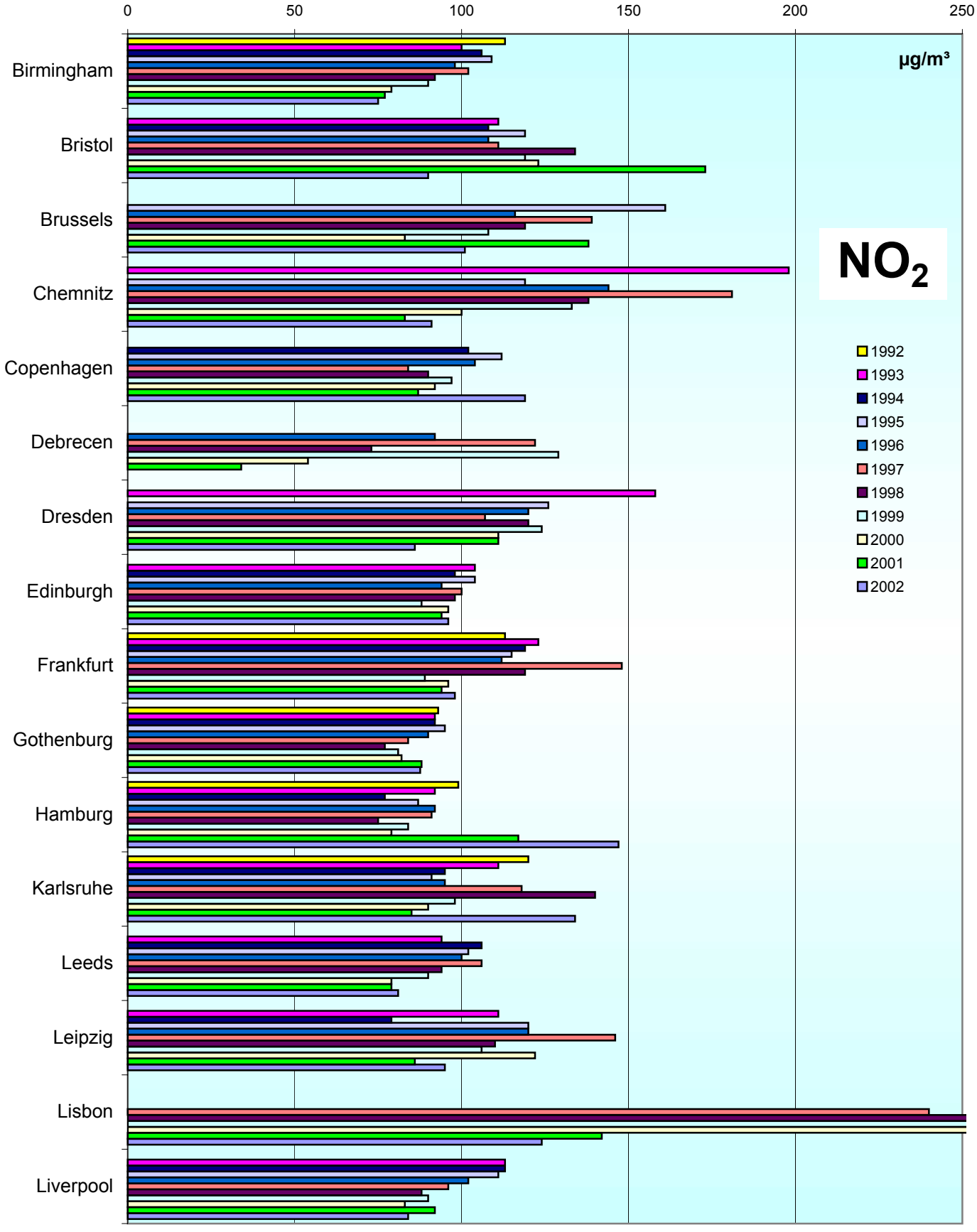
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

max. 98 percentile

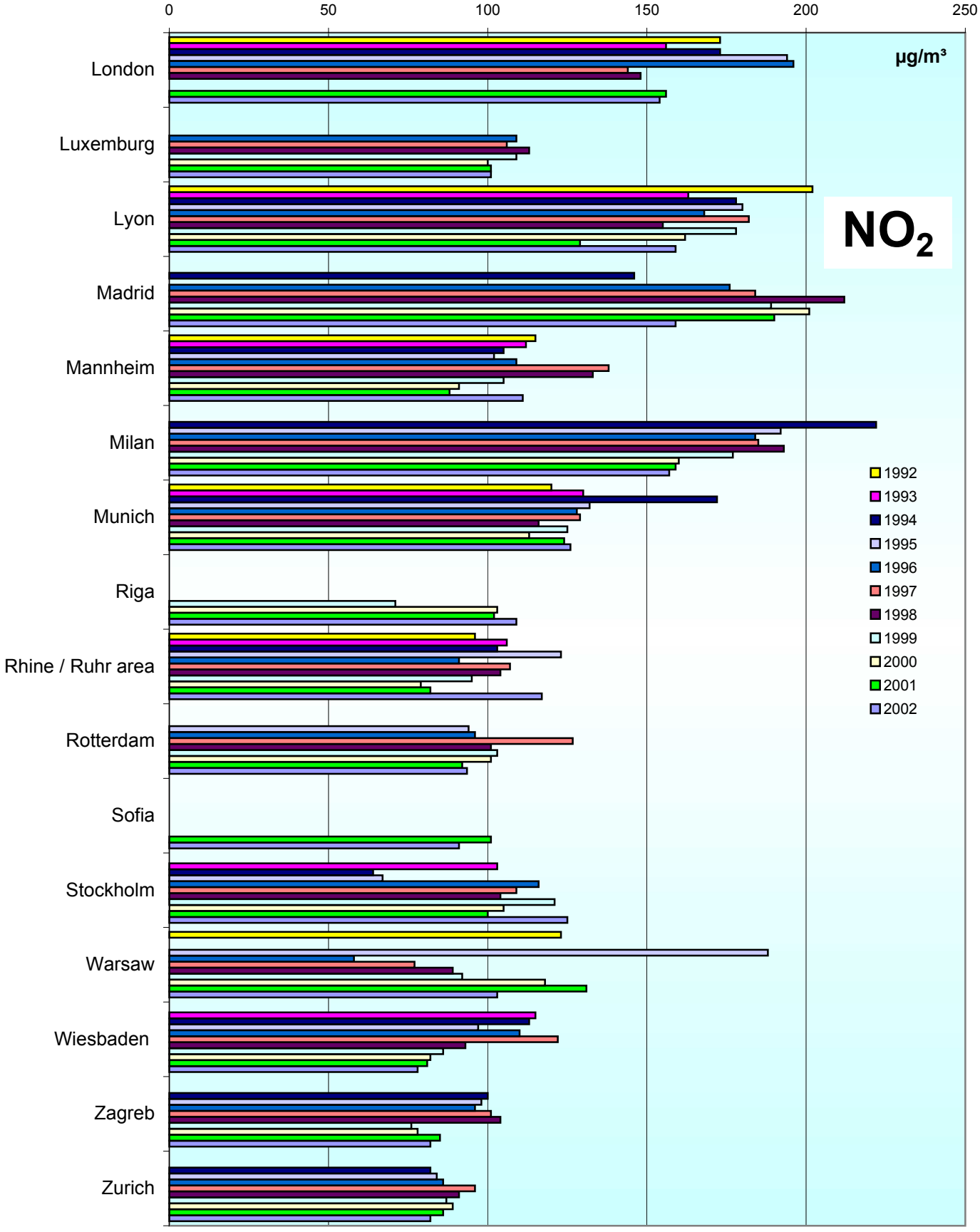
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

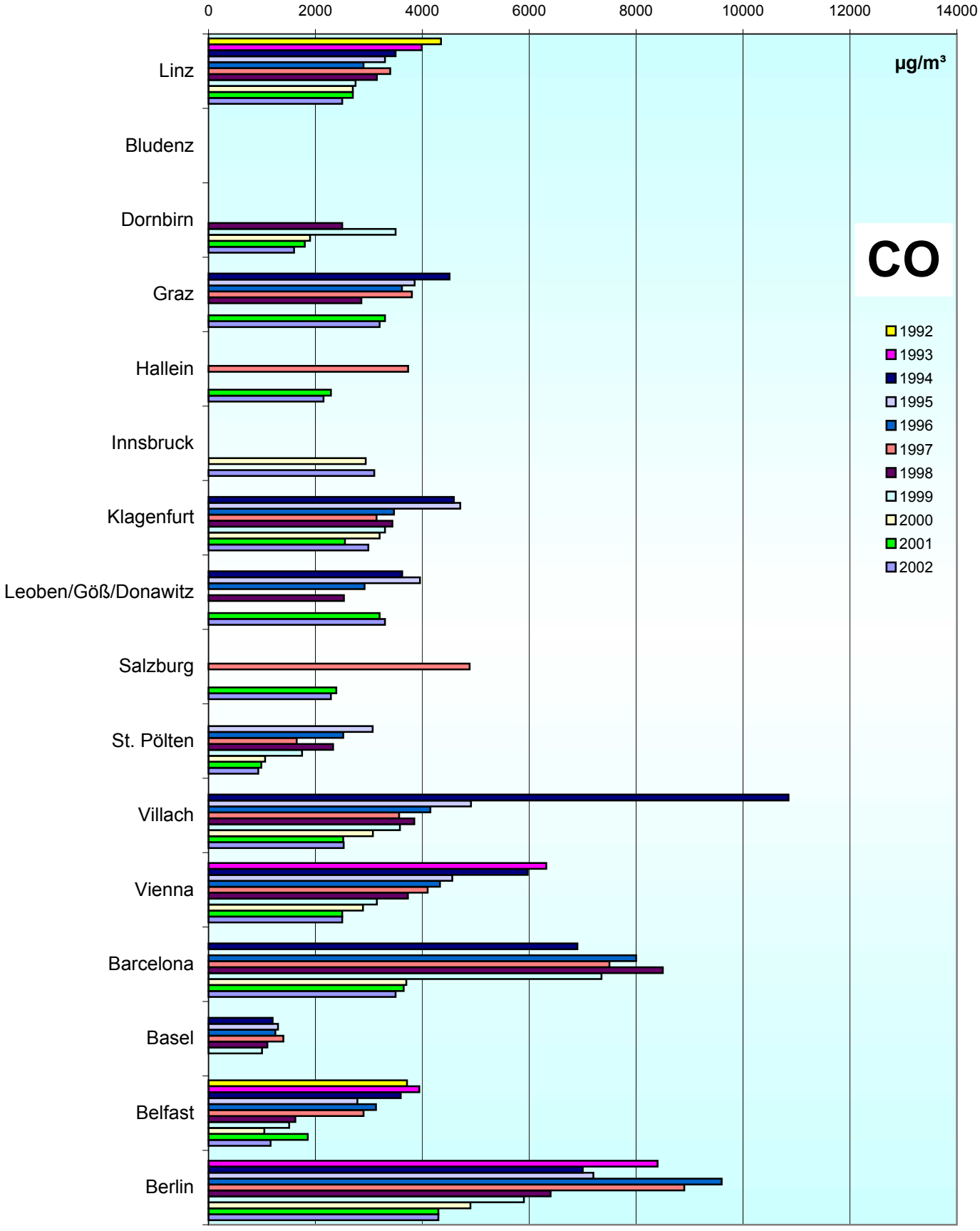
max. 98 percentile

(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

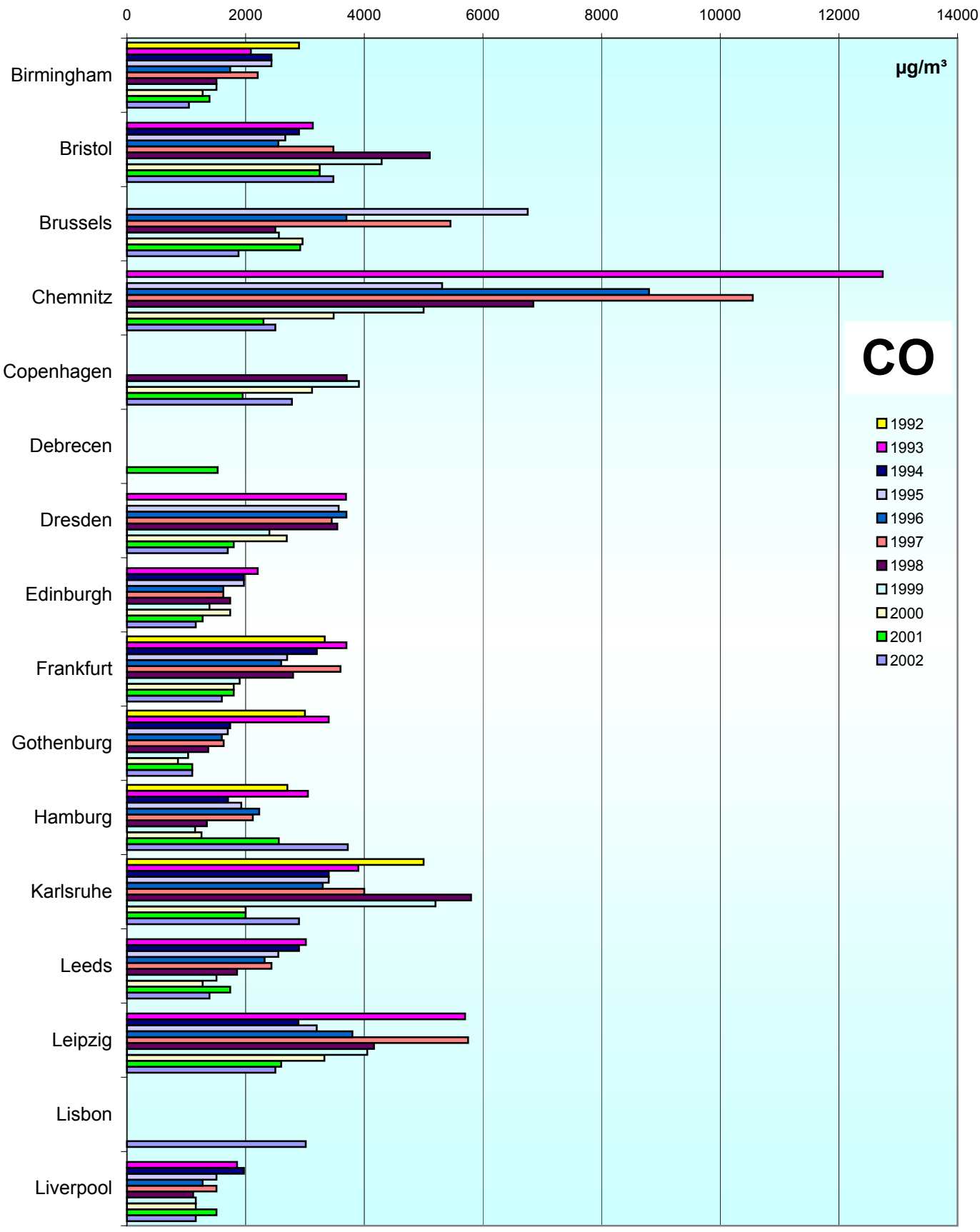
max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

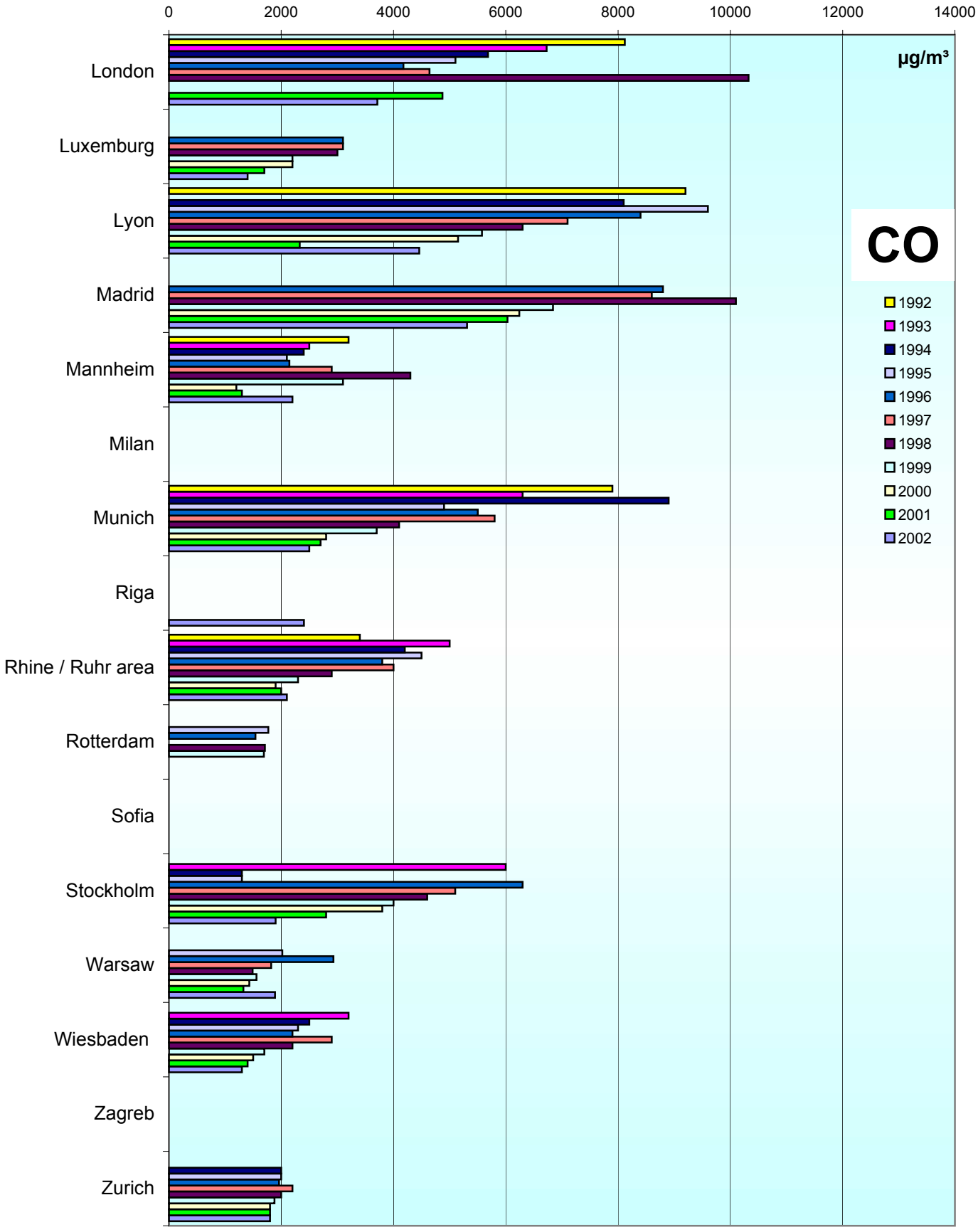
max. 98 percentile

(peak-stressed monitoring station)



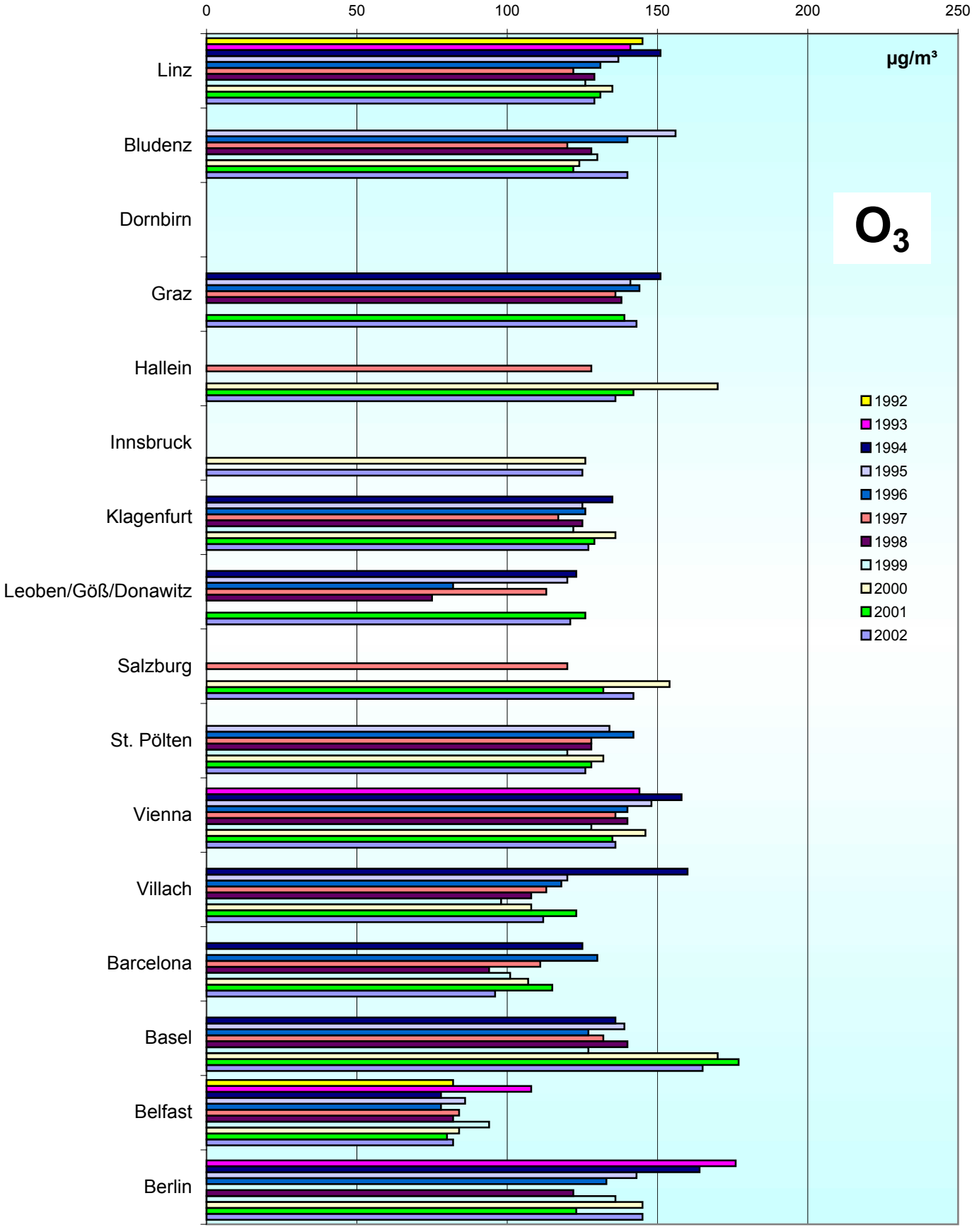
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



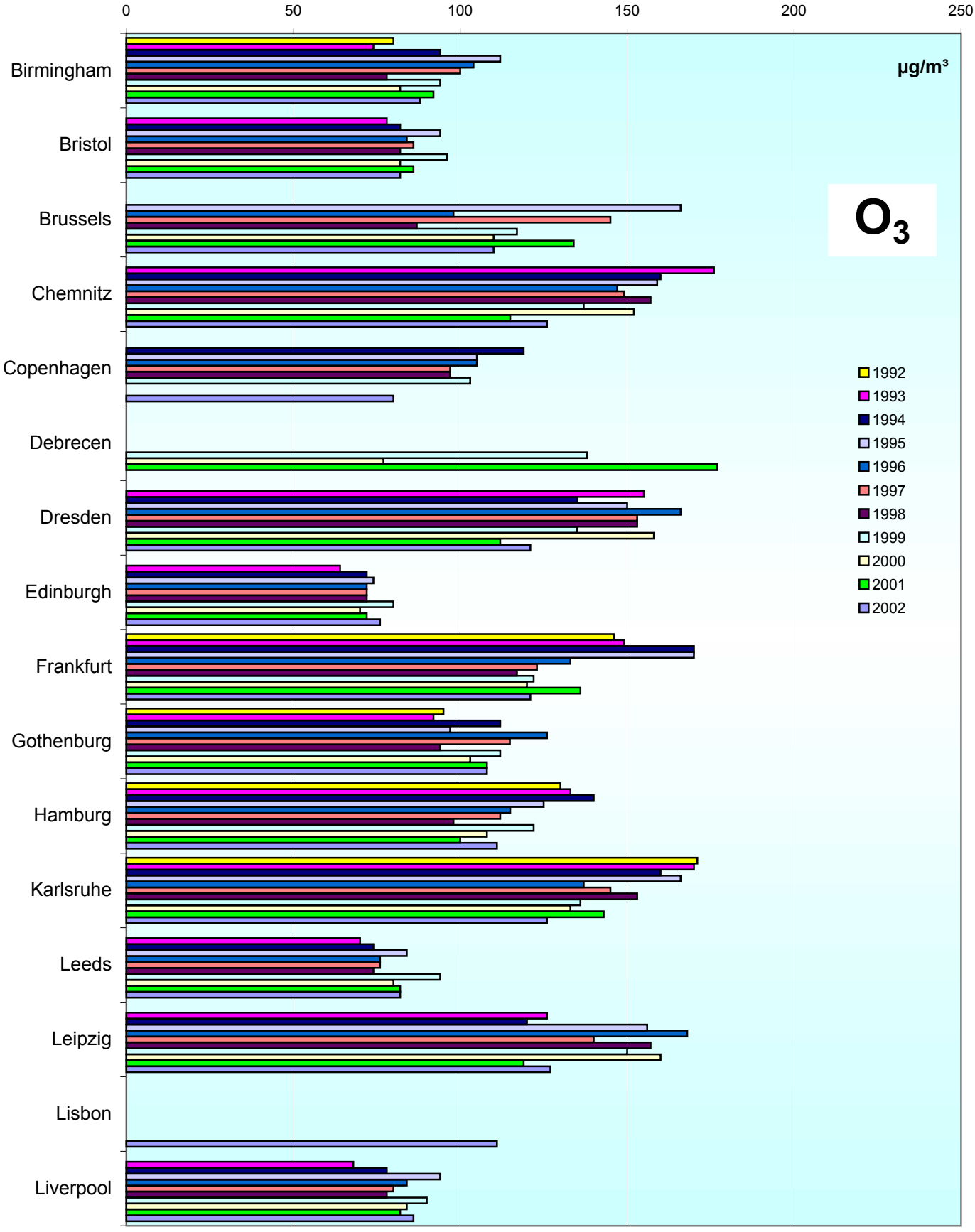
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



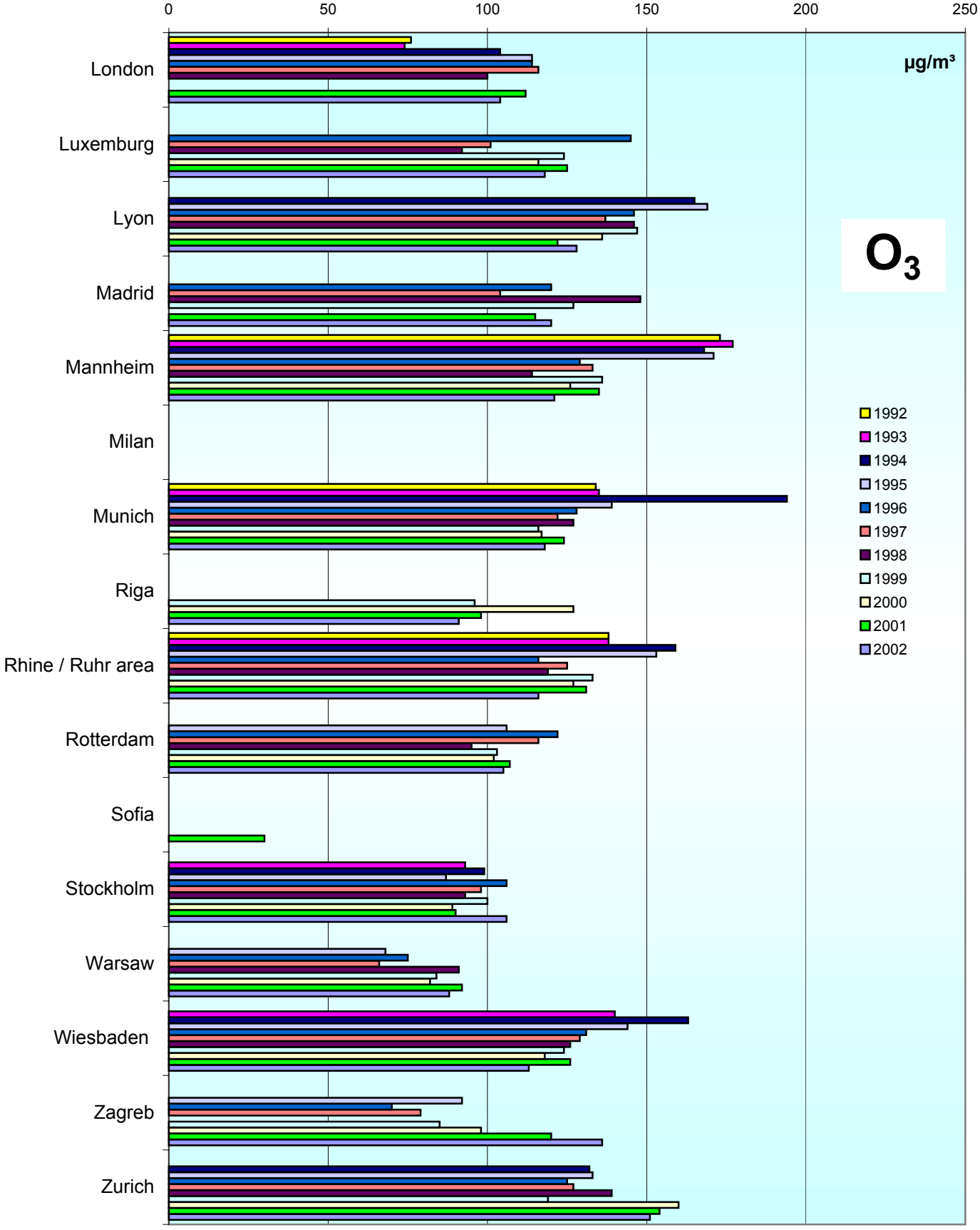
Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2002

max. 98 percentile
(peak-stressed monitoring station)



Jahresvergleich

1993 - 2002

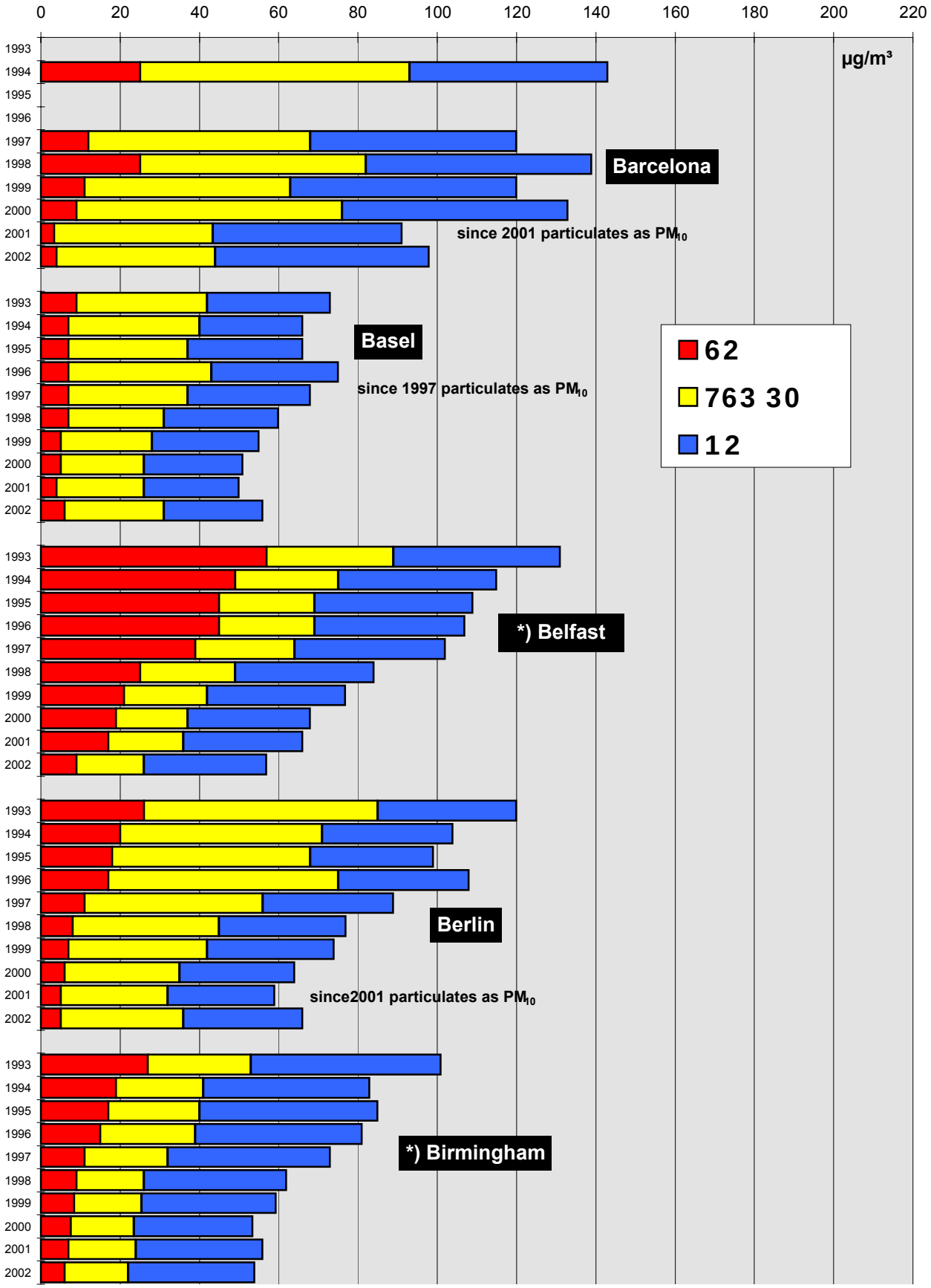
Jahresmittelwerte, $\bigcirc$ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality

1993 - 2002

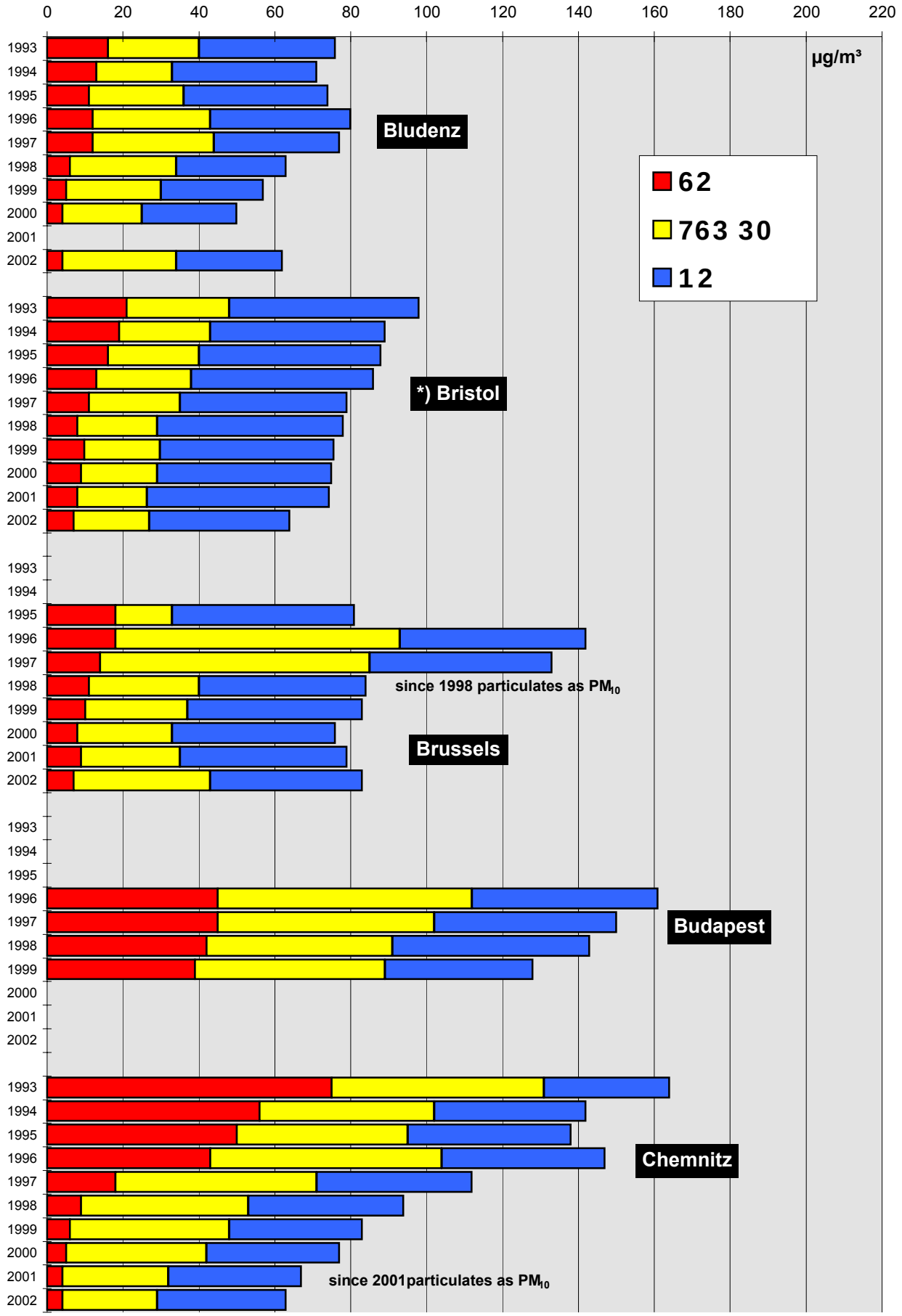
Annual Mean Values, $\bigcirc$ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality 1993-2002
Development of the annual mean values, SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002
Development of the annual mean values, SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)

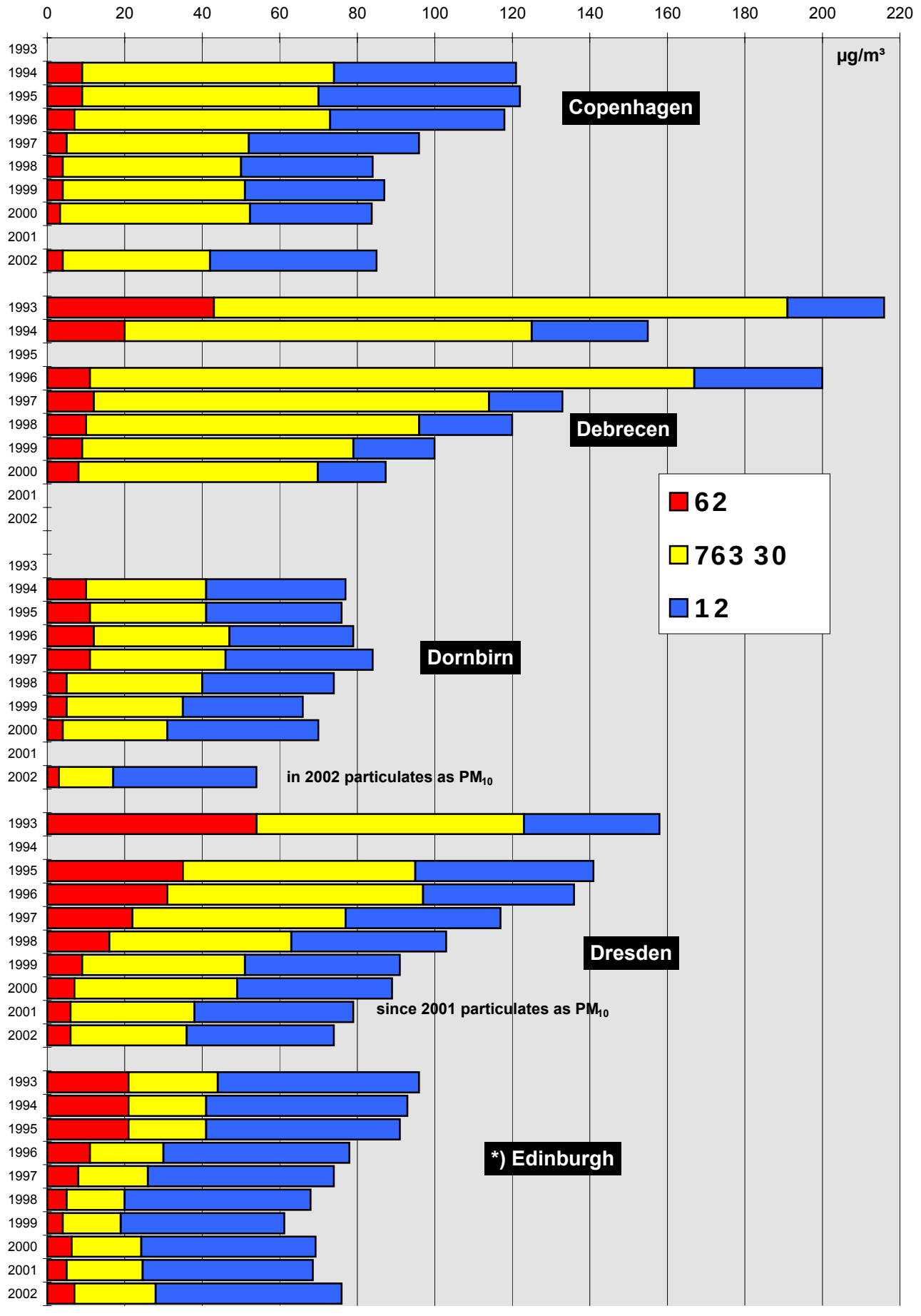


particulates calculated as PM_0

Comparison Of The Air Quality 1993-2002

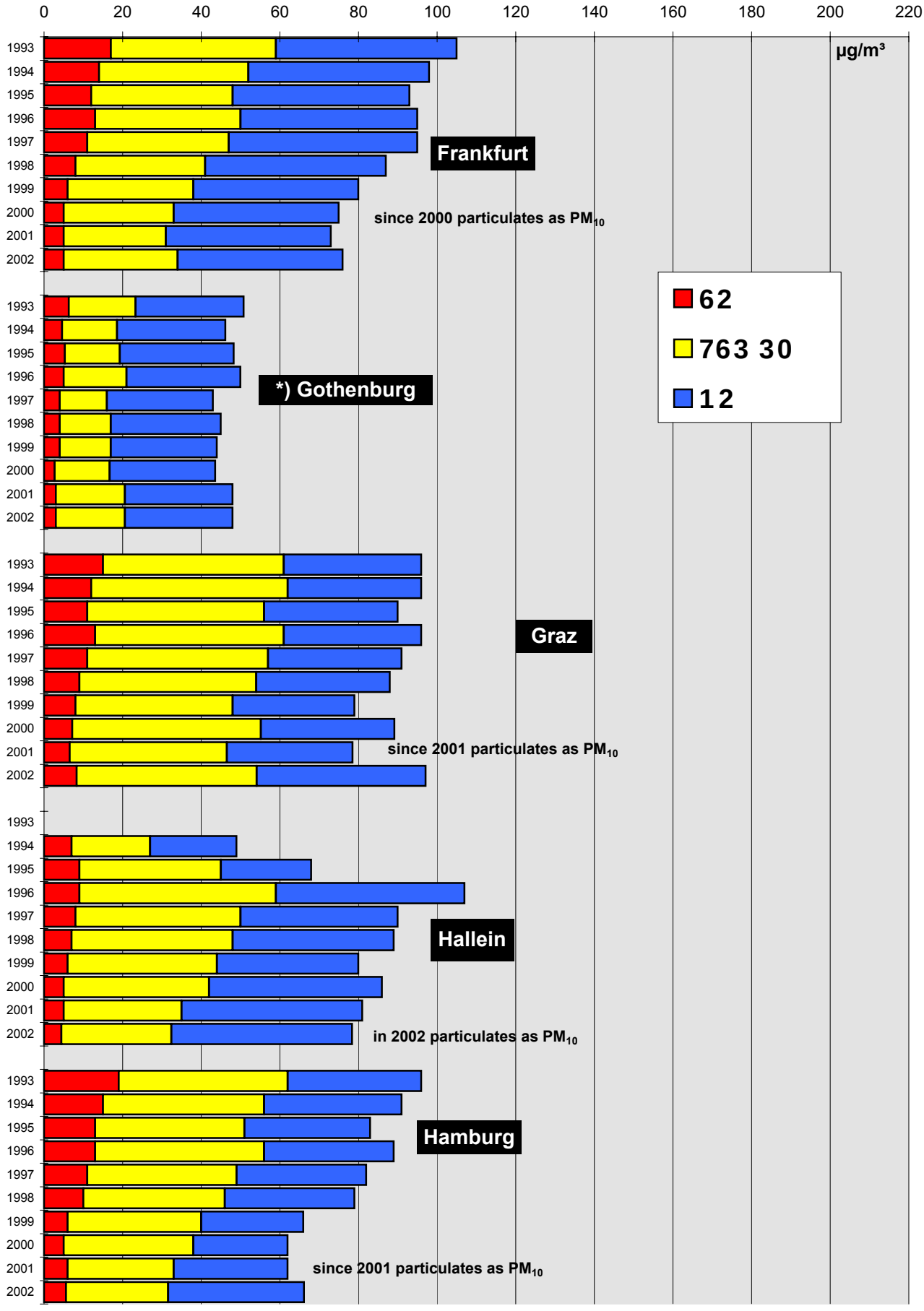
Development of the annual mean values, O#SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)



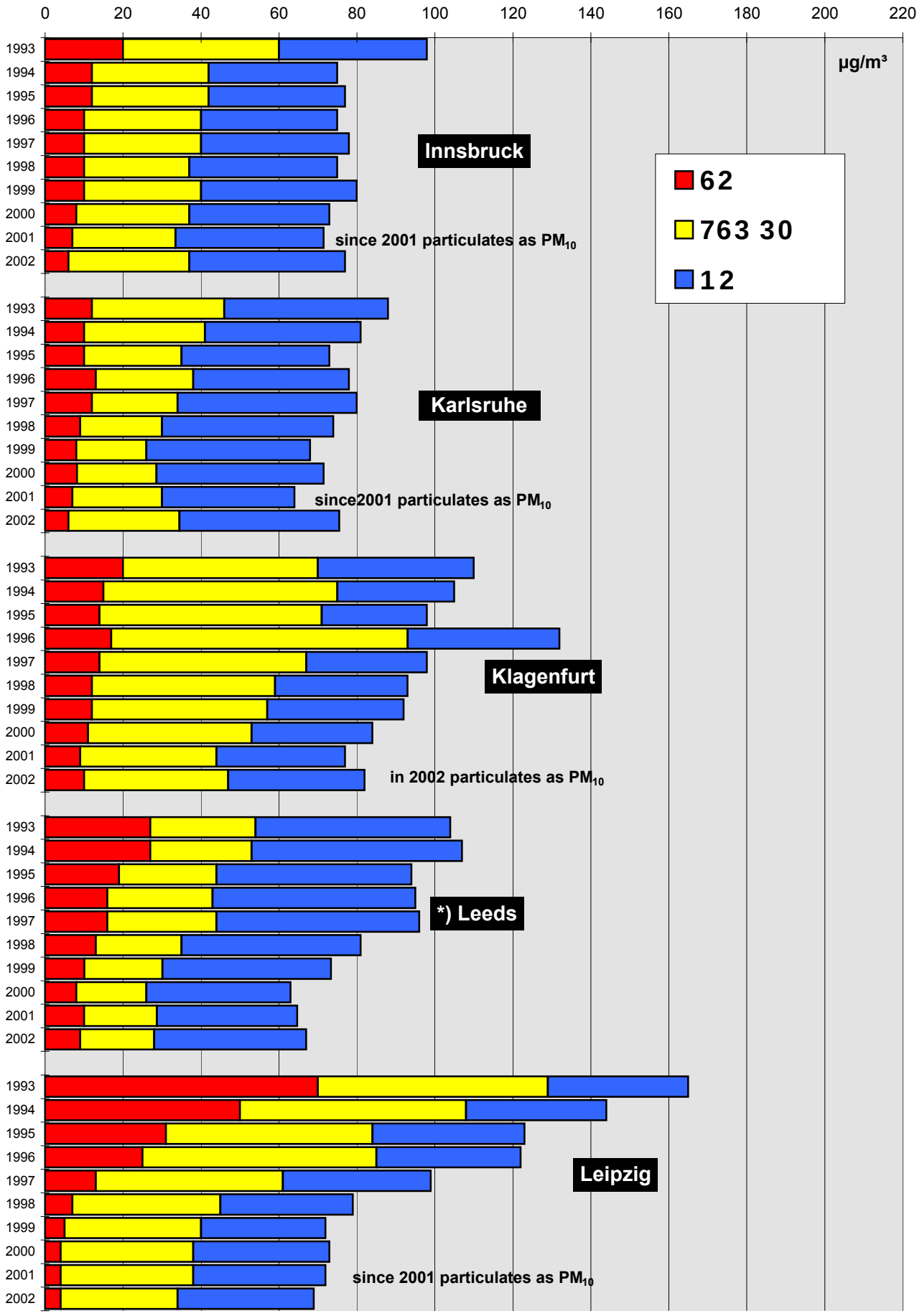
*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002
Development of the annual mean values, O SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002
Development of the annual mean values, O SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)

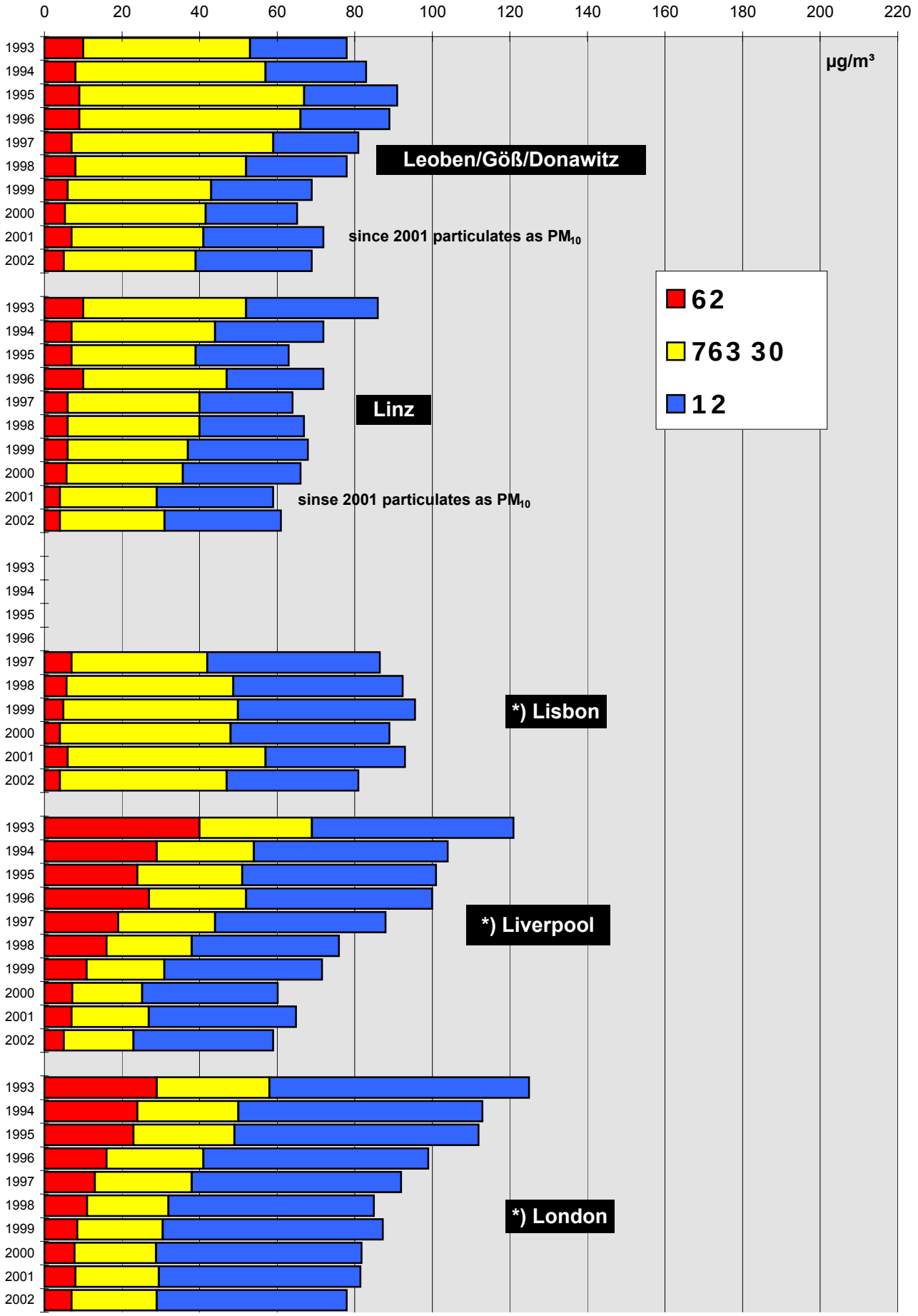


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002

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

(mean of all monitoring stations)

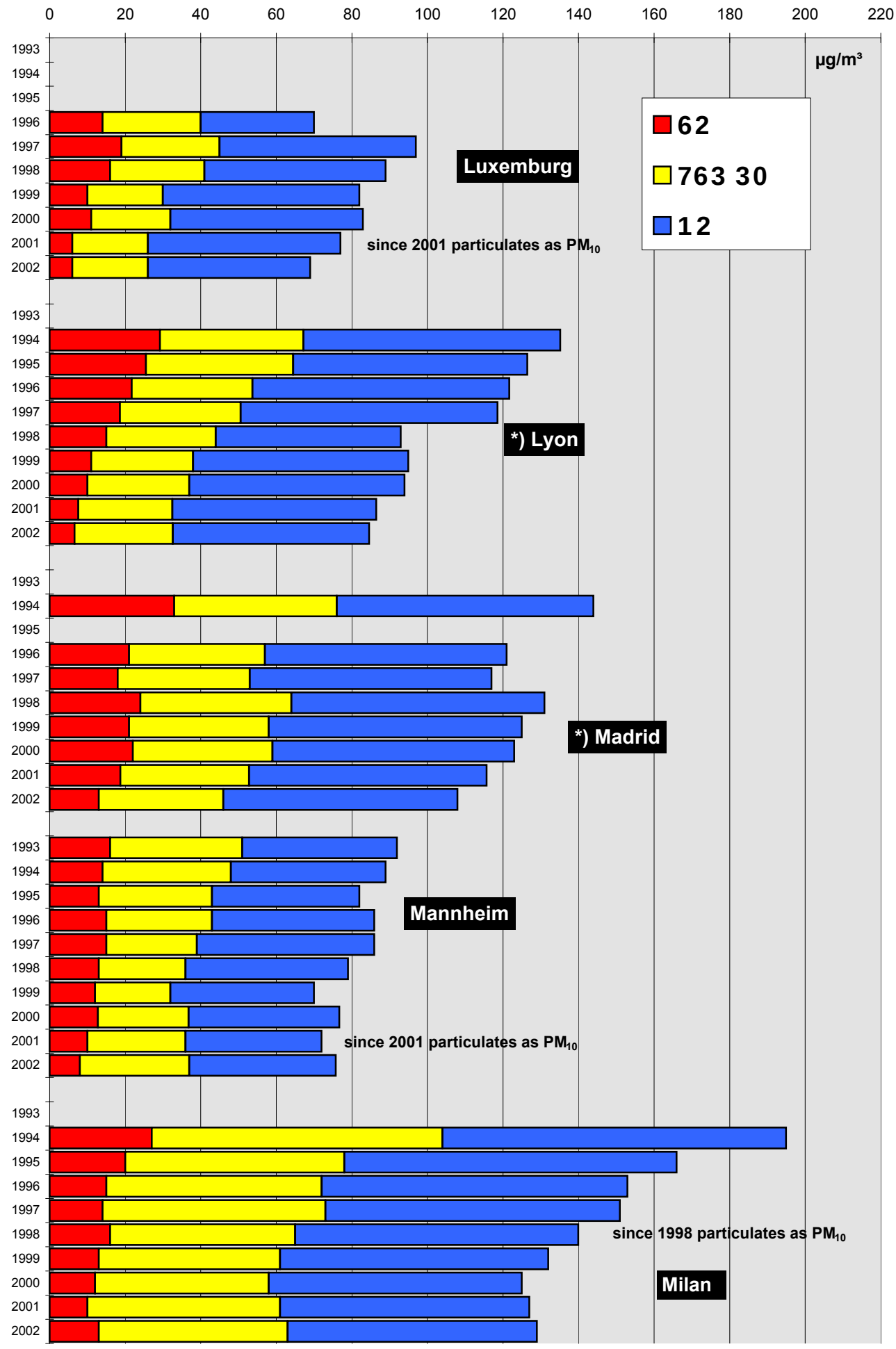


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002

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

(mean of all monitoring stations)

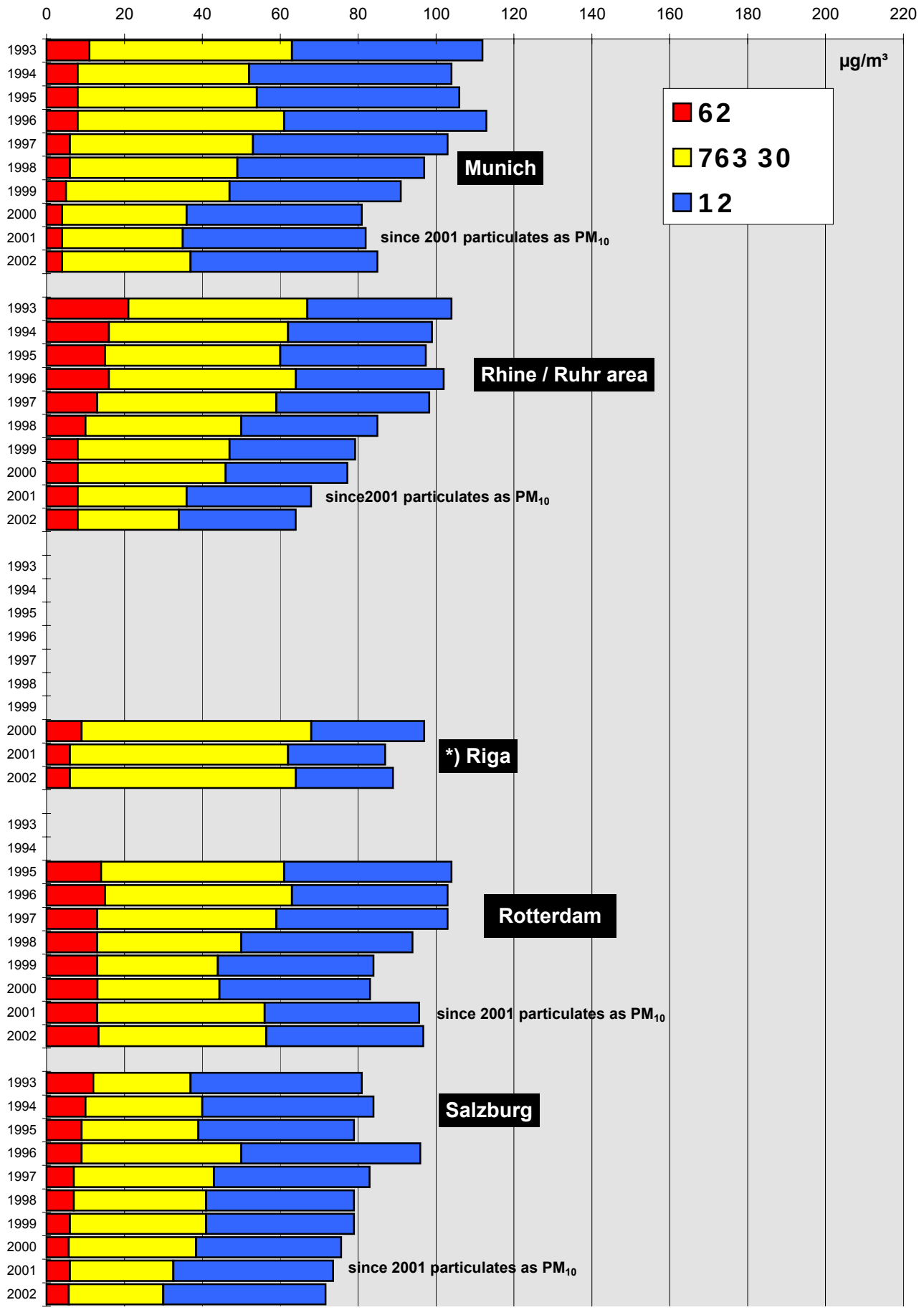


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002

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

(mean of all monitoring stations)

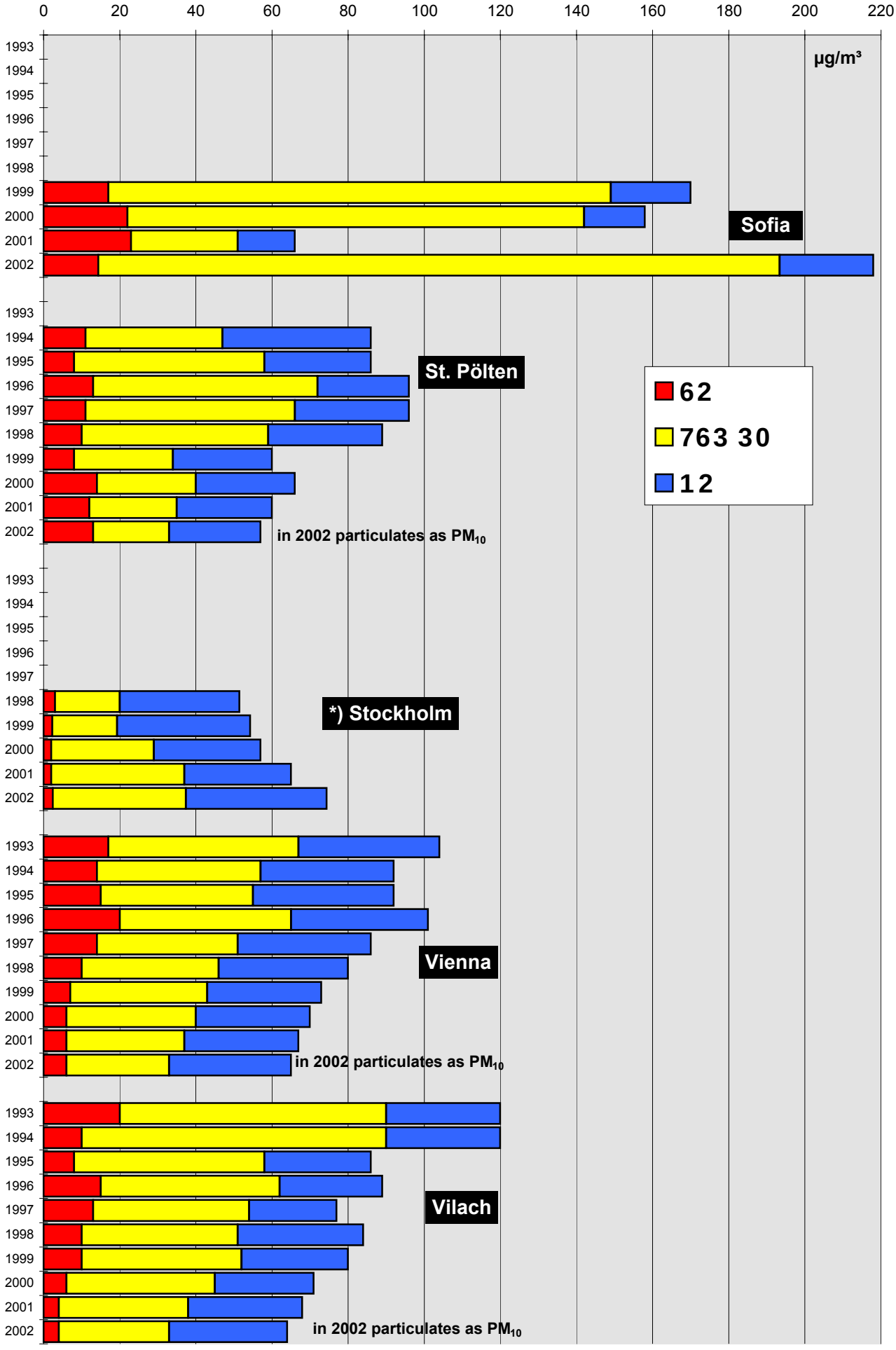


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002

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

(mean of all monitoring stations)

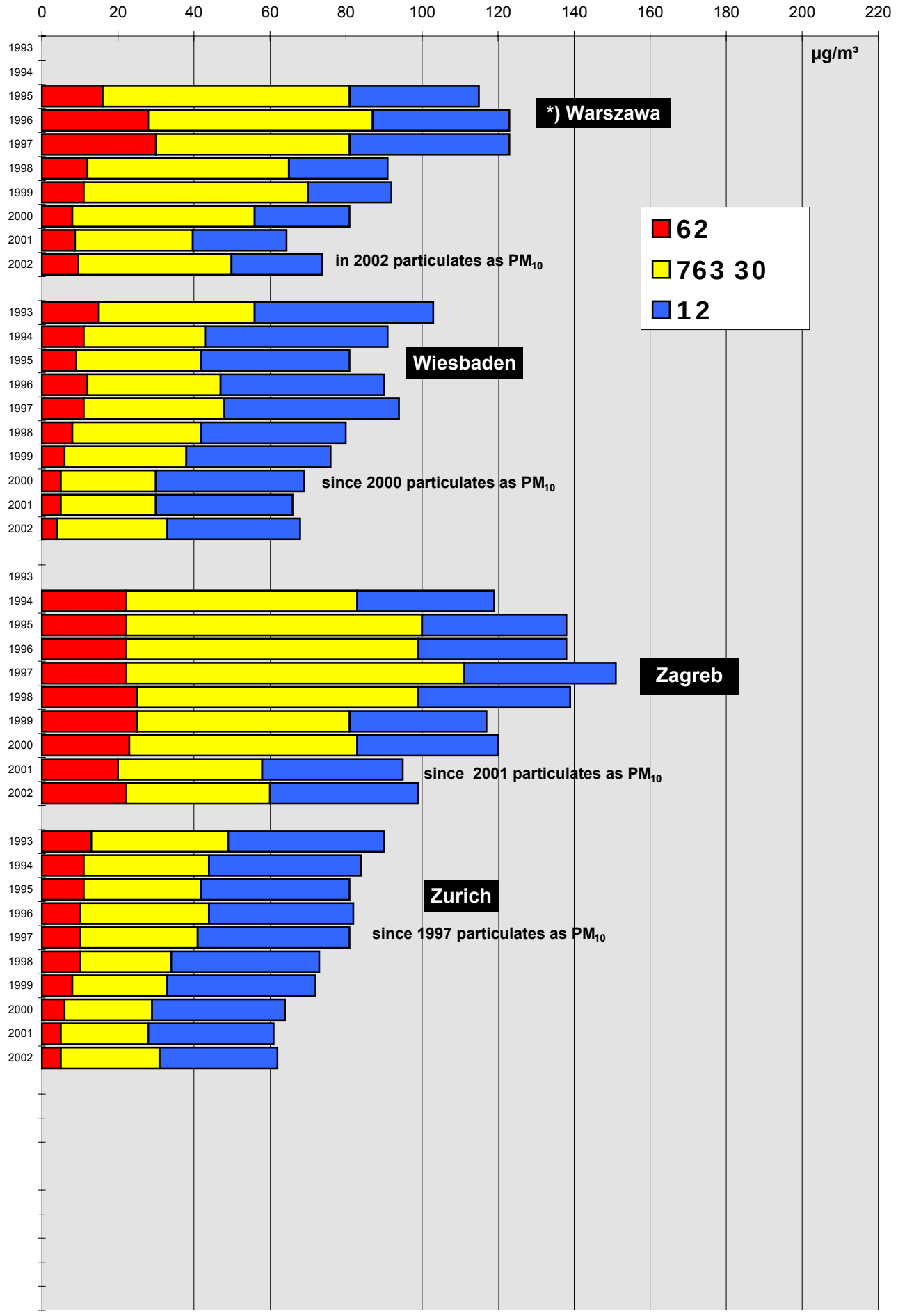


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2002

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

(mean of all monitoring stations)



*) particulates calculated as PM_{10}

Luftgütekennzahlen 2002

der einzelnen

Vergleichsregionen

Immission Reference Values 2002

Of All Compared Regions

Reference Numbers for The Air Quality 2002

Barcelona

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. **) 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max.***) 98-Percentile per year [2] (µg/m³)
SO_2	2	4	8	22	78	154	-	24
PM_{10}	1	40	69	130	519	844	-	120
NO	4	50	138	366	842	1140	-	318
NO_2	4	54	80	138	219	273	-	132
CO	4	770	1930	3610	7530	9800	-	3500
O_3	4	28	60	104	140	166	-	96
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							86

COMMENTS:

*) Max. 3h mean value ⸍; Static average (not moving average)

**) Max. 98 percentile per year; Maximum 98 percentile of 1-hour values

***) CO; figures are expressed in mg/m⸗

****) PM_{10} without correction factor

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for The Air Quality 2002

Basel

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	6	13	37	84	99	129	62
PM_{10}	1	25	44	94	255	310	364	103
NO	1	9	28	73	167	178	202	110
NO_2	1	25	44	65	87	92	95	76
CO	0	-	-	-	-	-	-	-
O_3	1	45	77	133	209	216	217	177
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							22

Belfast

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	2	9	22	113	237	314	327	49
PM_{10}	2	17	24	99	185	317	-	68
NO	1	18	48	264	934	1035	-	108
NO_2	1	31	40	96	236	259	-	77
CO	1	348	464	1972	4176	4640	-	1160
O_3	1	38	56	80	102	106	-	82
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							5

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Berlin

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 8-h- mean (2) (µg/m³)	Max. 1 h- mean (2) (µg/m³)	Max. 1/2 h- mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	10/4/3/3	5/4/5/7	-	43/40/35/43	-	194/92/70/194	-	32/25/28/32
station type	a/b/c/d	a/b/c/d	-	a/b/c/d	-	a/b/c/d	-	a/b/c/d
PM_{10}	12.09.2003	31/28/39	-	177/173/177	-	2327/787/2327	-	103/90/103
station type	a/d/e	a/d/e	-	a/d/e	-	a/d/e	-	a/d/e
NO	21/7/9/5	23/4/11/70	-	351/93/153/351	-	821/251/455/821	-	400/53/111/400
NO_2	21/7/9/5	30/17/28/53	-	134/70/76/134	-	201/116/165/201	-	140/64/79/140
station type	a/b/c/d	a/b/c/d	-	a/b/c/d	-	a/b/c/d	-	a/b/c/d
CO	13/4/4/5	600/300/400/1000	-	-	5900/1500/2900/5900	7700/2000/4200/7700	-	4300/700/1300/4300
station type	a/b/c/d	a/b/c/d	-	-	a/b/c/d	a/b/c/d	-	a/b/c/d
O_3	10.07.2003	44/46/40	-	-	190/190/176	210/210/201	216/216/202	134/134/124 3) 145/145/135 4)
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							**91**

Comments:

SO_2, NO, NO_2, CO, O_3 3): 98-Percentile of 1h mean values
PM_{10}: 98-perc. of daily mean value
O_3 4): 98-percentile of max. daily 8h-mean value
max. monthly mean and max. 3h-mean is not calculated
For CO und Ozone the max. 8-h-means are determined
max. daily means are not calculated for CO and Ozone
max. 1/2h-means are only calculated for Ozone

a) all monitoring stations
b) Berlin-Outskirts
c) Berlin-Centre
d) traffic influenced stations
e) background stations

(1) arithmetic mean of all monitoring stations of an immission-area
(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Birmingham

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	2	6	9	25	73	97	116	25
PM_{10}	2	16	20	54	298	491	-	43
NO	2	14	38	164	412	570	-	108
NO_2	2	32	45	74	113	134	-	75
CO	2	290	580	1276	2784	3596	-	1044
O_3	2	39	59	89	129	134	-	88
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							1

Bludenz

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	4	12	26	37	48	49	18
TSP	1	30	53	111	246	281	286	92
PM_{10}	-	-	-	-	-	-	-	-
NO	1	17	74	217	370	424	480	126
NO_2	1	28	55	92	119	127	142	80
CO	1	-	-	-	-	-	-	-
O_3	1	49	75	126	204	207	208	140
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							-

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality

2002

Bristol

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	1	7	10	20	73	120	120	23
PM_{10}	1	20	23	57	71	80	-	47
NO	1	36	69	233	433	531	-	245
NO_2	1	37	50	96	132	161	-	90
CO	2	754	1624	3364	6380	7076	-	3480
O_3	1	38	53	82	109	122	-	82
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							1

Brussels

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	8	7	20	41	72	84	89	29
PM_{10}	6	36	73	189	571	1043	1207	138
NO	10	21	132	260	500	658	712	218
NO_2	10	40	86	113	181	239	250	101
CO	7	450	1190	1980	3180	4120	4150	1880
O_3	7	34	64	106	196	208	208	110
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							153

Correction factor for PM_{10} : 1.37 for FAG and 1.47 for TEOM monitors

(1) arithmetic mean of all monitoring stations of an immission-are

(2) highest monitored value of an immission-area

MAGISTRAT LINZ

Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Chemnitz

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO2	1	4	11	27	74	91	103	25
PM10	2	25	32	75	-	-	-	58
NO	2	24	59	172	539	654	718	175
NO2	2	34	48	89	212	205 ?	440	91
CO	1	700	1020	2400	5100	6900	7100	2500
O3	2	43	66	115	171	179	183	126
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							20

Copenhagen (monitoring station at roof-level)

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	25	-	83	-	-	-	-
NO	1	4	-	-	95	190	-	27
NO_2	1	20	-	-	78	93	-	58
CO	1	328	-	809	-	2381	-	786
O_3	-	-	-	-	-	-	-	-
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							-

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality
2002

Copenhagen (monitoring station at street-level)

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	3,8	-	-	20	43	-	13
PM_{10}	2	45	-	144	-	-	-	-
NO	2	60	-	-	471	871	-	243
NO_2	2	54	-	-	149	178	-	119
CO	2	980	-	2471	-	9553	-	2781
O_3	2	29	-	96	-	107	-	80
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							-

Dornbirn

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	3	7	14	31	47	57	11
PM_{10}	1	14	24	50	215	313	336	45
NO	1	30	61	165	425	524	540	162
NO_2	1	37	69	116	155	175	185	96
CO	1	500	1100	2200	4100	4500	4700	1600
O_3	-	-	-	-	-	-	-	-
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							0

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Dresden

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	2	6	22	69	104	108	111	45
PM_{10}	2	30	43	114	-	-	-	68
NO	2	24	59	186	379	422	442	137
NO_2	2	38	53	83	116	131	145	86
CO	2	500	890	2100	3200	3800	4100	1700
O_3	2	39	66	114	170	182	183	121
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							36

Edinburgh

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	7	12	40	103	196	197	27
PM_{10}	1	21	35	77	209	260	-	58
NO	1	37	51	176	337	525	-	146
NO_2	1	48	58	87	128	152	-	96
CO	1	464	580	1160	3596	4176	-	1160
O_3	1	34	42	70	99	104	-	76
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							8

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Frankfurt

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	5	5	14	38	50	50	62	28
PM_{10}	5	29	49	127	381	463	768	90
NO	5	30	71	192	384	692	779	185
NO_2	5	42	60	113	140	168	183	98
CO	4	500	800	1700	3500	4700	5800	1600
O_3	5	36	65	111	232	244	249	121
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							44

Gothenburg

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	3	3	6	13	31	43	-	14
PM_{10}	1	18	25	60	137	284	-	50
NO	2	15	49	303	643	825	-	154
NO_2	3	27	37	105	186	261	-	88
CO	1	310	510	1980	3800	5460	-	1100
O_3	3	52	83	109	174	179	-	108
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							10

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Graz

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	2	7	17	31	56	62	75	27
TSP	3 *)	43	88	176	377	548	845	147
PM_{10}	3 **)	44	77	154	533	726	768	132
NO	5	40	146	369	657	883	975	317
NO_2	5	43	69	116	202	209	211	99
CO	2	700	1800	3500	6100	6500	7600	3200
O_3	4	54	115	155	174	176	177	143
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							99

Graz (traffic station)

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	11	29	46	69	74	98	46
TSP	-	-	-	-	-	-	-	-
PM_{10}	1	51	101	229	439	576	605	162
NO	1	74	205	430	741	809	907	380
NO_2	1	45	76	108	169	182	190	103
CO	1	800	1900	4000	6500	7000	8200	3100
O_3	-	-	-	-	-	-	-	-
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							131

*) Station "Graz Nord" TSP monitoring until 31.07.2002

**) Station "Graz Nord" PM_{10} monitoring from 09.08.2002

[1] arithmetic mean of all monitoring stations of an immission-are

[2] highest monitored value of an immission-are

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2001

Hallein

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	2	4	-	26	54	72	113	15
PM_{10}	1	28	-	95	-	-	-	84
NO	-	-	-	-	-	-	-	-
NO_2	2	46	-	144	187	203	208	101
CO	1	720	-	-	4800	5170	5900	2150
O_3	1	66	-	-	181	190	190	136
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							28

The high NO_2 values were monitored on a day with heavy inversions

Hamburg

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	11/2*	5/9*	14/14*	54/39*	179/113*	294/169*	462/224*	47/39*
TSP	3	36	63	227	700	872	1104	111
PM_{10}	7/2*	24/33*	41/45*	196/191*	578/372*	769/514*	771/649*	69/82*
NO	11/6*	9/64*	52/137*	158/336*	502/645*	572/778*	587/850*	151/383*
NO_2	11/6*	24/54*	47/72*	76/131*	119/202*	144/246*	302/152*	84/147*
CO	3/6*	451/972*	741//1558*	2063/2881*	4712/5931*	5774/9539*	6939/18361*	1228/3723*
O_3	6	40	61	102	149	156	161	111
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							33/43*

* traffic-influenced monitoring stations

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2001

Innsbruck

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	1	6	24	36	66	73	74	32
TSP	2	37	117	208	468	618	651	170
PM_{10}	2	31	98	173	390	515	543	142
NO	2	43	173	314	572	654	676	285
NO_2	2	40	70	96	146	170	174	93
CO	1	700	2100	3500	6500	7800	10000	3100
O_3	2	47	80	116	153	160	160	125
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							50

Karlsruhe

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	2	6	16	49	122	168	-	27
PM_{10}	3/1*	28/30*	50/60*	121/120*	229/-	331/-	-	85/-
NO	3/1*	26/69*	88/129*	211/284*	669/765*	761/922*	-	169/275*
NO_2	3/1*	34/62*	58/75*	102/127*	141/197*	166/216*	-	94/134*
CO	3/1*	360/960*	900/1400*	1700/3000*	3600/9500*	5200/10400*	-	1900/2900*
O_3	3	37	72	114	221	254	-	126
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							27/33*

* traffic-influenced monitoring stations

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Klagenfurt

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	2	10	16	27	73	124	155	39
TSP	2	36	77	147	339	569	691	142
PM_{10}	1	37	78	127	-	-	-	-
NO	2	36	140	249	600	676	699	272
NO_2	2	35	67	96	155	165	166	96
CO	2	592	1814	3057	7122	7739	7893	2889
O_3	2	44	84	122	156	162	163	127
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							58

Leeds

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	9	19	84	139	176	245	48
PM_{10}	1	19	24	74	146	184	-	52
NO	1	28	75	422	714	783	-	163
NO_2	1	39	55	116	158	177	-	81
CO	1	464	928	2320	5336	6264	-	1392
O_3	1	35	52	78	124	126	-	82
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							3

[1] arithmetic mean of all monitoring stations of an immission-area
[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Leipzig

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO2	2	4	8	19	37	67	105	15
PM10	3	30	54	121	-	-	-	88
NO	2	31	89	172	429	501	615	192
NO2	2	35	60	86	130	149	154	95
CO	1	900	1250	2100	4300	5400	6500	2500
O3	2	41	68	103	167	172	173	127
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							63

Leoben/Göß/Donawitz

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h- **) mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	3	5	12	28	110	157	209	27
TSP	2	34	60	247	224	580	685	112
PM_{10}	1*)	-	35	185	438	477	481	-
NO	3	42	91	184	364	390	433	190
NO_2	3	30	48	63	67	74	115	70
CO	1	800	1700	3600	8000	8400	11700	3300
O_3	1	36	63	97	163	166	167	121
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							7

*) PM_{10} only monitored at station Donawitz, 25.7.2002-1.1.2003

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Linz

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	9	4	10	34	130	164	195	34
TSP	8	33	60	216	508	766	1049	144
PM_{10}	7	27	42	126	287	308	369	112
NO	10	25	88	305	599	875	889	253
NO_2	10	30	55	91	142	162	174	97
CO	9	500	1200	2500	6000	10900	13100	2500
O_3	4	45	80	118	178	183	185	129
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							78

Lisbon

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	5	4	22	65	-	385	-	55
PM_{10}	3	43	72	151	-	359	-	154
NO	8	30	197	442	-	1238	-	435
NO_2	8	34	88	150	-	226	-	124
CO	8	432	1366	2746	-	13218	-	3013
O_3	4	49	75	124	-	211	-	111
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							222

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Liverpool

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	5	7	27	79	103	120	28
PM_{10}	1	18	23	59	112	115	-	45
NO	1	30	55	174	488	536	-	131
NO_2	1	36	46	79	120	127	-	84
CO	1	464	580	1276	2668	2668	-	1160
O_3	1	42	53	84	103	106	-	86
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							2

London

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	14	7	14	40	99	180	202	39
PM_{10}	11	22	38	100	581	664	-	82
NO	22	43	208	378	745	789	-	405
NO_2	22	49	100	142	255	369	-	154
CO	16	587	1856	2900	8120	8352	-	3712
O_3	14	31	70	104	176	187	-	104
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							29

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Luxemburg

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	2	6	14	31	49	60	63	22 (1/2h value)
PM_{10}	1	20	27	55	97	167	243	47 (daily value)
NO	2	36	79	200	413	474	511	195 (1h value)
NO_2	2	43	60	103	140	152	168	101 (1h value)
CO	1	500	700	1600	2800	3200	3900	1400 (3h value)
O_3	2	33	63	99	183	192	197	118 (1h value)
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							4

COMMENTS: All results related to 20°C and 1013 hPa; PM_{10} related to 25°C und 1013 hPa.
Correction factor for PM_{10}: 1,2

Lyon (urban site)

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	9	5	28	87	-	358	-	37
PM_{10}	4	22	45	117	-	198	-	73
NO	4	26	151	495	-	815	-	292
NO_2	4	37	82	163	-	250	-	113
CO	-	-	-	-	-	-	-	-
O_3	7	40	82	115	-	246	-	128
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							-

(1) arithmetic mean of all monitoring stations of an immission-area
(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Lyon Traffic site

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	6	9	26	59	-	279	-	36
PM_{10}	4	30	73	148	-	494	-	96
NO	7	96	337	588	-	1218	-	601
NO_2	7	61	85	199	-	389	-	159
CO	4	1076	2584	5415	-	11439	-	4458
O_3	-	-	-	-	-	-	-	-
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							83

Madrid

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max.**) 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max.***) 98-Percentile per year (2) (µg/m³)
SO_2	24	13	40	74	148	164	-	62
***) PM_{10}**	23	33	52	107	239	264	-	128
NO	24	40	132	275	653	744	-	309
NO_2	24	62	123	183	312	407	-	159
CO	24	760	1910	4230	10620	13920	-	5310
O_3	24	33	68	107	162	170	-	120
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							98

*) PM_{10} without correction factor

**) Static average (not moving average)

***) max. 98 percentile of 1-h-values.

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Mannheim

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	3	8	22	115	302	773	-	43
PM_{10}	3/1*	28/33*	51/60*	147/130*	412/-	576/-	-	86/-
NO	3/1*	20/53*	54/93*	179/188*	440/377*	479/516*	-	165/203*
NO_2	3/1*	34/53*	53/70*	119/120*	151/180*	161/224*	-	89/111*
CO	3/1*	260/680*	700/1400*	200/2300*	3500/4100*	4200/4800*	-	1300/2200*
O_3	3	37	61	112	220	233	-	121
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							33/44*

* traffic-influenced monitoring stations

Milan

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 2-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 95-Percentile mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	5	13	46	82	-	171	-	-
TSP	1	64	102	179	336	-	110 *)	129 **)
PM_{10}	1	50	101	229	374	-	-	-
$PM_{2,5}$	1	35	80	221	326	-	-	-
NO	10	71	280	610	-	1279	-	-
NO_2	10	66	125	219	-	391	-	157 ***)
CO	5	1700	4800	7500	-	17500	-	-
O_3	3	34	96	148	-	275	-	-
Benzene	2	6	17	28	-	53	-	-
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							177

Comments:

*) 95th percentile of the average 24 hour concentration levels

**) 98th percentile of the average 24 hour concentration levels

***) 98th percentile of the average 1 hour concentration levels

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Munich

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	4	4	9	28	45	52	52	17
PM_{10}	7	33	68	155	344	-	-	95
NO	8	41	123	391	785	966	1113	320
NO_2	8	48	74	151	229	263	275	126
CO	8	800	1200	3700	12700	12700	13500	2500
O_3	3	38	71	109	169	182	182	118
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							75

Riga

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	3/1*	5/9*	14/11*	41/29*	91/42*	126/56*	145/70*	36/20*
PM_{10}	1*	58	78	215	-	-	-	146
NO	-	-	-	-	-	-	-	-
NO_2	3/1*	18/44*	35/62*	71/140*	118/170*	136/182*	138/188*	77/109*
CO	1*	417	948	-	2848**	11107	-	2405
O_3	3/1*	65/55*	87/70*	114/89*	122/110*	123/113*	125/121*	97/91*
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							74

August 2002 in Latvia was in average 3.1 °C warmer than usually, but the summer mean temperature in the country 18° C was the largest during the all period of meteorological observations in Latvia. In many places of Latvia the daily maximum temperature in August exceeded 30 °C. The mean precipitation amount in August in Latvia was only 6 % of the long-term observations data characterizing August as a driest August during the all period of meteorological

* traffic-influenced monitoring stations

** max 8h mean value

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-are

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality
2002

Rhine / Ruhr area

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	21	8	26	-	-	-	868	95
TSP	24	37	76	211	-	-	-	129
PM_{10}	24	26	53	148	-	-	-	90
NO	37	17	73	-	-	-	1003	274
NO_2	37	30	47	-	-	-	240	-
CO	5	300	870	-	-	-	7700	2100
O_3	23	34	64	-	-	230	-	116
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							48

Comments:
relation for gaseous substances: 20 °C
without traffic stressed monitoring stations and special monitorings
The figures for PM_{10} are calculated from TSP as followed:
PM_{10} = 0,7 * TSP

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Rotterdam

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	9	13	29	107	-	406	-	71 (1h value)
TSP	5	34	54	119	-	-	-	92 (daily value)
PM_{10}	3	43	58	196	-	>1000	-	114 (1h value)
NO	3	21	50	261	-	579	-	144 (1h value)
NO_2	3	40	54	103	-	253	-	93 (1h value)
CO	-	-	-	-	-	-	-	-
O_3	3	38	58	107	-	199	-	114 (1h value)
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							103

The PM_{10} data for Rotterdam are higher than the TSP data. This is strange and unfortunate but there is an explanation (in fact two).
The TSP and the PM_{10} networks do not coincide. TSP measurements are mainly located in the harbour area where we have a lot of transhipment and storage of dry bulk such as coal and ore but also a lot of clean wind from the sea. PM_{10} measurements are mainly in the city and petrochemical industrial area with numerous local sources and a slightly higher background than at the extreme west of our area of operation. So, to some extend it is correct that PM_{10} levels are higher as these measurements occur in areas with more and other pollution. However, even our city TSP measurement site gives lower readings than a nearby PM_{10} measurement site.
As you probably know, automated PM_{10} measurements are corrected for the potential loss of volatile particles. Due to this correction factor or PM_{10} measurements turn out to be higher than our TSP readings if they are compared at the same site. This is a very unsatisfactory situation but we don't have an easy solution.
Our correction factor is based on a limited local comparison and a generic correction used country wide. The aim of the local research was to make the DCMR readings comparable to our national (reference) network. This has led to a substantial correction factor. Though this factor is marred by several uncertainties, it is the best we have for the moment.
We are busy looking into this matter but for the moment we don't know what the truth is (TSP readings too low, PM_{10} too high)? Based on incomplete data and model calculations I have the impression that our correction factor is a bit too high so actual PM_{10} levels could be slightly lower (5 % ??). However, as far as I can see this will not be enough to cover the gap between the two types of measurements.
I hope that in one or two years from now we will have site and season specific corrections factors and we will have better PM_{10} concentrations.

[1] arithmetic mean of all monitoring stations of an immission-area
[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Salzburg

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	3	5,7	-	20	32	47	65	17
PM_{10}	3	24,3	-	95	-	-	-	84
NO	-	-	-	-	-	-	-	-
NO_2	3	41,7	-	150	212	240	251	111
CO	2	690	-	-	7000	7060	7070	2290
O_3	3	42	-	-	186	190	192	142
PM_{10}:	NumNumber of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							34

The high NO_2 values were monitored on a day with heavy inversions

Sofia

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	8	14	24	280	-	988	-	92
TSP	4	195	331	1110	-	-	-	-
PM_{10}	-	-		-	-	-	-	-
NO	-	-		-	-	-	-	-
NO_2	8	25	41	-	-	312	-	91
CO	-	-	-	-	-	-	-	-
O_3	-	-	-	-	-	-	-	-
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							**–**

The Ambient Air Quality in Sofia has been controlled by 8 stations – 4 stations with manual sampling and 4 automatic stations.
The manual stations operate in unified sampling regime and standardized analytical methods. The sampling frequency.
is 4 times a day, 5 days a week. The automatic stations operate continuously
The basic measured pollutant are: TSP, PM_{10}, Pb aer., SO_2, NO_2, H_2S, Phenol, CO, NO, and O_3.
The automatic station measure also meteorological parameters: wind speed, wind direction, temperature, relative humidity, atmospheric pressure and global radiation.

(1) arithmetic mean of all monitoring stations of an immission-are

(2) highest monitored value of an immission-are

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Stockholm

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	1	2,4	5	16	57	83	-	10
PM_{10}	2	35	97*	333*	682*	723*	-	245
NO	-	-	-	-	-	-	-	-
NO_2	3	37	73	124	155	189	-	125
CO	2	850	1100	2700	11300	12600	-	1900
O_3	1	53	76	104	136	143	-	106
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							110

* traffic-influenced monitoring stations

St. Pölten

	# of monitoring stations	annual mean (1) (µg/m³)	Max. monthly mean (2) (µg/m³)	Max. daily mean (2) (µg/m³)	Max. 3-h-mean (2) (µg/m³)	Max. 1 h-mean (2) (µg/m³)	Max. 1/2 h-mean (2) (µg/m³)	Max. 98-Percentile per year (2) (µg/m³)
SO_2	1	13	20	77	248	280	312	77
TSP	1	24	28	97	246	275	401	66
PM_{10}	1*)	20	23	80	205	229	334	55
NO	1	7	14	46	172	201	220	46
NO_2	1	24	31	56	91	99	104	58
CO	1	441	614	957	2123	2258	2700	931
O_3	1	48	74	114	161	165	178	136
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							9

*) PM_{10} monitoring from 29.10.2002

(1) arithmetic mean of all monitoring stations of an immission-area

(2) highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Vienna

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max.99,9-Percentil 3-h-mean [2] (µg/m³)	Max.99,9-Percentil 1 h-mean [2] (µg/m³)	Max.99,9-Percentil 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	17	6	20	60	87	93	98	40
TSP	15	32	62	157	257	265	278	126
PM_{10}	2	27	44	92	-	-	-	76 (daily value)
NO	17	21	185	353	588	651	664	455
NO_2	17	32	68	120	161	170	173	126
CO	4	640	1140	2050	3290	3660	3810	2500
O_3	5	52	96	134	166	172	173	163
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							57

Villach

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	4	15	23	40	46	50	21
TSP	1	34	56	242*	881*	1083*	1148*	93
PM_{10}	1	29	50	149	-	-	-	-
NO	1	35	94	171	338	449	510	184
NO_2	1	31	52	76	130	142	145	77
CO	1	632	1643	2561	5359	6349	7133	2528
O_3	1	31	60	99	149	151	152	112
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							24

* caused by long distance transport of sahara-dust due to stormy conditions

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Warsaw

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	16	10	106	196	-	-	-	130
TSP *)	1	85	108	219	-	-	-	169
PM_{10}	5	40	73	216	-	-	-	146
NO	3	8	23	164	-	292	292	31
NO_2	15	24	44	189	-	-	-	103
CO	3	855	905	4310	-	6680	-	1890(1h value)
O_3	2	45	68	98	-	176	182	88
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							-

*) Traffic Station

Wiesbaden

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	4	10	26	44	47	52	17
PM_{10}	1	29	44	118	173	260	272	86
NO	1	24	55	178	326	362	414	161
NO_2	1	35	44	97	144	150	158	78
CO	1	400	600	1500	2400	2900	3500	1300
O_3	1	33	58	96	206	244	252	113
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							35

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Reference Numbers for Air Quality 2002

Zagreb

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	6	22	52	93	-	-	-	81
TSP	5	50	92	180	-	-	-	153
PM_{10}	1	38	51	136	-	-	-	98
NO	-	-	-	-	-	-	-	-
NO_2	5	39	52	99	-	-	-	82
CO	-	-	-	-	-	-	-	-
O_3	5	38	95	241	-	-	-	136
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							-

Zurich

	# of monitoring stations	annual mean [1] (µg/m³)	Max. monthly mean [2] (µg/m³)	Max. daily mean [2] (µg/m³)	Max. 3-h-mean [2] (µg/m³)	Max. 1 h-mean [2] (µg/m³)	Max. 1/2 h-mean [2] (µg/m³)	Max. 98-Percentile per year [2] (µg/m³)
SO_2	1	5	10	24	42	47	53	33
PM_{10}	1	26	41	105	209	272	515	103
NO	1	15	32	143	247	281	311	166
NO_2	1	31	44	69	98	105	106	82
CO	1	500	700	1500	2500	2900	3300	1800
O_3	1	41	74	108	184	200	201	151
PM_{10}:	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2002 (measured values including correction factor for the monitoring method used according to EU-directive 1999/30/EC)							23

[1] arithmetic mean of all monitoring stations of an immission-area

[2] highest monitored value of an immission-area

MAGISTRAT LINZ
Amt für Natur- und Umweltschutz

Publikationsliste des ANU-Grüne Reihe

1/74 **Gesetzesantrag: Umweltfreundliche Energieträger I**
J. A. Schedling, J. Wanek

2/74 **Gesetzesantrag: Umweltfreundliche Energieträger II, III**
J. Frenzel

1/76 **Emissionen und Immissionen des Kraftfahrzeugverkehrs der Landeshauptstadt Linz**
(Kurzfassung)
J. R. Möse, A. Pischinger, A. Litschmann, W. Mahringer

1/81 **Emissionskataster für das Stadtgebiet von Linz (Kurzfassung)**
Gradischnik

1/83 **Nitrosamine; Eigenschaften, Vorkommen, Messungen im Großraum Linz**
E. Glötzl

1/84 **Forstschädliche Luftverunreinigungen im Raum Linz**
Herbert Gutternigg

1/87 **Immissionserhebung Nutzpflanzen Linz 1986**
Sonderdruck Naturkundliches Jahrbuch
Roland Mayr

2/87 **Immissionsmessungen in der Nähe stark befahrener Straßenzüge**
(Kurzfassung)
Gerald Binder, Erhard Glötzl

1/89 **Studie über die Linzer Chemischreinigungsbetriebe; Emissionsverhalten, Immissionssituation, Lebensmittelkontamination**
R. Doppler, Erhard Glötzl

2/89 **Emissionsmessungen an einem Solo-Bus der Städtischen Verkehrsbetriebe**
(Kurzfassung)
Gerald Binder, Erhard Glötzl

3/89 **Umweltampel, Immissionsmessung**
(Kurzfassung)
Gerald Binder, Erhard Glötzl

4/89 **Periodenvergleich Staubniederschlag Linz 1968/69, 1969/70, 1977/78, 1988/89**
(Kurzbericht)
Wilfried Hager, Erhard Glötzl

5/89 **Schallpegelmessungen an Personenkraftwagen bei Tempo 30 und Tempo 50 auf einer Versuchsstrecke**
Herbert Gutternigg, Reinhard Doppler, Thomas Resch

6/89 **Bodenuntersuchungen in Linzer Ackerböden**
K. Aichberger

7/89 **Tagungsband über das PVC-Hearing Linz 1988**

8/89 **Flechtenuntersuchung 1988; Vergleich mit der Untersuchung im Jahre 1987**
Roman Türk

9/89 **Luftgütevergleich österreichischer Städte 1988**
Wilfried Hager, Erhard Glötzl

10/89 **Bericht über das Bürgerbeteiligungsverfahren für den Versuchsbetrieb der Hochtemperaturvergasungsanlage im Werksgelände der VÖEST**
(Kurzfassung)

11/89 **Geruchsauswirkungen eines Gießereibetriebes**
Thomas Resch, Erhard Glötzl

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K. Aichberger, G. Hofer, H. Thalhammer

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K. Öllinger

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Walter Medinger, Erhard Glötzl

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(Kurzfassung)

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Martin Sonnleitner

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I. Heber, W. Heber, Roman Türk

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Walter Medinger

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Endbericht, Kurzfassung
Hans Gsellmann. B. Holub, Fereydoun Sameh, Wilfried Hager

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Manfred Neuberger

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Wilfried Hager, Fereydoun Sameh

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Walter Medinger, Wolfgang Hansl

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Wilfried Hager, M. Joos

5/95 **Immissionsmessung Linz-Ebelsberg - „Ufer-Kurve" (Kurzfassung)**
Wilfried Hager, Harald Panhofer

1/96 **Bilanz der Quecksilberemissionen aus Quellen im Linzer Stadtgebiet**
Walter Medinger, Gerhard Utri

2/96 **Aktivitäten der Stadt Linz auf dem Gebiet des Klimaschutzes (Stand Anfang 1996)**
Gerhard Utri

3/96 **Longitudinalstudie über Lunge und Luftqualität; Veränderung der Luftqualität in Linz und der Lungenfunktion**
Manfred Neuberger

4/96 **Staubniederschlag im Werksgelände und in der Umgebung der Linzer Großbetriebe 1993/94**
Wilfried Hager, Harald Panhofer

5/96 Immissionsbelastung an PCDD und PCDF in Linz; sämtliche Messungen bis 1995
Walter Medinger, Harald Panhofer

6/96 **Luftgütedaten 1995; Nationaler und internationaler Städtevergleich**
Wilfried Hager, Fereydoun Sameh

7/96 Baubiologische Tage 1996 - Tagungsband

8/96 **Beschwerden über Umweltbelastungen 1988 - 1995**
Herbert Gutternigg, Thomas Resch

1/97 **Modellierung des Schadstofftransports und der Schadstoffverteilung zur Anwendung über städtischem Gebiet mit komplexen Geländeverhältnissen**
Thara V. Prabha, Inst. für Meteorologie und Physik, Universität für Bodenkultur, Wien

2/97 **Air Quality Data 1996; Austrian and International Comparison of Cities and Regions**
Wilfried Hager, Fereydoun Sameh

1/98 **„Industrieschnee" in Linz 1996, 1997, 1998**
Wilfried Hager

2/98 **Air Quality Data in 1997; Austrian and European Comparison of Cities and Regions**
Wilfried Hager, Fereydoun Sameh

3/98 **Energiebedarf der Haushalte sowie Emissionen des Hausbrandes in der Landeshauptstadt Linz**
Gerhard Utri

4/98 **Wärmeinselstruktur des Linzer Raumes und damit verbundene belüftungsrelevante Strömungssysteme (Zwischenbericht)**
Univ.-Prof. Dr. Erich Mursch-Radlgruber

1/99 **Air Quality Data in 1998; Austrian and European Comparison of Cities and Regions**
Wilfried Hager, Fereydoun. Sameh

1/2000 **Die „Industrieschnee"-Episoden Jänner 1999 und Jänner 2000 in Linz**
Wilfried Hager

2/2000 **Klimauntersuchungen in Linz**
Univ.-Prof. Dr. Erich Mursch-Radlgruber (überarbeitet von Wilfried Hager)

3/2000 **Staubniederschlagsuntersuchungen Linz 1990/91; Bestimmung der Niederschlagsmengen und Staubinhaltsstoffe im Raum Linz**
Wilfried Hager, Harald Panhofer, Fereydoun Sameh

4/2000 **Air Quality Data in 1999; Austrian and International Comparison of Cities and Regions**
Fereydoun Sameh, Wilfried Hager

1/2001 **Air Quality Data in 2000; Austrian and International Comparison of Cities and Regions**
Fereydoun Sameh, Wilfried Hager

2/2001 ---- *Aus Grüner Reihe herausgenommen und als Bericht Rote Reihe 3/2001 veröffentlicht*

3/2001 **Durchführung einer Evaluierung für die Errichtung einer Abfallbehandlungsanlage für die im Raum Linz anfallenden Abfälle – Verfahrensauswahl**
BZL Kommunikation und Projektsteuerung GmbH (Dr. Uwe Lahl) und D.I. Kurt Scheidl, Zivilingenieur für Technische Chemie

1/2002 **Die Moosflora von Linz und ihre Bedeutung für die Bioindikation**
H. Zechmeister, Institut für Ökologie und Naturschutz der Universität Wien

2/2002 **Staubniederschlag 1998/99; Bestimmung der Niederschlagsmengen und Staubinhaltsstoffe im Raum Linz**
(Textteil und zusammengefasste Ergebnisse)
Wilfried Hager

3/2002 **Staubniederschlag 1998/99; Bestimmung der Niederschlagsmengen und Staubinhaltsstoffe im Raum Linz**
(Detailergebnisse, Tabellenteil, Stationsbeschreibungen)
Wilfried Hager, Fereydoun Sameh

4/2002 **Air Quality Data in 2001; The Comparison of Cities and Regions in Europe**
Fereydoun Sameh, Wilfried Hager

5/2002 **Umweltverträglichkeitsprüfung für eine Chemieanlage unter Bürgerbeteiligung ∝**
Ein Fall unmittelbarer Anwendung der UVP-Richtlinie der EU
Johannes Hanetseder, Alfred Klinglmair, Josef Knipp, Walter Medinger und Daniela Palk

6/2002 **Verminderung der Luftbelastung und Verbesserung der Lungenfunktion österreichischer Kinder**
Prof. Manfred Neuberger, Inst. für Umwelthygiene, Univ. Wien

7/2002 **Wärmeinsel Linz und belüftungsrelevante Strömungssysteme**
Univ.-Prof. Dr. Erich Mursch-Radlgruber, Univ. für Bodenkultur, Wien

8/2002 **50 (Plus-)Punkte für Weltklima**
Klimaschutzmaßnahmen der Stadt Linz im Rahmen des Klimaschutz-Aktionsprogramms
Gerhard Utri

1/2003 **Feinstaubproblematik in Linz**
Herwig Marhold

2/2003 **Linzer Reparatur- und Verleihführer 2003/04**

3/2003 **Air Quality Data in 2002; The Comparison of Cities and Regions in Europe**
Fereydoun Sameh, Wilfried Hager