MUNICIPALITY OF LINZ
Environmental and Technical Center

Report Nr. 1/2014

Air Quality Data in 2013

The Comparison of Cities and Regions in Europe

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Environment + Technology

LINZ verändert

Publisher:
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Einführung

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

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

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

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Introduction

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

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

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

Luftgütevergleiche werden durch das Umwelt- und Technik-Center (früher: Amt für Natur- und Umweltschutz) bereits seit vielen Jahren durchgeführt, genau genommen seit 1989. Anfänglich wurden nur österreichische Städte miteinander verglichen. In den folgenden Jahren wurde der Städtevergleich aufgrund des großen Interesses auf immer mehr europäische Städte und Regionen ausgedehnt. Im Jahr 2013 wurden Städte bzw. Regionen aus Deutschland, Großbritannien, Frankreich, Schweden, Italien, Schweiz, Spanien, Polen, Bulgarien, Niederlande, Tschechien, Ungarn, Griechenland, Lettland, Portugal, Slowakei und Kroatien mit einbezogen. Die Städte Athen, Thessaloniki, Brüssel, Kopenhagen, Luxemburg und Zagreb lieferten für das Jahr 2013 keine Daten.	Comparisons of the air quality have been carried out by our organization already for a number of years, exactly since 1989. At first only Austrian Cities were compared. During the last years the comparison was extended to other European cities and regions, for there is much interest in such studies. The comparison of the air quality of the year in 2013 comprised cities and regions of Austria, Germany, cities from Great Britain, France, Sweden, Italy, Switzerland, Spain, Poland, Bulgaria, The Netherland, Czech Republic, Hungary, Latvia, Portugal, Slovakia and Croatia. No data were sent to us by the city of Luxemburg, Sofia and Lisbon in 2013.
Die Stadt Bukarest liefert seit 13 Jahren keine Daten mehr. Sollten diese noch eintreffen, werden sie in künftigen Städtevergleichen in Form von Zeitreihen mit berücksichtigt.	The city of Bucharest has not been delivering any data for 13 years. In the case of delivery to us they will be taken into account for future reports in terms of time series.
Ab dem Jahr 2008 wurde der Luftgütevergleich mit dem lungengängigen Feinstaubanteil $PM_{2,5}$ ergänzt, da diese Partikel erhebliche negative Auswirkungen auf die menschliche Gesundheit besitzen.	Since 2008 the comparison of the air quality has been extended with fine particulate matter $PM_{2,5}$. These respirable particles are responsible for significant negative impacts on human health.
Die Größe des Immissionsgebietes und die Bevölkerungszahl wurden ebenfalls seit 2008 in den Luftgütevergleich aufgenommen, um die Messstellendichte miteinander zu vergleichen.	Since 2008 the comparison is also extended with the immission area and the population in order to compare the closeness of the measurement points.

Kritische Anmerkungen

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

1. die Zahl der Messstellen sehr verschieden ist (die Anzahl der Messstellen pro Messgebiet ist in der Tabelle auf Seite 16 und den nachfolgenden Grafiken angeführt),
2. die Messstellendichte unterschiedlich ist,
3. die Situierung der Messstellen nicht immer vergleichbar ist (In manchen Städten wurde deswegen bei den Schadstoffkomponenten zwischen verkehrsbelasteten Messstationen und anderen Messstationen unterschieden).

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

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

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

Critical remarks

Over and over again it is critically remarked that it is not possible to compare the pollutant stress between monitoring areas. 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 16 and the subsequent charts),
2. the density of distribution of the monitoring stations is different,
3. the location of the monitoring stations is not always comparable (for that reason in some cities the network services distinguish between traffic-stressed and non-traffic-influenced monitoring stations).

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

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

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

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

Immissionskenngrößen

In der vorliegenden Studie wurden verschiedene Immissionskenngrößen erhoben:

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

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

Wie schon in den letzten Berichten, ist der vorliegende Bericht bei den grafischen Auswertungen kürzer gefasst als in den früheren Jahren. Seit 2006 wurden die grafischen Darstellungen für die Perzentile, die max. 3-Stunden-Mittelwerte, die max. Halbstundenmittelwerte und die max. Monatsmittelwerte, da sie im Allgemeinen von nicht so starkem öffentlichem Interesse sind, herausgenommen. Aufgenommen wurden hingegen die grafischen Auswertungen über 1-Stunden-Mittelwerte, die nunmehr fast überall die Norm für die Bewertung von Kurzzeitbelastungen darstellen.

Immission reference values

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

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

The runners of air pollution monitoring networks support 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 is not available but the value for the 95-Percentile is given. In most of the monitoring networks the percentiles are calculated based on the *1/2-hours mean* values of a calendar year, sometimes they were based on the *daily mean* values.

As already done in the latest report the present report has been shortened in comparison to former years, regarding the graphical evaluations of immission reference values. Since 2006 the graphical presentation of percentiles, max. 3h mean values, max. monthly mean values, 1/2h mean values have not been carried out any more, for they seem not to be of such a public interest as others. On the other hand the max. 1h mean values are graphically presented now, for they are nowadays the evaluation standard for short term stress nearly everywhere.

Es wurde also nur ein Teil der zur Verfügung gestellten Luftgütekennzahlen für die Grafiken verwendet. Die kompletten Datensätze können aus den Übersichtstabellen im Anhang entnommen werden.

Verglichene Luftschadstoffe

Folgende Luftschadstoffe wurden miteinander verglichen:

SO_2, CO, NO, NO_2, O_3, Feinstaub (PM_{10} und $PM_{2,5}$)

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

Mehrjahresvergleich

Ein gutes Bild über die Entwicklung der Luftbelastung geben die Grafiken wieder. Dabei wurde von den am Luftgütevergleich teilnehmenden Städten die Entwicklung der Immissionsbelastung von 1993 bis 2013 aufgetragen.

Nach Analyse der Daten, können folgende Aussagen getroffen werden:

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

Only a part of the provided air quality values has been used for graphical evaluation. The whole data set can be obtained from the overview tables of the annex.

Pollutants compared

The following air pollutants have been compared:

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

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

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 2013 are plotted.

The following statements can be given when analysing the data:

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

4. Es zeigt sich, dass in den Städten und Regionen die Schwebstaub-(TSP)-Messungen abgeschaltet wurden. Diese Messungen wurden von Feinstaub (PM_{10}-Messungen) abgelöst. TSP-Messungen wurden daher im vorliegenden Vergleich nicht mehr miteinbezogen.

5. Entwicklung der Langzeitbelastung - Jahresmittelwerte SO_2, Schwebestaub (TSP) (nur bis 2004!), NO, NO_2, CO, und O_3 gegenüber 1993; PM_{10}: gegenüber 2001; $PM_{2,5}$: gegenüber 2008:

   SO_2: Alle Regionen *geringer* belastet

   Staub: TSP-Messung in nahezu allen Regionen eingestellt. Wenn vorhanden, ist die Tendenz zu *geringeren* Belastungen (Vergleich nur bis 2004).

   PM_{10}: uneinheitlich, tendenziell *gleich bleibend* oder *geringer belastet*

   $PM_{2,5}$: uneinheitlich, tendenziell gleich bleibend oder leicht geringer belastet

   NO: uneinheitlich, tendenziell *geringer* belastet

   NO_2: uneinheitlich, tendenziell *geringer* belastet

   CO: alle Regionen *geringer* belastet

   O_3: Belastung tendenziell *gleich bleibend oder leicht erhöht*

4. It can be seen that cities and regions do not monitor TSP any more. These measurements were replaced by monitoring the pollutant PM_{10}. So TSP measurements have not been included in the present report any more.

5. Long term development of the air pollution stress - annual mean values of SO_2, TSP (only until 2004!), NO, NO_2, CO, O_3 in comparison with 1993; for PM_{10}: comparison with 2001; for $PM_{2,5}$: comparison with 2008:

   SO_2: All regions *less* stressed

   TSP: Nearly no TSP-measurements any more. If there is still monitoring, regions are *less* stressed in tendency (Comparison only up to 2004).

   PM_{10}: non-uniform, trend is constant or *lower* stressed

   $PM_{2,5}$: non-uniform, trend constant or slightly lower stressed

   NO: non-uniform, trend of lower stress

   NO_2: non-uniform, trend is *lower* stressed

   CO: all regions trend of *lower* stress

   O_3: trend is constant or *slightly higher* stressed

Quellen für die Immissionsdaten Sources for the immission data

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U.K. ***Belfast, Birmingham,*** ***Bristol, Edinburgh, Leeds*** ***Liverpool, London***	The Department of the Environment, Food and Rural Affairs Environmental protection Ashdown House, 123 Victoria St London SW 1E 6DE Homepage: *http://www.airquality.co.uk*

Anzahl der Messstellen Number of monitoring stations

Country	Monitored Area	SO_2	PM_{10}	$PM_{2,5}$	NO	NO_2	CO	O_3
Austria	Bludenz	-	1	-	1	1	-	1
	Dornbirn	-	1	1	1	1	-	-
	Graz	4	3	2	6	6	3	4
	Hallein	2	1	-	2	2	1	1
	Innsbruck	1	2	1	3	3	1	3
	Klagenfurt	1	2	2	2	2	1	2
	Region Leoben	2	1	-	3	3	1	1
	Linz	5	6	3	6	6	5	3
	Salzburg	2	3	2	3	3	2	2
	St. Pölten	2	2	2	2	2	2	1
	Vienna	7	13	5	17	17	4	5
	Villach	-	1	-	1	1	-	-
Belgium	Brussels (2012)	7	6	5	10	10	7	7
Bulgaria	Sofia	6	7	2	6	6	4	5
Croatia	Zagreb (2012)	6	6	3	-	5	1	5
Czech Republic	Prague	3	17	6	12	15	3	7
Denmark	Copenhagen (2012)	1	3	2	3	3	2	2
France	Lyon	1	5	2	7	7	1	3
Germany	Berlin	2	12	5	15	15	-	7
	Chemnitz	-	2	1	2	2	-	1
	Dresden	1	4	3	4	4	-	3
	Frankfurt	1	3	2	3	3	1	2
	Hamburg	5	11	4	17	17	6	6
	Karlsruhe	2	2	2	2	2	1	2
	Leipzig	1	3	2	3	3	-	1
	Mannheim	2	3	2	3	3	1	2
	Munich	1	4	4	4	4	3	3
	Rhine/Ruhr Area (2012)	8	21	12	21	21	-	16
	Stuttgart	1	2	2	2	2	1	2
	Wiesbaden	1	3	2	3	3	1	1
Greece	Athens (2012)	5	7	2	14	14	7	13
	Thessaloniki (2012)	2	5	-	6	6	4	5
Hungary	Budapest	10	12	1	12	12	12	10
Italy	Milan	1	3	2	8	8	4	3
Latvia	Riga	2	3	1	1	3	1	2
Luxemburg	Luxemburg (2010)	2	1	1	2	2	2	2
The Netherlands	Rotterdam	6	3	3	3	3	3	3
Poland	Warsaw	2	5	3	-	4	3	3
Portugal	Lisbon	2	5	2	6	6	4	4
Slovakia	Bratislava	1	4	-	3	3	1	2

Country	Monitored Area	SO_2	PM_{10}	$PM_{2,5}$	NO	NO_2	CO	O_3
Spain	Barcelona	4	10	6	7	7	4	5
	Madrid	10	12	6	24	24	10	14
Switzerland	Basel	1	1	1	1	1	-	1
	Zurich	1	1	1	1	1	1	1
Sweden	Gothenburg	3	3	-	-	5	-	2
	Stockholm	1	5	4	-	5	2	1
U.K.	Belfast	1	1	1	1	1	1	1
	Birmingham	2	2	3	3	3	-	3
	Bristol	1	1	1	1	1	1	1
	Edinburgh	1	1	1	1	1	1	1
	Leeds	1	2	2	2	2	1	1
	Liverpool	1	1	1	1	1	1	1
	London	5	7	10	15	15	3	8

- no monitoring station

Immissionsgebiete und Bevölkerung

Immission area and population

Country	Monitored Area	Immission area [km²]	Population
Austria	Bludenz	3	14 000
	Dornbirn	13	47 000
	Graz	128	265 000
	Hallein	27	21 000
	Innsbruck	105	149 000
	Klagenfurt	120	96 000
	Region Leoben	108	25 000
	Linz	96	194 000
	Salzburg	66	148 000
	St. Pölten	108	52 000
	Vienna	415	1 714 000
	Villach	135	60 000
Belgium	Brussels	161	1.139.000
Bulgaria	Sofia	1 311	1.250 000
Croatia	Zagreb	641	790 000
Czech Republic	Prague	496	1 260 000
Denmark	Copenhagen	88	559.000
France	Lyon	48	445.000
Germany	Berlin	892	3 489 000
	Chemnitz	221	242 000
	Dresden	328	531 000
	Frankfurt	248	693 000
	Hamburg	755	1 743 000
	Karlsruhe	173	299 000
	Leipzig	298	531 000
	Mannheim	145	295 000
	Munich	310	1 390 000
	Rhine/Ruhr Area	5 770	8 214 000
	Stuttgart	207	598 000
	Wiesbaden	204	280 000
Greece	Athens	1 948	3 551 370
	Thessaloniki	129	794 330
Hungary	Budapest	525	1 736 000
Italy	Milan	182	1 126 000
Latvia	Riga	307	643 000
Luxemburg	Luxemburg	51	107 000
The Netherlands	Rotterdam	803	1 200 000
Poland	Warsaw	517	1 716 000
Portugal	Lisbon	85	550 000

Country	Monitored Area	Immission area [km²]	Population
Slovakia	Bratislava	368	4 170 000
Spain	Barcelona	101	1 612 000
	Madrid	604	3 207 000
Switzerland	Basel	557	501 000
	Zurich	1 086	1 185 000
Sweden	Gothenburg	198	526 000
	Stockholm	48	832 000
U.K.	Belfast	115	281 000
	Birmingham	268	1 085 000
	Bristol	110	432 000
	Edinburgh	262	486 000
	Leeds	552	475 000
	Liverpool	112	471 000
	London	1 572	8 308 000

Übersicht über die Entwicklung der Schadstoffbelastungen 1993 -2013 [1)]

Beurteilungsbasis: Jahresmittelwerte über alle Stationen einer Region

Overview over the development of the stress of air pollutants from 1993 through 2013 [1)]

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

Austrian Towns, Cities and Regions

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [2)]	Trend last 5 years	Stress in 2013	Stress in 1993 [2)]	Trend last 5 years	Stress in 2013	Stress in 1993 [2)]	Trend last 5 years	Stress in 2013	Stress in 1993 [2)]	Trend last 5 years	Stress in 2013	Stress in 1993 [2)]	Trend last 5 years	Stress in 2013
Linz		==			==			==			↘			==	
Bludenz		n.d.	n.d.	1994	==			==		-	n.d.	n.d.	1994	==	
Dornbirn		n.d.	n.d.	1994	==			↘		1998	n.d.	n.d.	-	n.d.	n.d.
Graz		==		1994	↘			==			==			==	
Hallein		==		2003	==			==			↘			==	
Innsbruck		↘			==			==			==			↗	
Klagenfurt		↘			==			↘			==			==	
Region Leoben		==			↘			==			==			==	
Salzburg		==		2003	↘			↘			↘			==	
St. Pölten	1994	==		**1994**	==		1994	↘		1994	↘		1994	==	
Vienna		↗		**1994**	↓			↘			↘			↑	
Villach		n.d.	n.d.		↗			==			n.d	n.d		↓	

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

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

European Cities and Regions

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [3]	Trend last 5 years	Stress in 2013	Stress in 1993 [3]	Trend last 5 years	Stress in 2013	Stress in 1993 [3]	Trend last 5 years	Stress in 2013	Stress in 1993 [3]	Trend last 5 years	Stress in 2013	Stress in 1993 [3]	Trend last 5 years	Stress in 2013
Athens	2007	n.d.	n.d.	2007	n.d.	n.d.	2007	n.d.	n.d.	2007	n.d.	n.d.	2007	n.d.	n.d.
Barcelona	1994	==		1994	==		1994	↘			↗		1994	↗	
Basel		↘			==			==			n.d.	n.d.		==	
Belfast		↘			↘			==			==			==	
Berlin		↘			==			==			↘			==	
Birmingham		==			↘			↘			n.d.	n.d.		==	
Bristol		==			↓			↓			==			==	
Brussels	1995	n.d.	n.d.	1995	n.d.	n.d.	1995	n.d.	n.d.		n.d.	n.d.	1995	n.d.	n.d.
Budapest	1996	↘		2003	↘		2003	↘			↘		2003	==	
Chemnitz		n.d.	n.d.		==			==			n.d.	n.d.		==	
Copenhagen		n.d.	n.d.	1994	n.d.	n.d.	1995	n.d.	n.d.	n.d.	n.d.	n.d.	1994	n.d.	n.d.
Dresden		==			==			↘			n.d.	n.d.		==	
Edinburgh		↘			↘			==			==			==	
Frankfurt		↘			==			==			==			==	
Gothenburg		↘			n.d.	n.d.		==			n.d.	n.d.		==	
Hamburg		==			↗			==			==			==	
Karlsruhe		↘			↗			==			↗			↗	
Leeds		==			↘			==			==			↗	
Leipzig		==			==			↘			n.d.	n.d.		↗	
Lisbon	1997	==		2001	n.d.		1997	↘			==		1997	↗	
Liverpool		↘			↓			↘			==			↗	
London		==			↘			↘			==			==	

[3] … or year when data were primarily available

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [4]	Trend last 5 years	Stress in 2013	Stress in 1993 [4]	Trend last 5 years	Stress in 2013	Stress in 1993 [4]	Trend last 5 years	Stress in 2013	Stress in 1993 [4]	Trend last 5 years	Stress in 2013	Stress in 1993 [4]	Trend last 5 years	Stress in 2013
Luxemburg	1996	n.d.	n.d.	1996	n.d.	n.d	1996	-	n.d.	1996	n.d.	n.d.	1996	n.d.	n.d.
Lyon		↓			==			↘		1994	↘		1994	↘	
Madrid	1994	↓		1999	==		1994	↓		1994	↘		1994	==	
Mannheim		↘			==			↘			==			↗	
Milan	1994	↗		1994	↘		1994	↘		1994	==		1994	==	
Munich		==			==			↘			↘			==	
Prague	2007	↘		2007	==		2007	↘		2007	==		2007	==	
Riga	1999	==		2007	==		1999	↗		2002	==		1999	↗	
Rhine/Ruhr Area		↓			↘			↘			n.d.	n.d.		↗	
Rotterdam	1995	↓		1995	↘		1995	↘		2003	↘		1995	==	
Sofia	1999	↘		2003	↘		1999	↘		1999	↘		1999	==	
Stockholm		==		1994	n.d.	n.d.	1994	==		1994	==			↗	
Stuttgart	2007	↘		2008	↗		2007	==		2007	==		2007	==	
Thessaloniki	2007	n.d.	n.d.	2007	n.d.	n.d.	2007	n.d.	n.d.	2007	n.d.	n.d.	2007	n.d.	n.d.
Warsaw	1995	==		2001	n.d.	n.d.	1995	↗		1995	==		1995	==	
Wiesbaden		==			↘			↘			↘			==	
Zagreb		n.d.	n.d.	n.d.	n.d.	n.d.	1994	n.d.	n.d.	2005	n.d.	n.d.	1999	n.d.	n.d.
Zurich		↘			==			==			==			==	

Legend:

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

n.d. no data

↘ Slight stress decrease
↓ Strong stress decrease
== Constant stress
↗ Slight stress increase
↑ Strong stress increase

[4] … or year when data were primarily available

	PM10		
	Stress in 2002 [5]	Stress in 2013	Trend 2009-2013
Linz			==
Bludenz	2005		==
Dornbirn			==
Graz			==
Hallein			==
Innsbruck			↘
Klagenfurt			==
Region Leoben	2003		↘
Salzburg			==
St. Pölten			==
Vienna			==
Villach			↘
Athens	2007	n.d.	n.d.
Barcelona			🡻
Basel			==
Belfast			==
Berlin			==
Birmingham			==
Bristol			==
Brussels		n.d.	n.d.
Budapest	2004		↘
Chemnitz			==
Copenhagen		n.d.	n.d.
Dresden			↘
Edinburgh			==
Frankfurt			↘

	PM10		
	Stress in 2002 [5]	Stress in 2013	Trend 2009-2013
Gothenburg			↗
Hamburg			==
Karlsruhe			==
Leeds			↘
Leipzig			==
Lisbon		n.d.	↘
Liverpool			↘
London			==
Luxemburg		n.d.	n.d.
Lyon			==
Madrid			↘
Mannheim			==
Milan			==
Munich			↘
Prague	2007		==
Riga			==
Rhine/Ruhr Area			==
Rotterdam			↘
Sofia			==
Stockholm			==
Stuttgart	2007		==
Thessaloniki	2007	n.d.	n.d.
Warsaw			==
Wiesbaden			==
Zagreb		n.d.	n.d.
Zurich			==

Legend:

- Slightly stressed (PM_{10} < 20 µg/m³)
- Medium stressed (PM_{10} < 40 µg/m³)
- Highly stressed (PM_{10} > 40 µg/m³)
- n.d. No data

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

	PM$_{2,5}$		
	Stress in 2008 [6]	Stress in 2013	Trend 2009-2013
Linz			==
Bludenz	n.d.	n.d.	n.d.
Dornbirn	2013		n.d.
Graz			↘
Hallein	n.d.	n.d.	n.d.
Innsbruck			↘
Klagenfurt			==
Region Leoben	n.d.	n.d.	n.d.
Salzburg			==
St. Pölten			==
Vienna	2010		==
Villach		n.d.	n.d.
Athens		n.d.	🡻
Barcelona			🡻
Basel			==
Belfast	2009		↘
Berlin			↘
Birmingham	2009		↘
Bristol	2009		==
Brussels		n.d.	==
Budapest	2009		↗
Chemnitz			==
Copenhagen		n.d.	==
Dresden			==
Edinburgh	2009		==
Frankfurt	2010		↘

	PM$_{2,5}$		
	Stress in 2008 [5]	Stress in 2013	Trend 2009-2013
Gothenburg		n.d.	↘
Hamburg			↘
Karlsruhe	2011		n.d.
Leeds	2009		==
Leipzig			==
Lisbon			==
Liverpool	2009		==
London			==
Luxemburg	n.d.	n.d.	n.d.
Lyon			↘
Madrid			↘
Mannheim	2011		n.d.
Milan			==
Munich	2009		↘
Prague			==
Riga			🡻
Rhine/Ruhr Area			↘
Rotterdam			↘
Sofia			↗
Stockholm			↘
Stuttgart	2011		n.d.
Thessaloniki	n.d.	n.d.	n.d.
Warsaw			↗
Wiesbaden			==
Zagreb		n.d.	==
Zurich			==

Legend:

- Slightly stressed ($PM_{2,5}$ < 10 µg/m³)
- Medium stressed ($PM_{2,5}$ < 20 µg/m³)
- Highly stressed ($PM_{2,5}$ > 20 µg/m³)
- n.d. No data

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

Anzahl der Tage mit Überschreitungen des PM_{10}-Tagesmittelwertes von 50 µg/m³ in den Jahren 2001 bis 2013 [7)]

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

Number of days with exceedances of the PM_{10} daily mean of 50 µg/m³ 2001 through 2013 [9)]

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

	PM_{10} number of days >50 µg/m³												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Linz	62	66	80	46	68	71	41	47	30	45	45	25	33
Bludenz	-	-	-	-	13	45	16	13	12	17	14	11	12
Dornbirn	-	-	38	21	22	40	18	20	14	21	13	10	11
Graz	159	131	131	117	127	113	76	73	57	69	78	49	44
Hallein	-	28	49	26	27	50	20	13	20	29	19	18	27
Innsbruck	-	50	61	52	55	83	46	28	26	29	46	23	25
Klagenfurt	36	58	74	80	82	79	42	33	34	43	46	27	32
Region Leoben	26	7	42	29	36	49	36	25	19	20	31	3	4
Salzburg	-	34	62	34	39	56	25	34	37	41	31	17	24
St. Pölten	-	-	58	79	87	57	23	20	23	38	39	22	21
Vienna	-	57	95	54	92	108	48	39	40	87	62	35	35
Villach	-	24	35	25	29	45	10	9	17	7	18	2	0

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

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

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

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

	PM_{10} number of days >50 µg/m³												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Athens	-	-	-	-	-	-	178	163	122	99	101	40	-
Barcelona	-	86	-	47	74	100	97	72	94	23	43	42	7
Basel	11	22	23	16	15	24	12	6	10	11	8	4	5
Belfast	16	7	33	8	5	7	5	7	3	10	10	7	5
Berlin	60	91	117	62	74	71	30	24	39	46	54	31	55
Birmingham	2	1	5	4	5	9	18	10	7	8	18	17	9
Bratislava	-	-	-	-	-	-	-	-	-	-	-	-	60
Bristol	7	1	9	12	4	6	15	15	7	4	12	8	2
Brussels	52	153	163	127	67	56	56	66	66	45	87	55	-
Budapest	-	-	-	178	160	162	117	96	71	84	86	60	64
Chemnitz	41	20	35	12	59	65	27	19	32	34	39	28	32
Copenhagen	-	59	91	-	-	68	60	59	59	18	46	29	-
Dresden	53	36	53	27	78	49	27	35	42	40	46	22	34
Edinburgh	3	8	2	0	3	2	6	0	3	0	0	2	3
Frankfurt	42	44	51	19	48	24	33	22	36	26	42	19	21
Gothenburg	1	10	12	2	7	13	3	4	0	0	21	11	17
Hamburg	33	43	62	20	45	31	26	18	15	26	46	12	11
Karlsruhe	6	33	33	25	22	34	16	10	20	23	18	8	13
Leeds	3	3	9	4	15	10	11	8	16	11	26	18	4
Leipzig	109	63	92	49	82	74	40	40	51	49	69	39	41
London	28	29	61	107	121	157	124	157	47	22	57	23	28
Lisbon	230	222	183	147	180	145	154	82	92	90	113	-	38
Liverpool	4	2	1	14	5	8	11	12	6	2	8	4	6
Lyon	-	83	124	71	153	-	142	79	39	81	93	69	29

- No Data

	PM_{10}												
	number of days >50 µg/m³												
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Madrid	-	98	-	121	159	181	123	65	35	18	41	22	8
Mannheim	25	44	36	41	43	20	26	12	23	24	27	23	17
Milan	148	177	137	139	152	149	132	115	106	85	132	107	81
Munich	64	75	123	59	107	92	53	60	52	65	48	27	39
Prague	-	-	-	-	-	-	132	84	48	71	68	73	55
Riga	57	74	105	160	88	244	148	126	46	31	11	25	48
Rhine/Ruhr Area	40	48	58	38	21	-	71	68	70	54	62	41	-
Rotterdam	98	103	123	54	30	31	26	12	12	12	-	16	5
Sofia	-	-	225	178	162	-	195	199	106	134	134	-	110
Stockholm	101	113	80	80	80	74	75	77	65	46	58	39	52
Stuttgart	-	-	-	-	-	-	110	14	19	40	42	15	27
Thessaloniki	-	-	-	-	-	-	152	155	80	96	87	92	-
Warsaw	-	-	89	184	162	192	136	133	148	151	129	90	75
Wiesbaden	15	35	19	11	18	32	20	8	13	5	25	8	11
Zagreb	-	-	-	75	89	134	108	116	61	73	101	87	-
Zurich	18	23	38	23	15	39	17	11	11	12	11	7	11

- No Data

Anzahl der Überschreitungen des 1h-Grenzwertes für NO_2 von 200 µg/m³ in den Jahren 2004 bis 2013

Beurteilungsbasis: Anzahl der Überschreitungen an der höchstbelasteten Station eines Messgebietes

Number exceedances of the NO_2 1h mean value of 200 µg/m³ in 2004 through 2013
based on the number of exceedances at the peak stressed monitoring station of a region

	NO_2 number of 1 h mean values >200 µg/m³									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Linz	0	1	4	4	1	5	3	6	7	15
Bludenz	0	0	0	0	0	0	0	0	0	0
Dornbirn	-	0	0	0	0	0	0	0	0	0
Graz	0	0	4	0	0	0	1	0	0	0
Hallein	0	0	1	3	0	0	0	0	0	0
Innsbruck	0	0	4	0	0	1	0	0	3	0
Klagenfurt	-	1	1	1	0	0	1	1	1	0
Region Leoben	0	0	0	0	0	0	0	0	0	0
Salzburg	0	0	2	1	2	4	3	0	0	0
St. Pölten	0	0	0	0	1	0	0	0	0	0
Vienna	8	24	26	11	17	4	7	5	0	0
Villach	0	0	0	0	0	0	0	0	0	0
Athens	-	-	-	192	56	35	8	1	0	-
Barcelona	13	-	18	22	13	9	0	12	5	3
Basel	0	0	0	0	0	0	0	0	0	0
Belfast	0	4	5	0	3	0	0	0	0	2
Berlin	-	-	-	6	0	8	6	3	5	8
Birmingham	0	2	0	0	3	0	7	4	0	1
Bratislava	-	-	-	-	-	-	-	-	-	2
Bristol	0	22	13	8	5	11	3	0	0	0
Brussels	24	90	2	2	6	1	1	3	2	-
Budapest	1	25	19	9	1	0	1	3	4	5
Chemnitz	1	0	0	1	0	2	0	2	0	0
Copenhagen	-	-	-	-	-	-	-	-	0	-
Dresden	0	0	0	0	0	0	0	0	0	0
Edinburgh	0	0	0	0	6	0	0	0	0	0
Frankfurt	0	10	3	6	2	16	5	8	5	0

- No Data

	NO_2									
	number of 1 h mean values >200 µg/m³									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Gothenburg	2	0	7	1	1	0	3	8	1	17
Hamburg	0	0	26	19	30	29	24	10	2	5
Karlsruhe	5	0	0	0	3	3	4	2	8	0
Leeds	0	0	0	0	8	0	1	0	0	0
Leipzig	1	39	0	0	0	0	0	0	0	1
Liverpool	0	458	0	0	0	0	0	0	0	0
Lisbon	52	-	80	39	20	69	21	37	-	15
London	542	139	686	458	822	486	539	229	143	60
Luxemburg	-	267	-	-	-	-	0	-	-	-
Lyon	35	0	-	139	66	28	181	150	66	0
Madrid	83	-	208	267	119	150	76	103	52	37
Mannheim	0	69	0	0	0	0	1	1	0	0
Milan	47	1	123	-	241	101	25	132	99	35
Munich	11	0	103	69	56	95	192	50	27	50
Prague	-	0	-	1	106	98	56	51	4	6
Riga	0	0	0	0	0	0	0	0	0	0
Rhine/Ruhr Area	0	24	-	0	0	0	1	0	0	-
Rotterdam	10	3	2	0	0	0	0	-	0	0
Sofia	7	450	-	24	155	95	30	55	-	1
Stockholm	0	3	1	3	1	0	3	1	0	2
Stuttgart	-	-	-	5	9	22	6	6	3	4
Thessaloniki	-	3	-	3	1	0	0	0	0	-
Warsaw	0	0	5	17	0	0	1	5	1	8
Wiesbaden	0	0	2	3	1	7	1	3	2	1
Zagreb	0	0	0	0	0	0	0	0	0	-
Zurich	0	0	0	0	0	0	0	0	0	0

- No Data

Luftgütevergleich

2013

Jahresmittelwerte (Gebietsmittel)

Comparison of The Air Quality

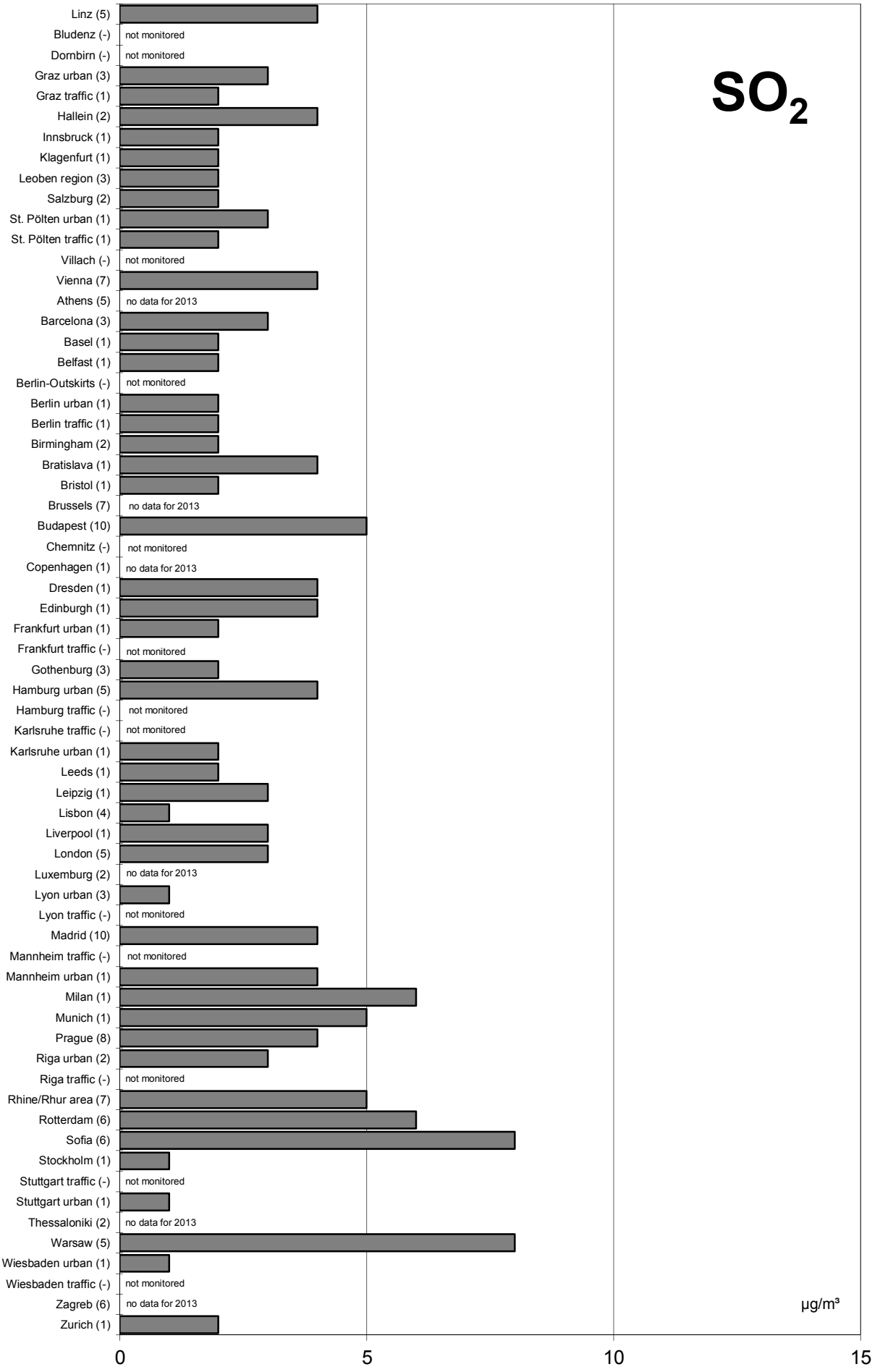
2013

Annual Mean Values

Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

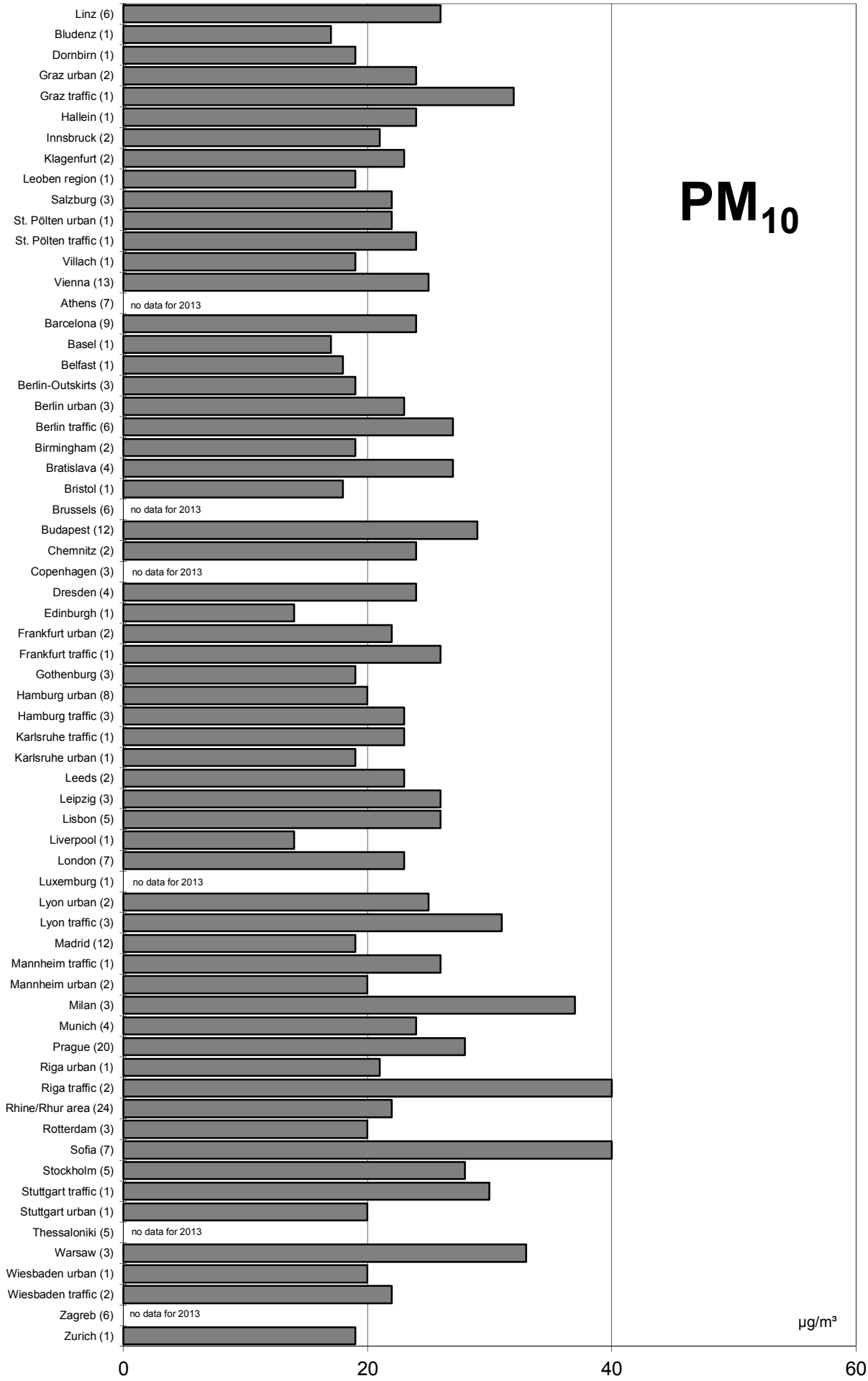
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

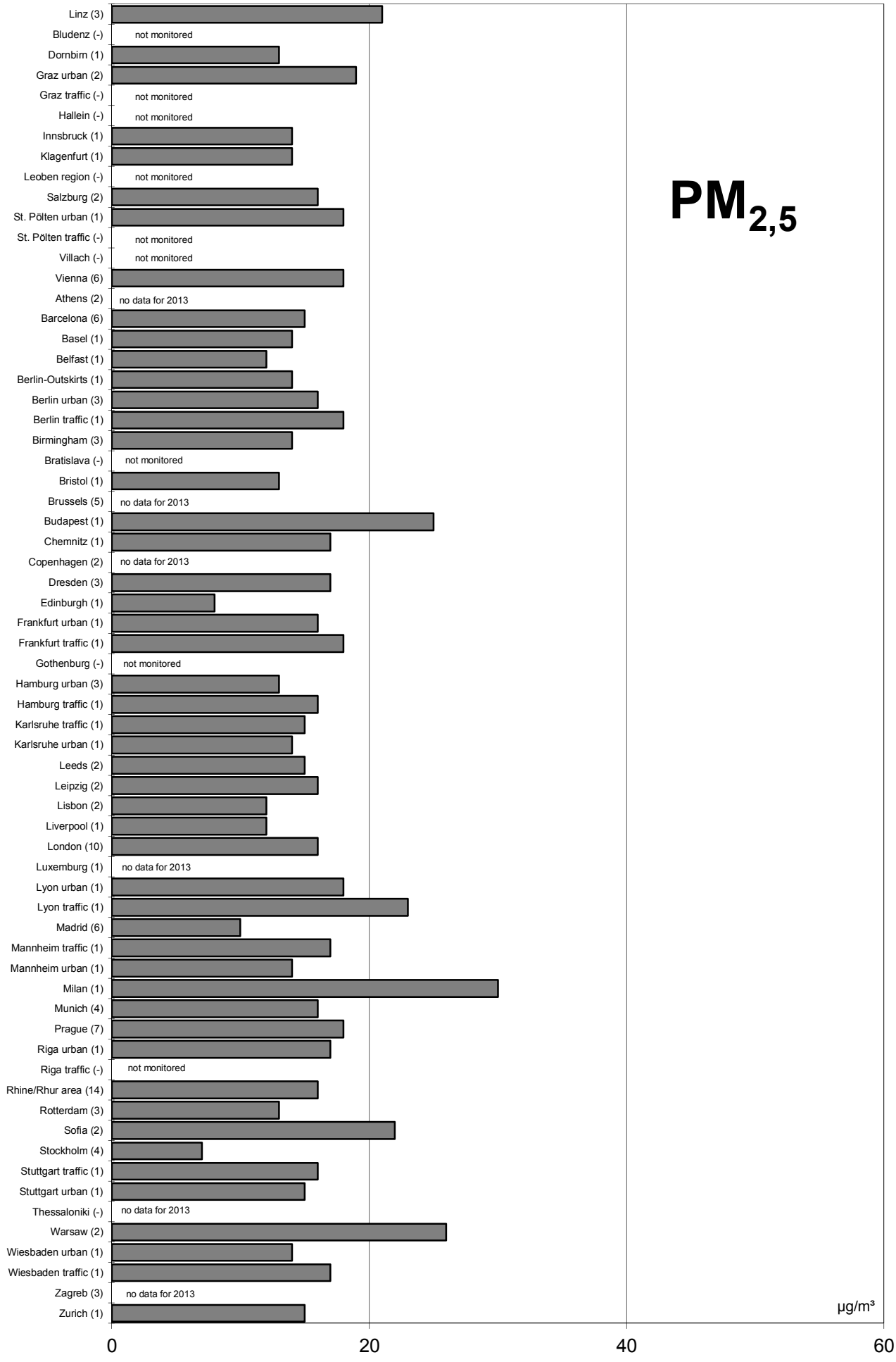
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

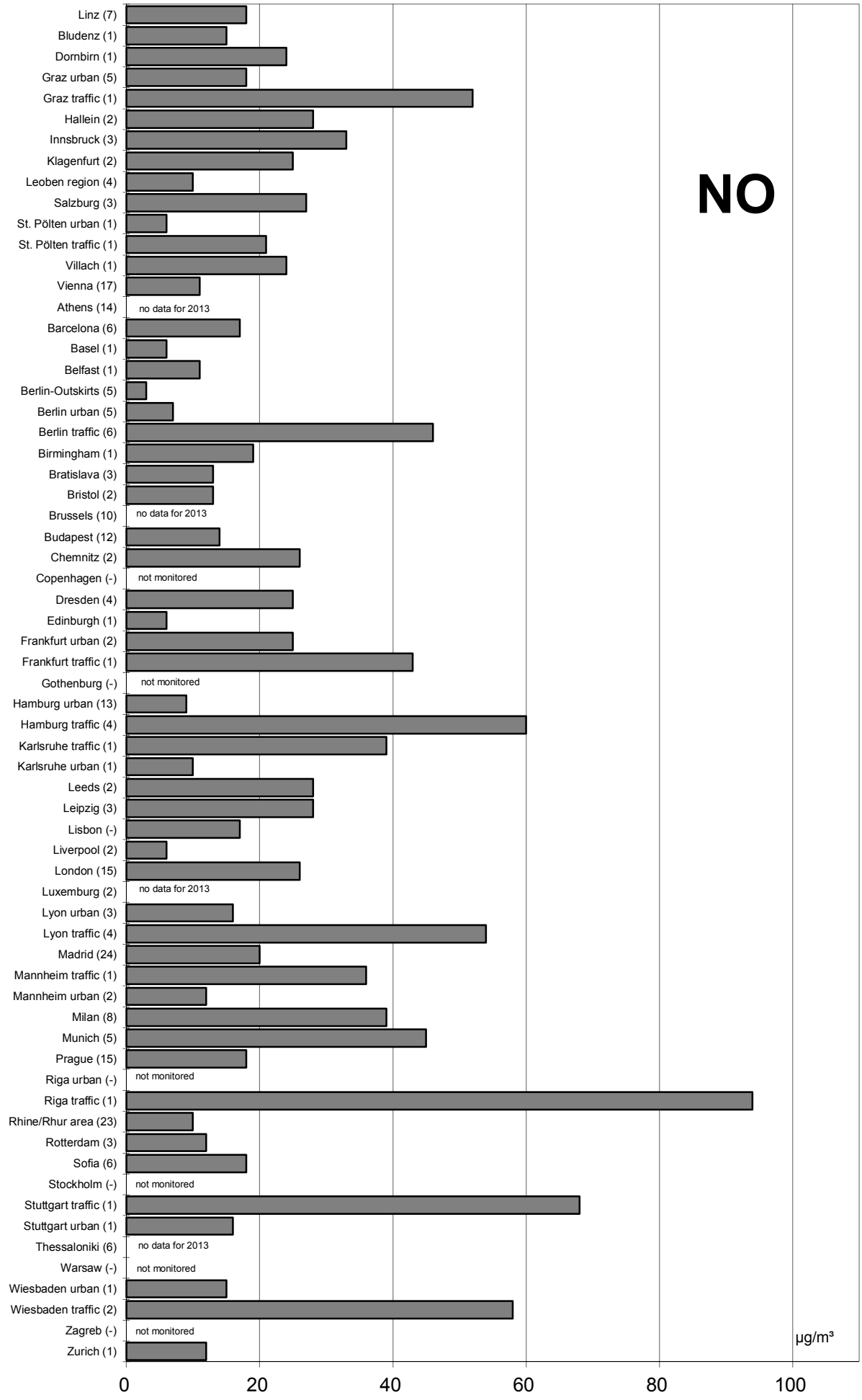
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

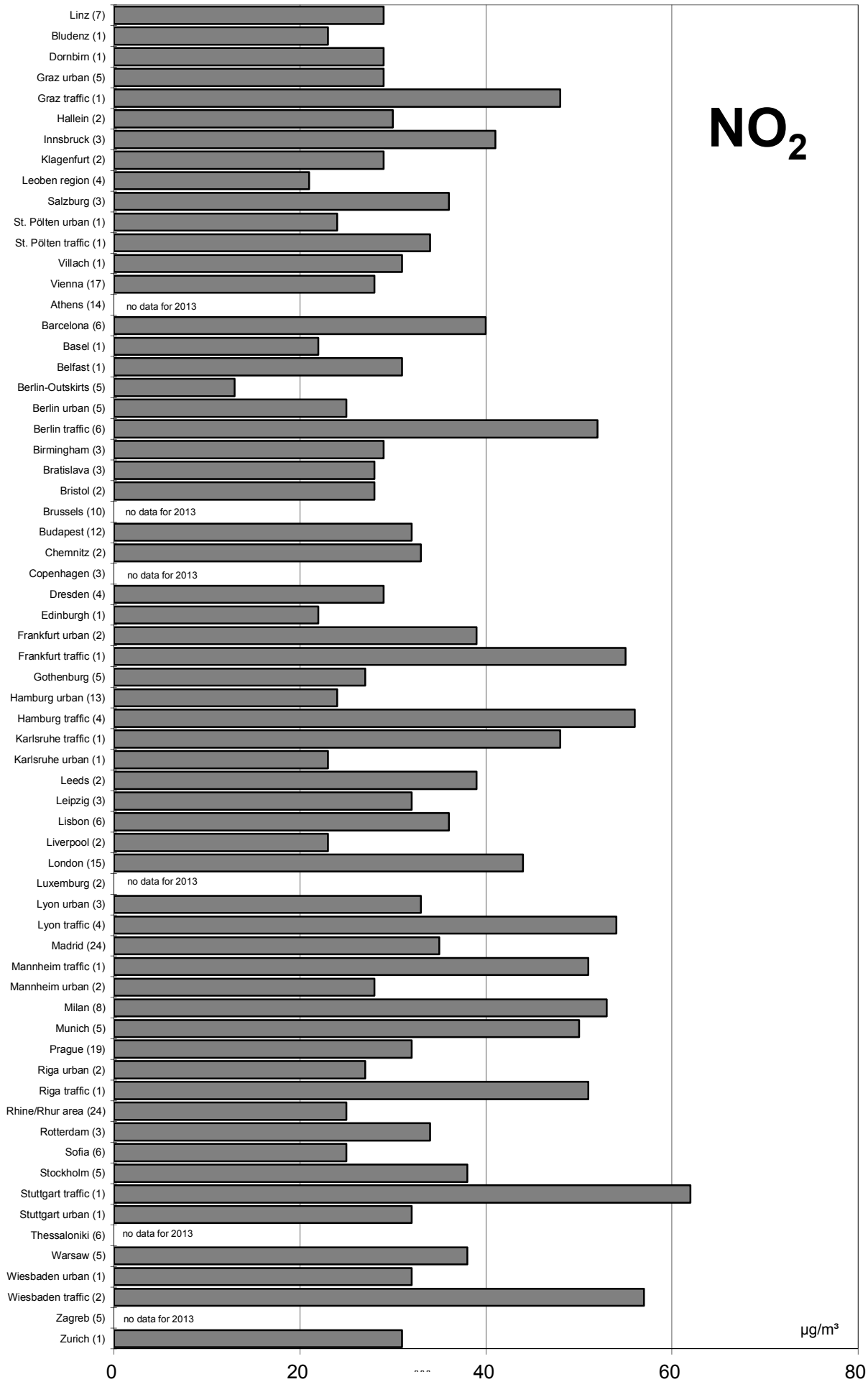
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

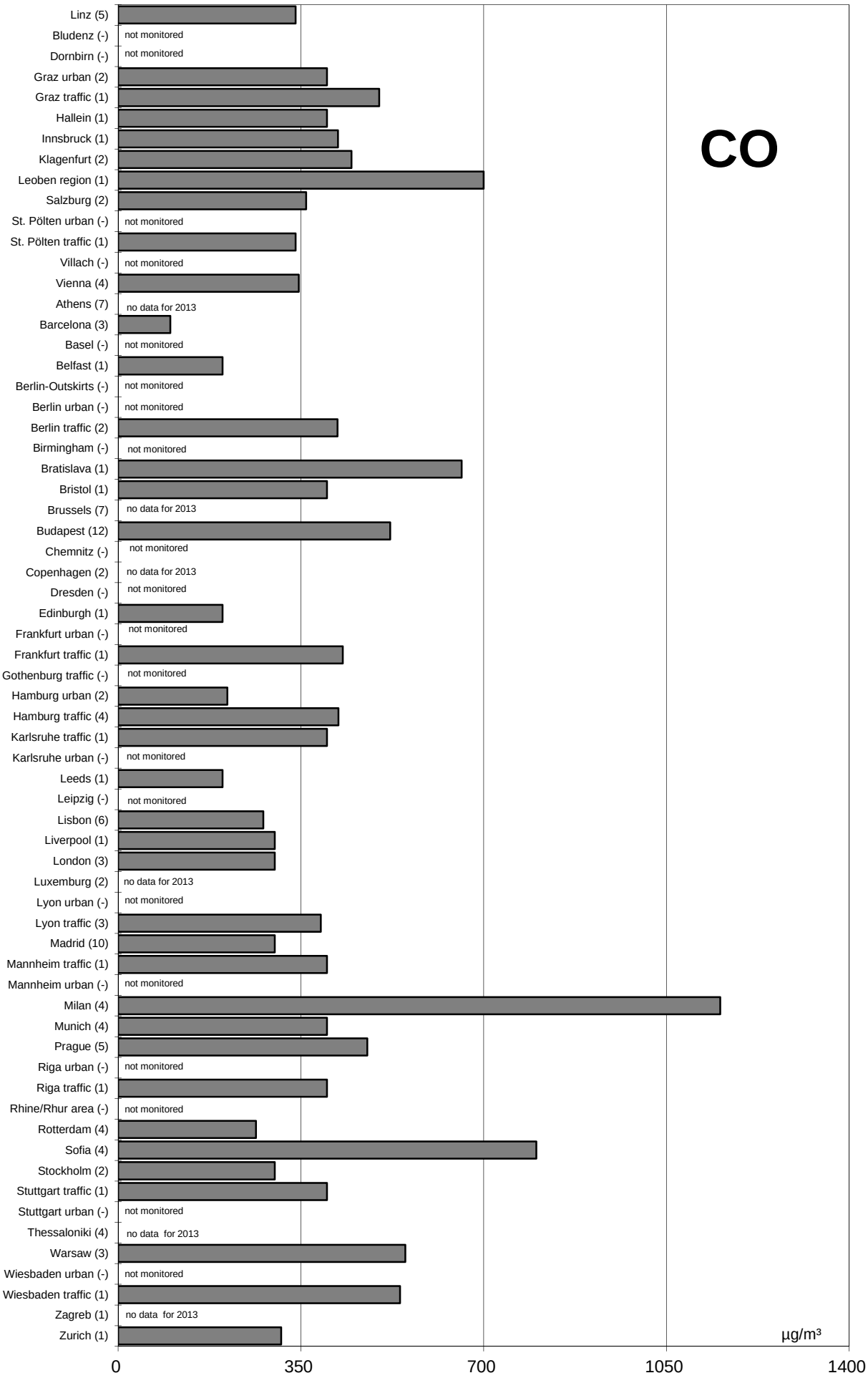
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

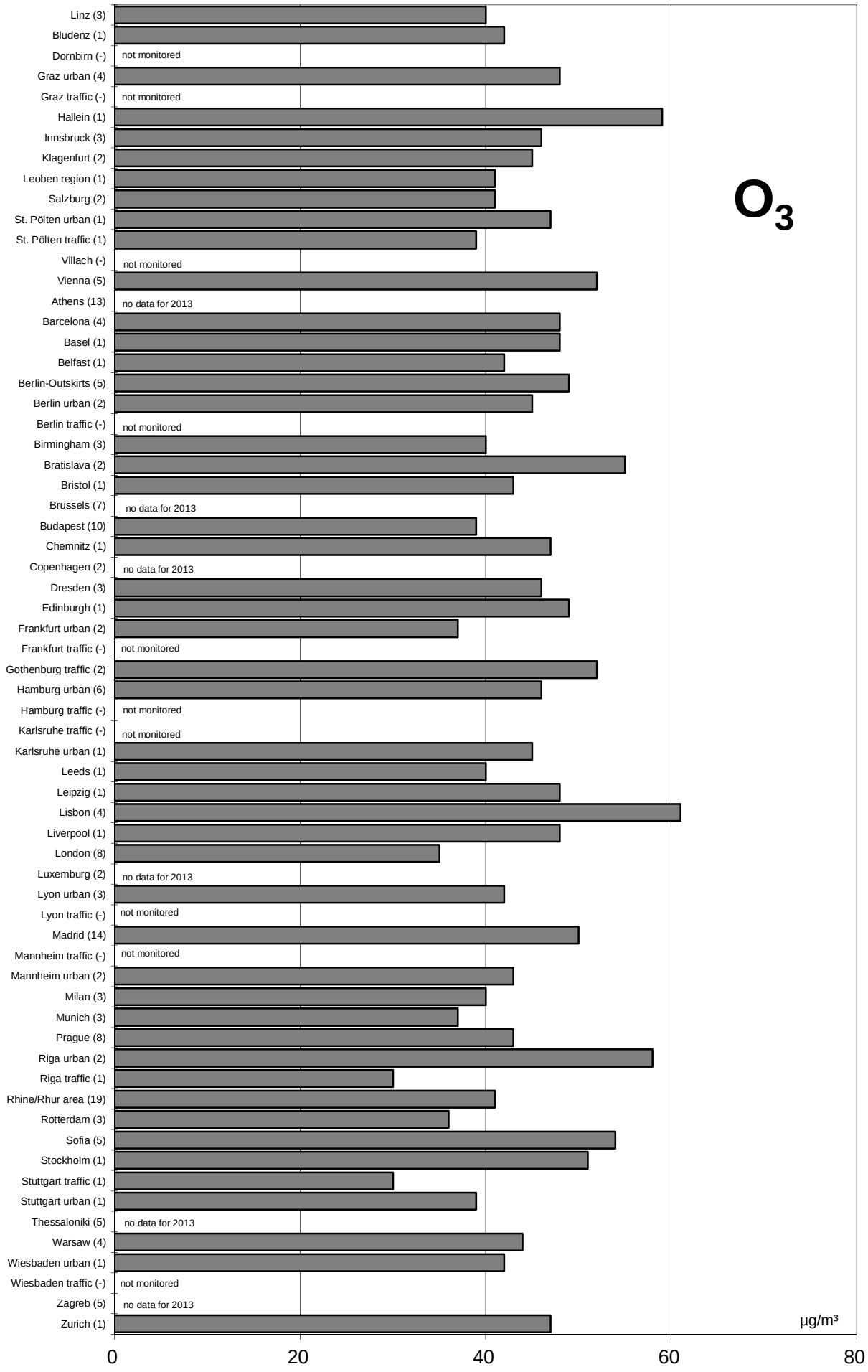
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

annual mean values (mean of all monitoring stations of the city/region)

(in parentheses: number of monitoring stations)



Luftgütevergleich

2013

max. Tagesmittelwerte

Comparison of The Air Quality

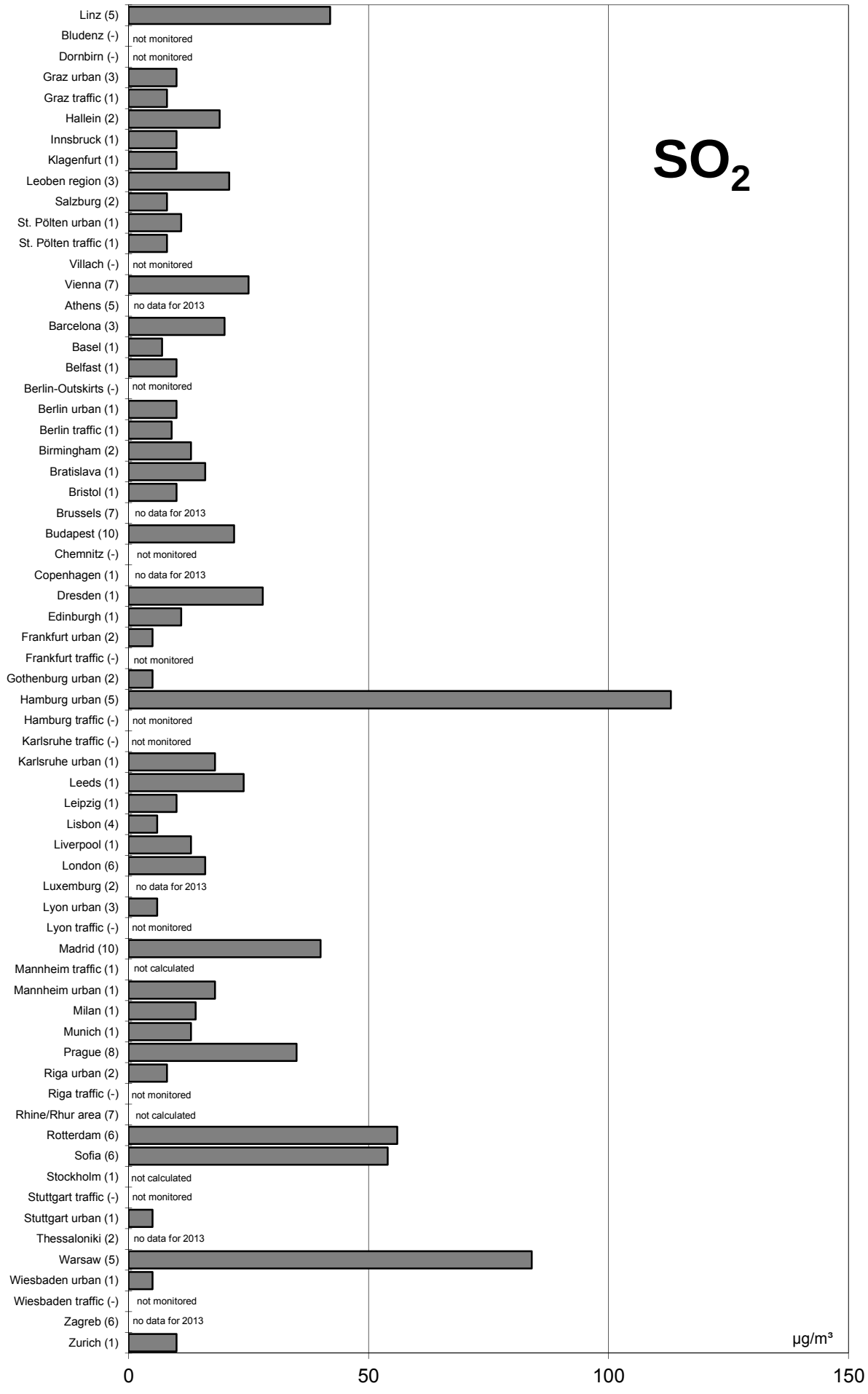
2013

Max. Daily Mean Values

Comparison of The Air Quality in 2013

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

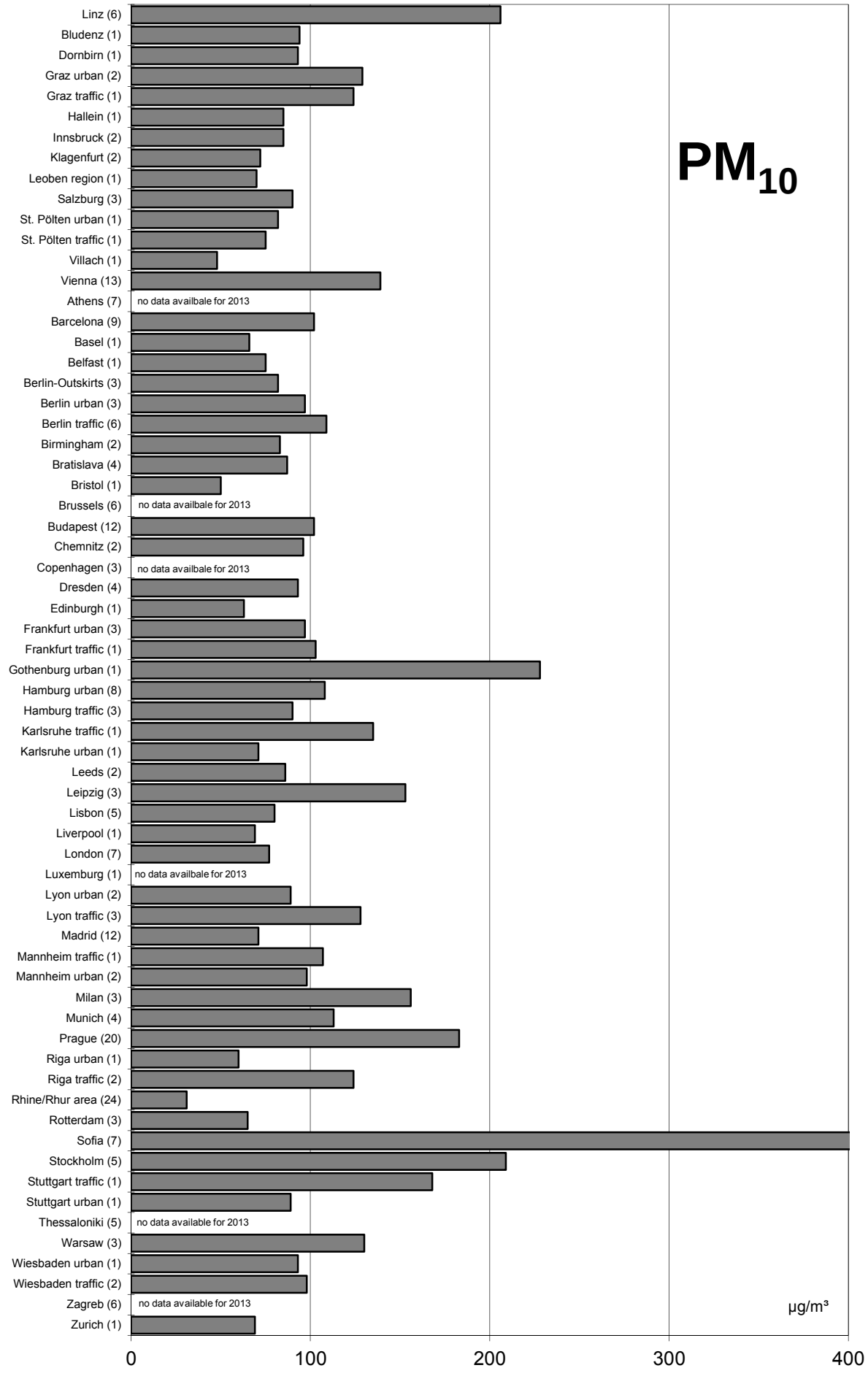
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

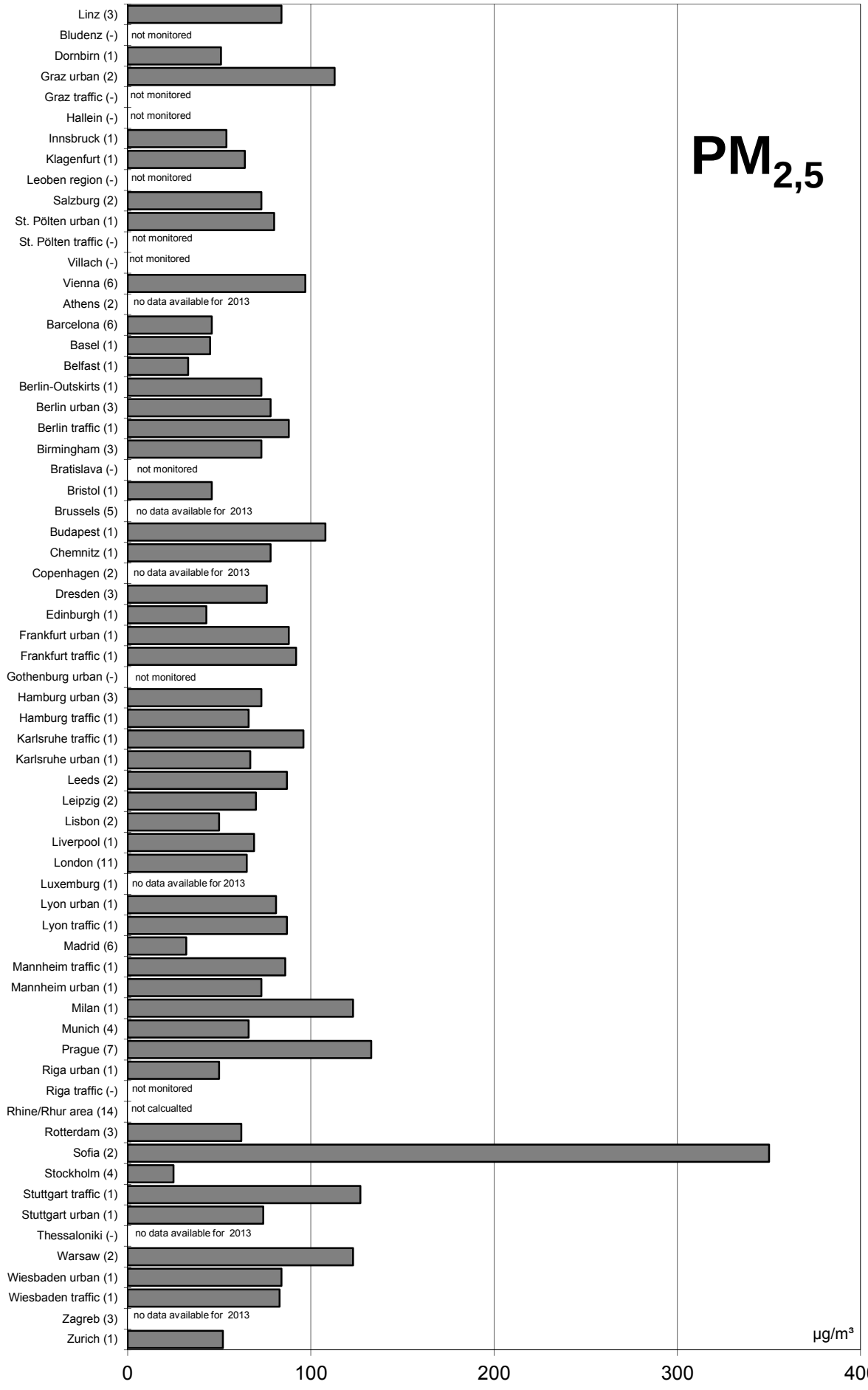
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

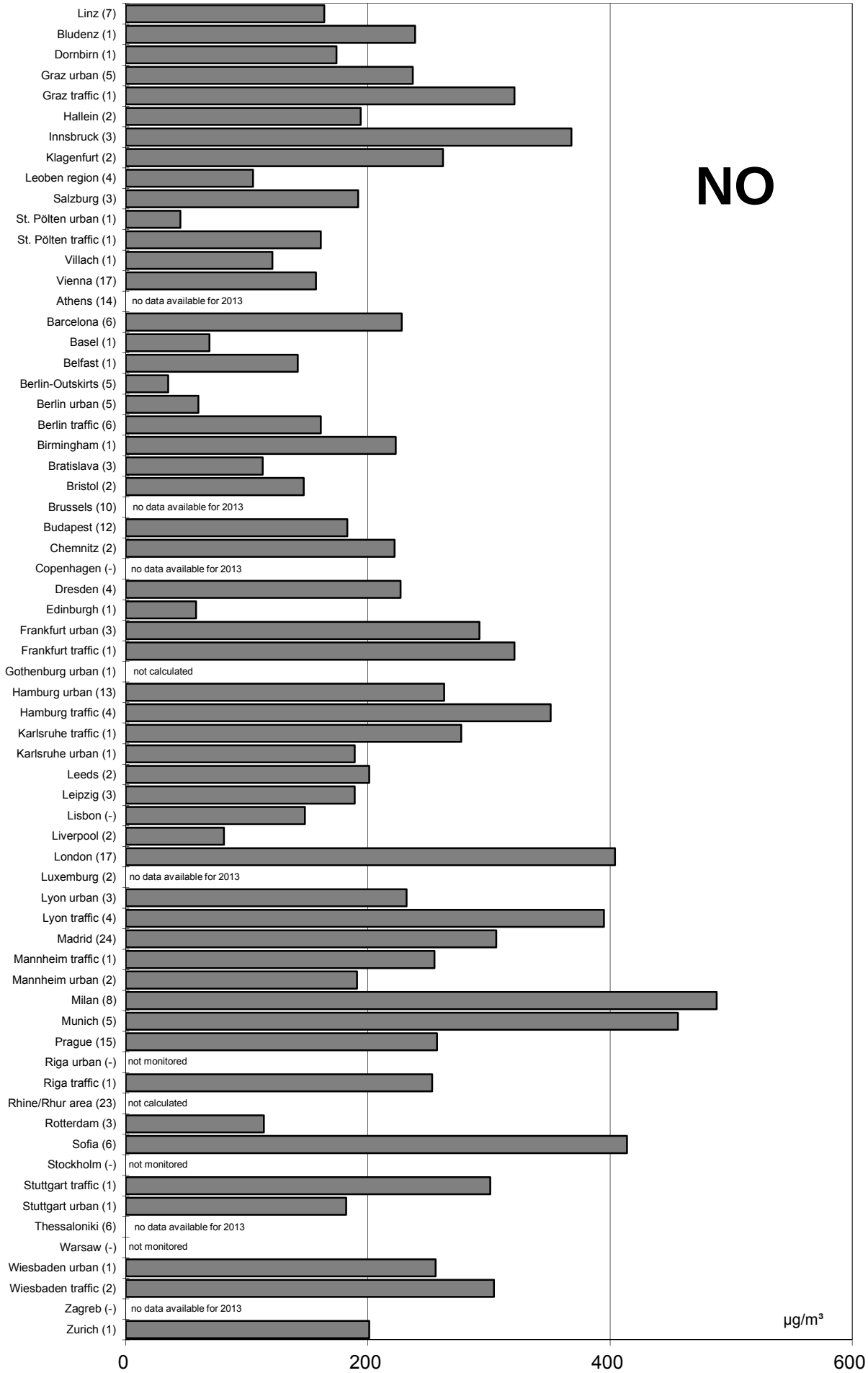
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

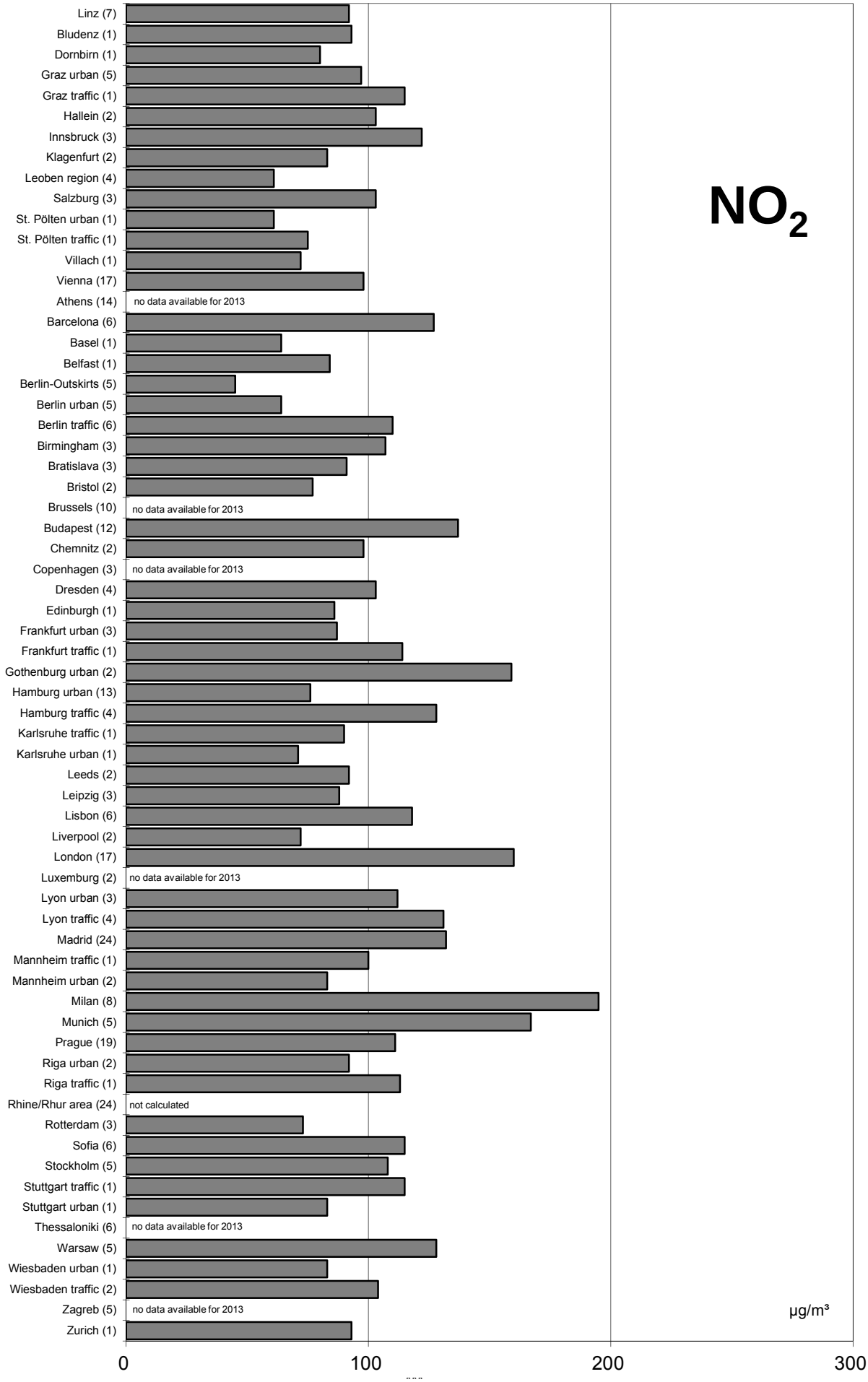
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

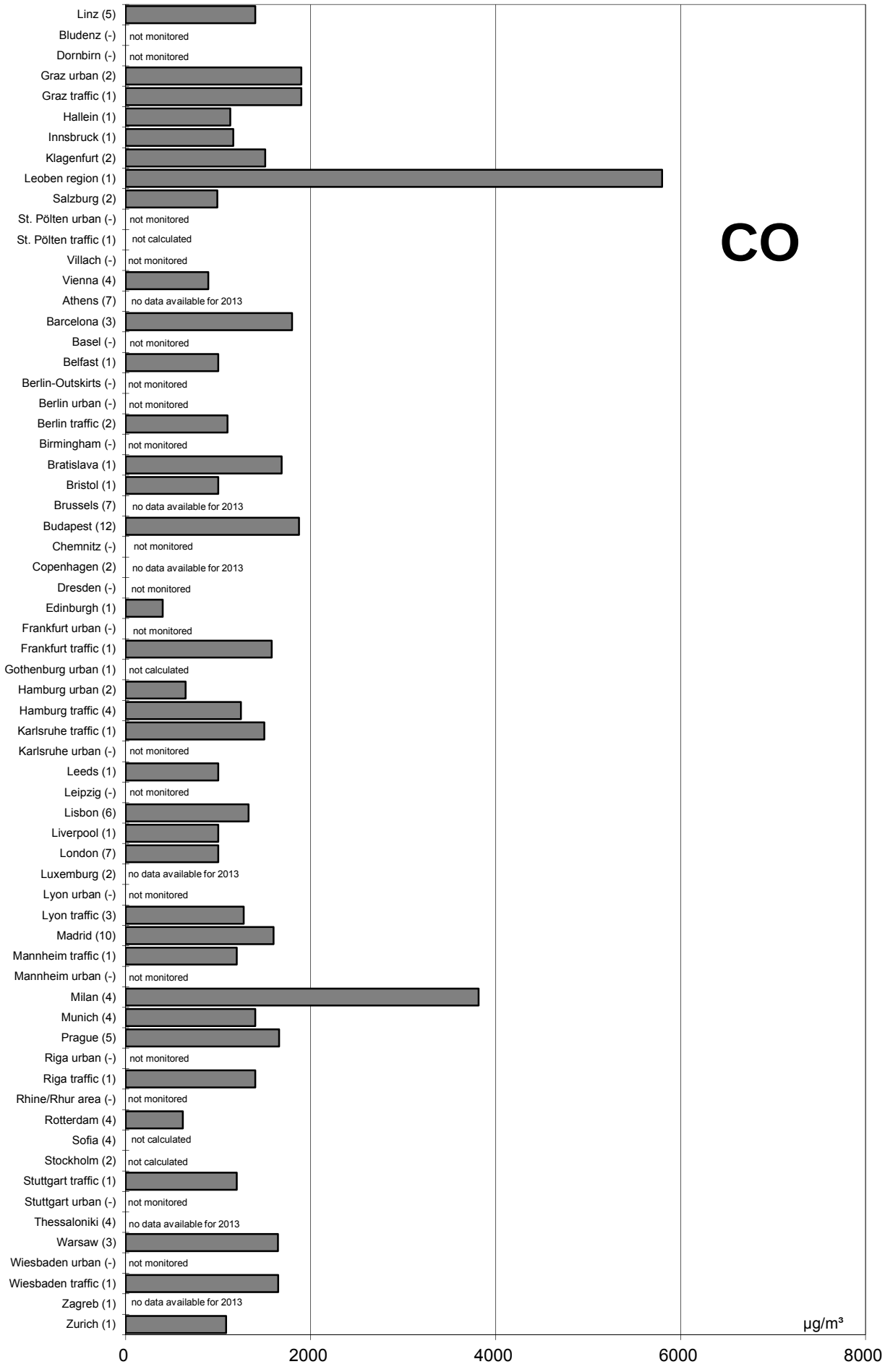
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

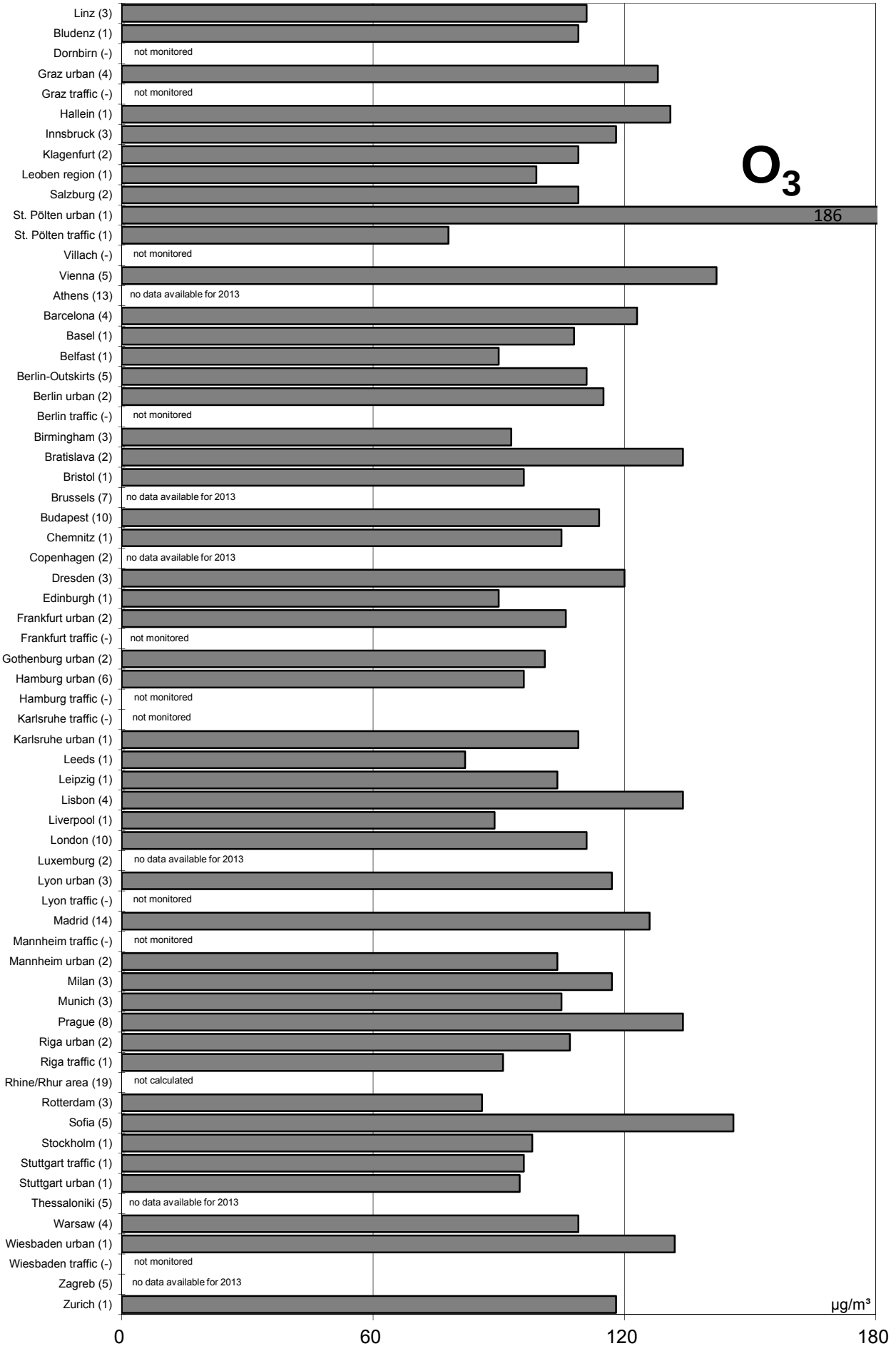
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

(in parentheses: number of monitoring stations)



Luftgütevergleich

2013

max. 1h-Mittelwerte

Comparison of The Air Quality

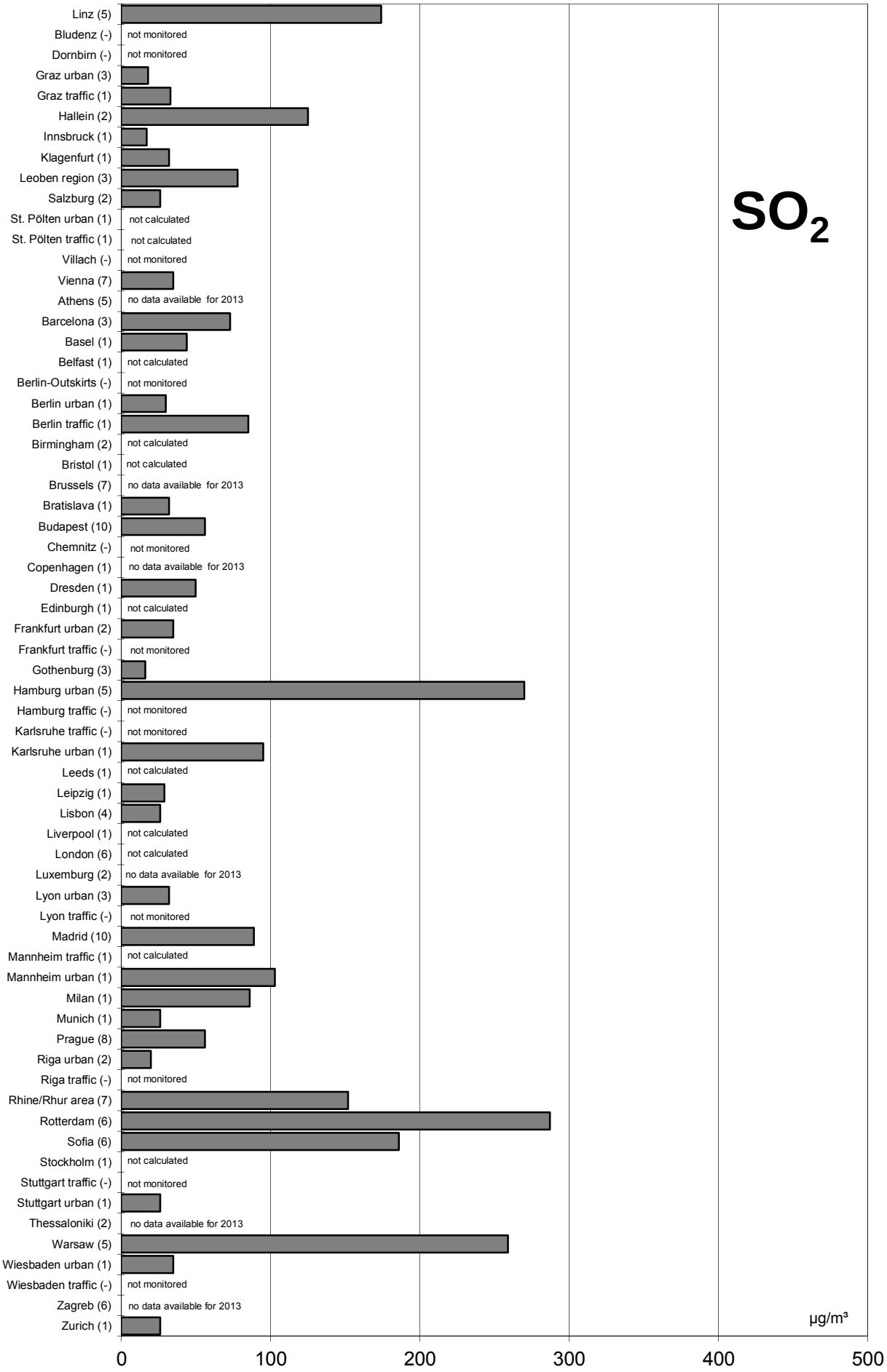
2013

Max. 1h-Mean Values

Comparison of The Air Quality in 2013

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

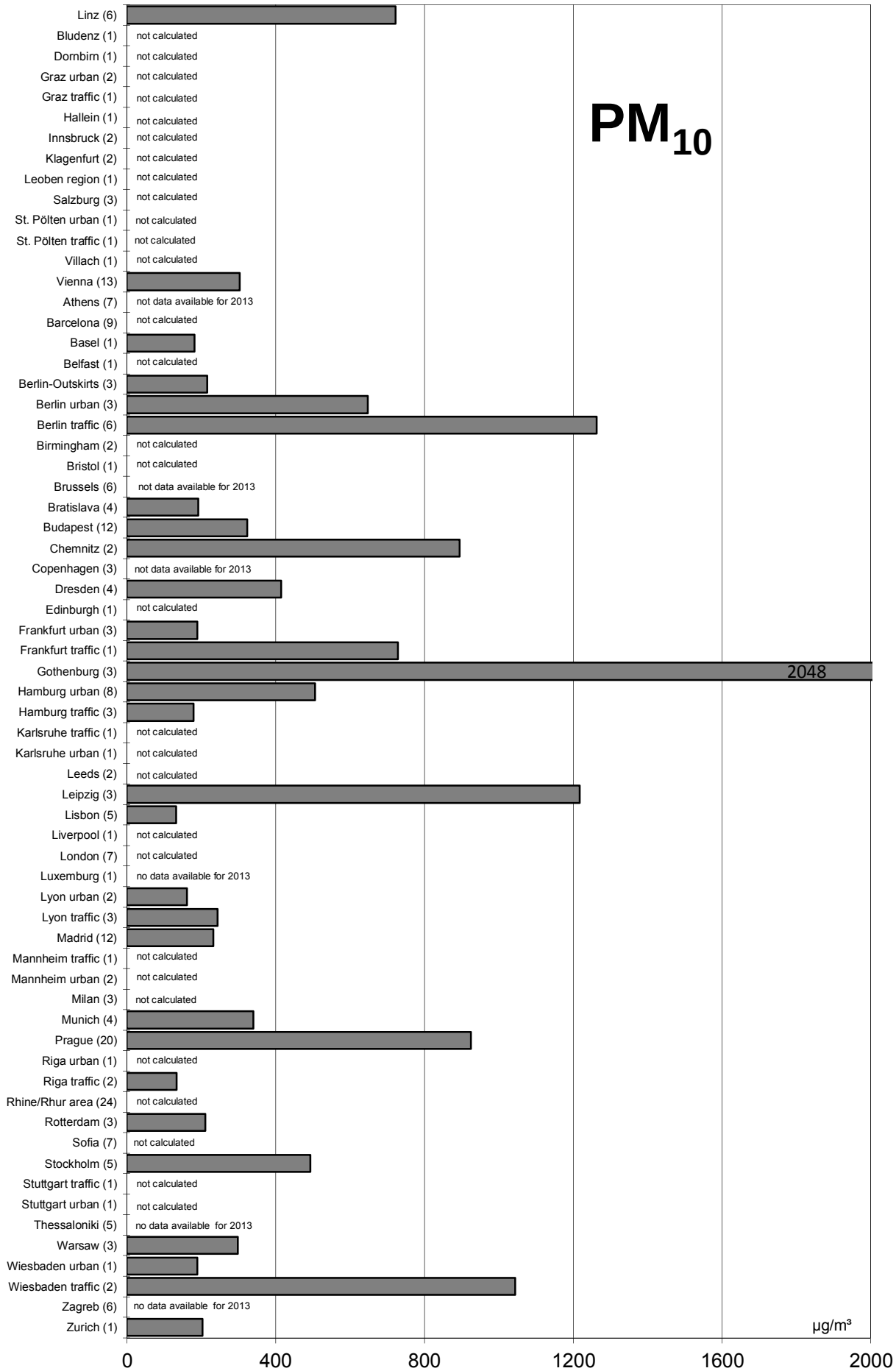
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

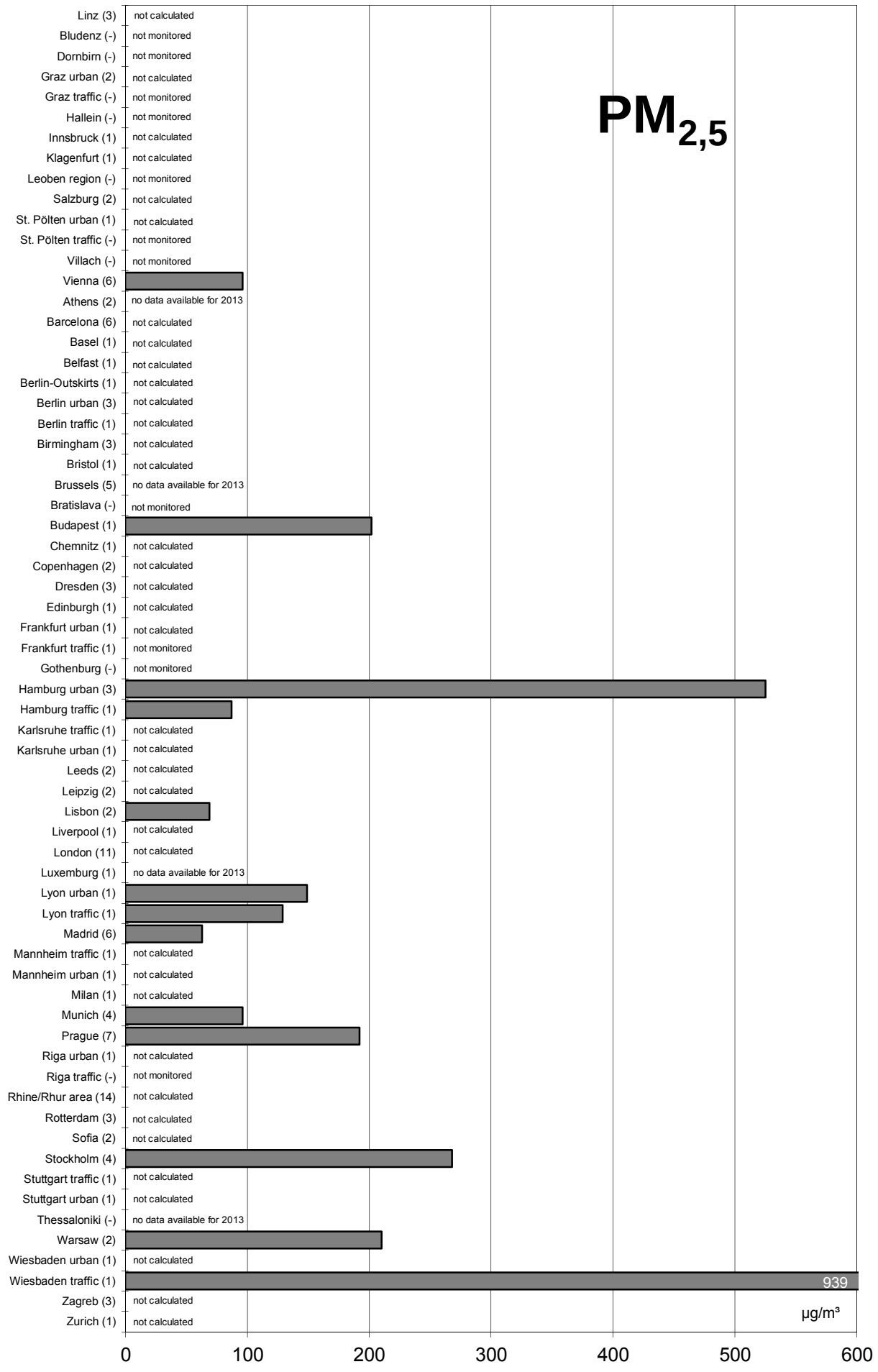
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

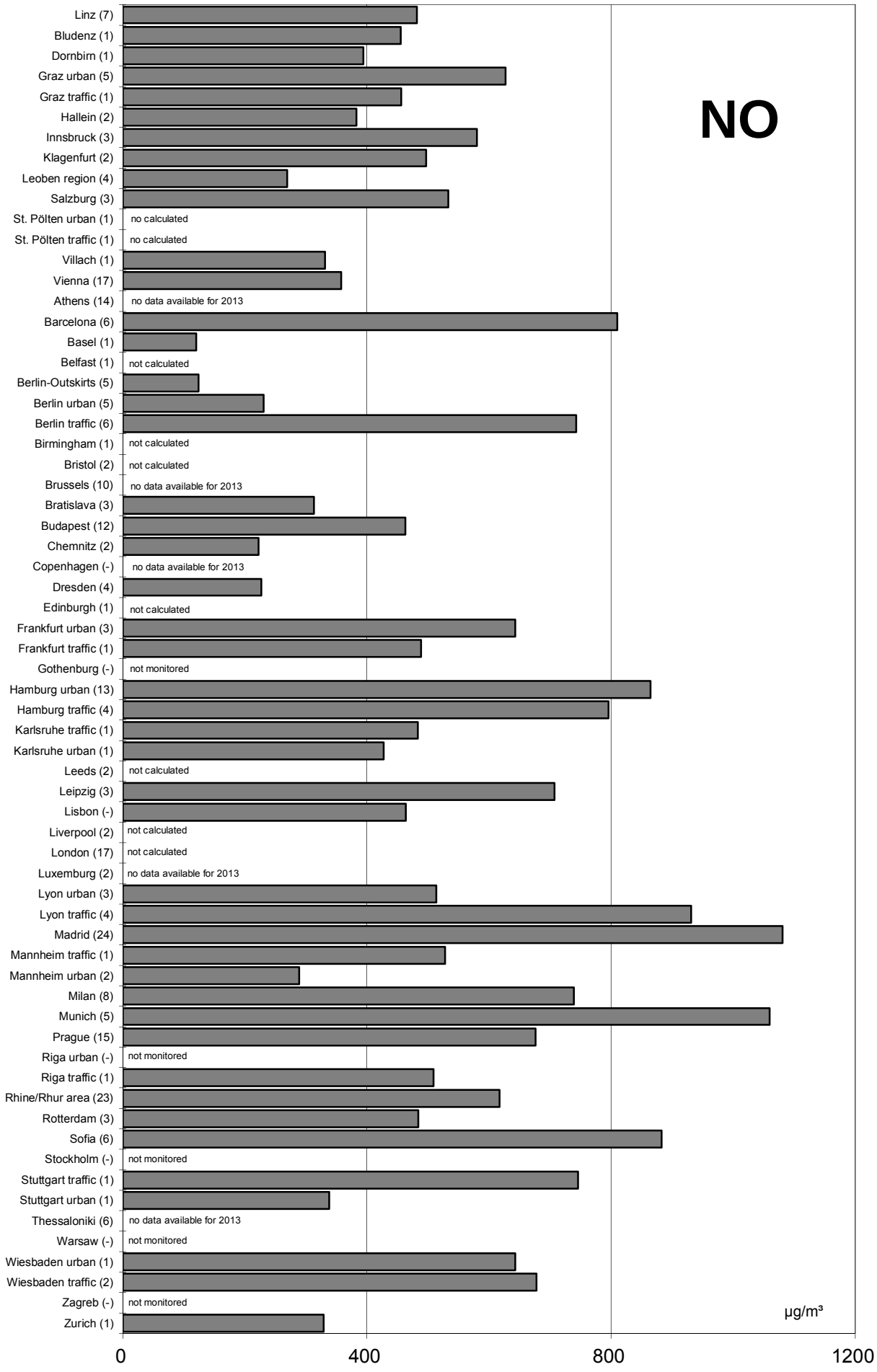
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

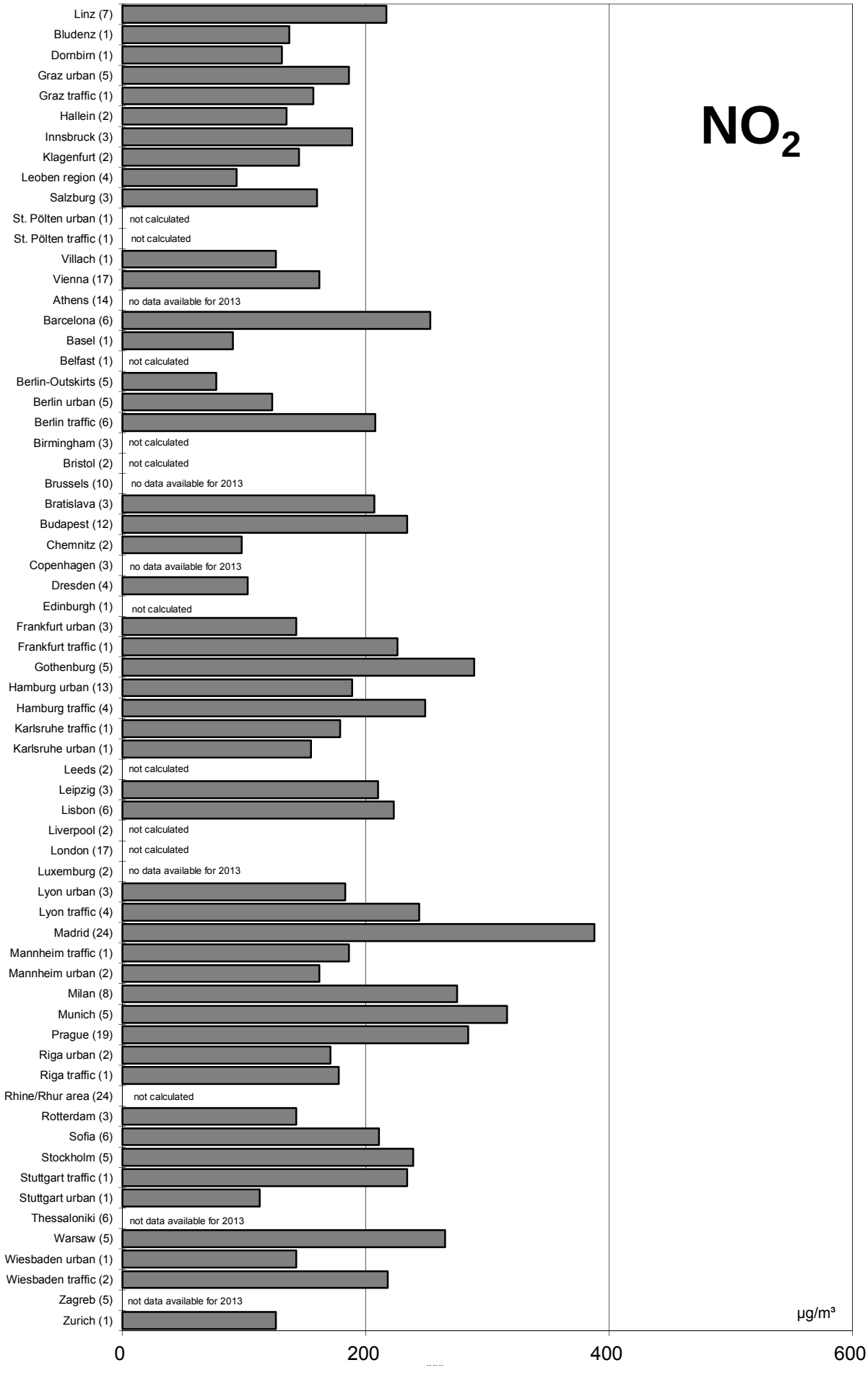
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

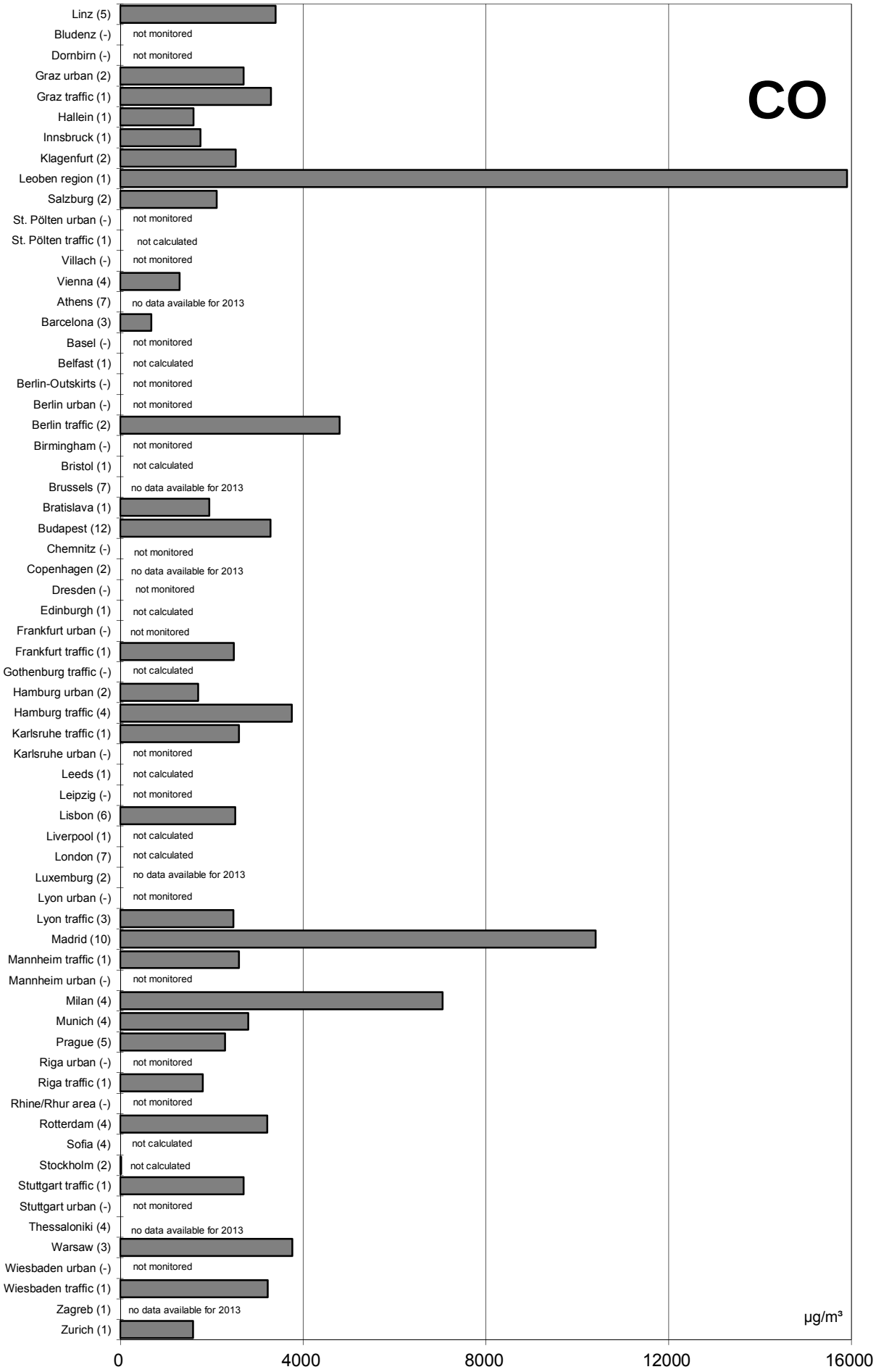
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

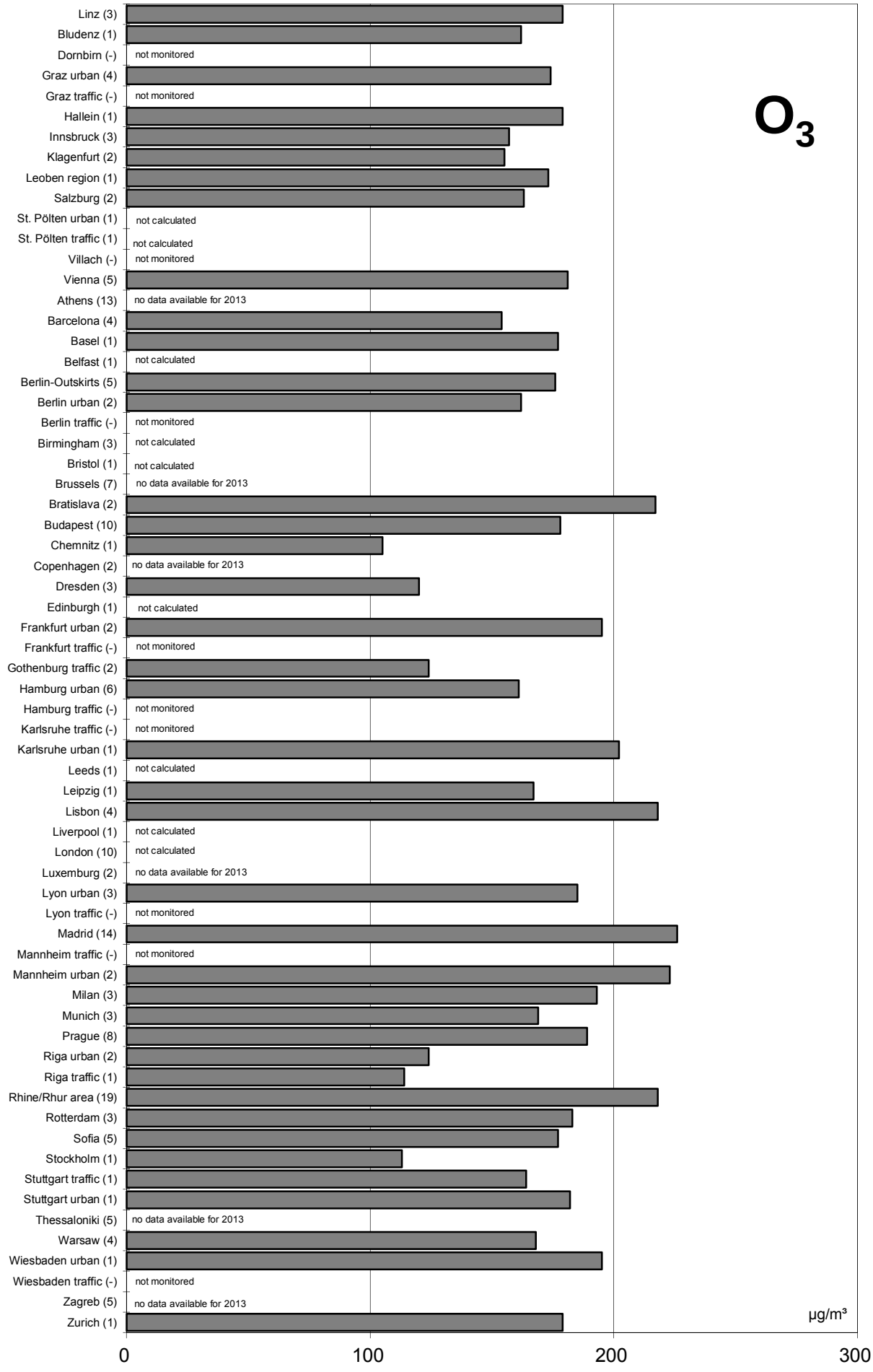
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2013

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

(in parentheses: number of monitoring stations)



Jahresvergleich

1992 - 2013

Jahresmittelwerte

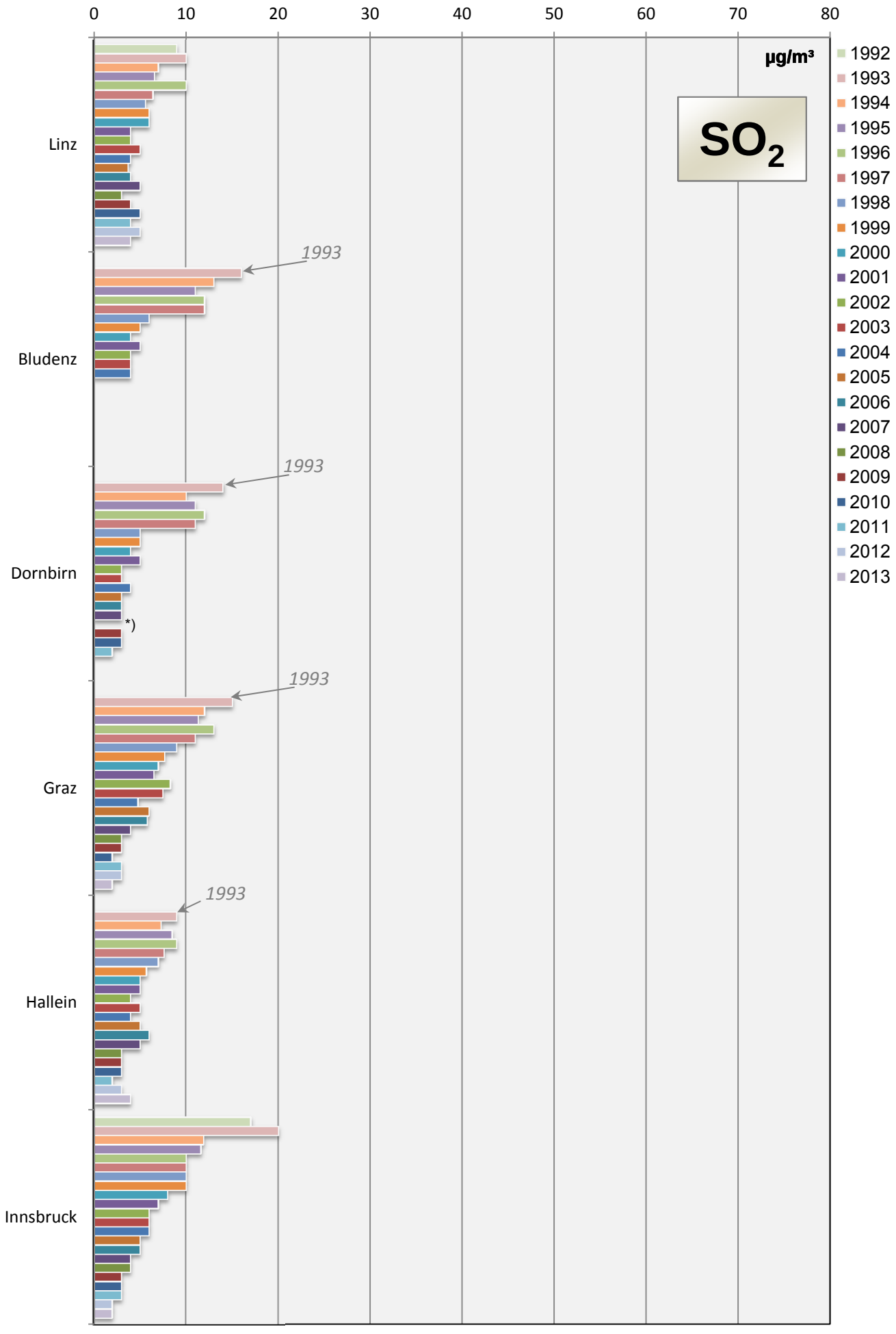
Comparison of The Air Quality Over The Years

1992 - 2013

Annual Mean Values

Comparison of The Air Quality 1992 - 2013

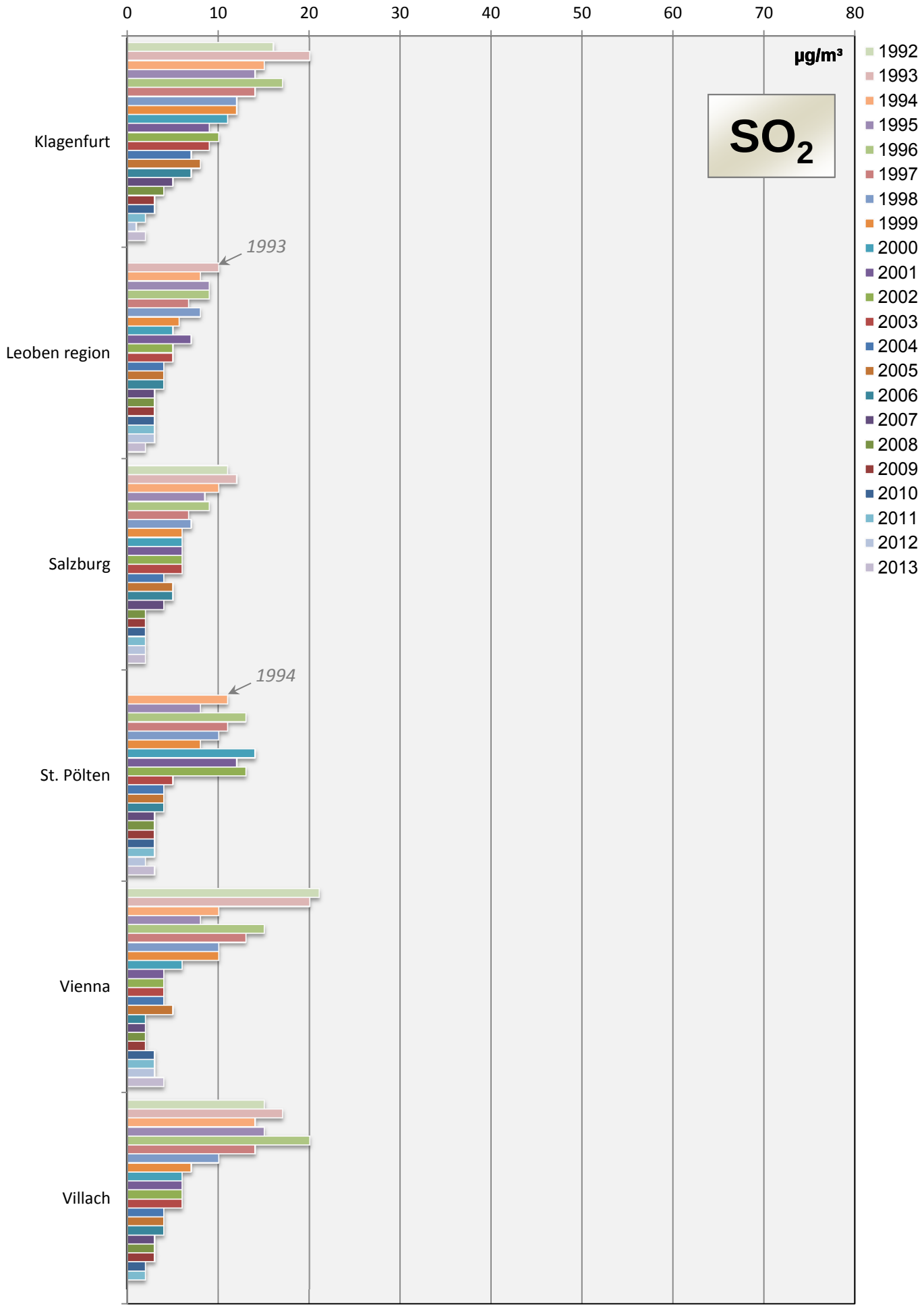
Annual mean values (mean of all monitoring stations)



*) data of the year 2008 are not used for the comparison, because the street near the measurment point was closed for 11 months

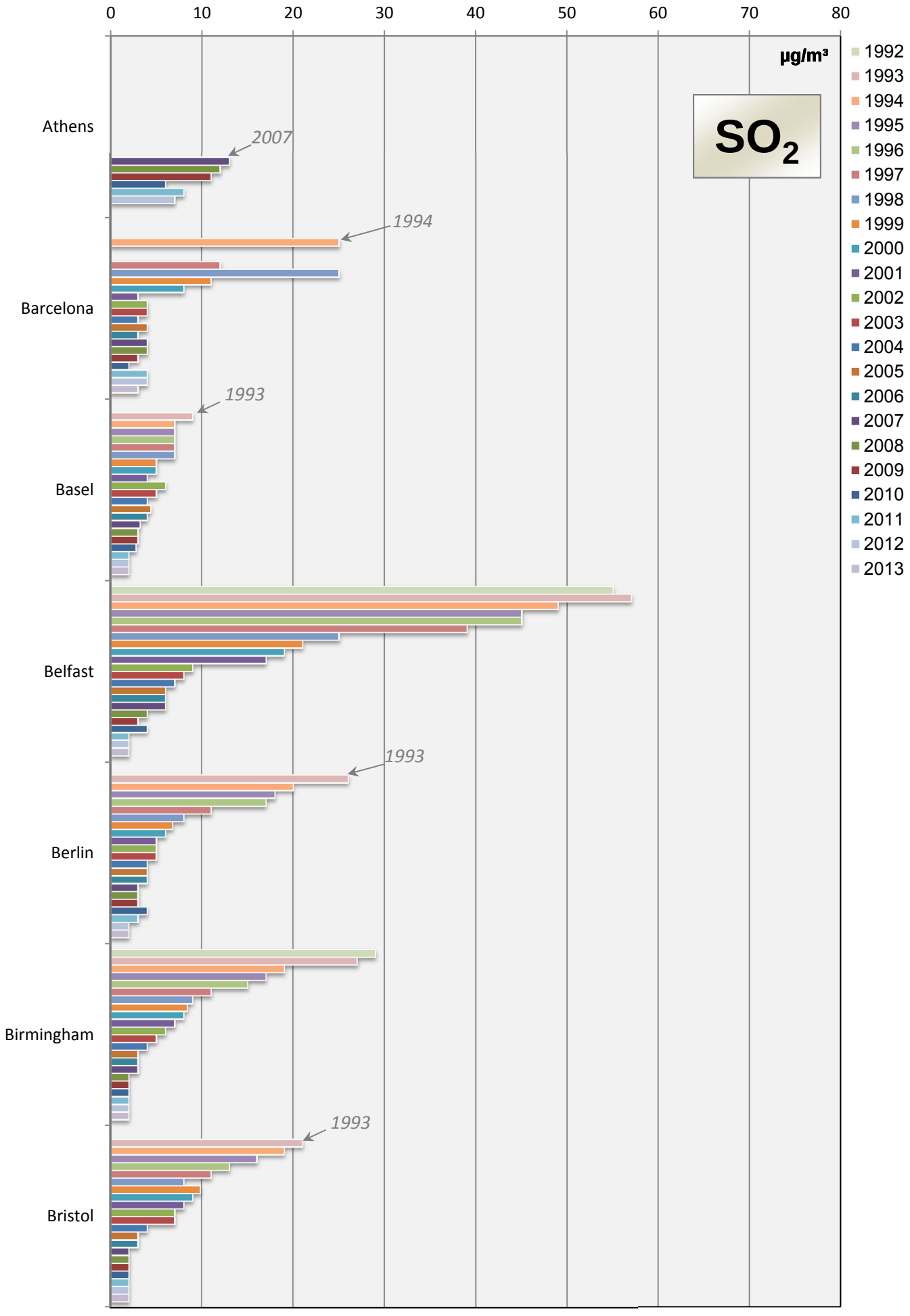
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



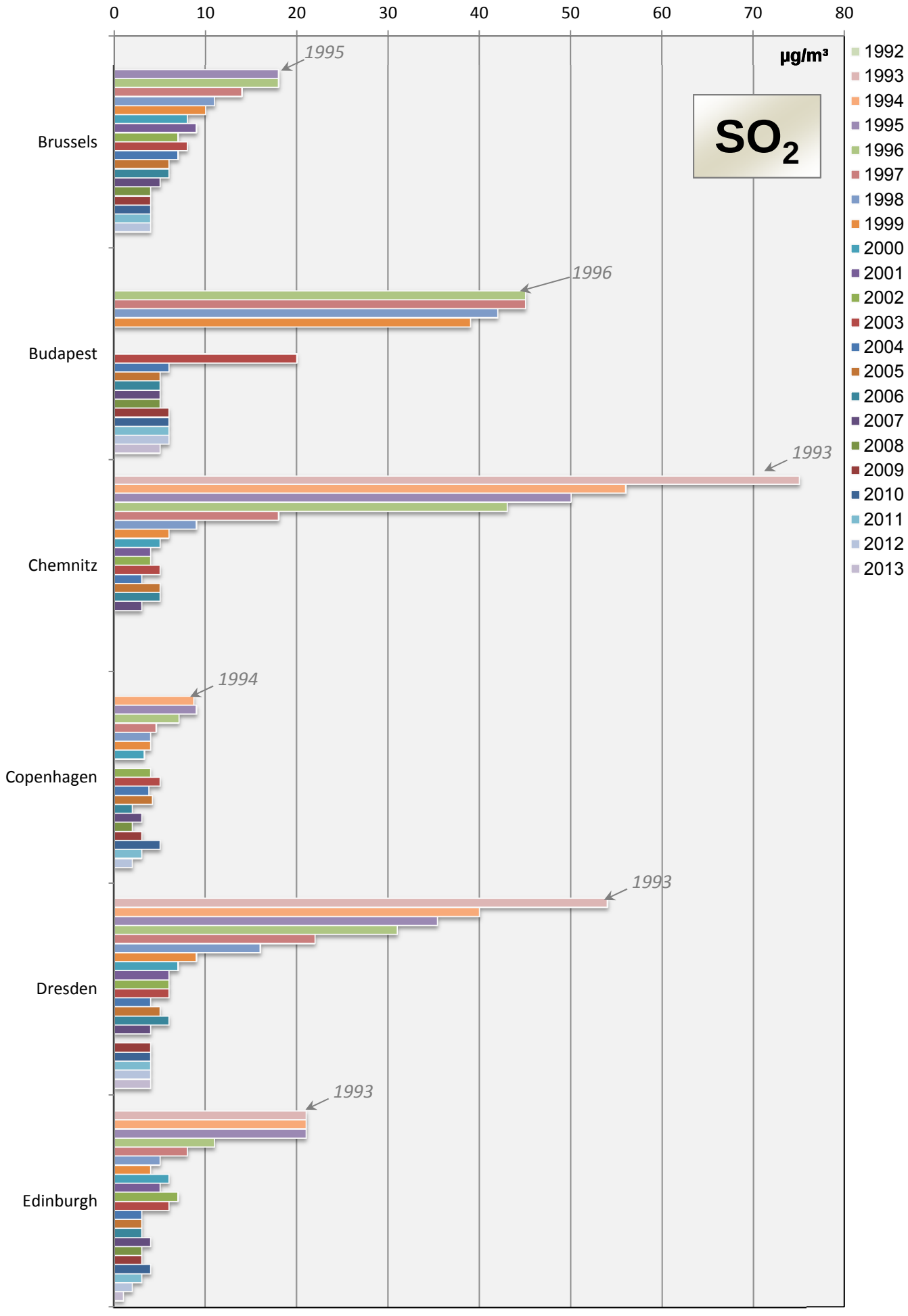
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



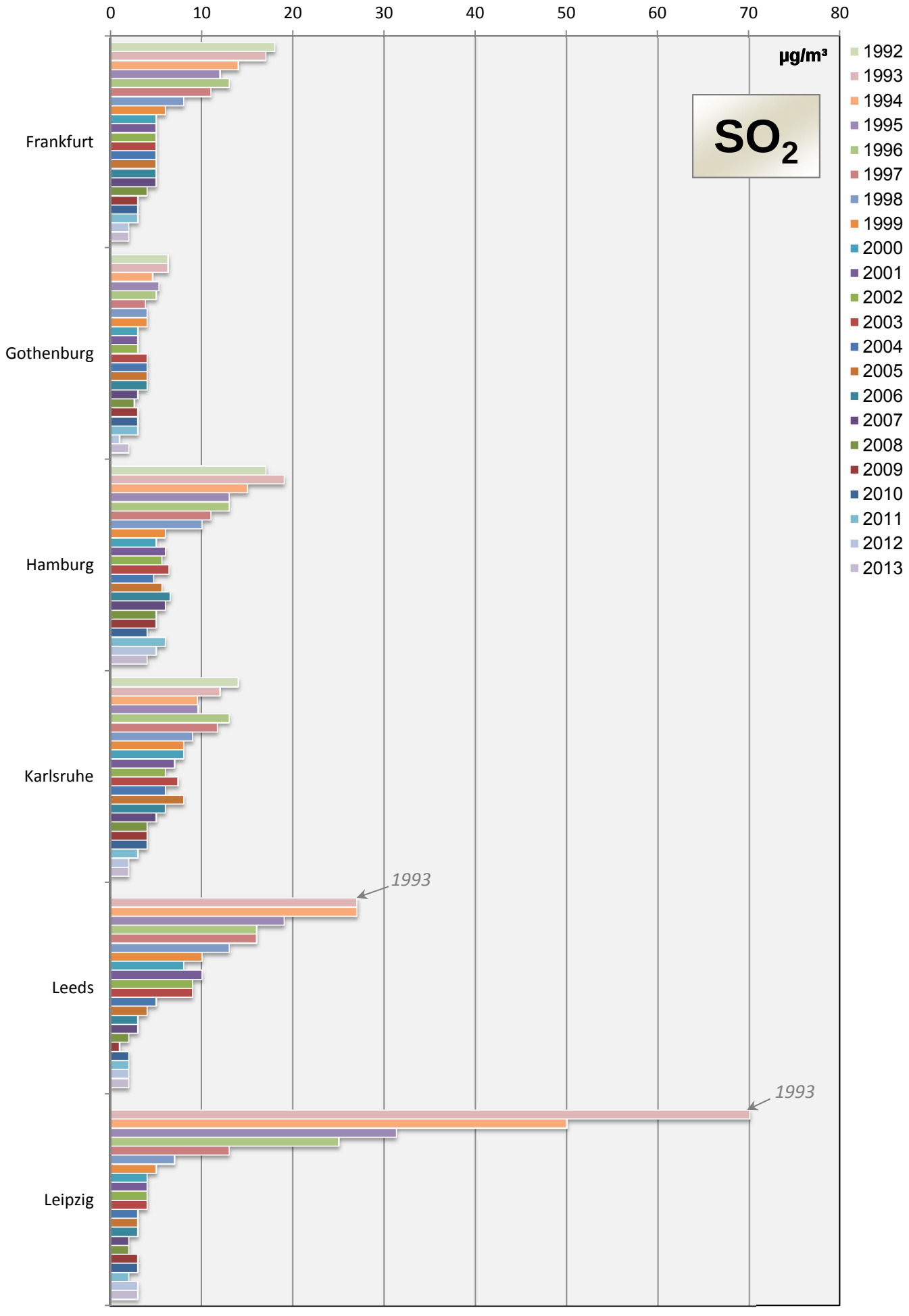
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



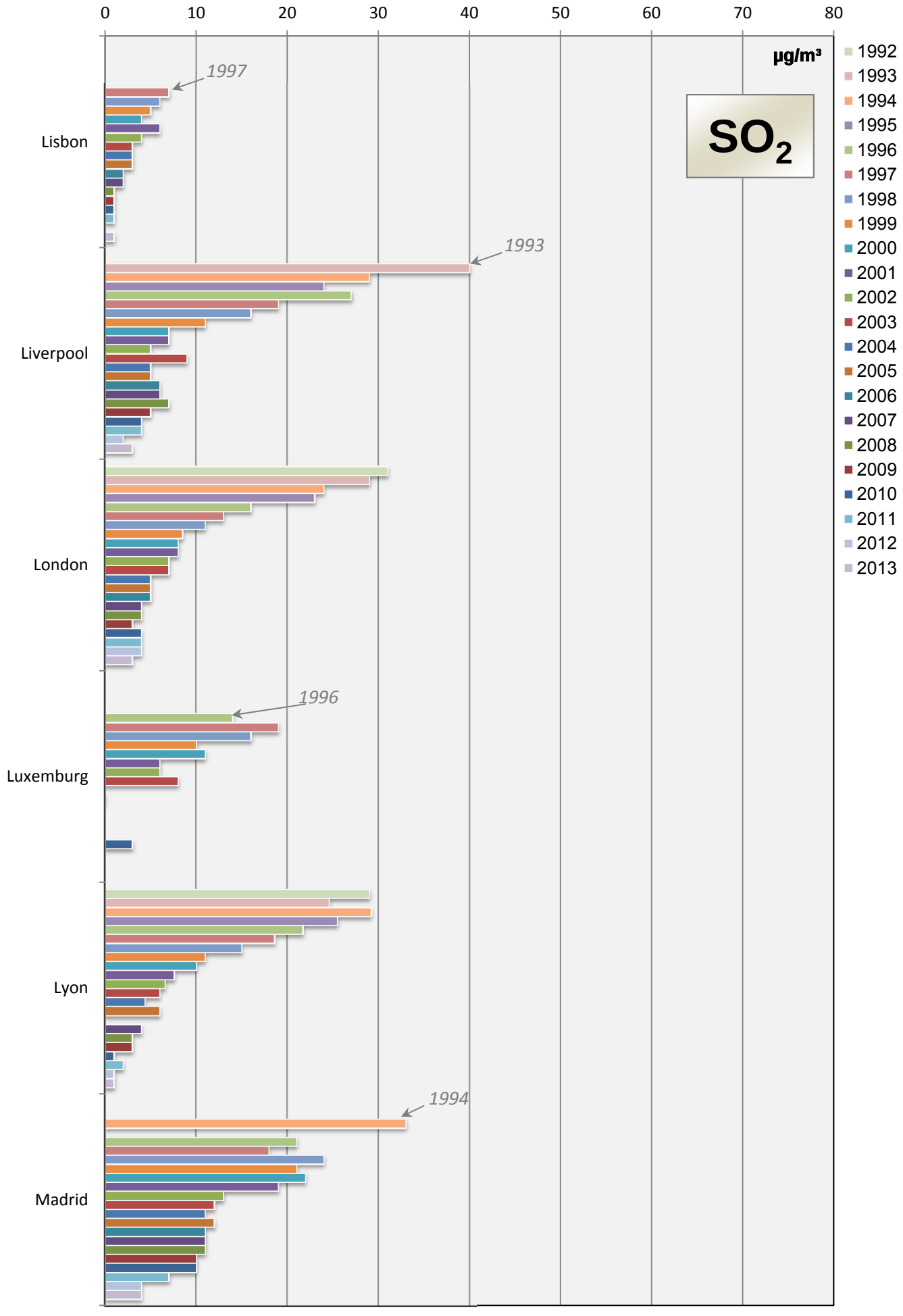
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



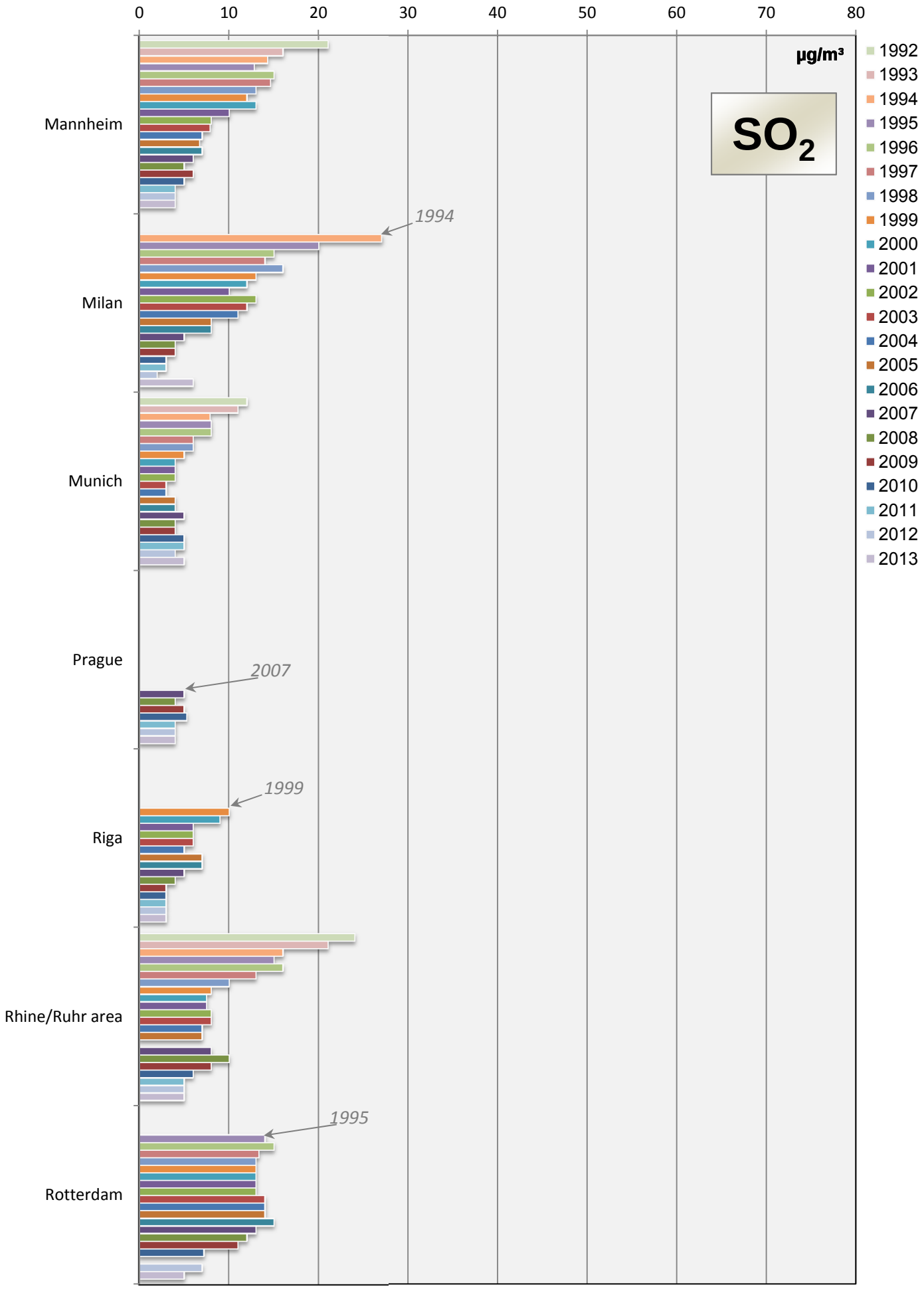
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



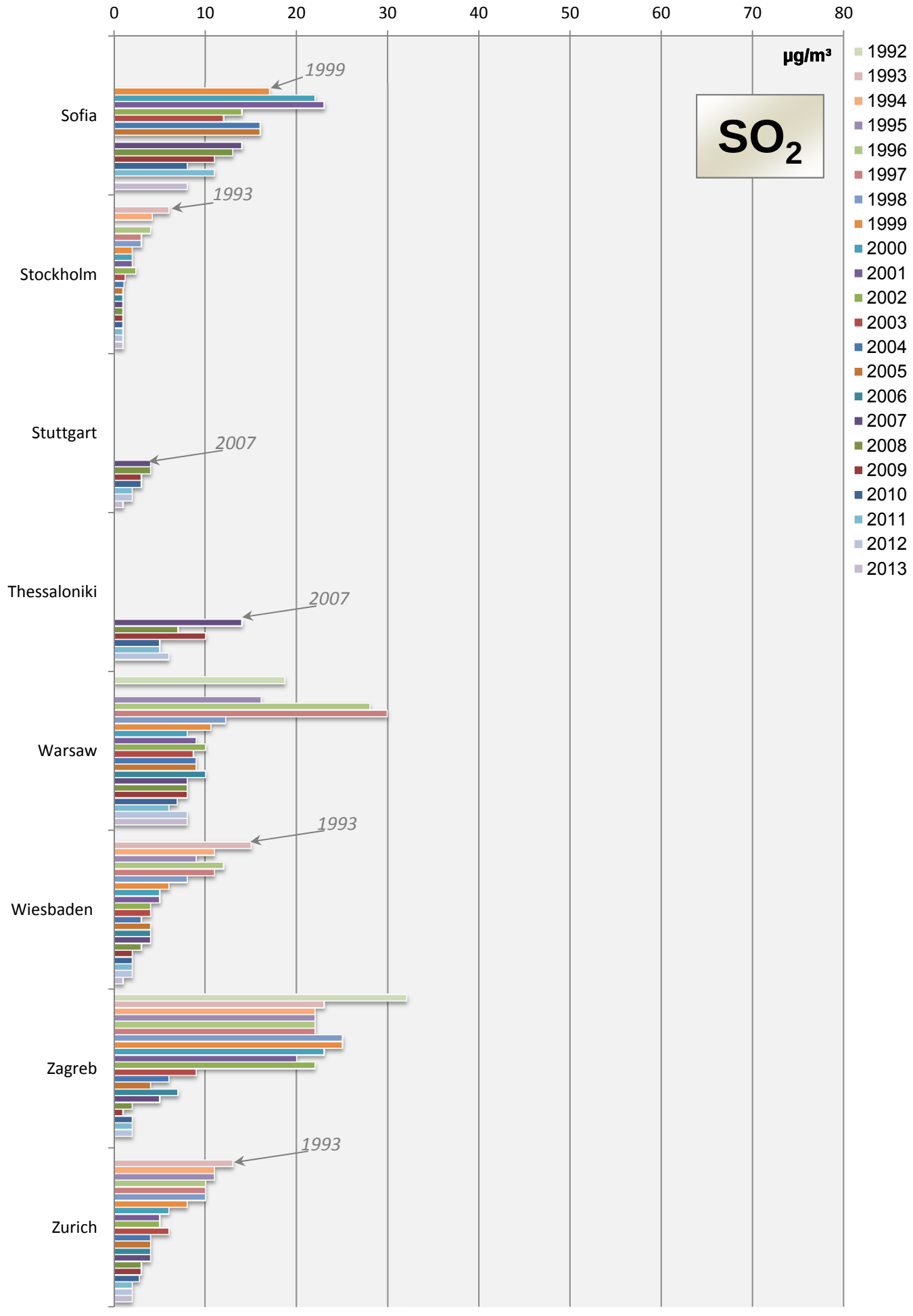
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



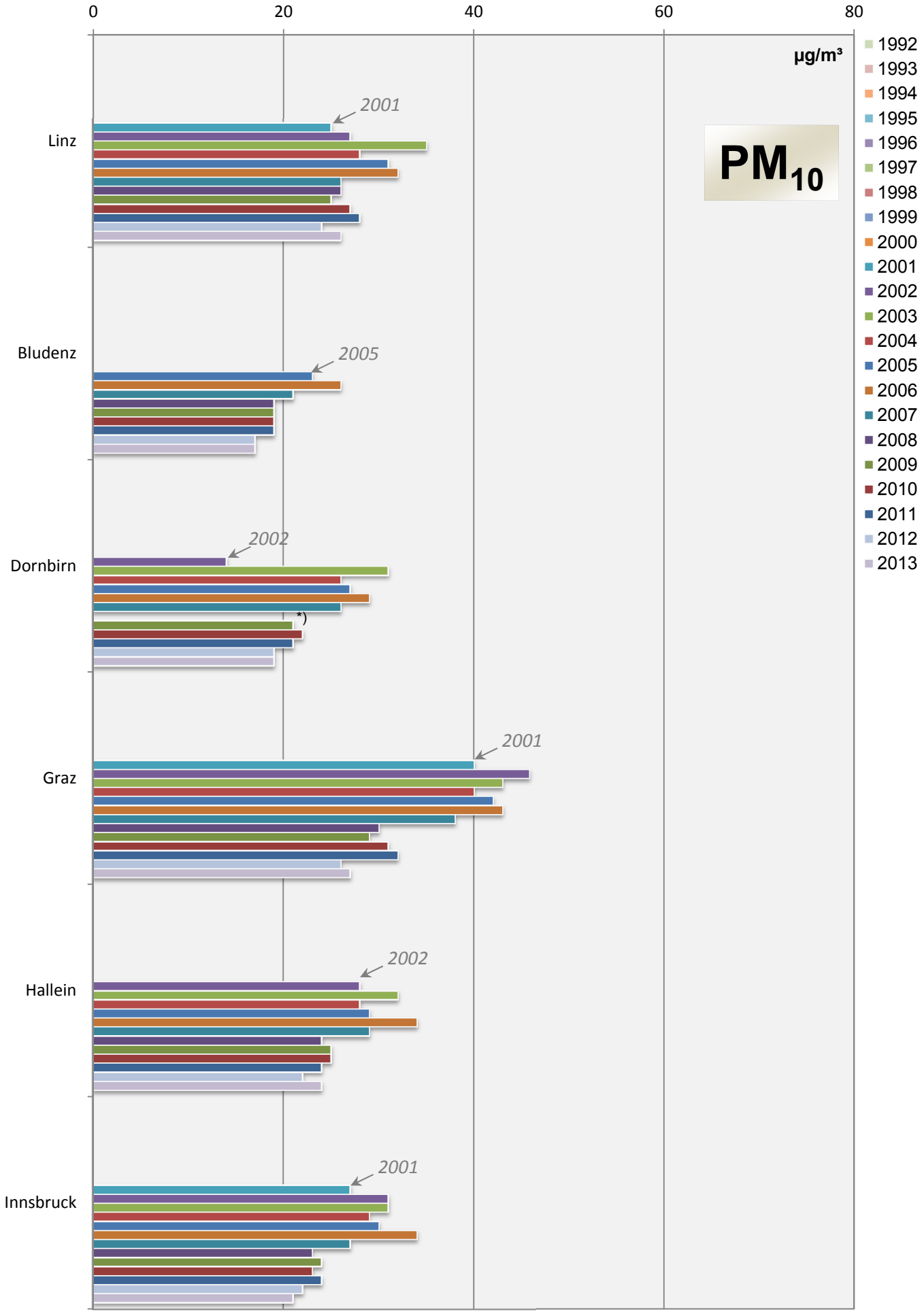
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



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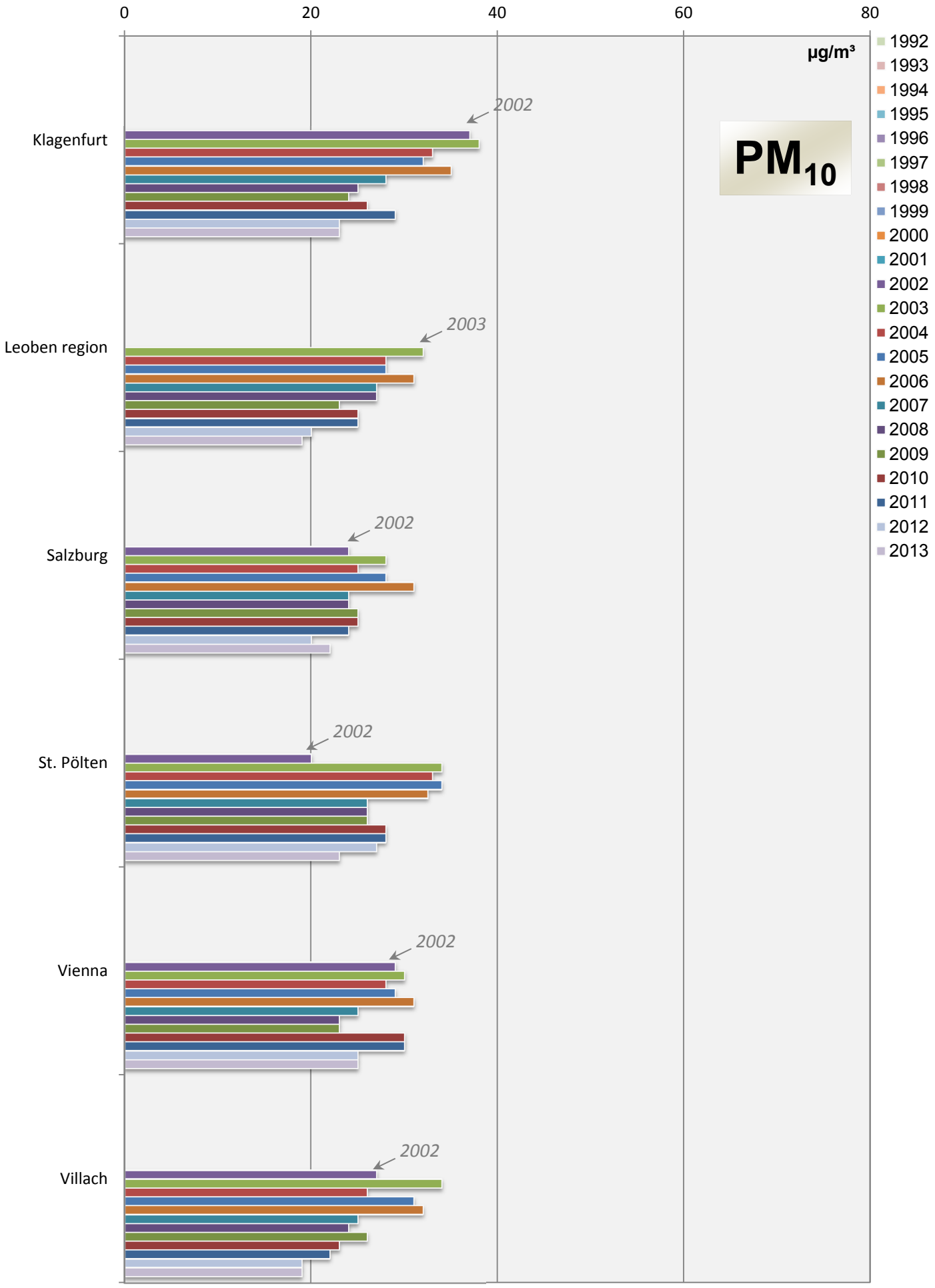
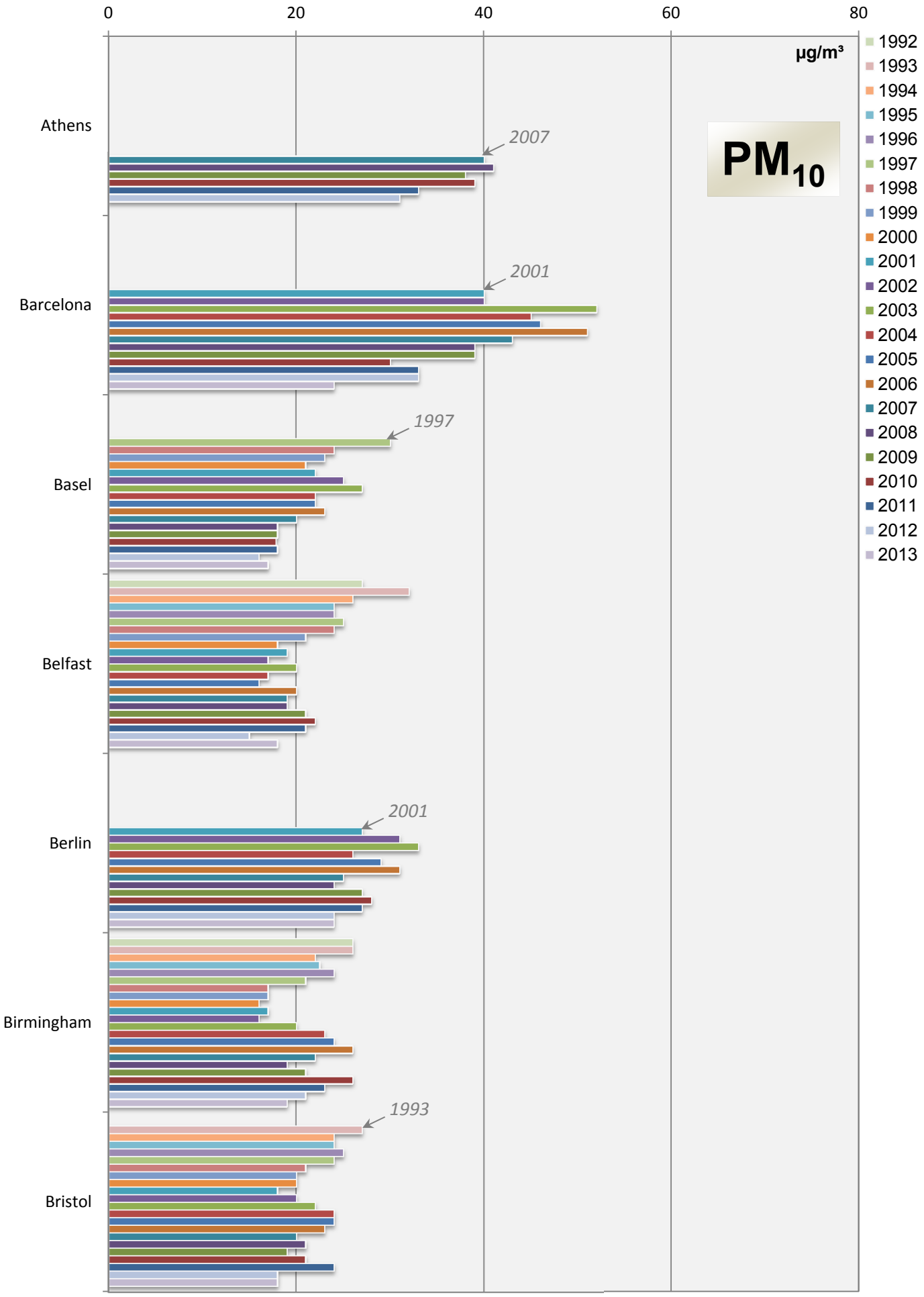
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



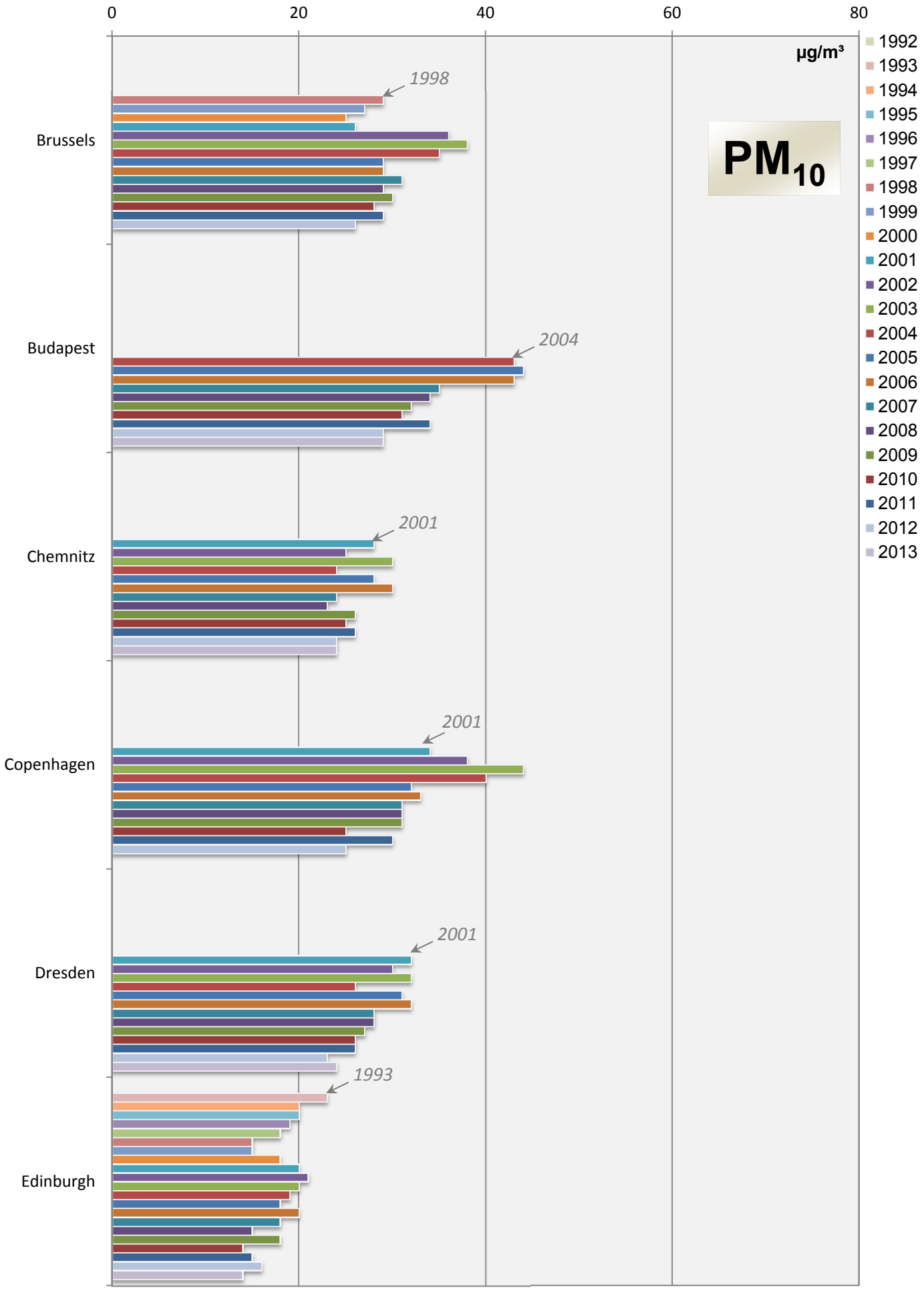
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



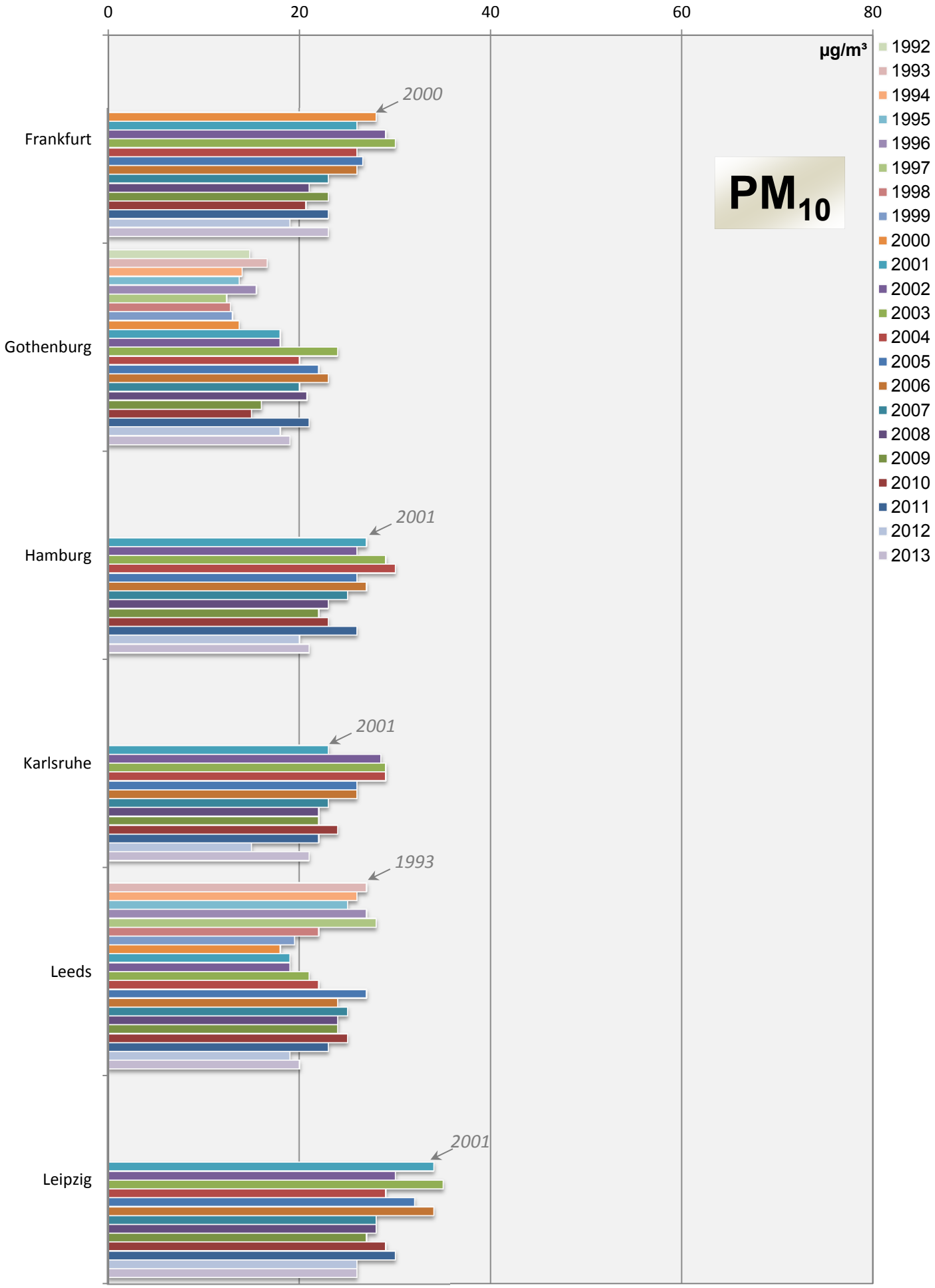
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



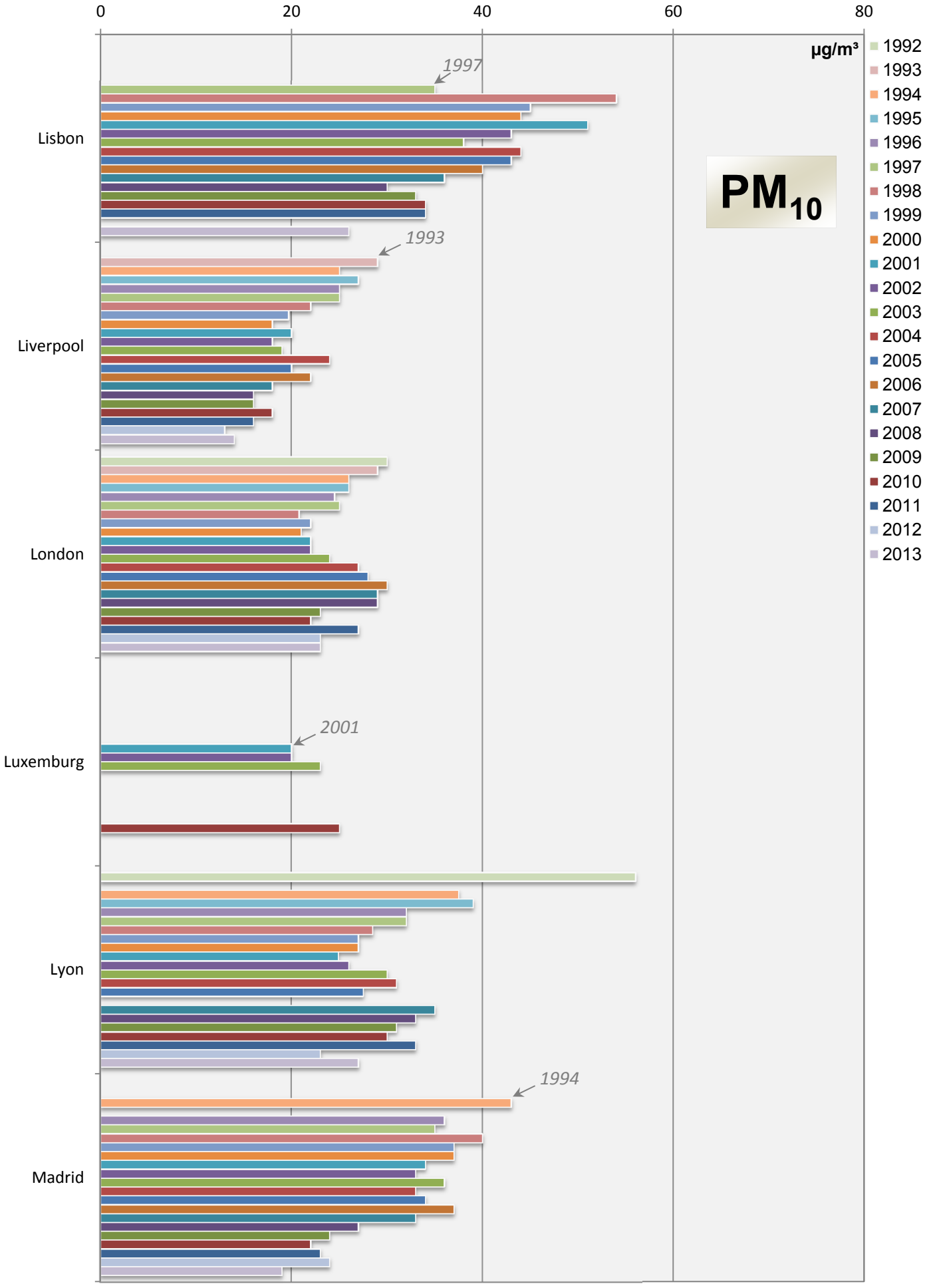
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



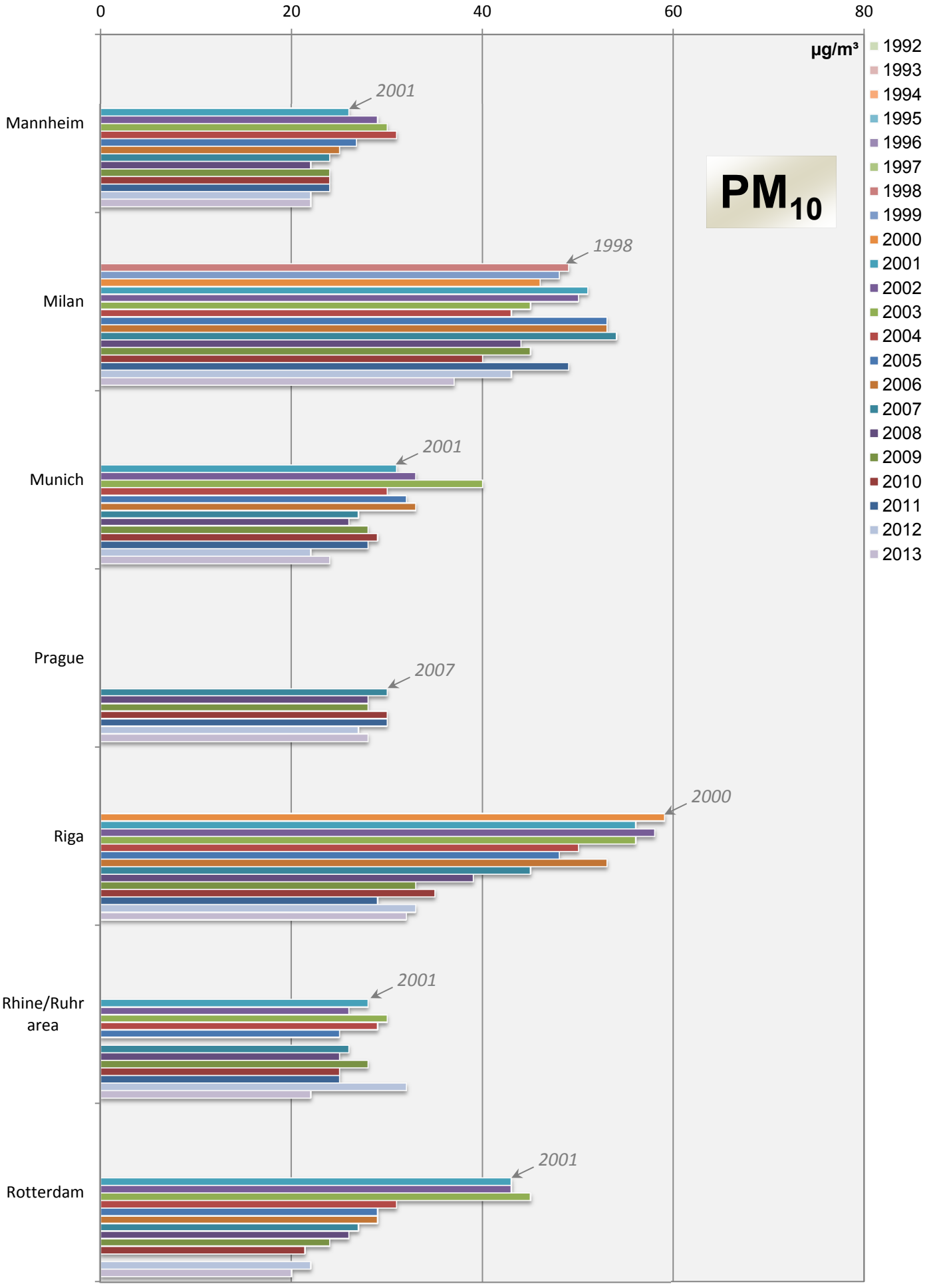
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



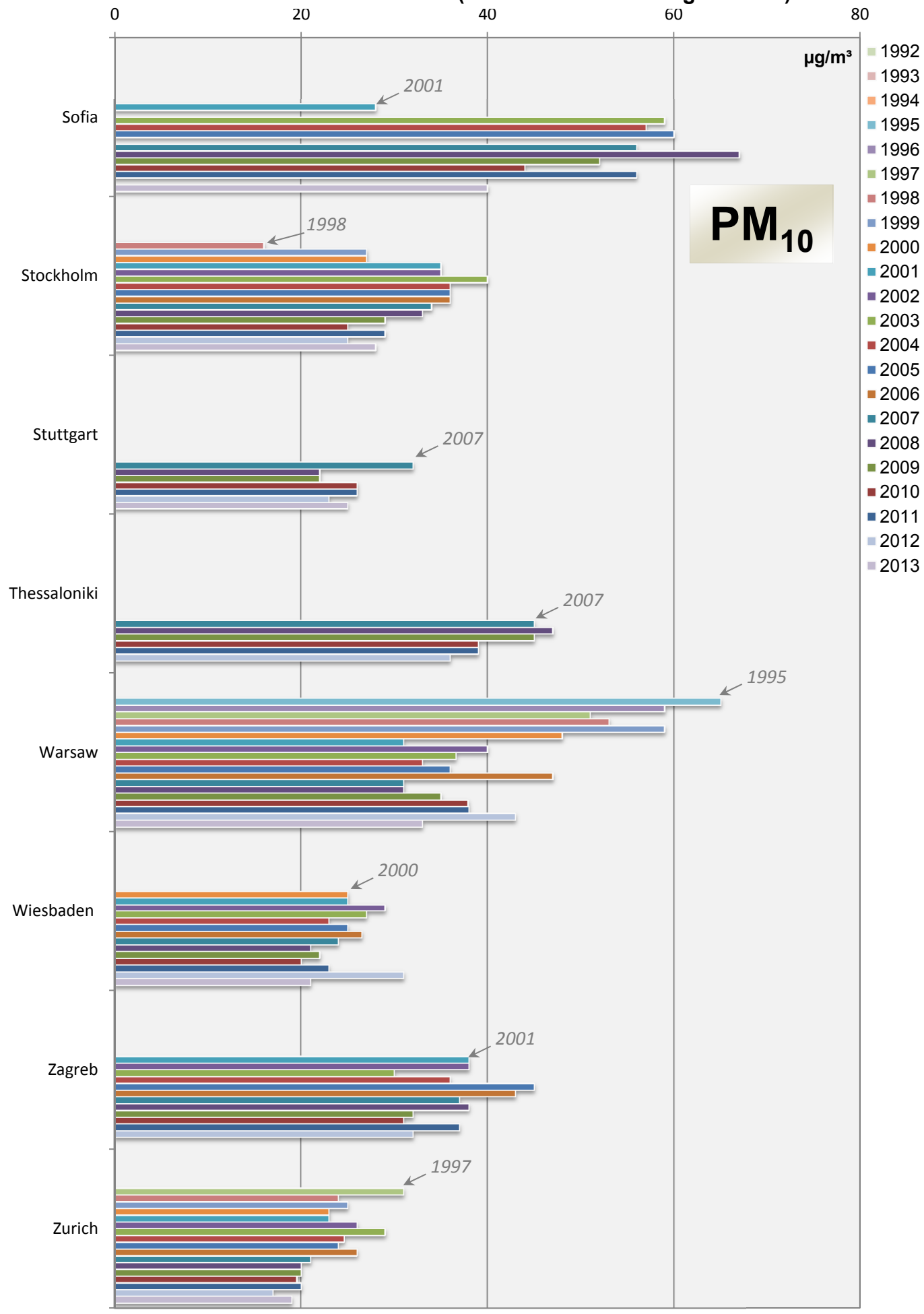
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)

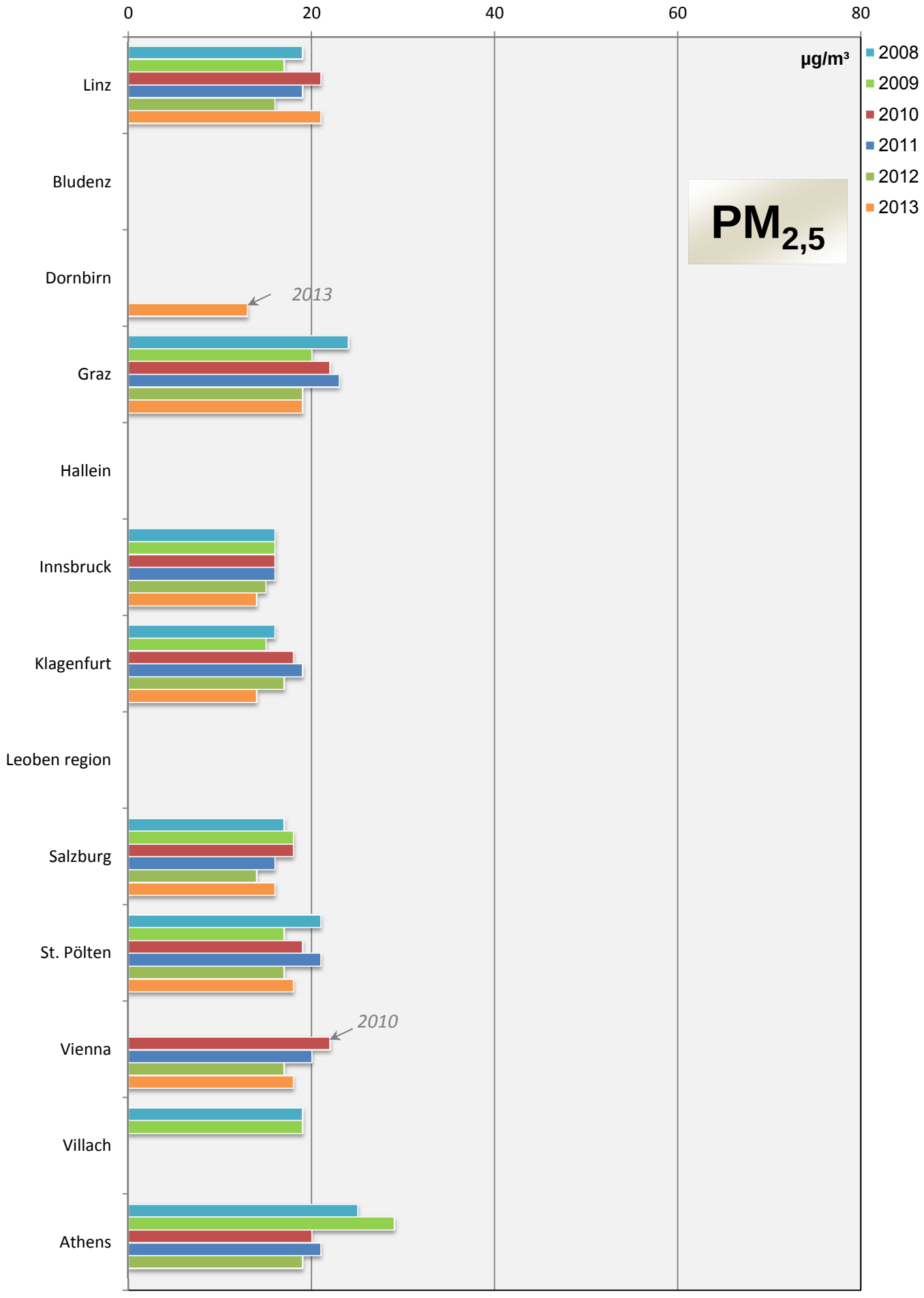


Comparison of The Air Quality 1992 - 2013

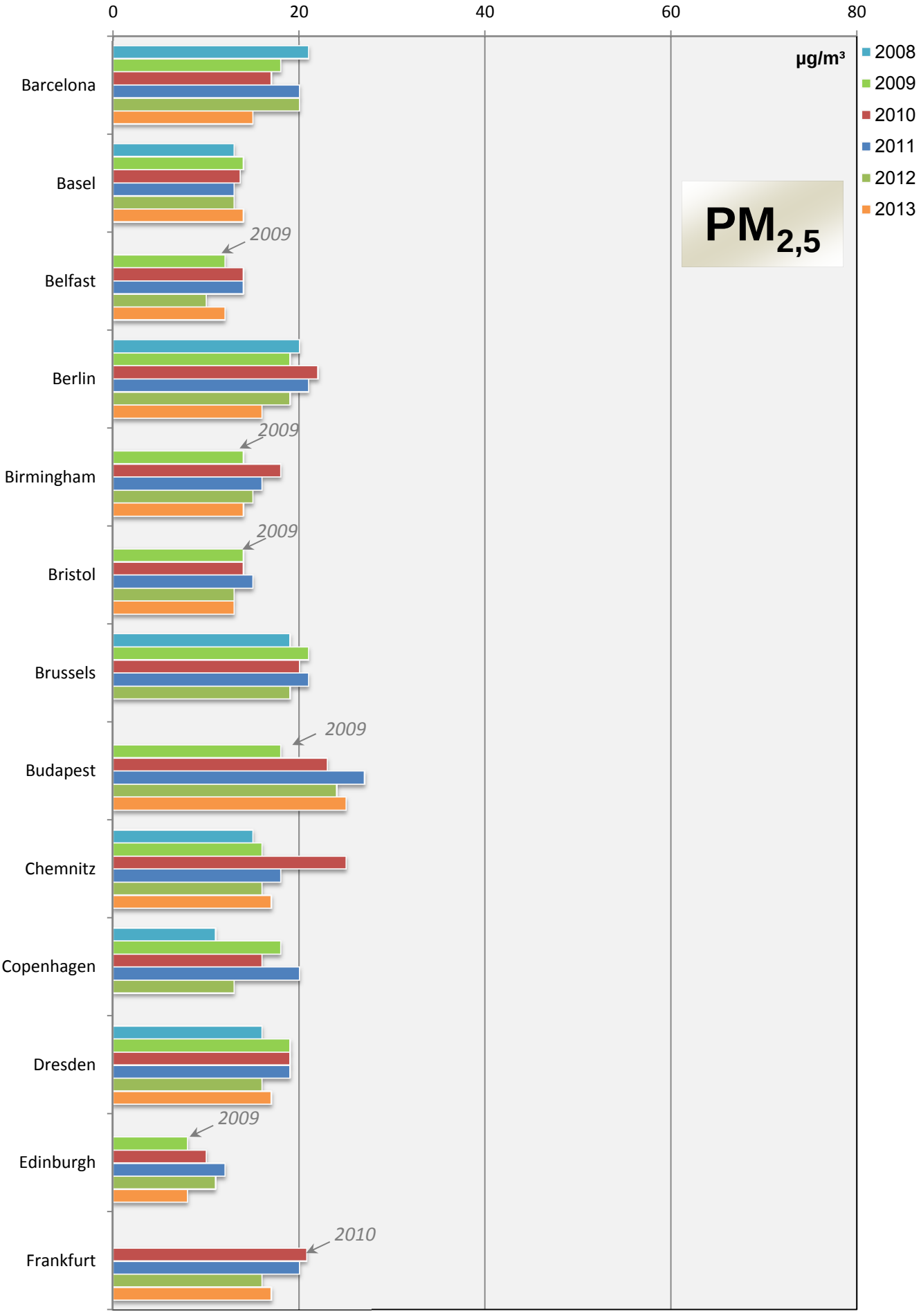
Annual mean values (mean of all monitoring stations)



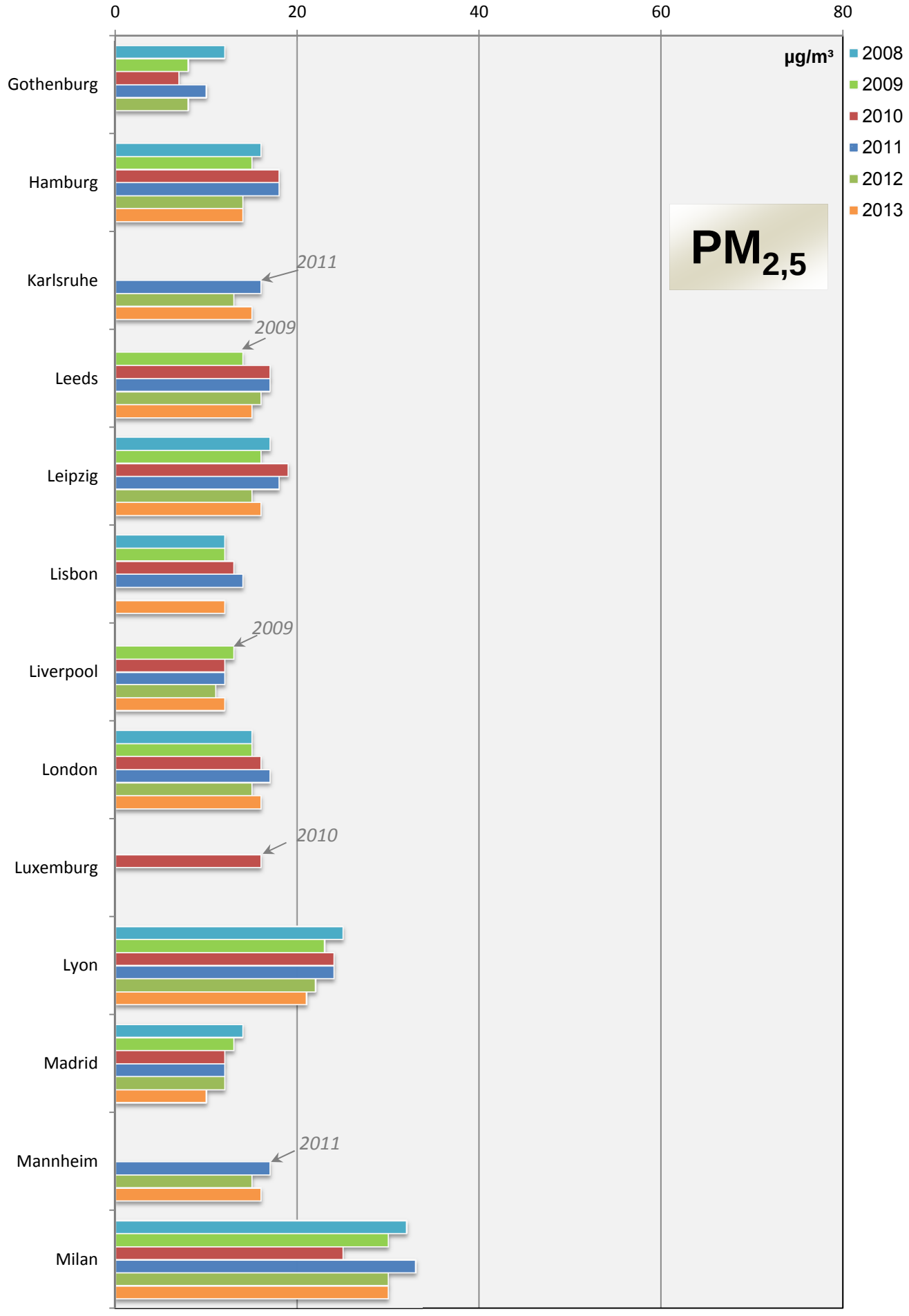
Comparison of The Air Quality 2008 - 2013
Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 2008 - 2013
Annual mean values (mean of all monitoring stations)

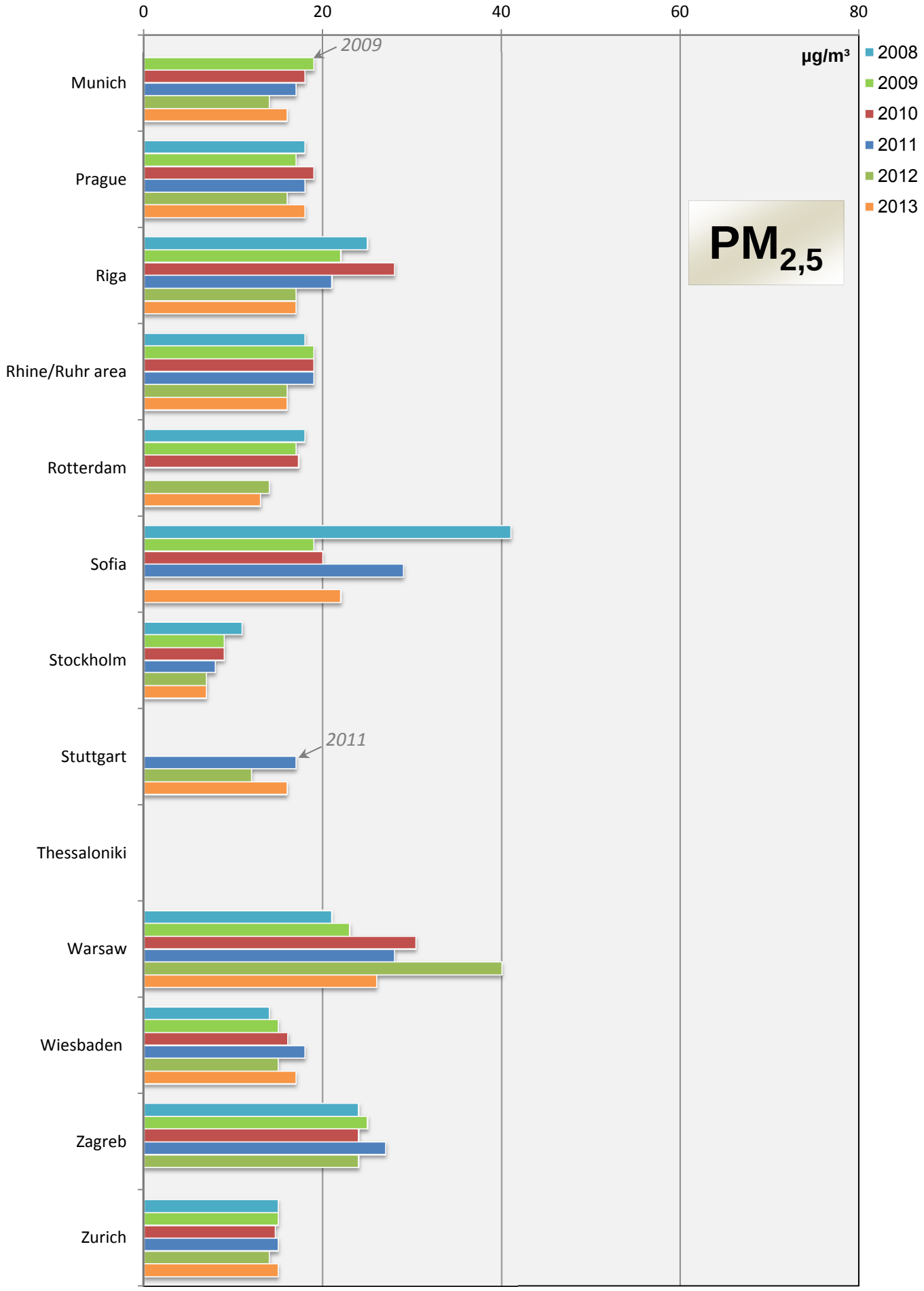


Comparison of The Air Quality 2008 - 2013
Annual mean values (mean of all monitoring stations)



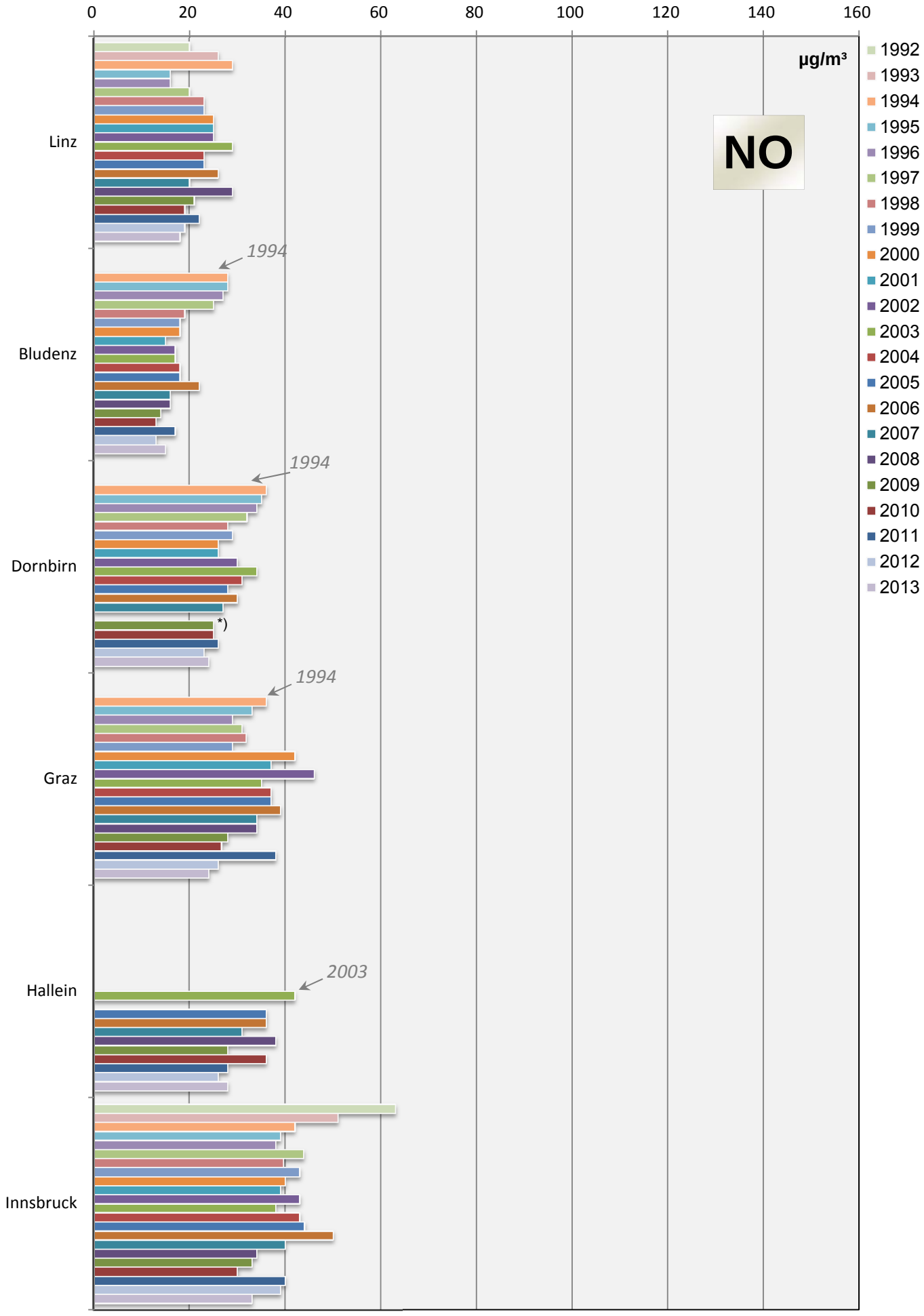
Comparison of The Air Quality 2008 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



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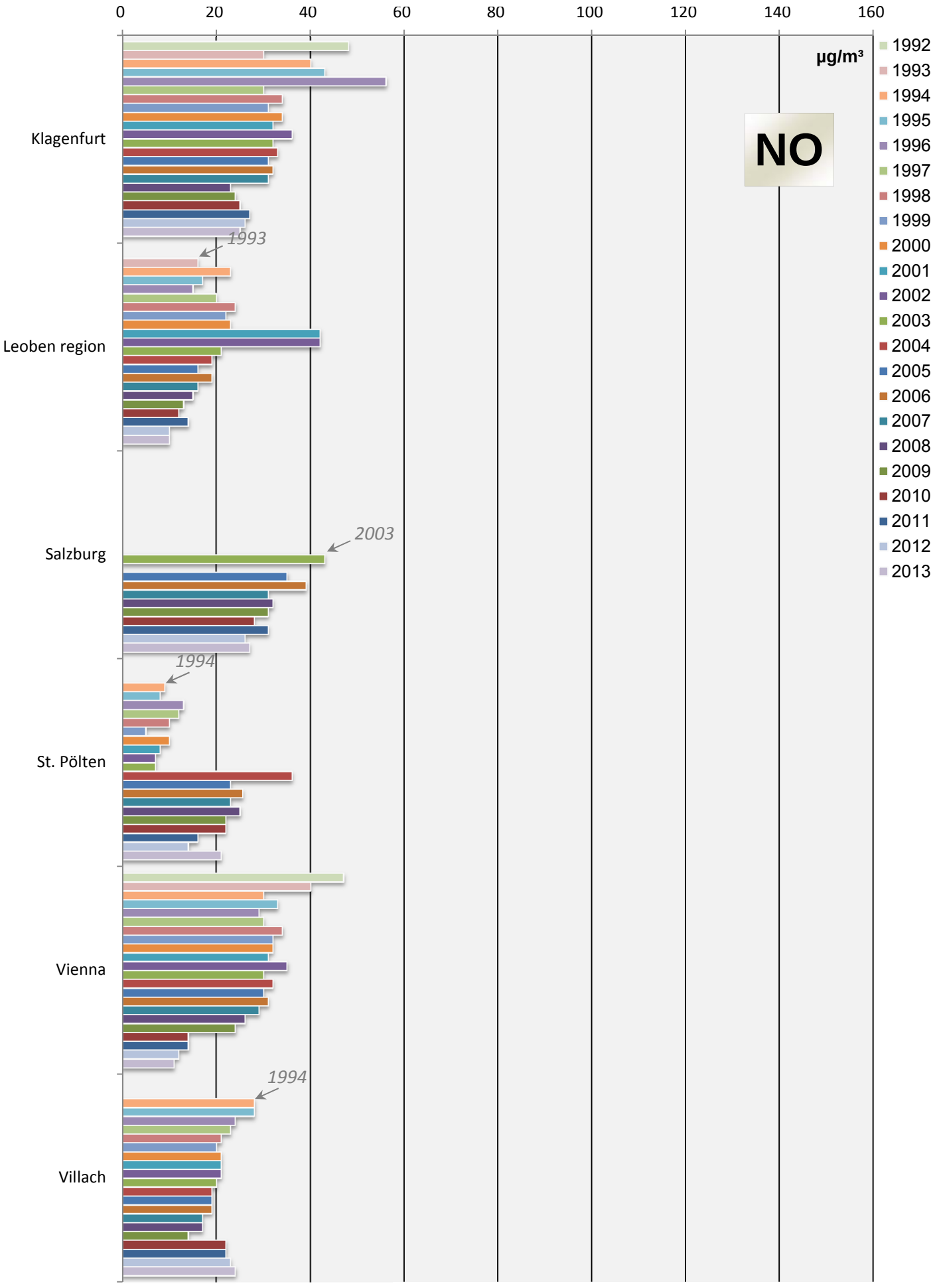
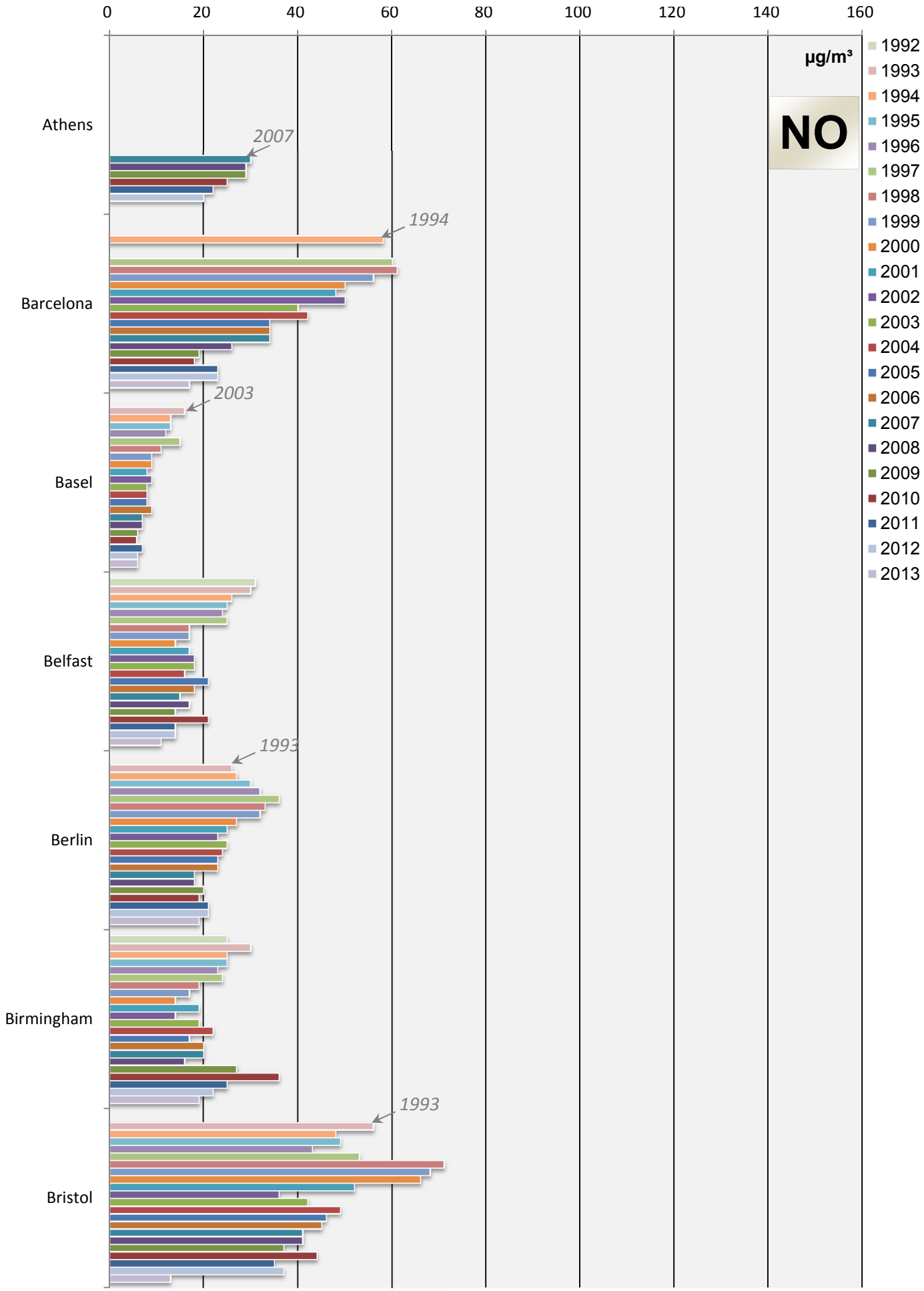
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



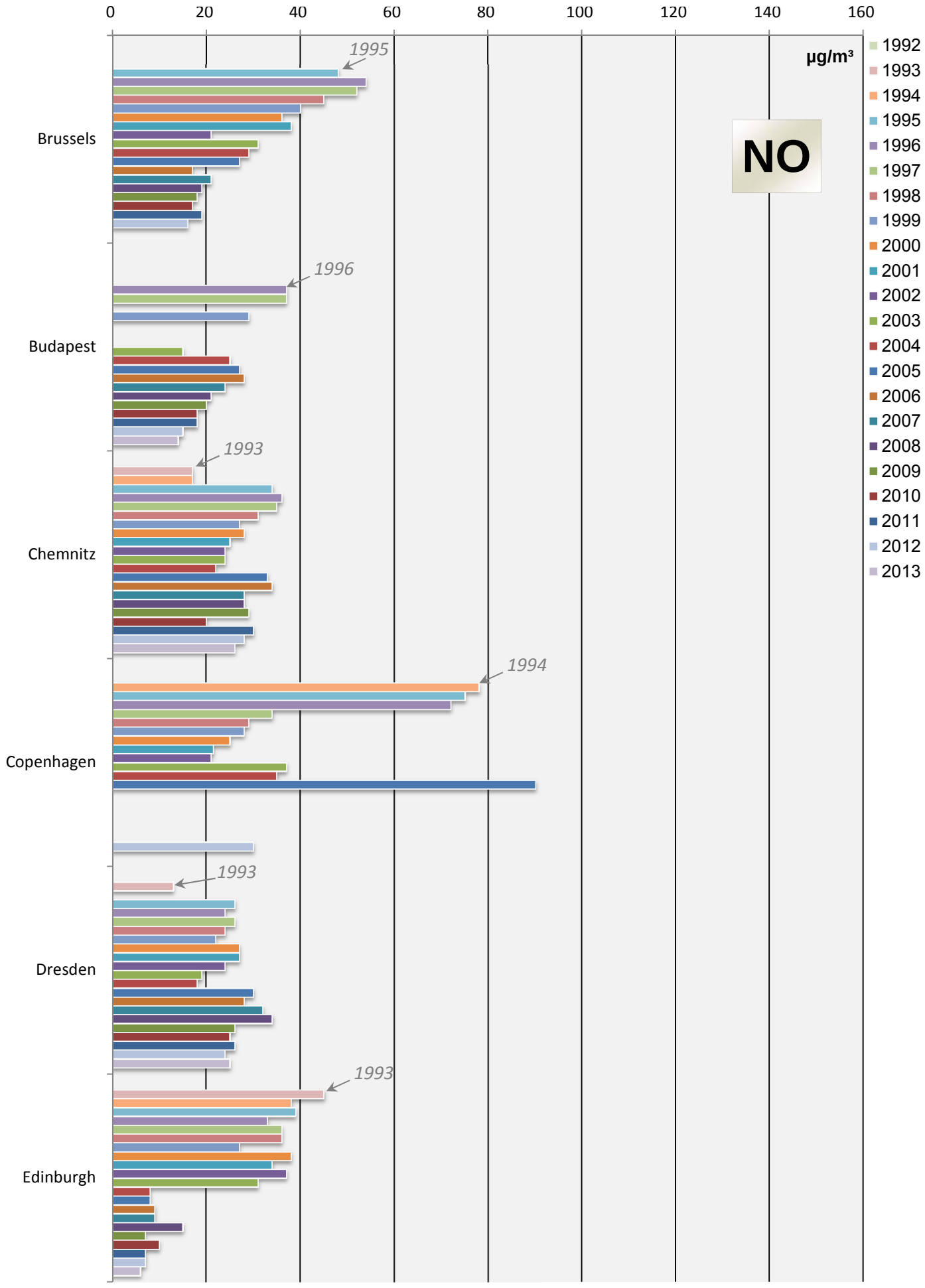
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



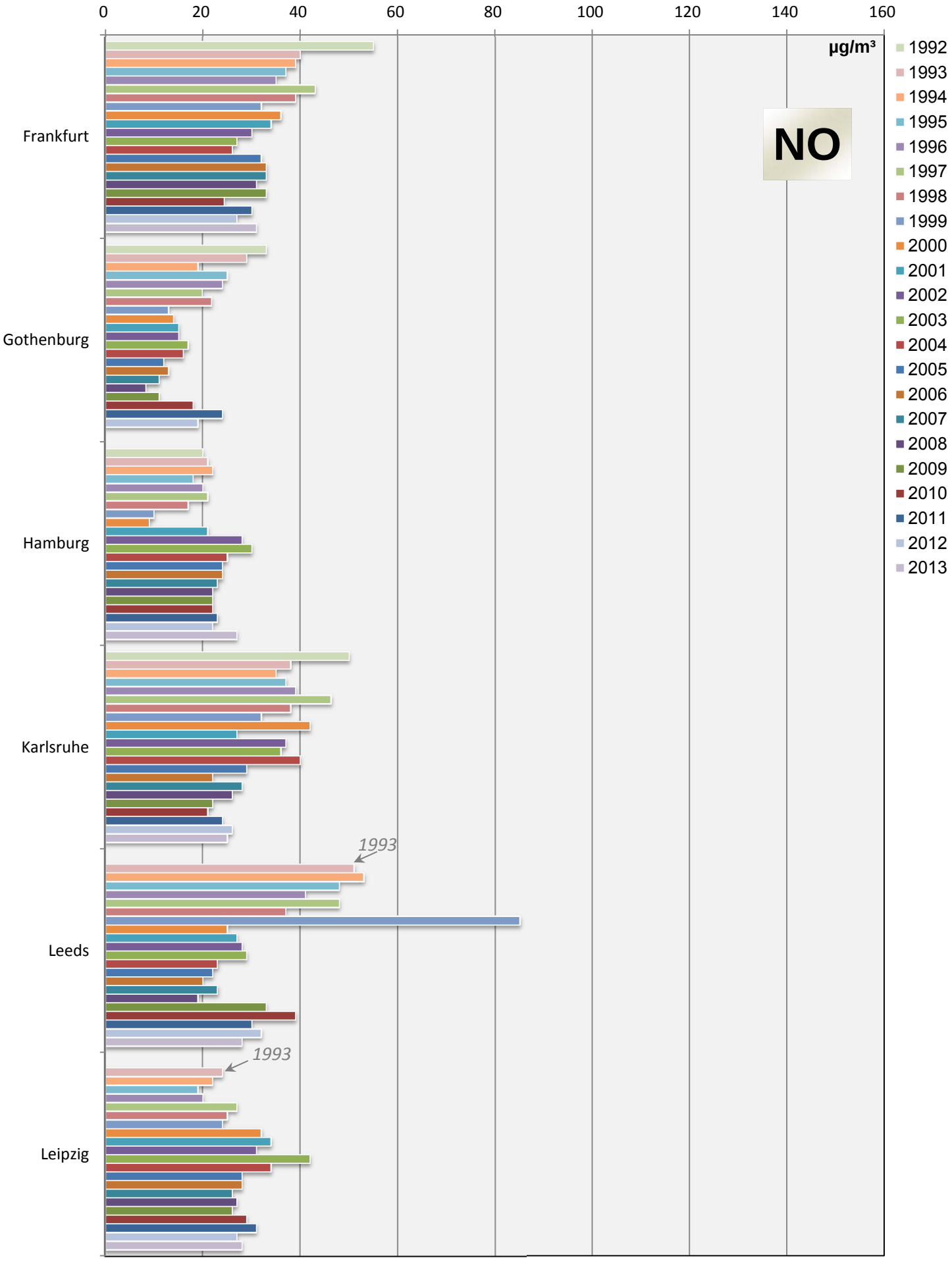
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



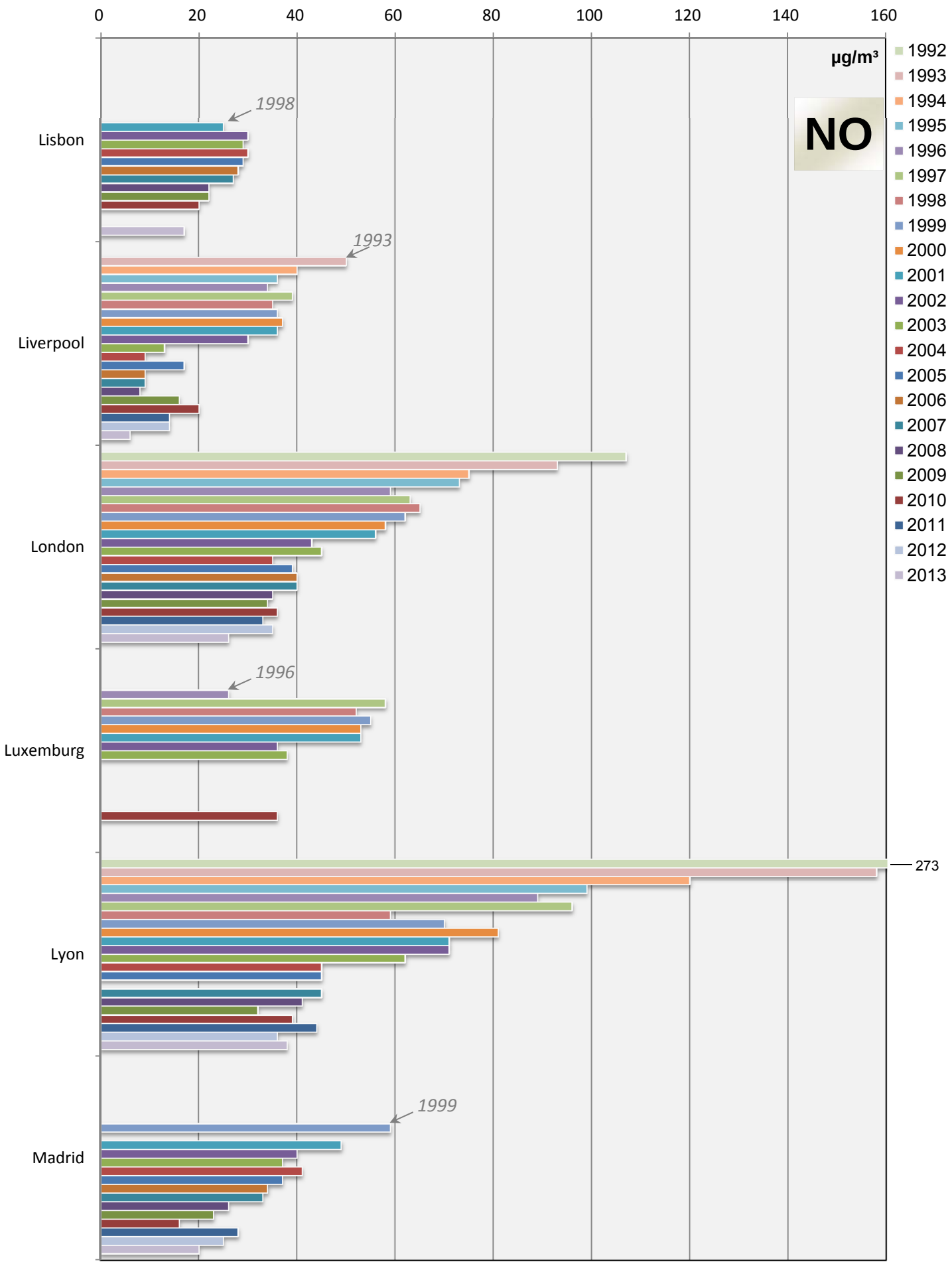
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



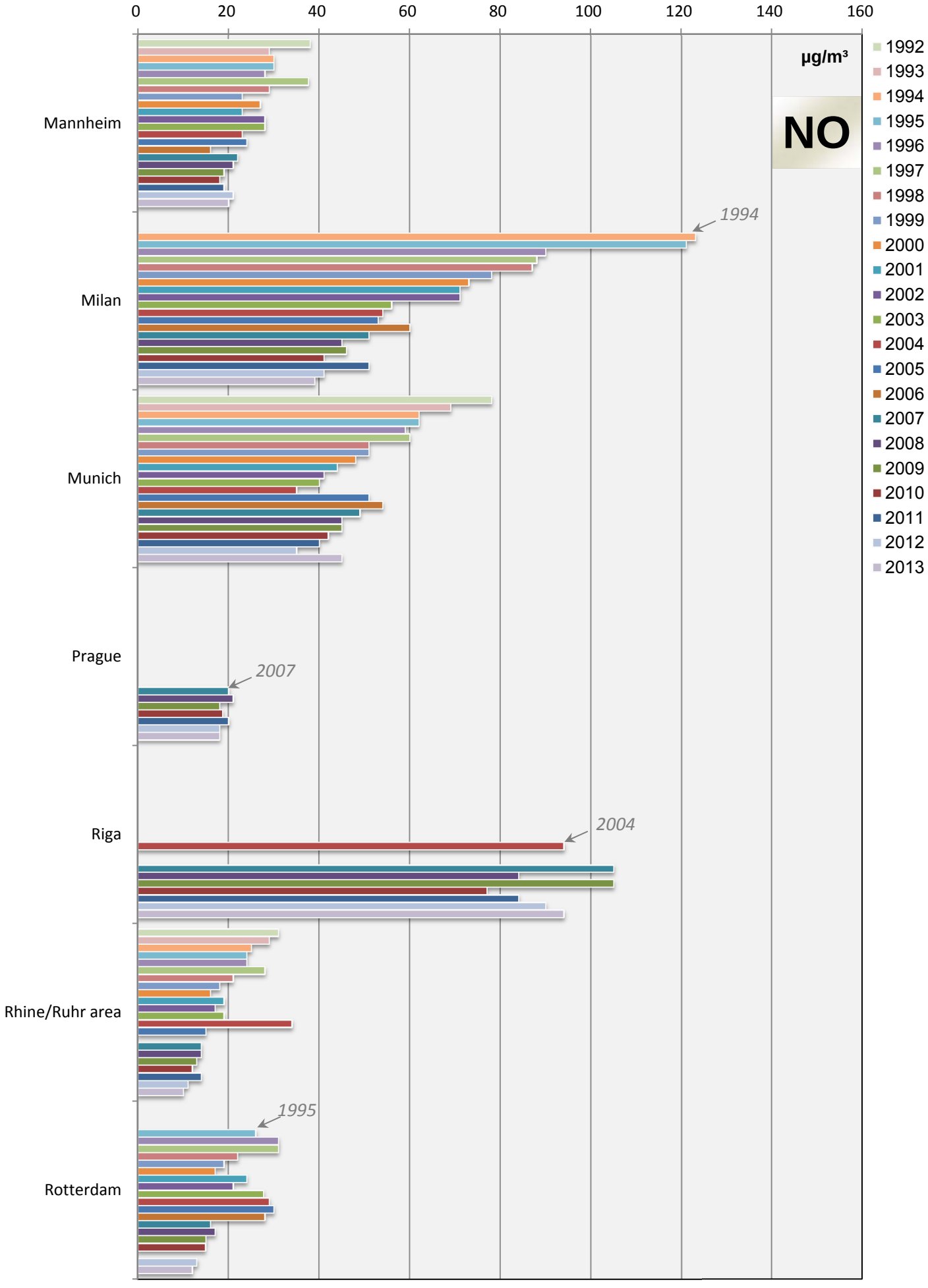
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



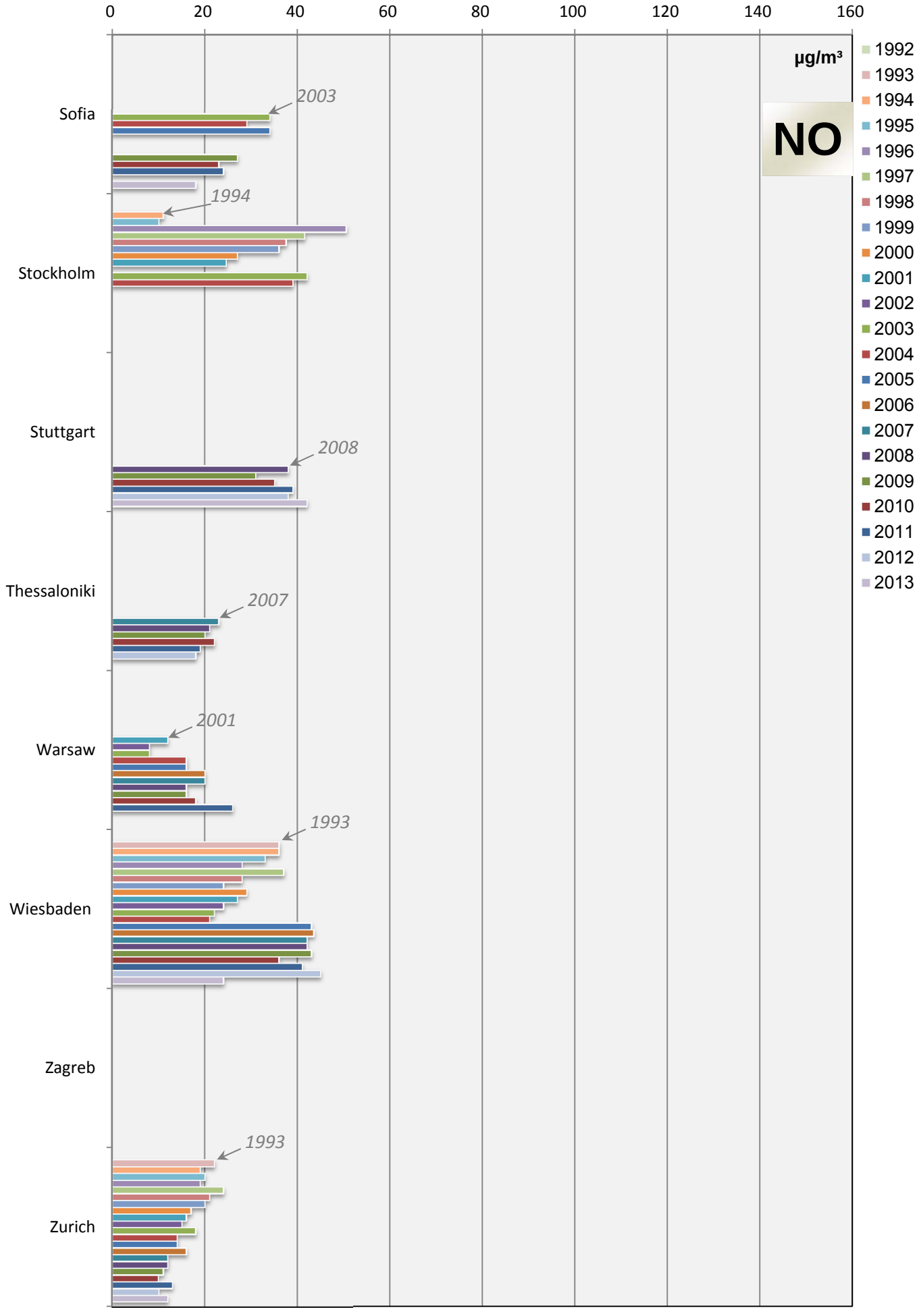
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



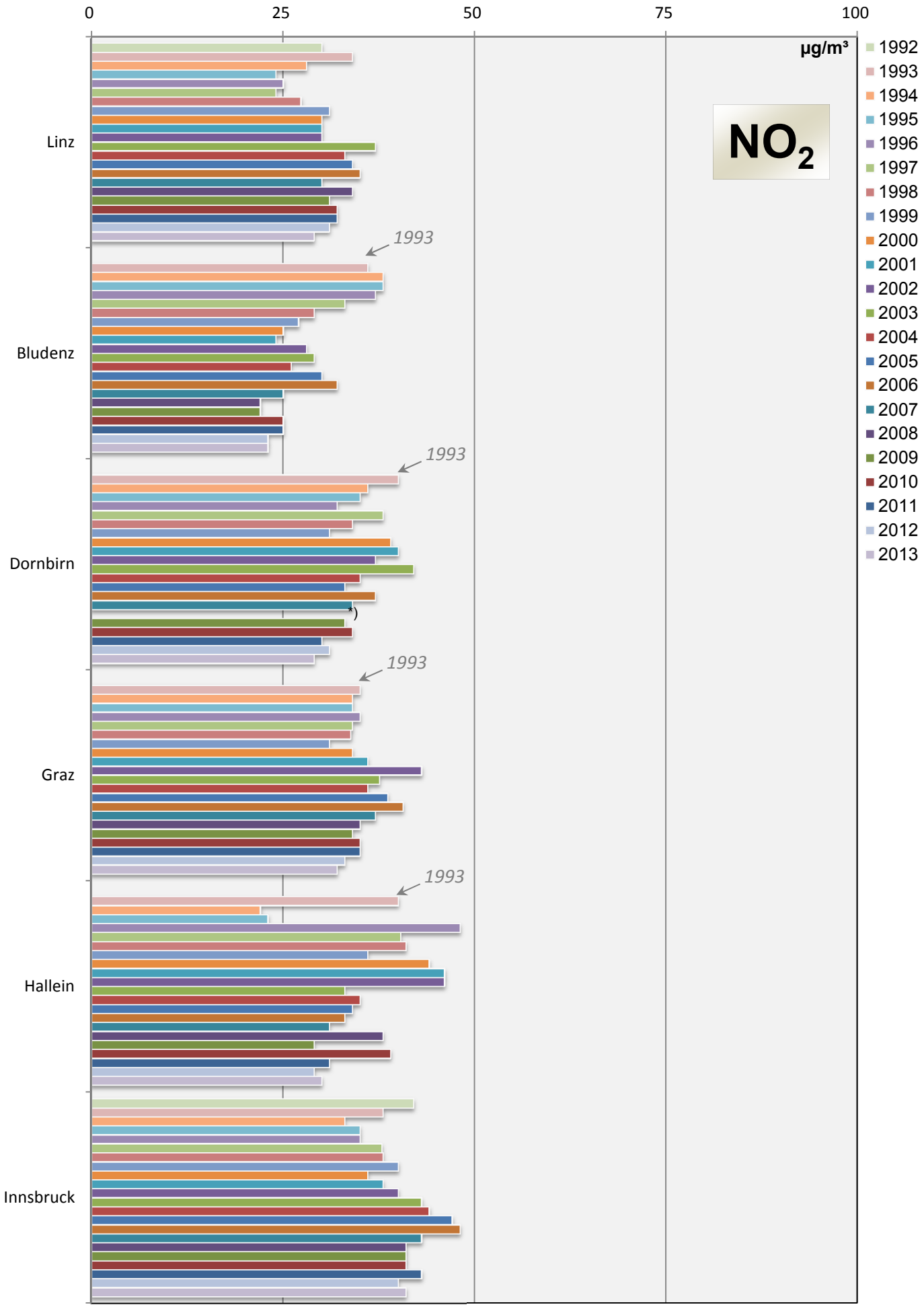
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



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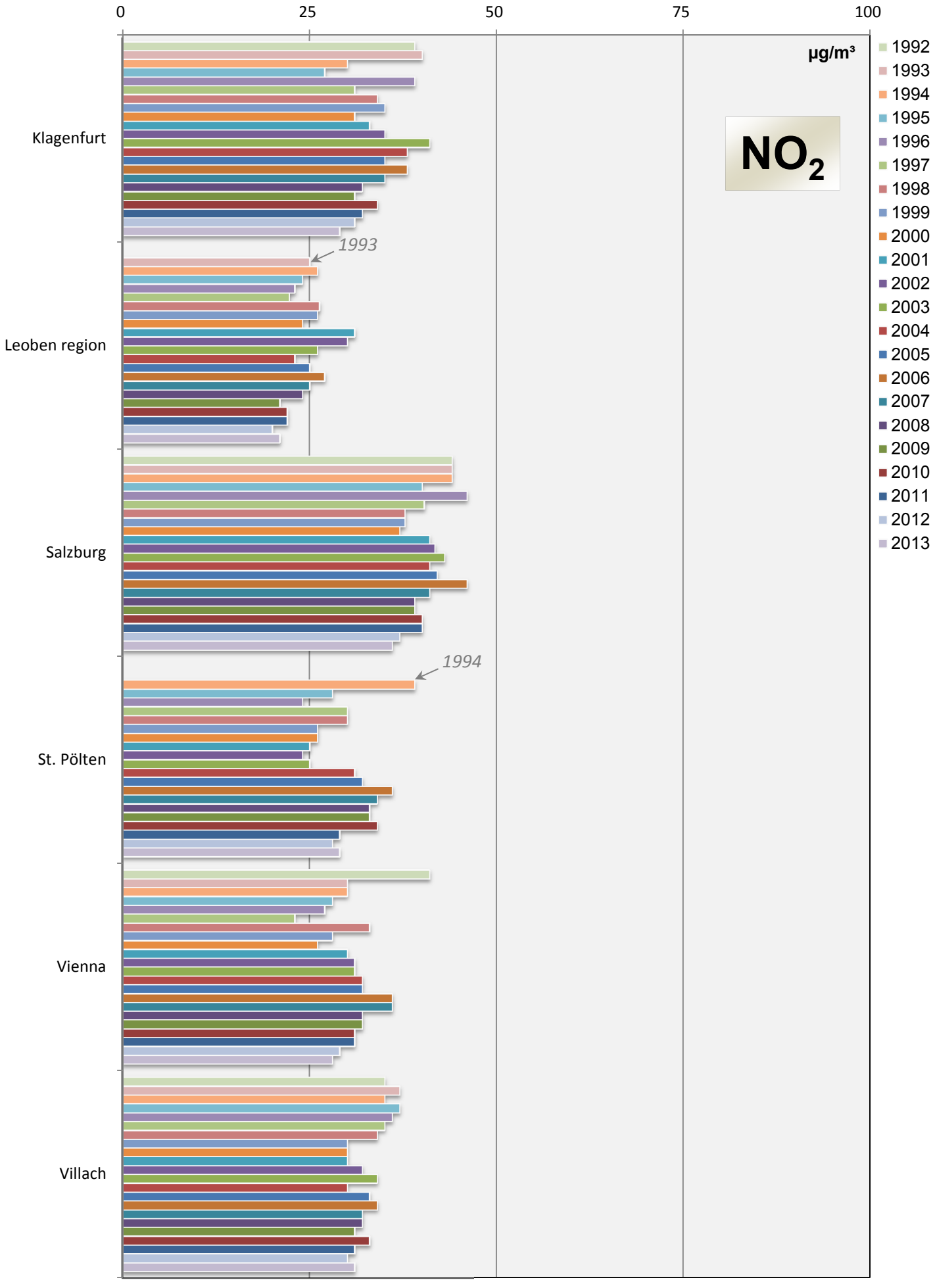
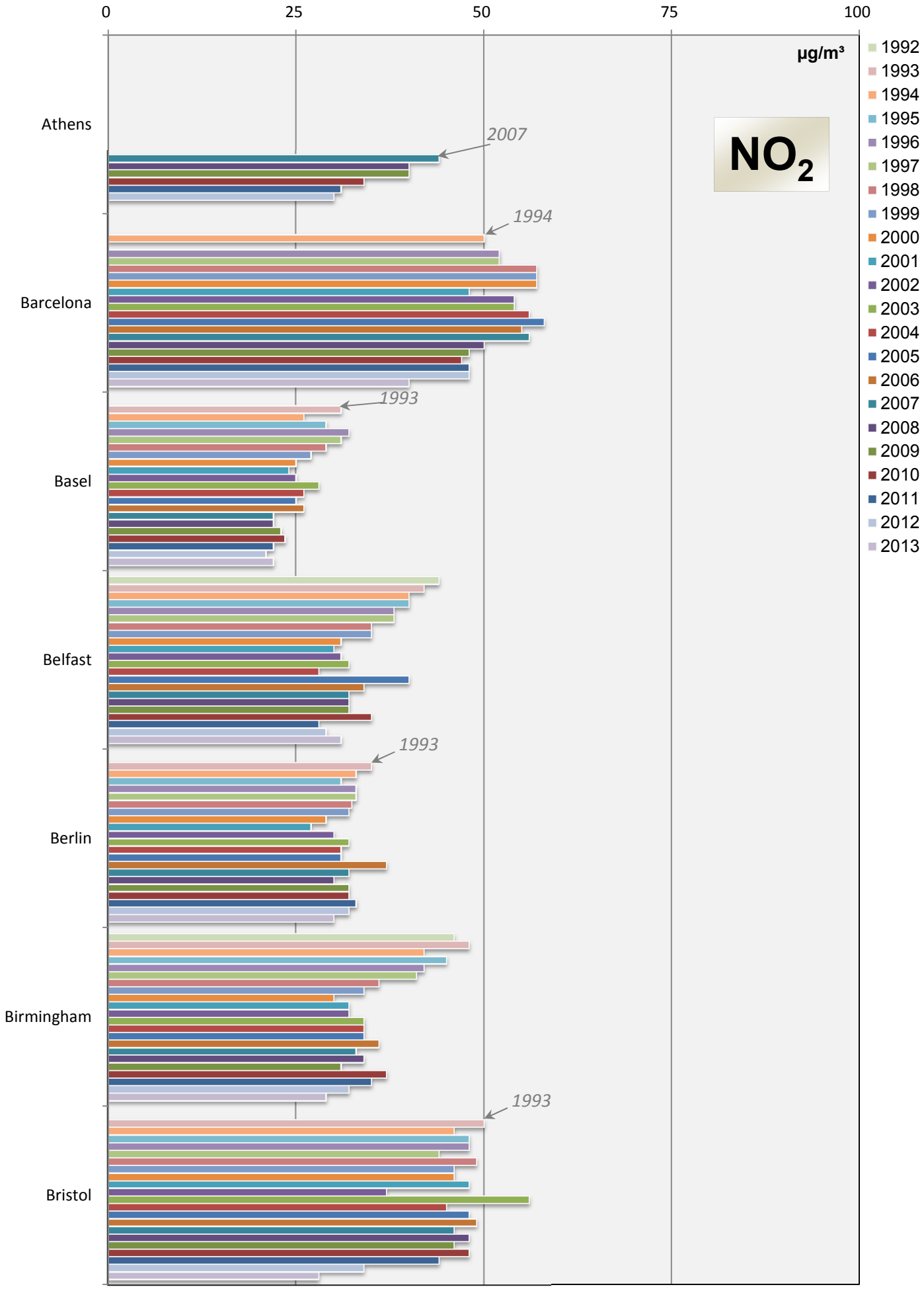
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



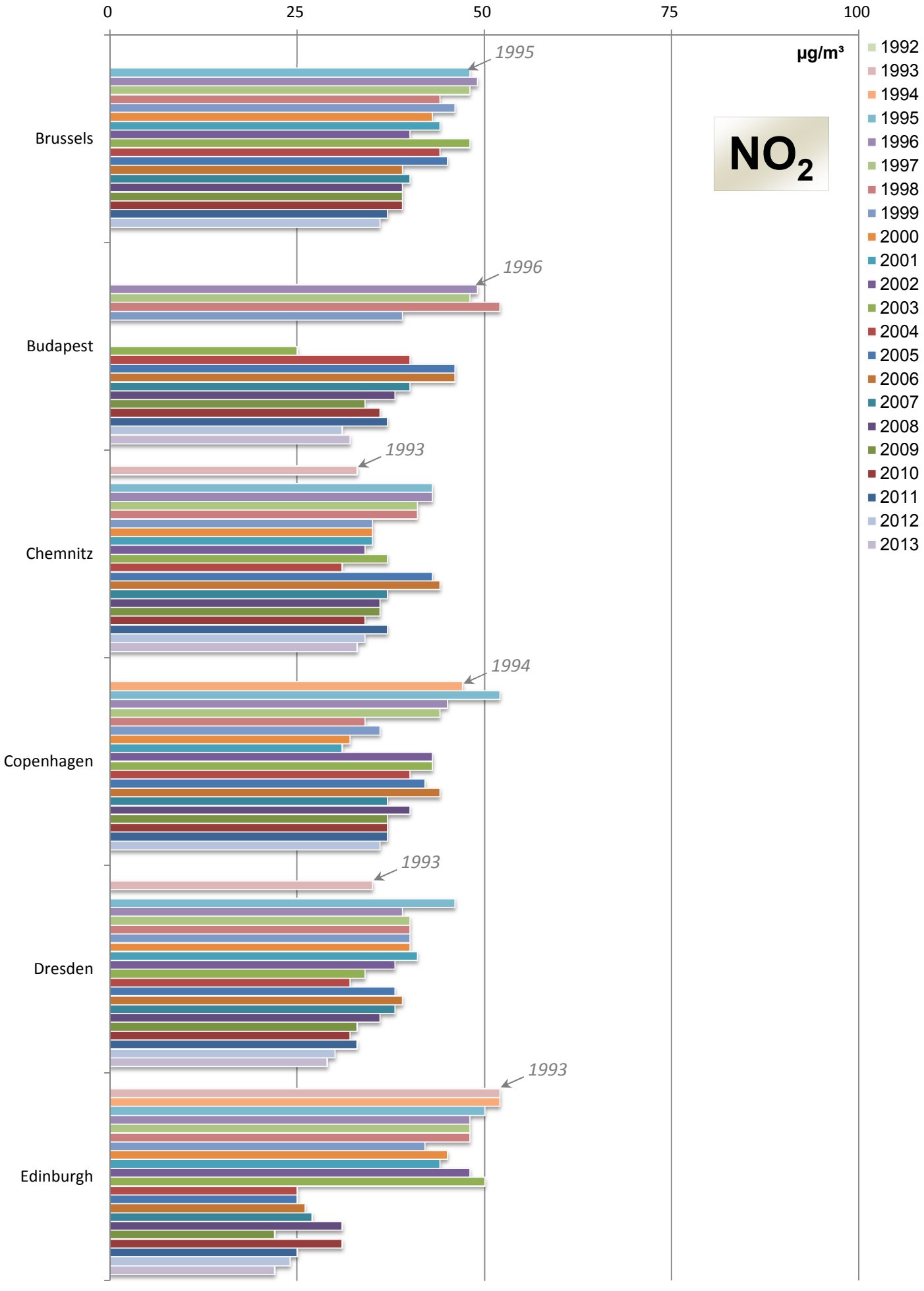
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



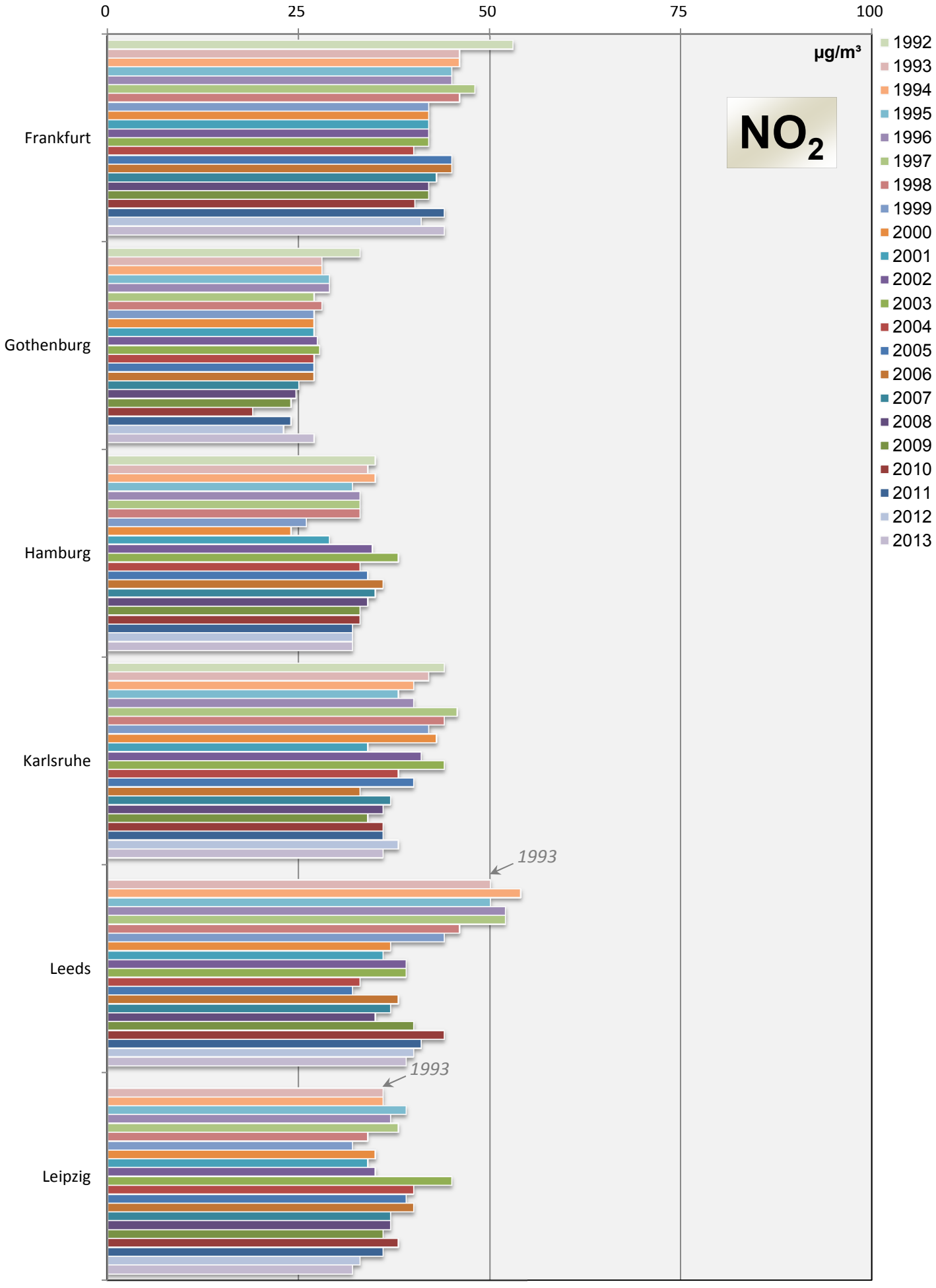
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



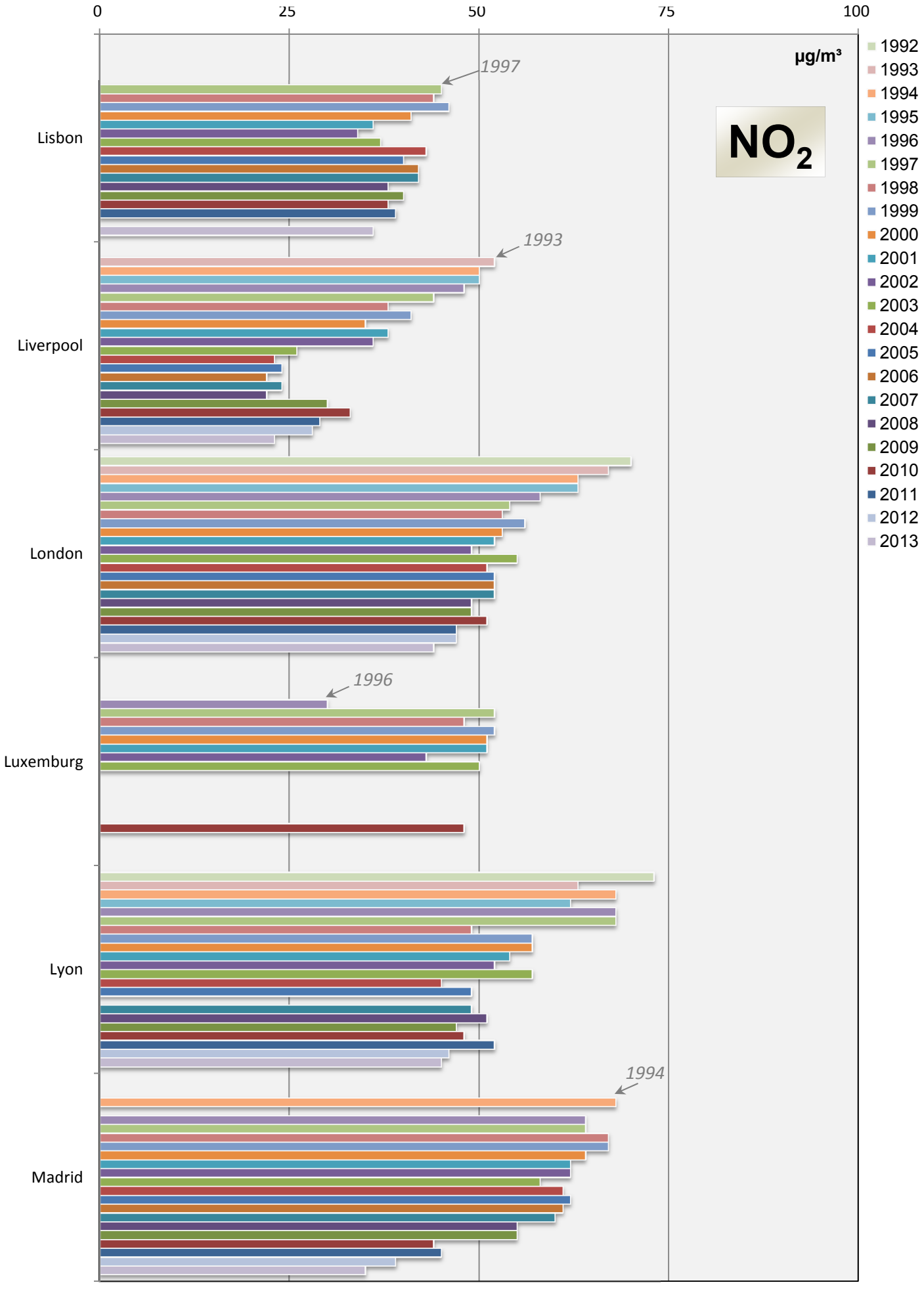
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



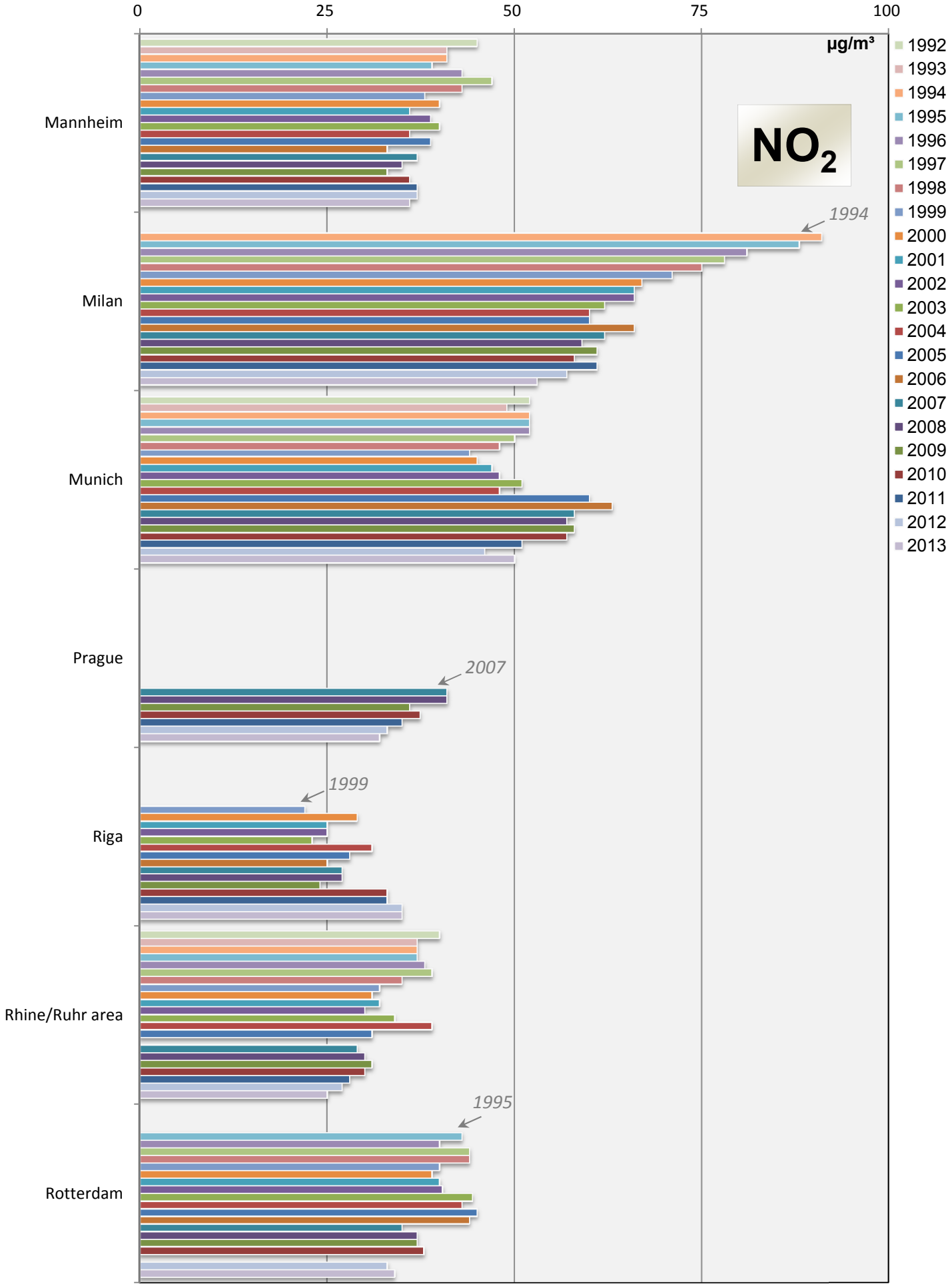
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



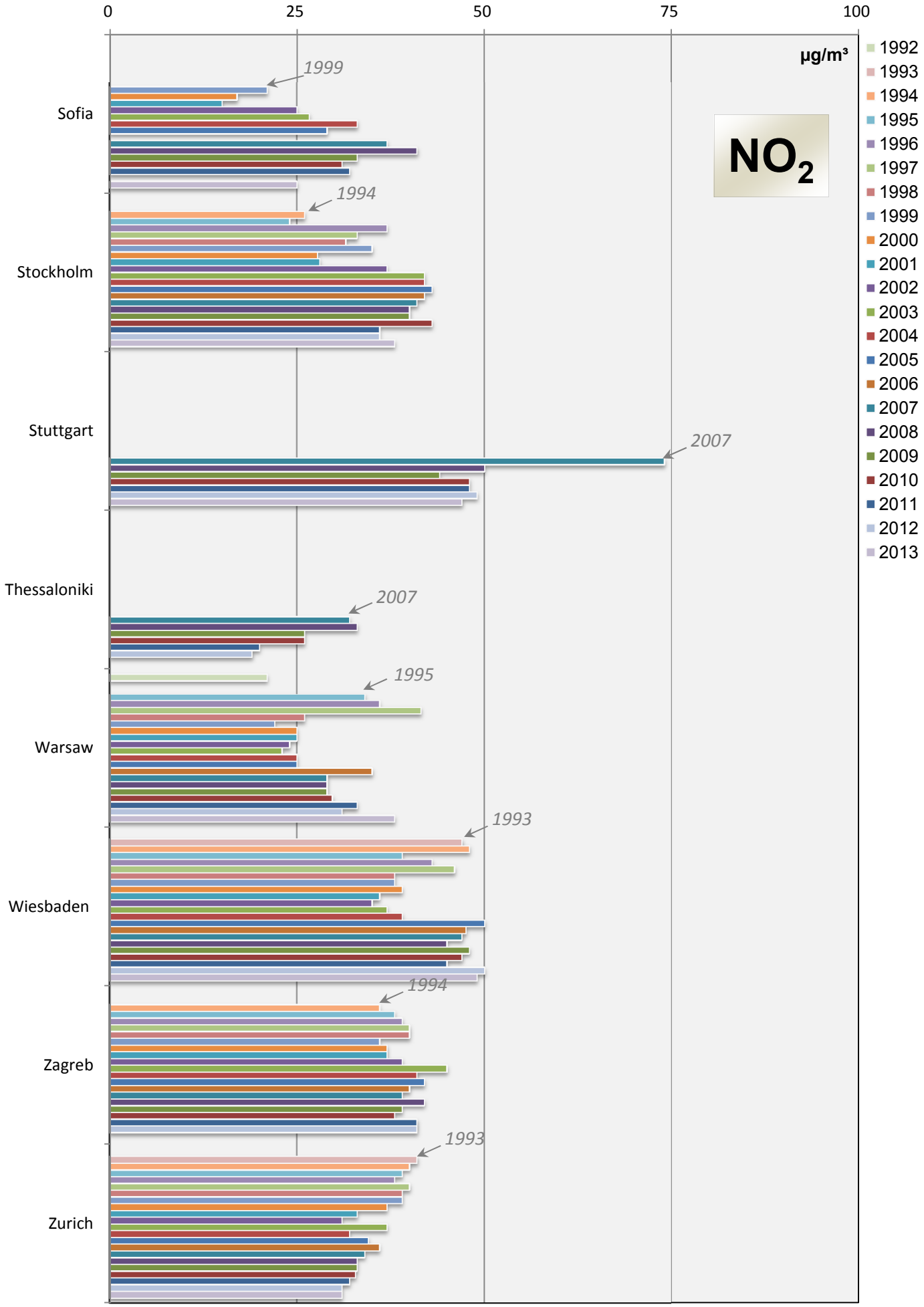
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



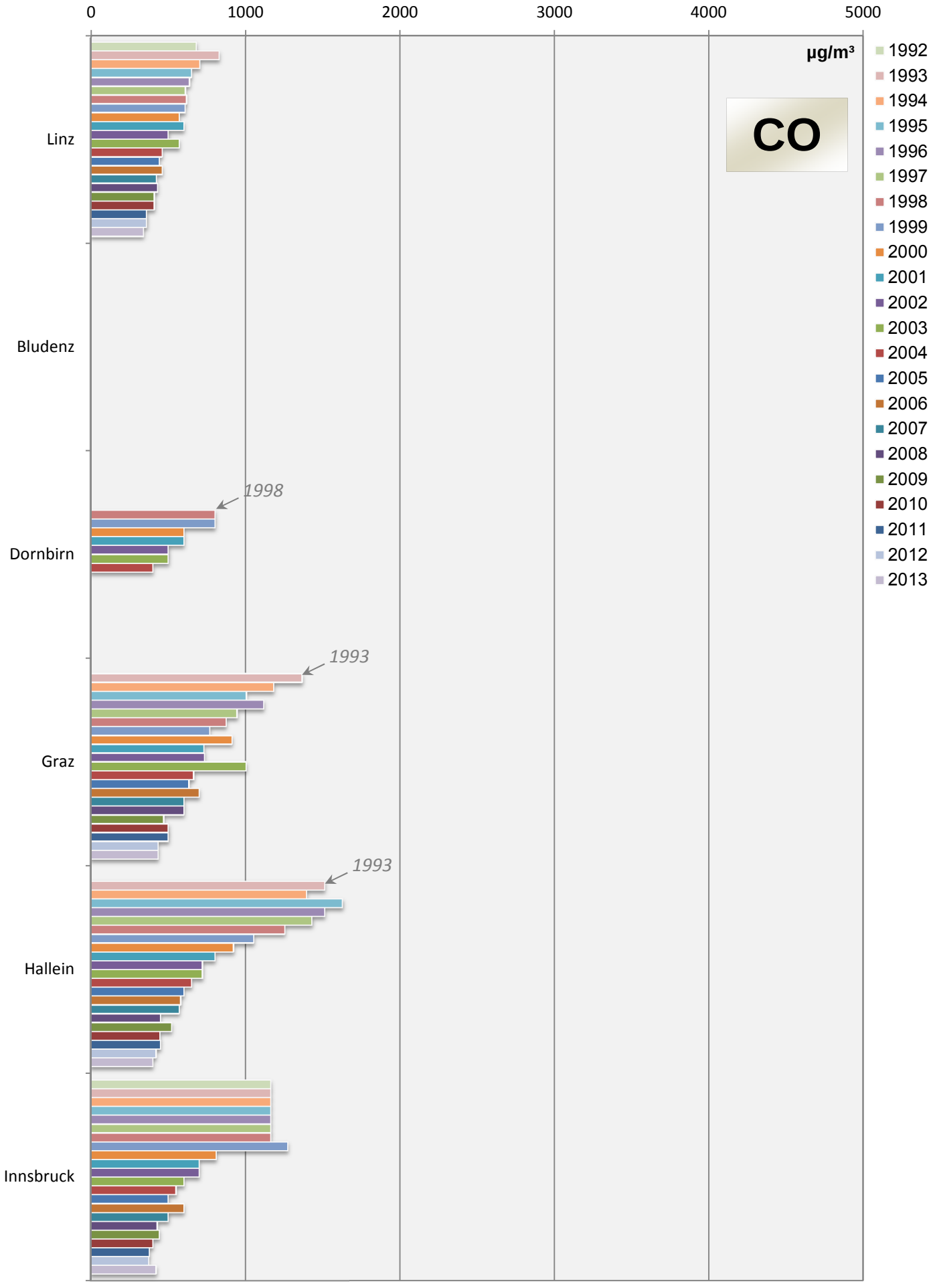
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



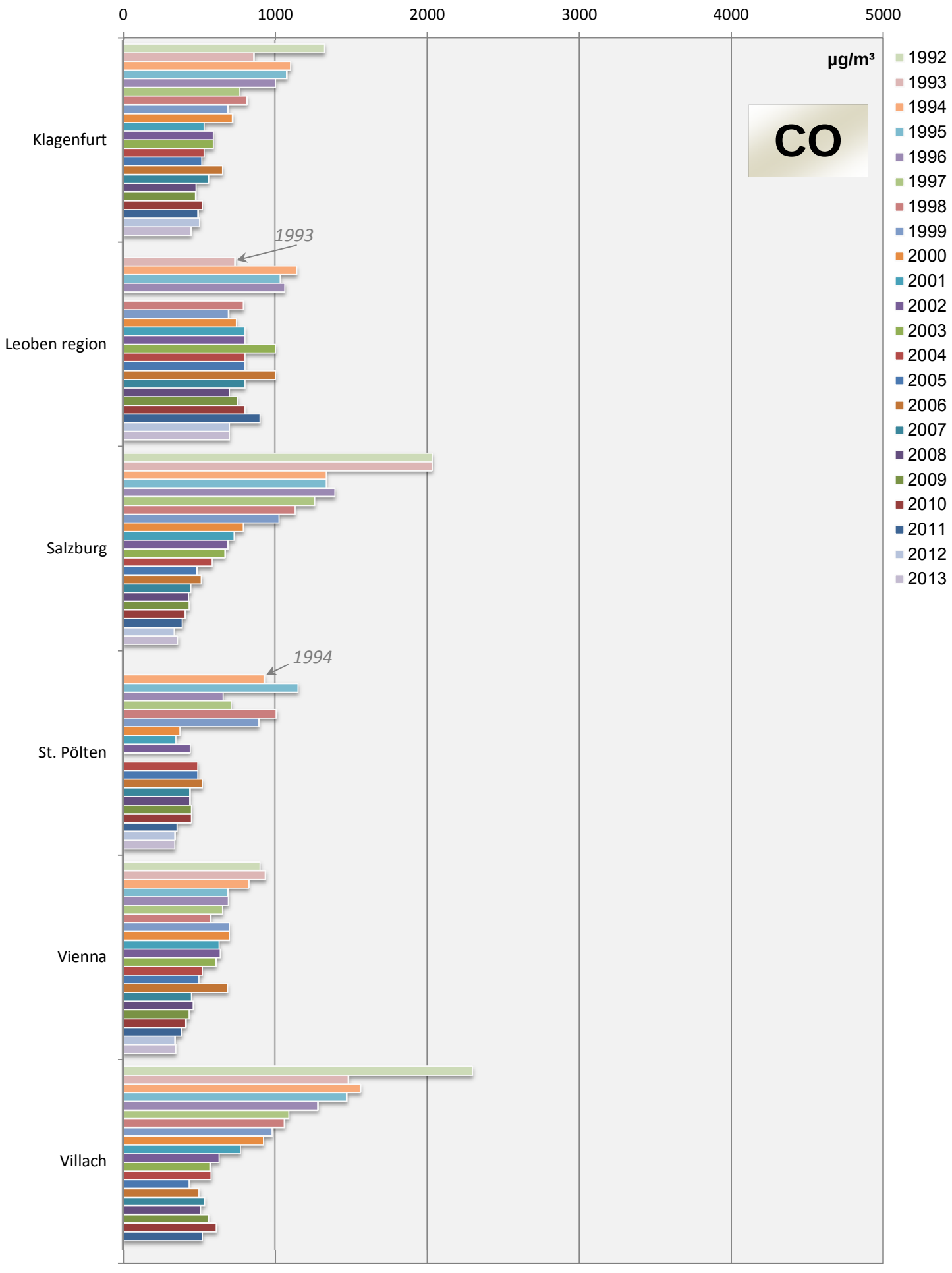
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



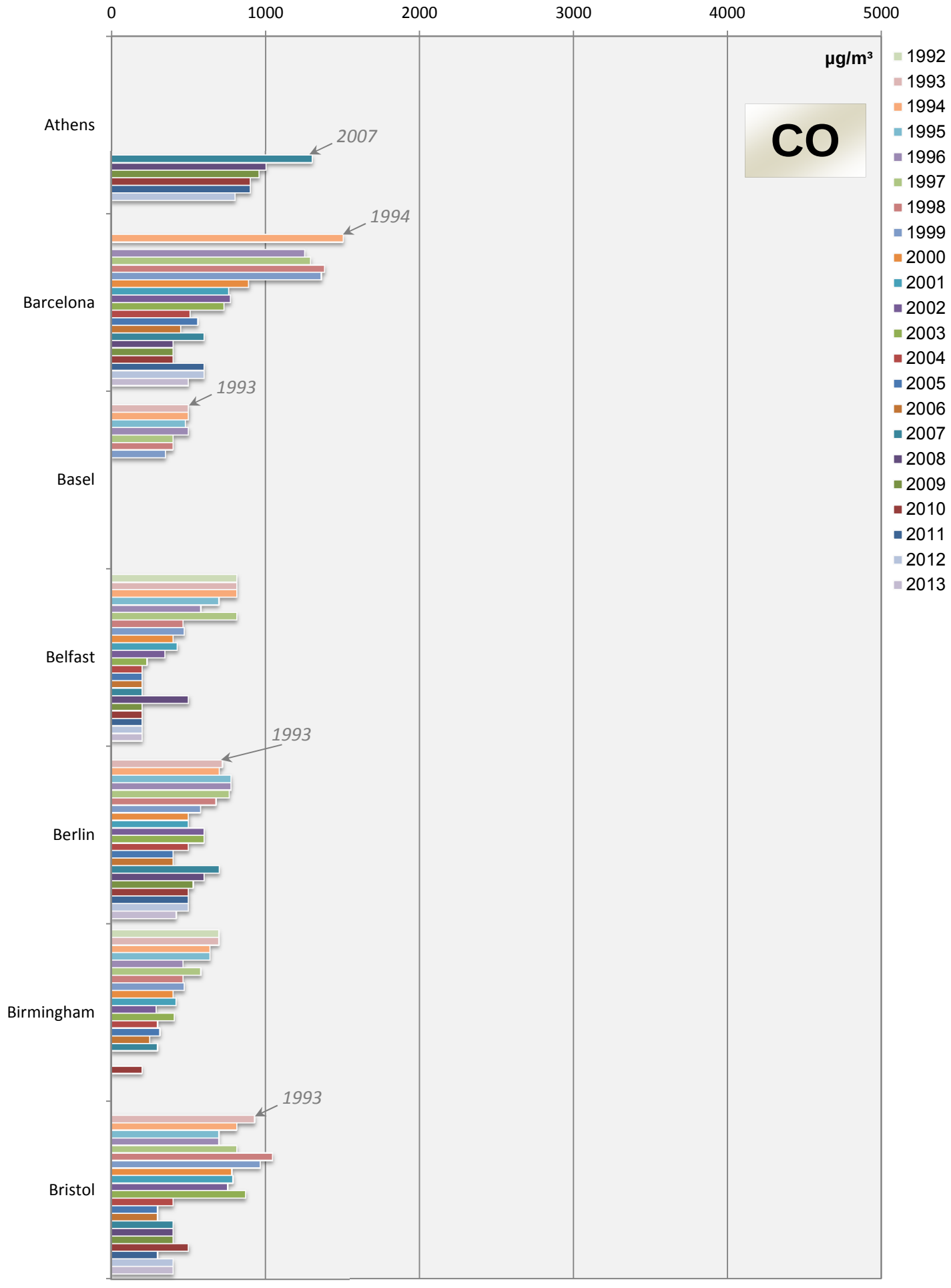
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



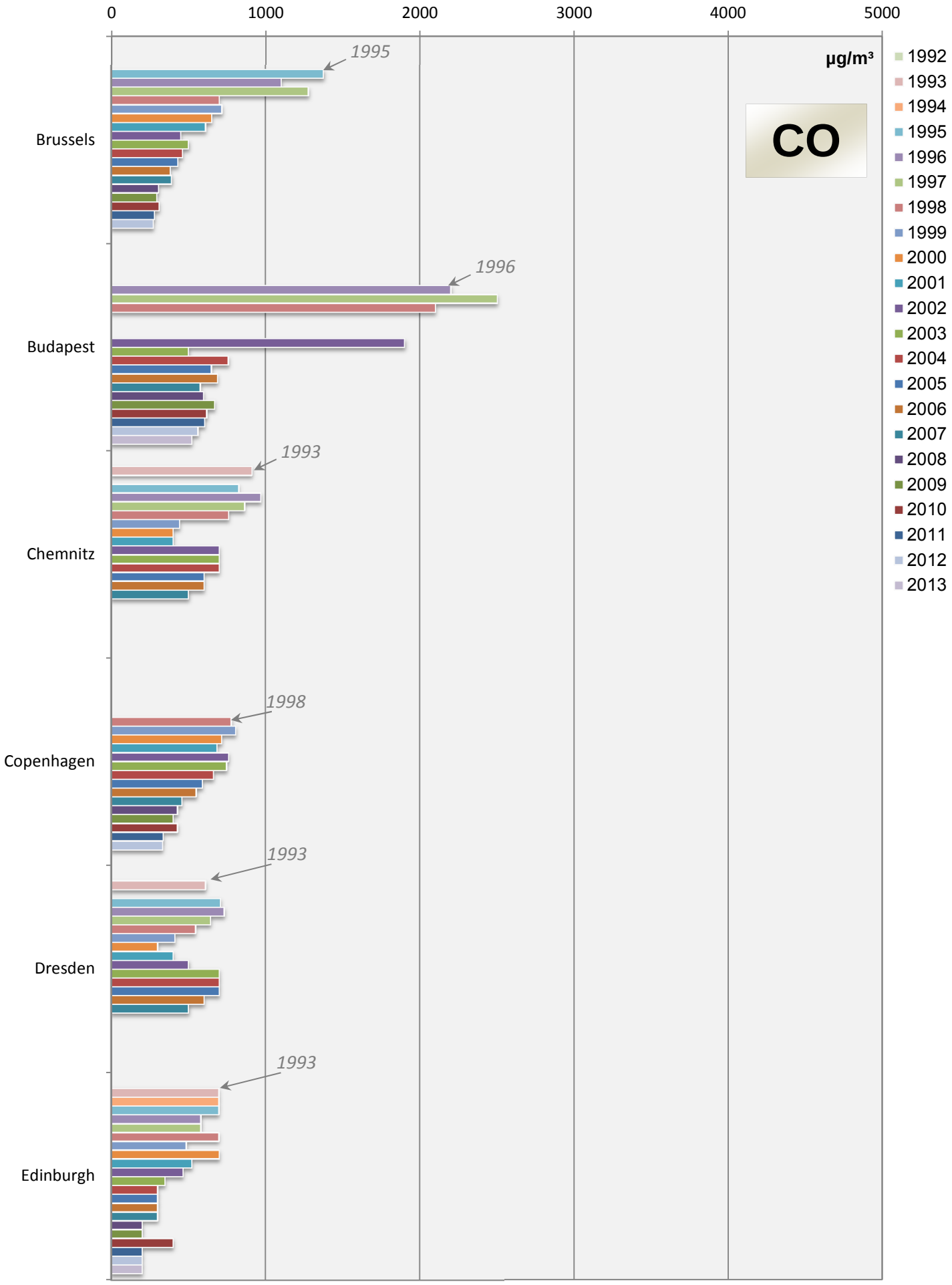
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



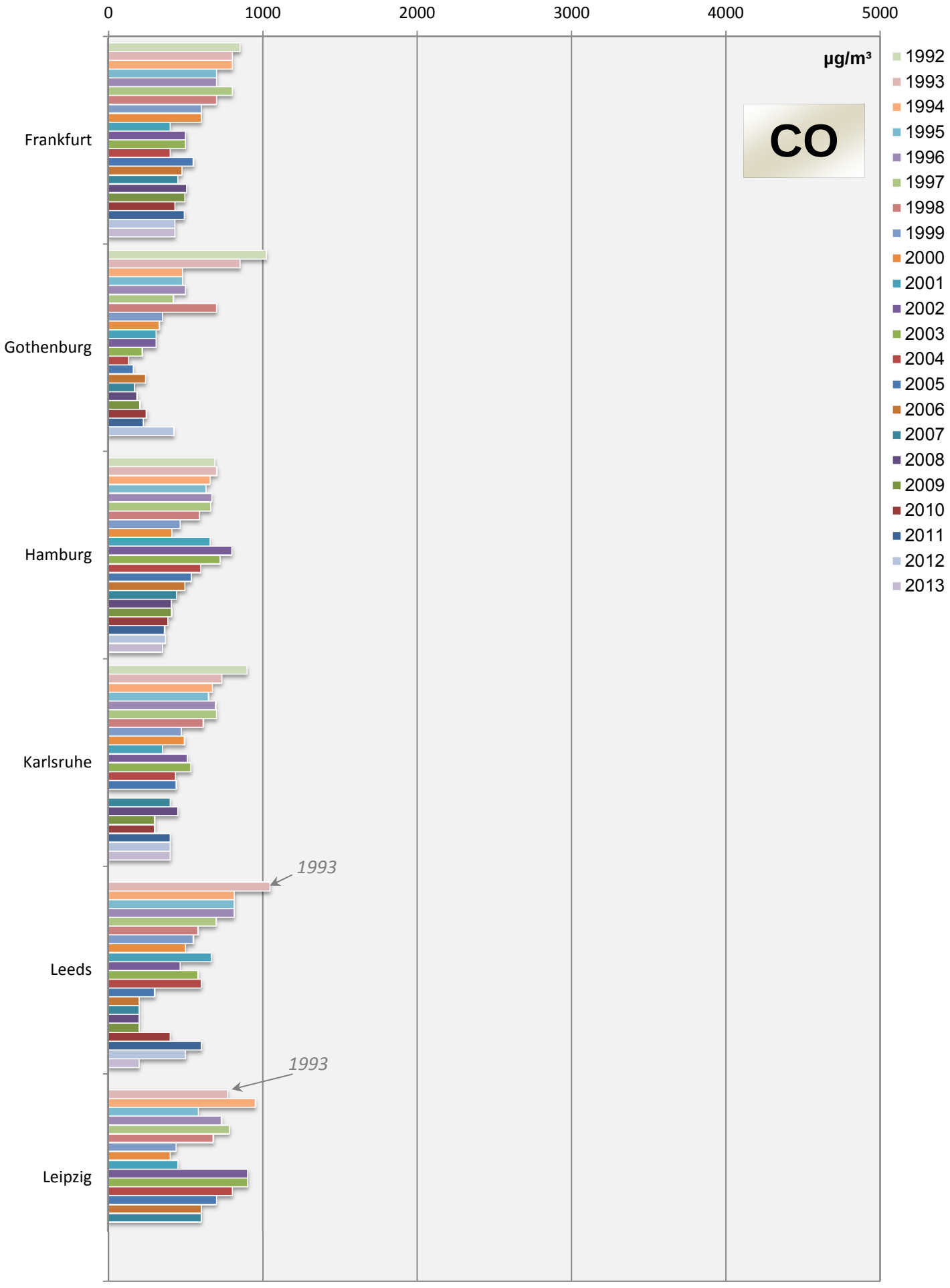
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



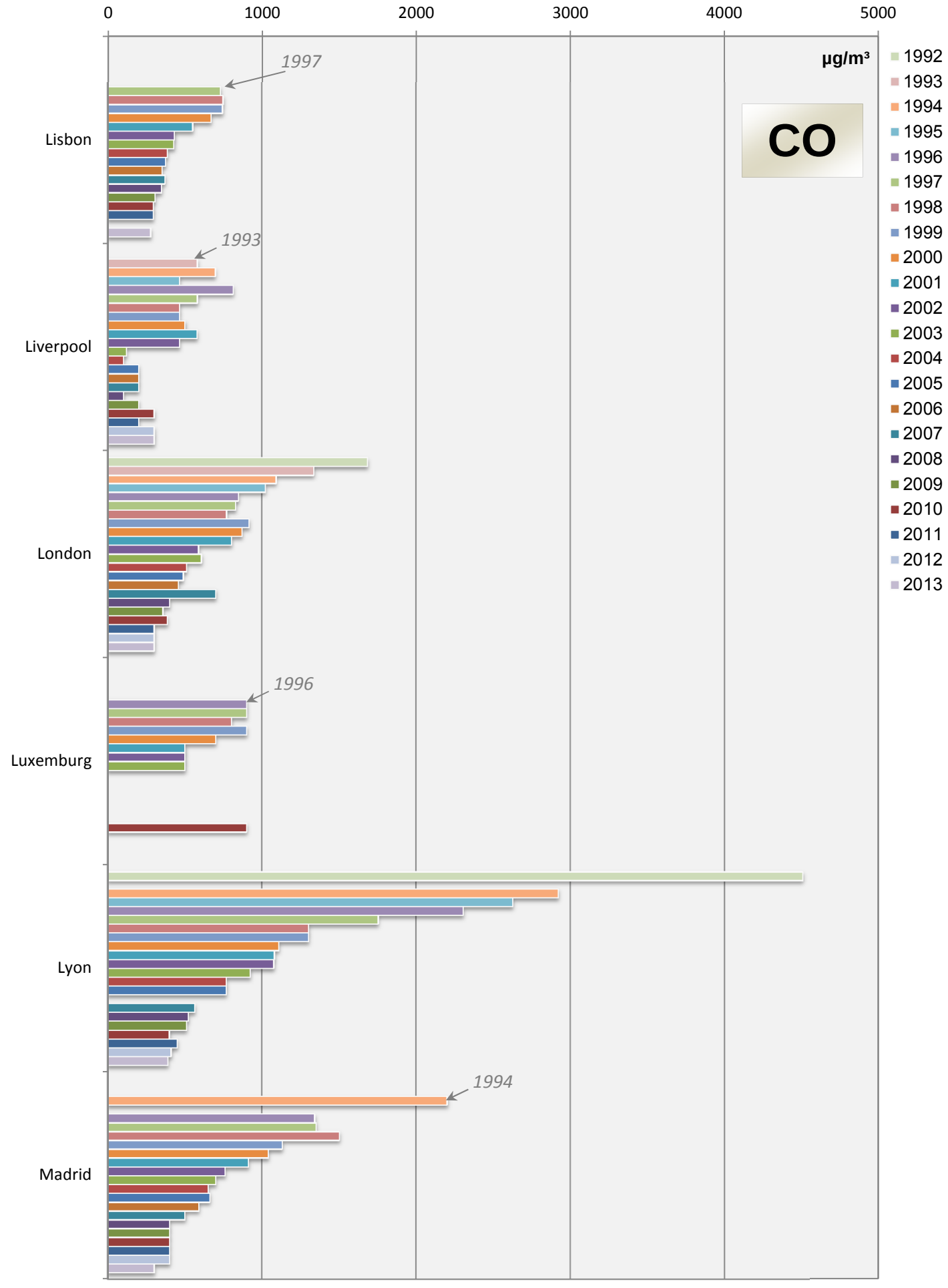
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



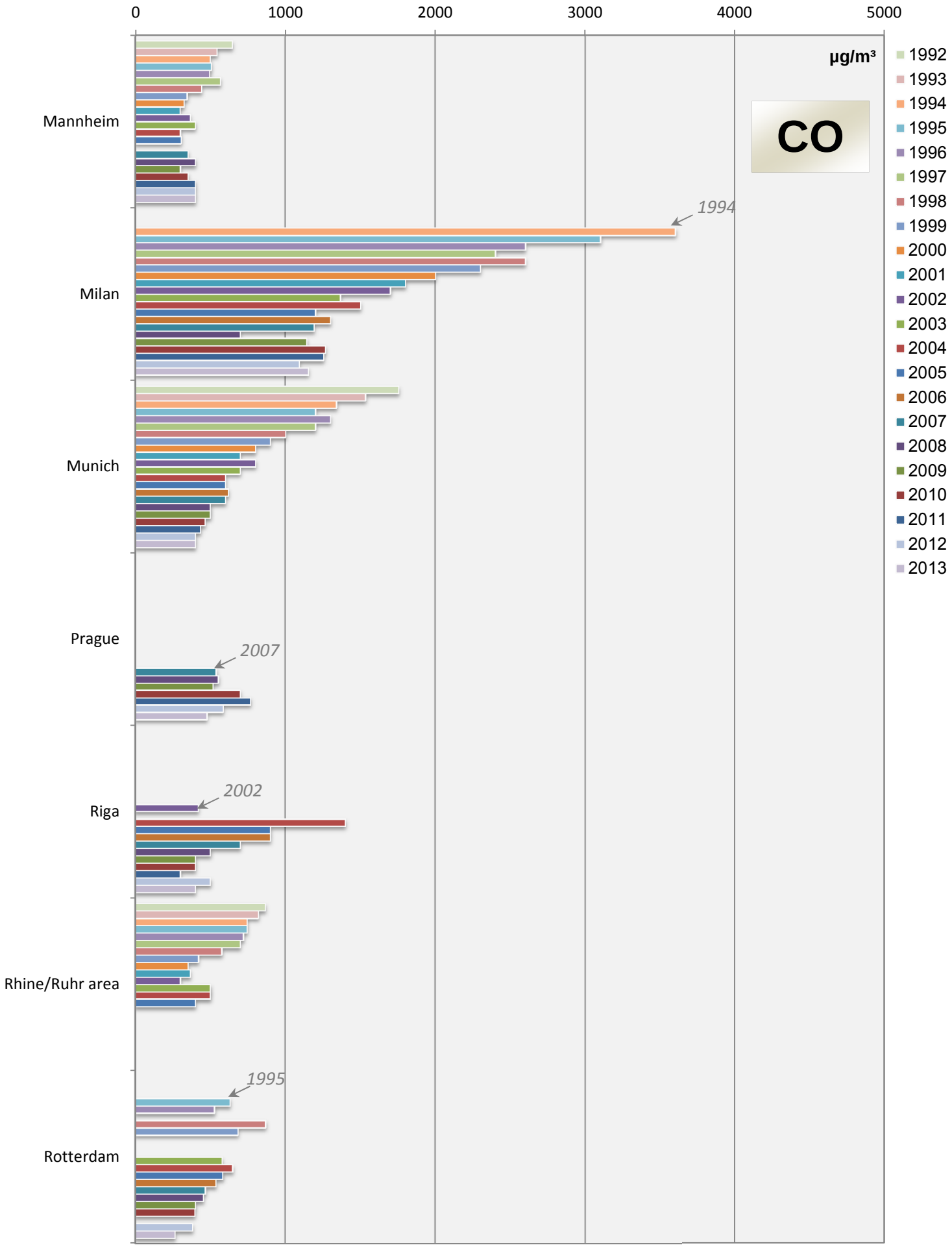
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



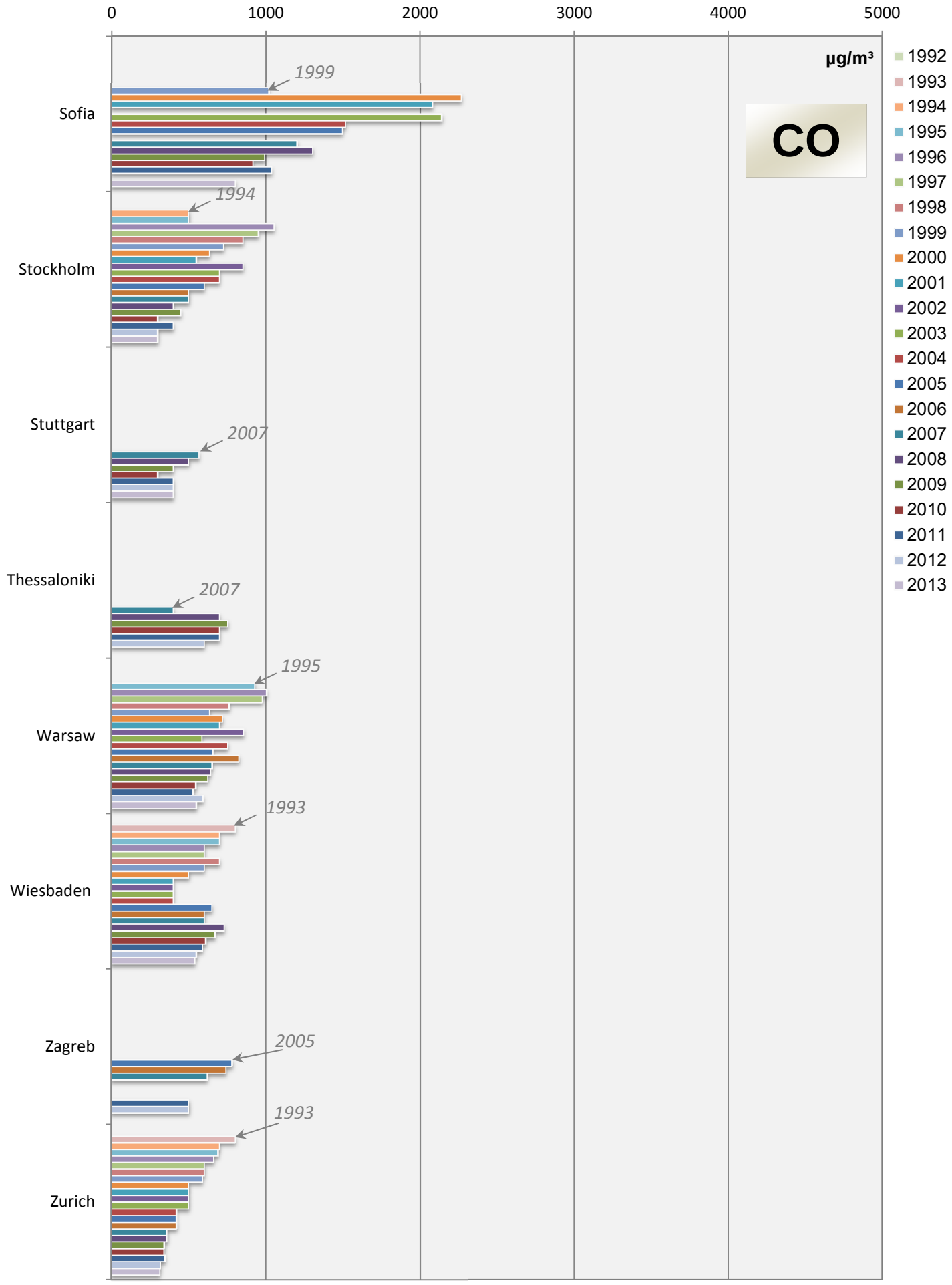
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

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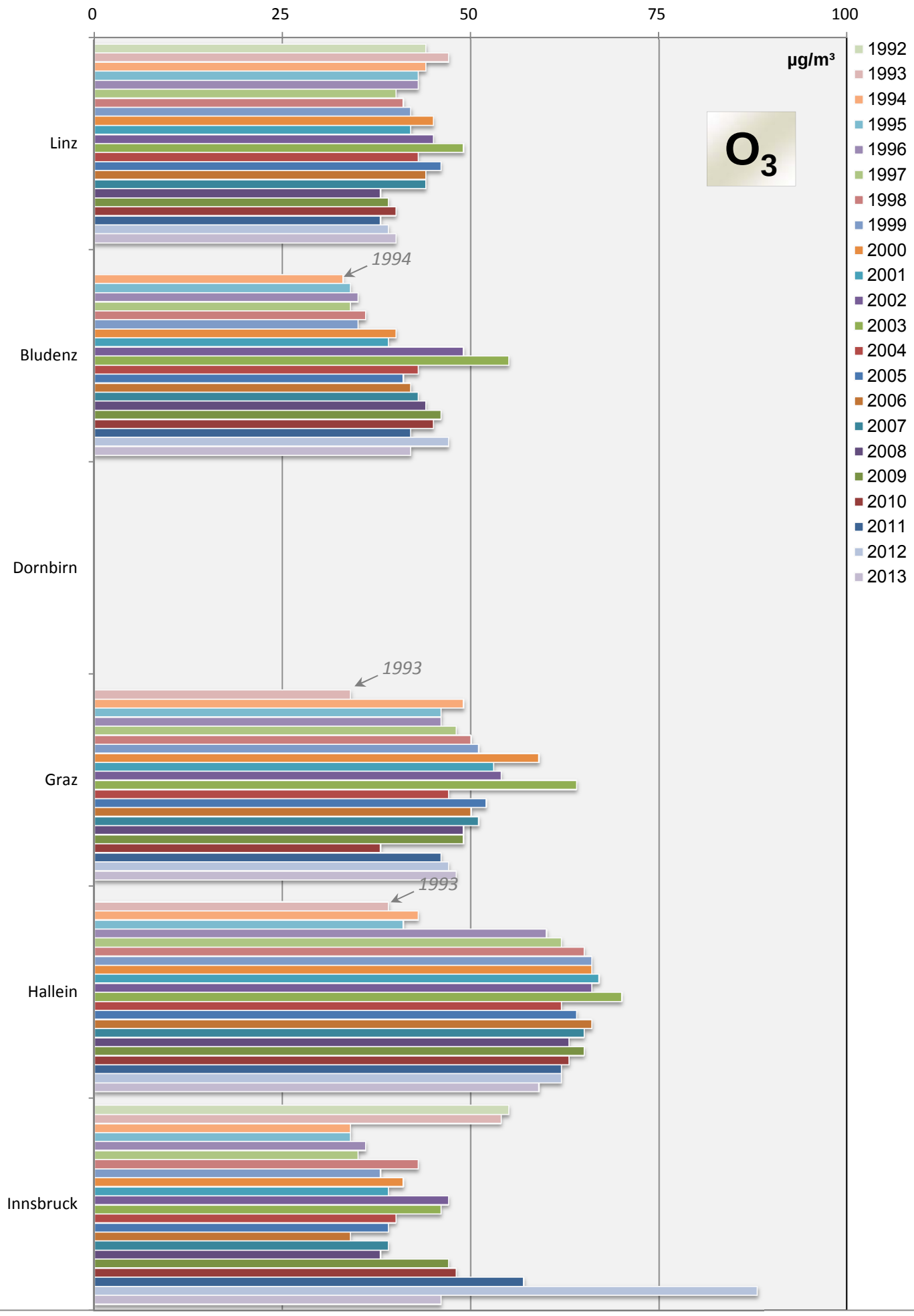
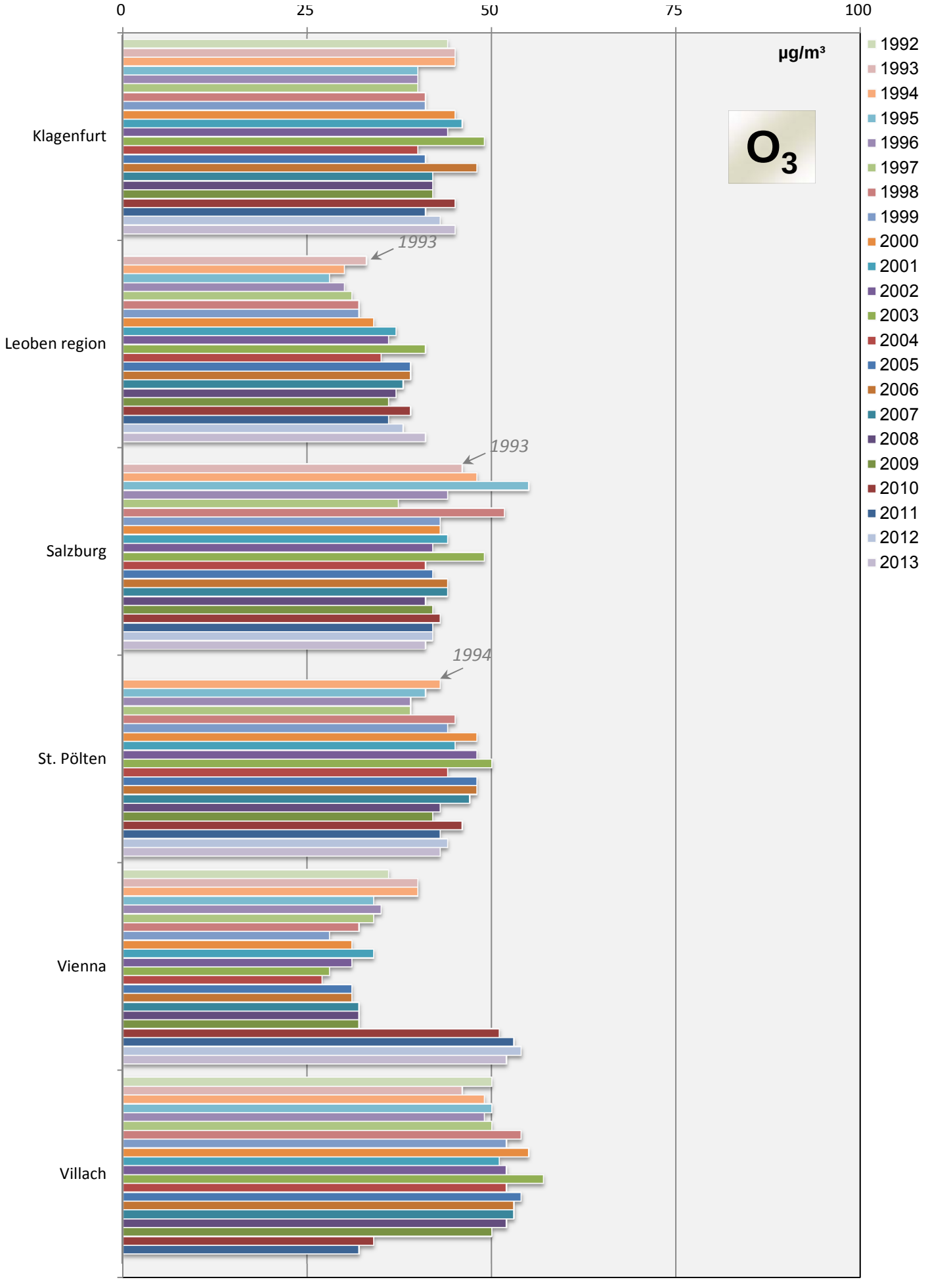


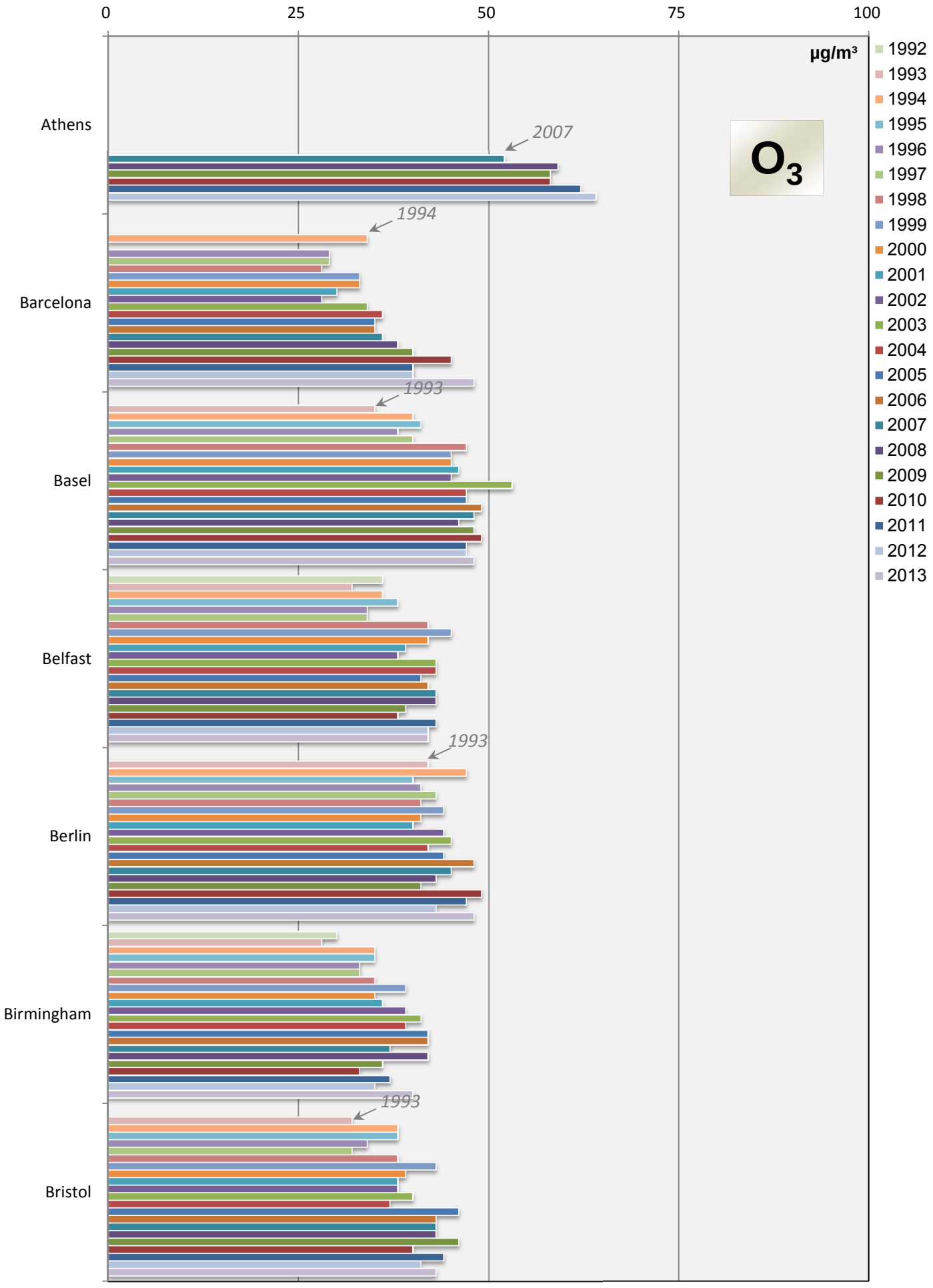
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



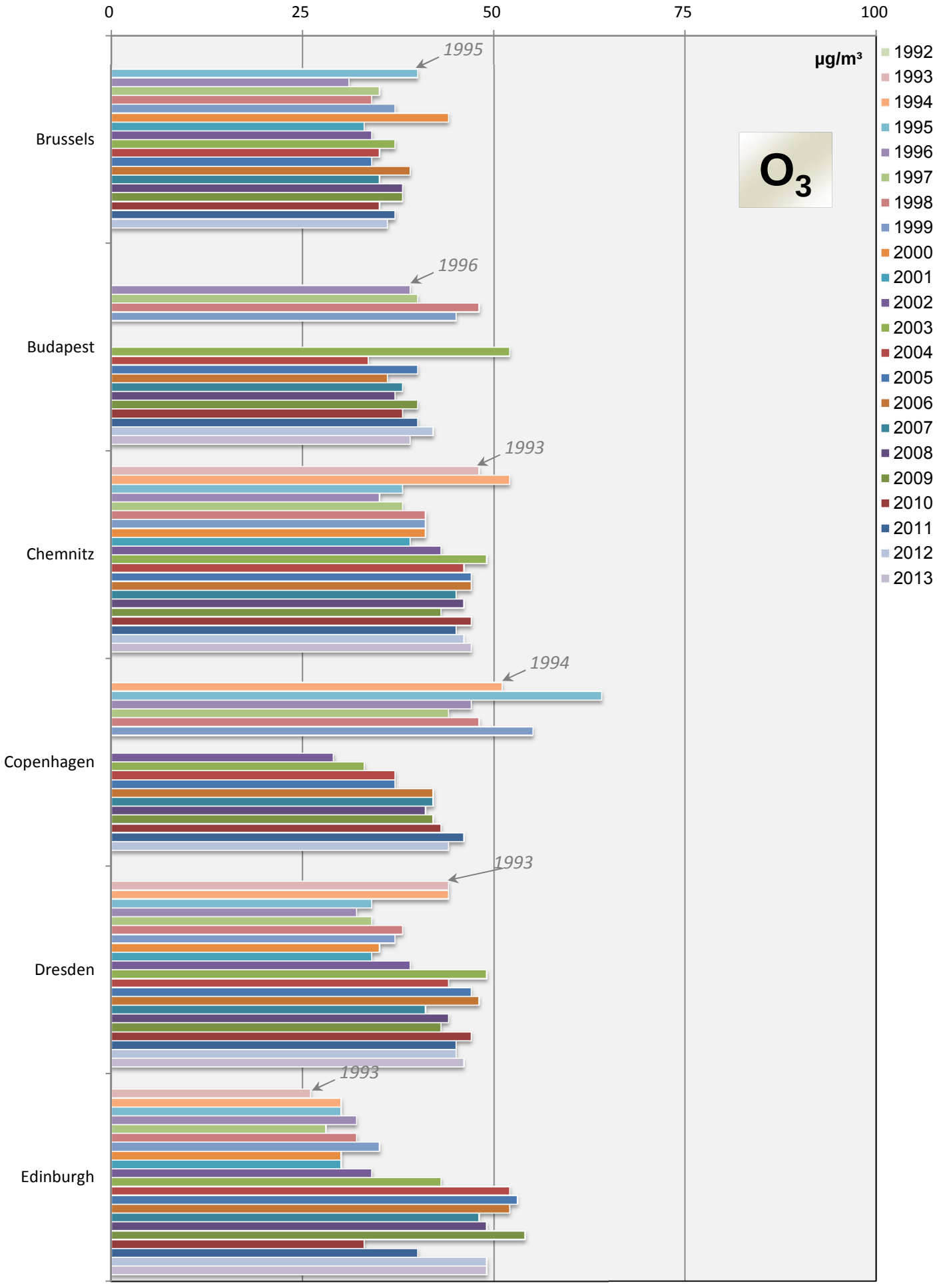
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



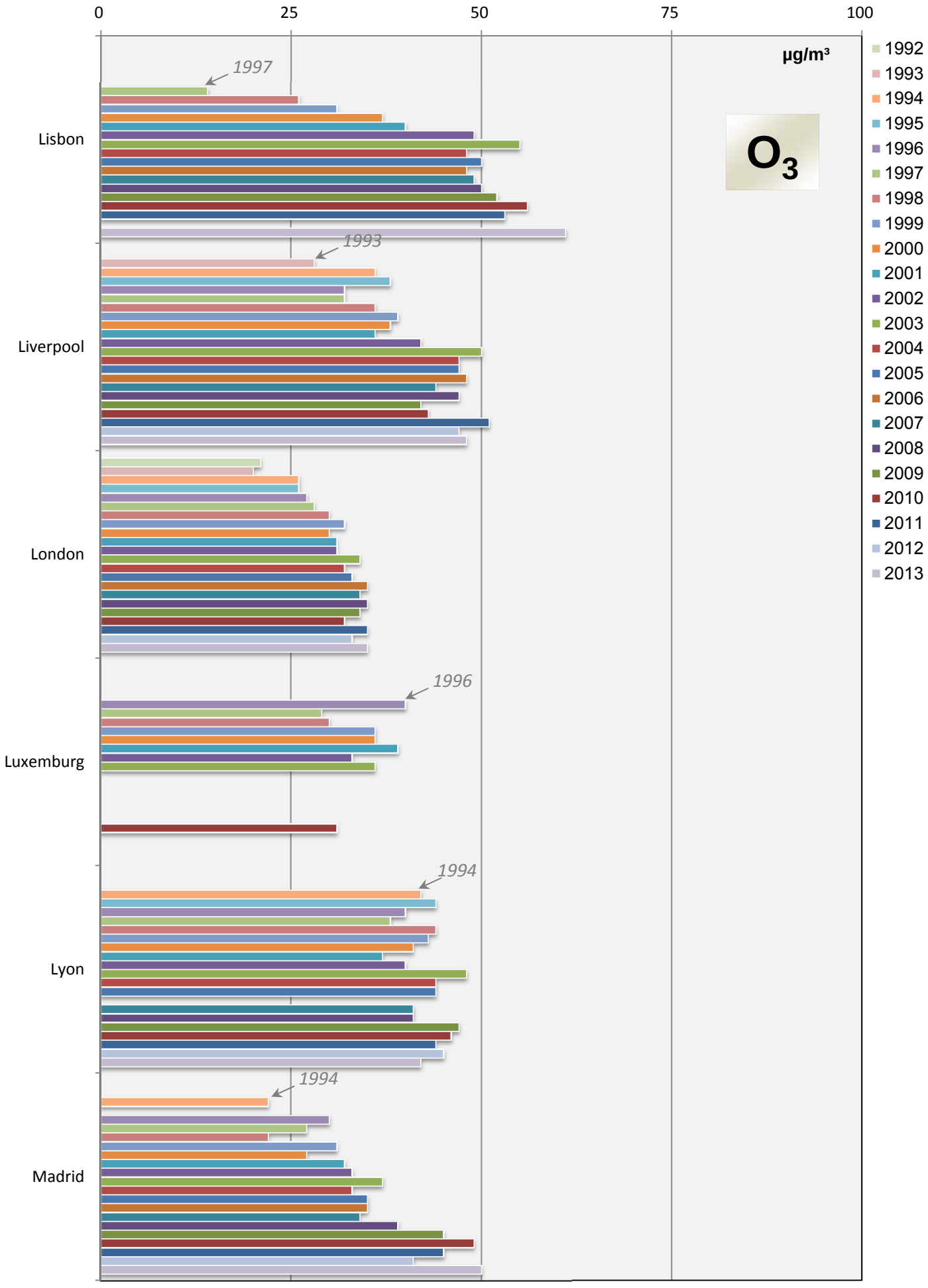
Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2013

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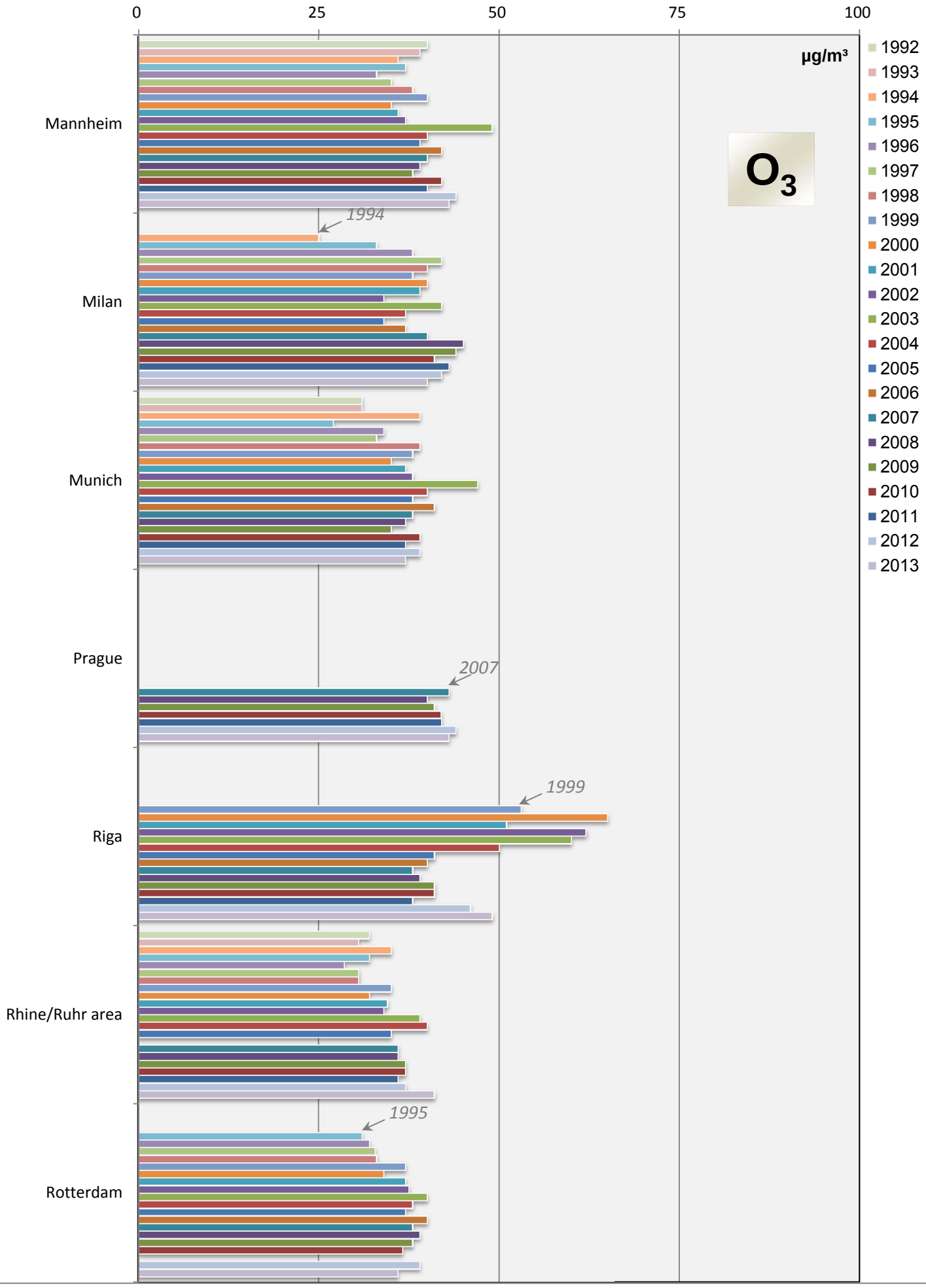

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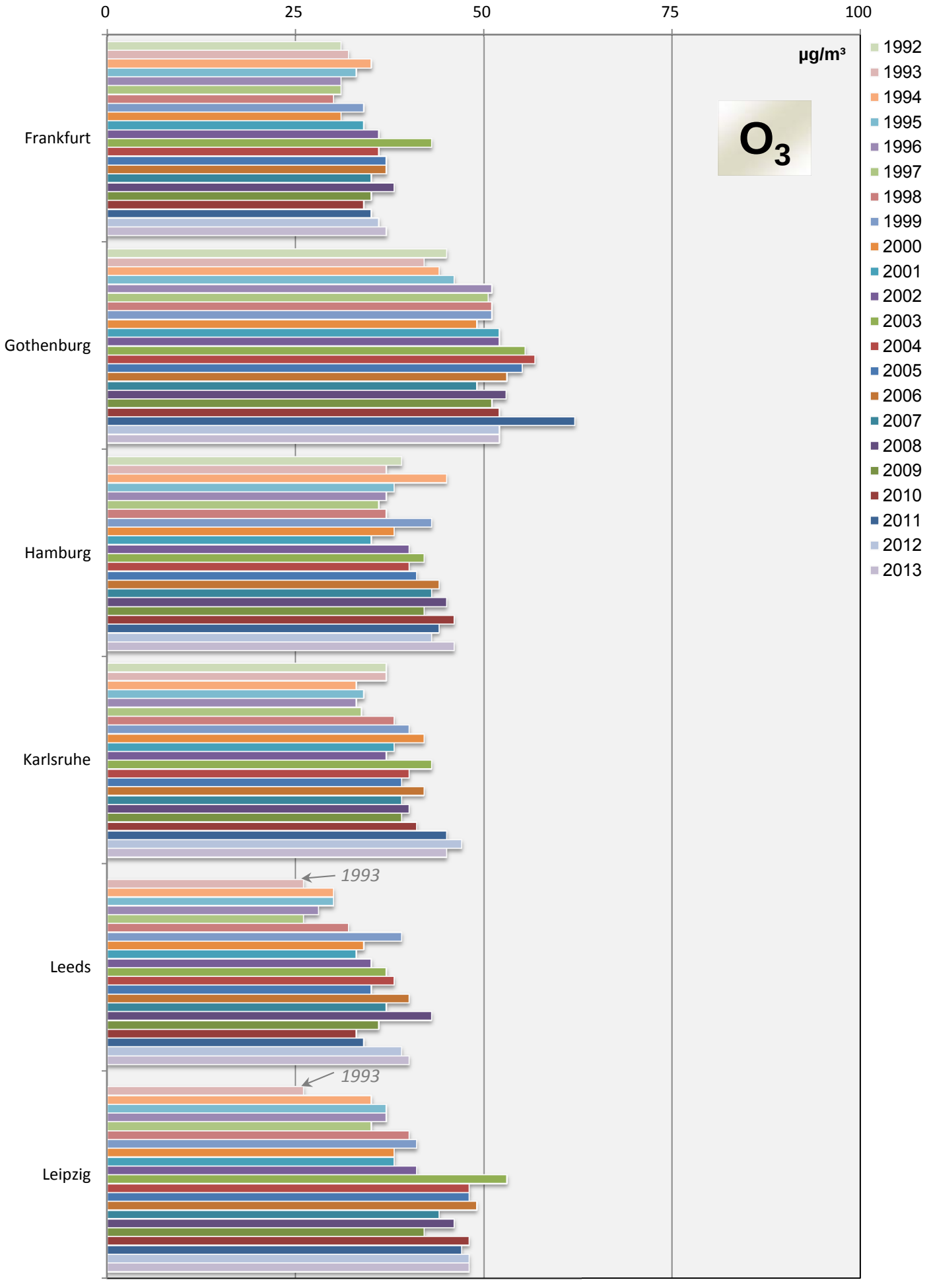

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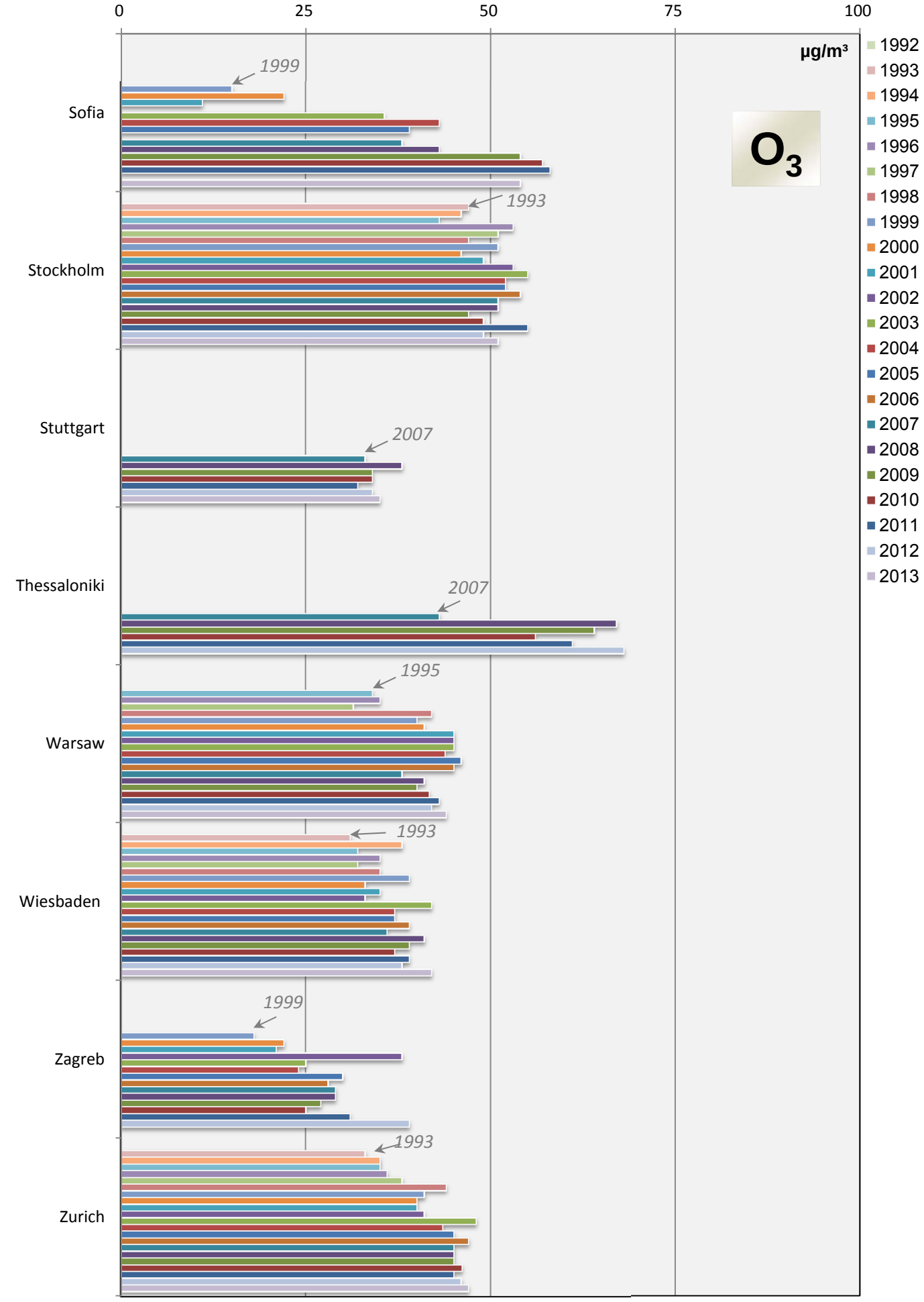
Annual mean values (mean of all monitoring stations)



Jahresvergleich

1992 - 2013

max. Tagesmittelwerte

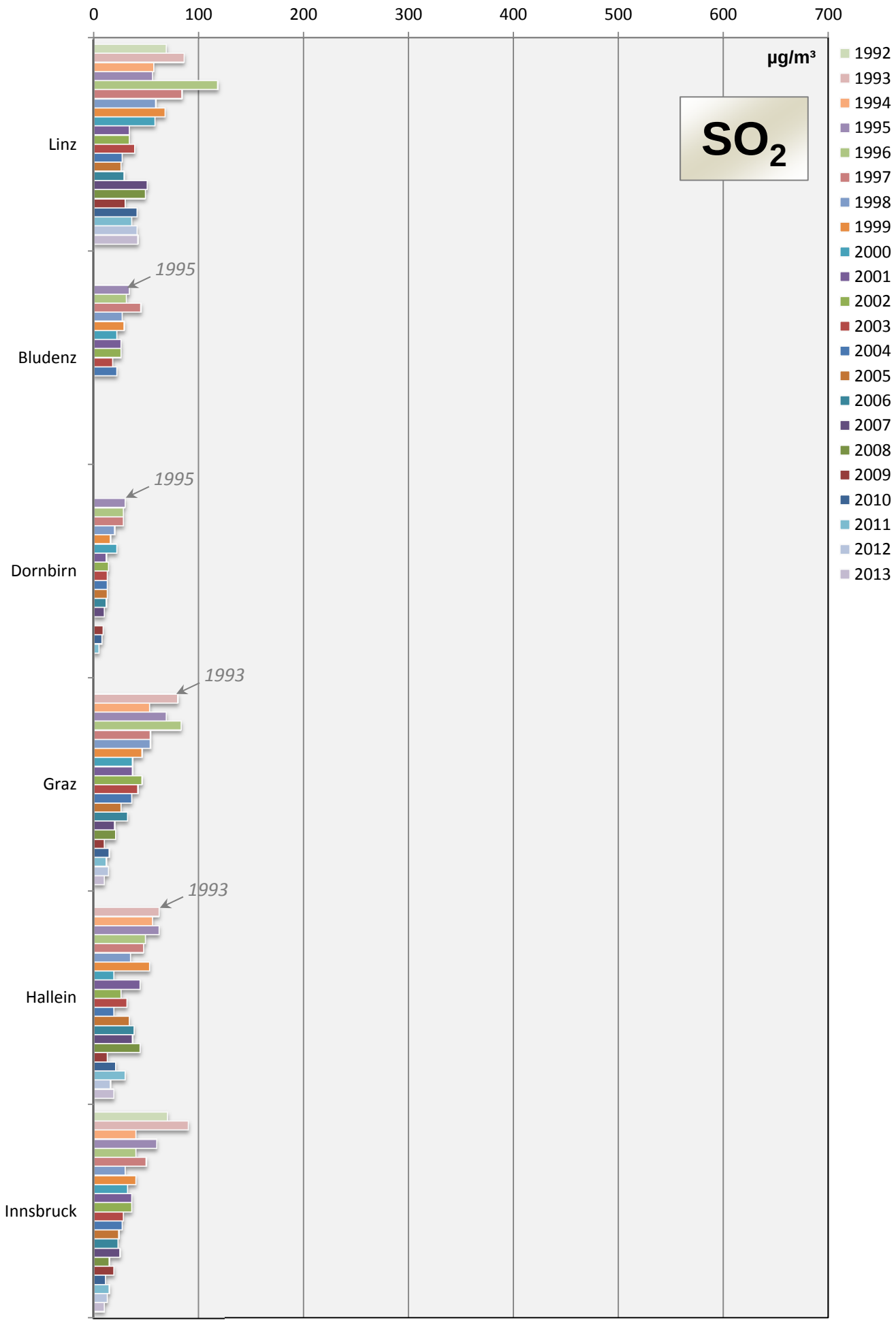
Comparison of The Air Quality Over The Years

1992 - 2013

Max. Daily Mean Values

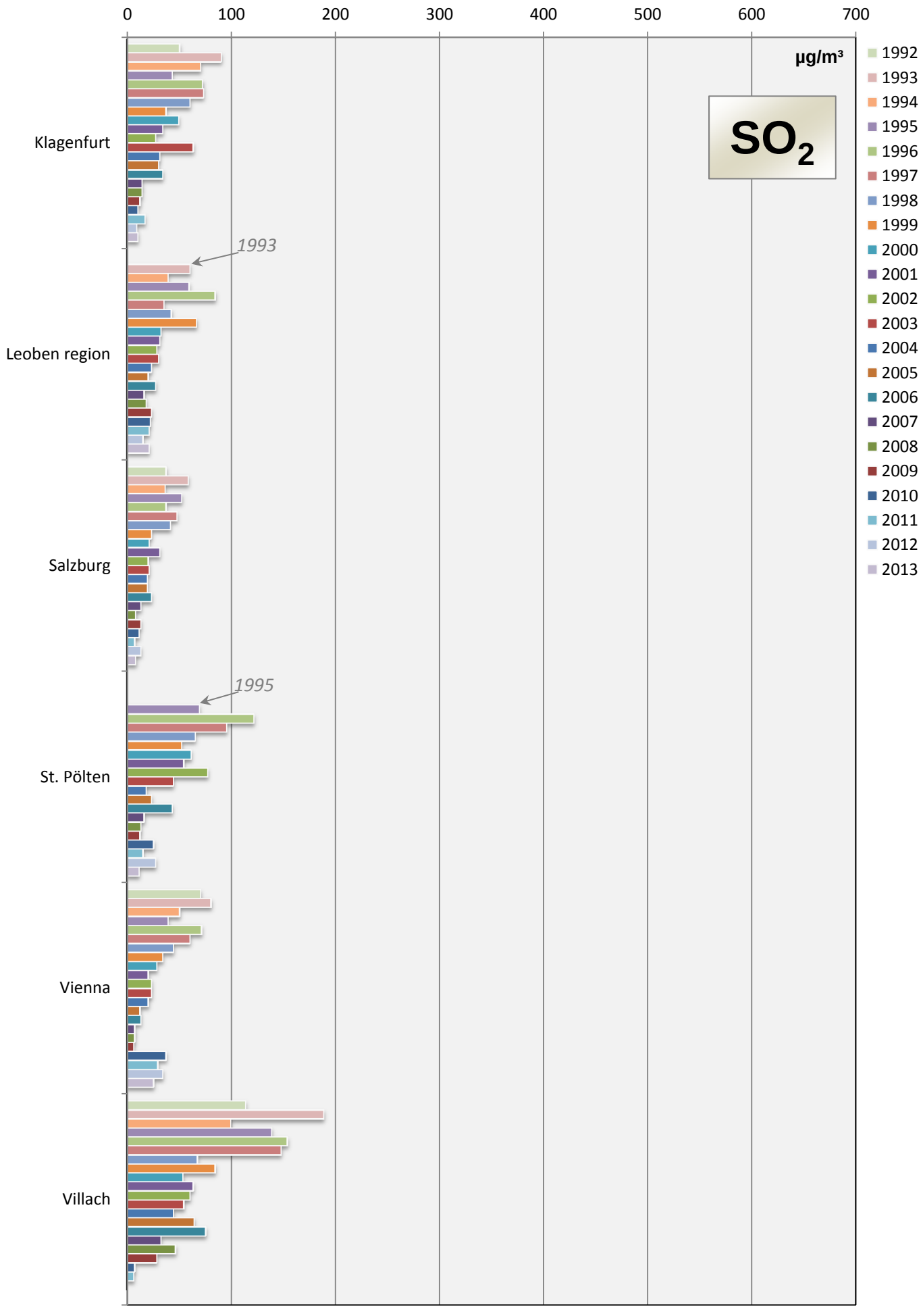
Comparison of The Air Quality 1992 - 2013

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



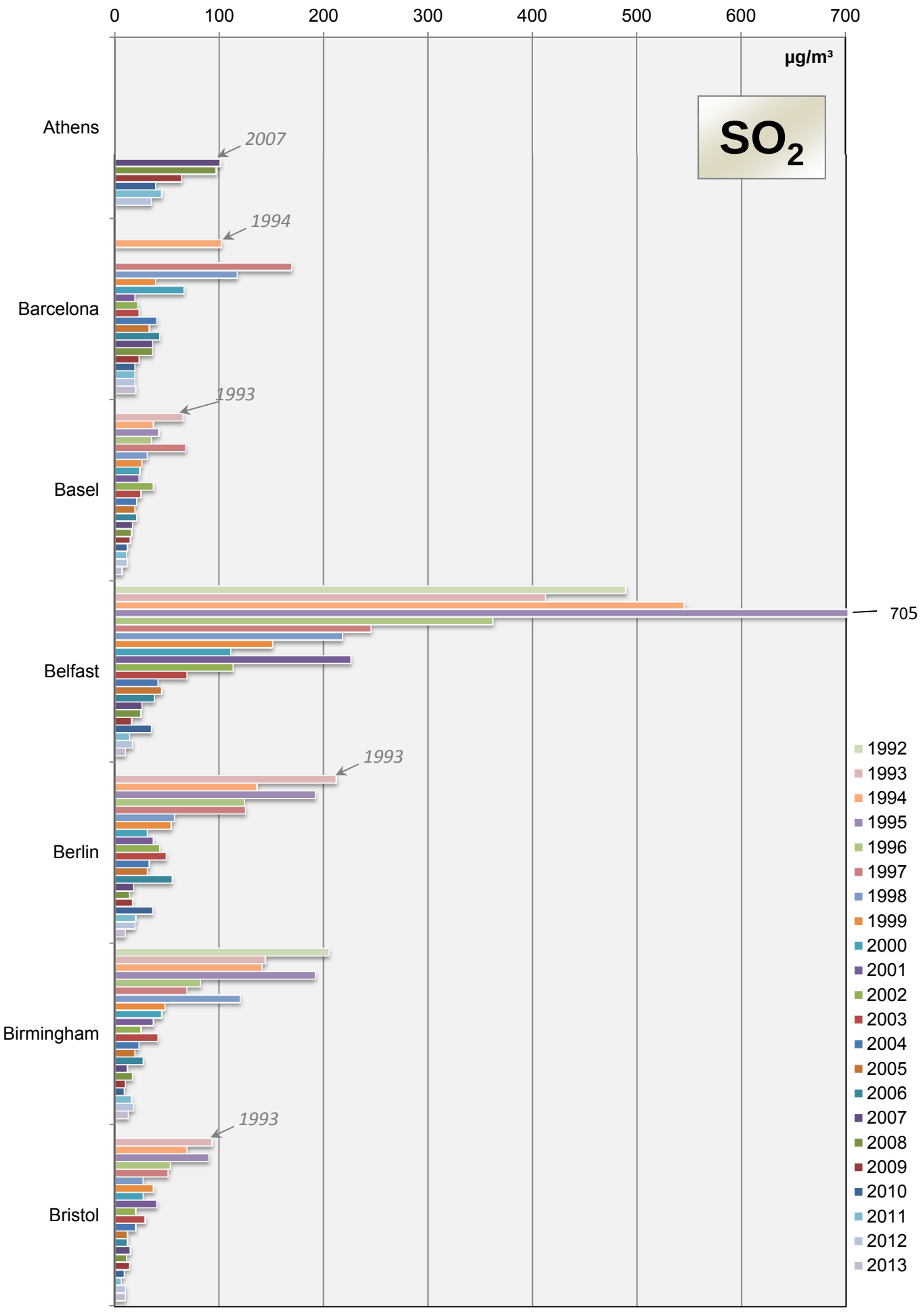
Comparison of The Air Quality 1992 - 2013

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



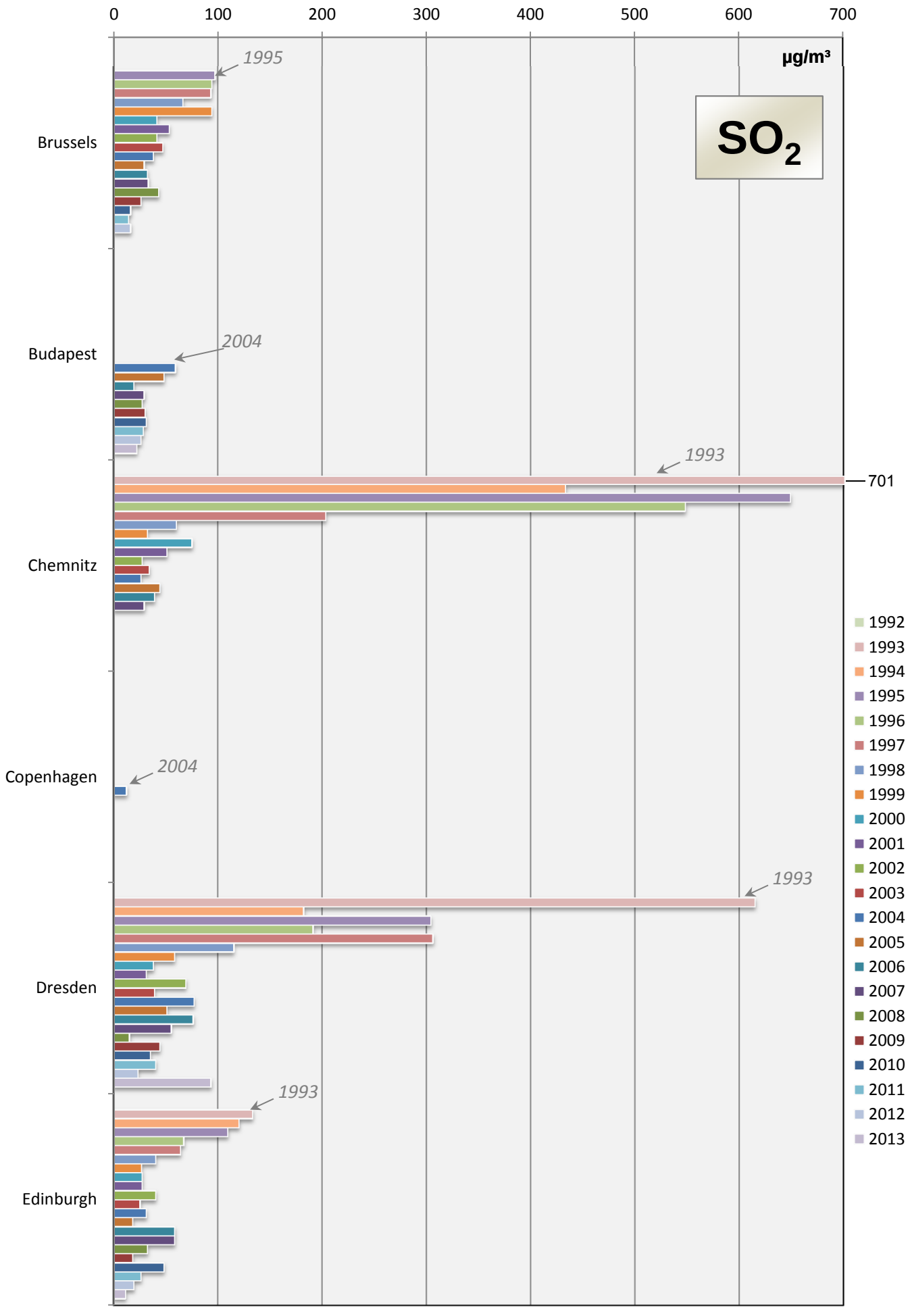
Comparison of The Air Quality 1992 - 2013

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



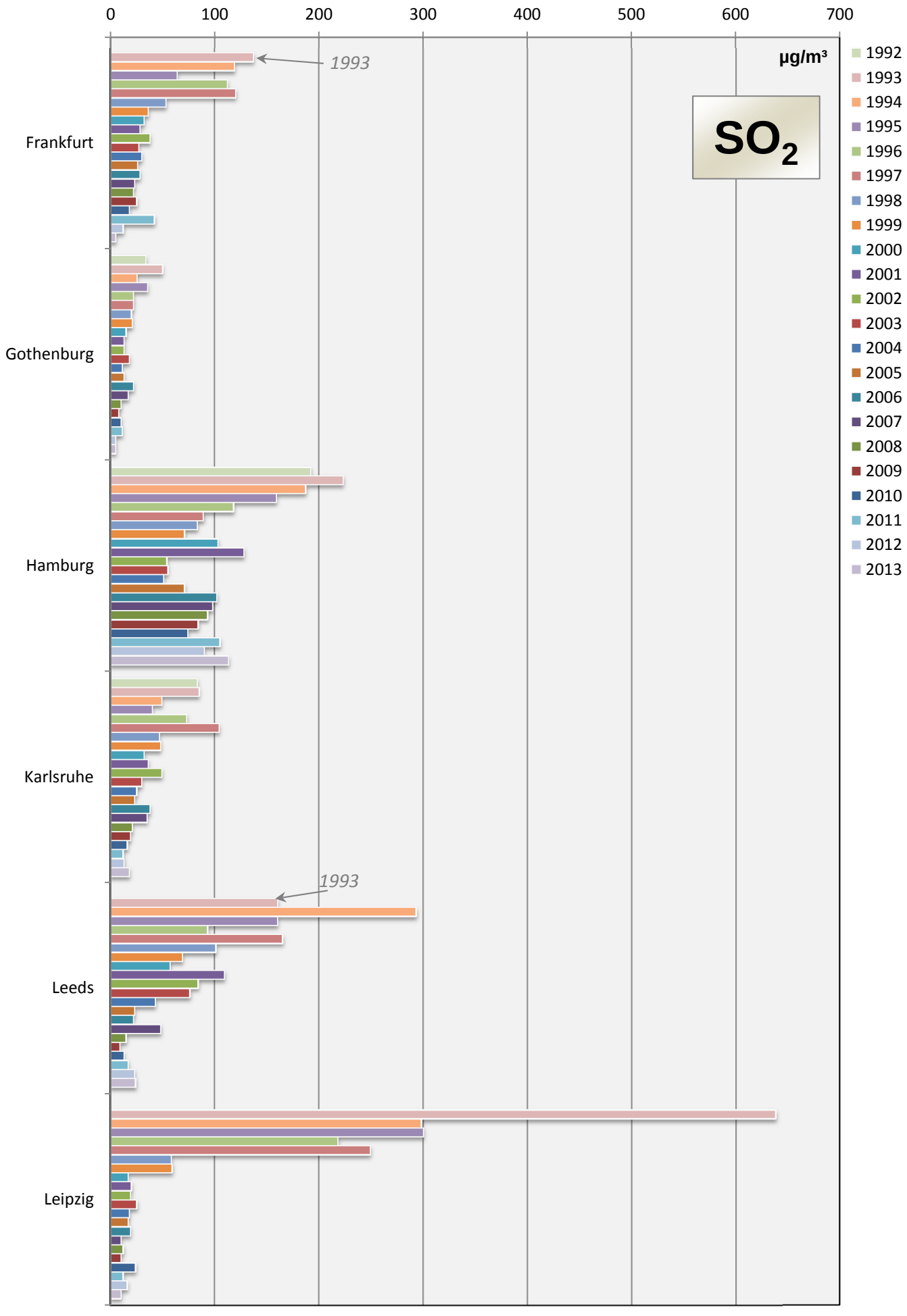
Comparison of The Air Quality 1992 - 2013

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



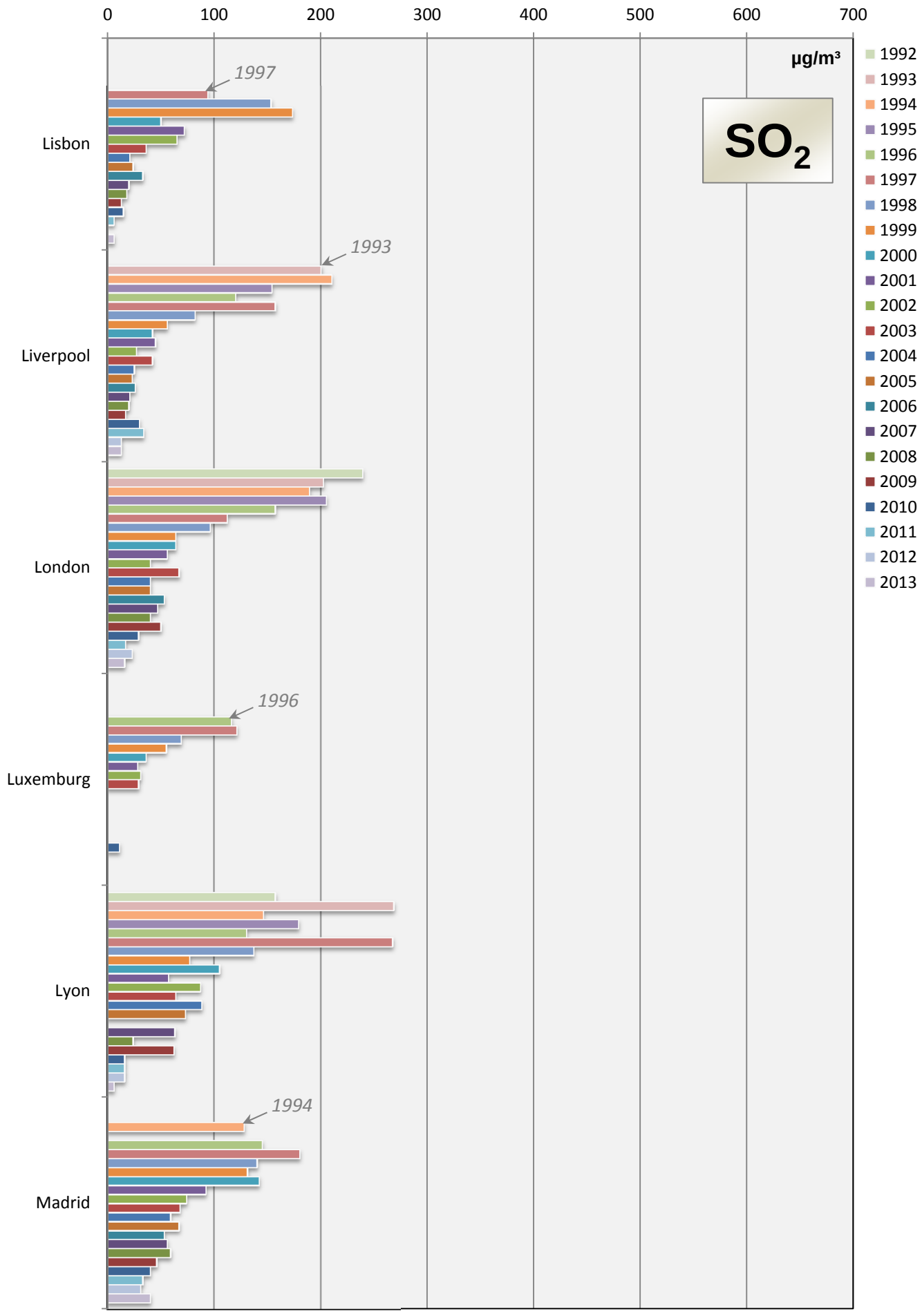
Comparison of The Air Quality 1992 - 2013

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



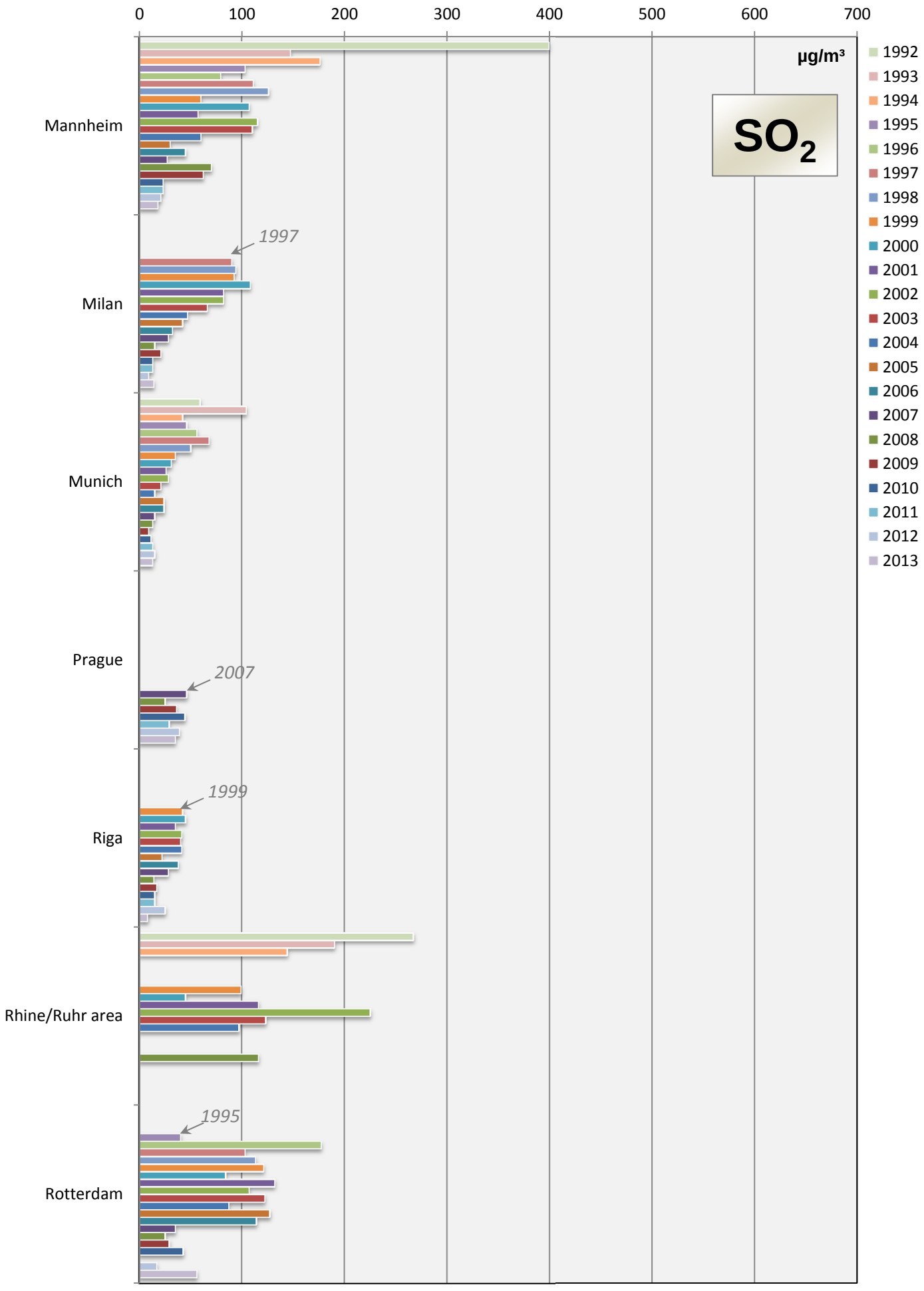
Comparison of The Air Quality 1992 - 2013

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



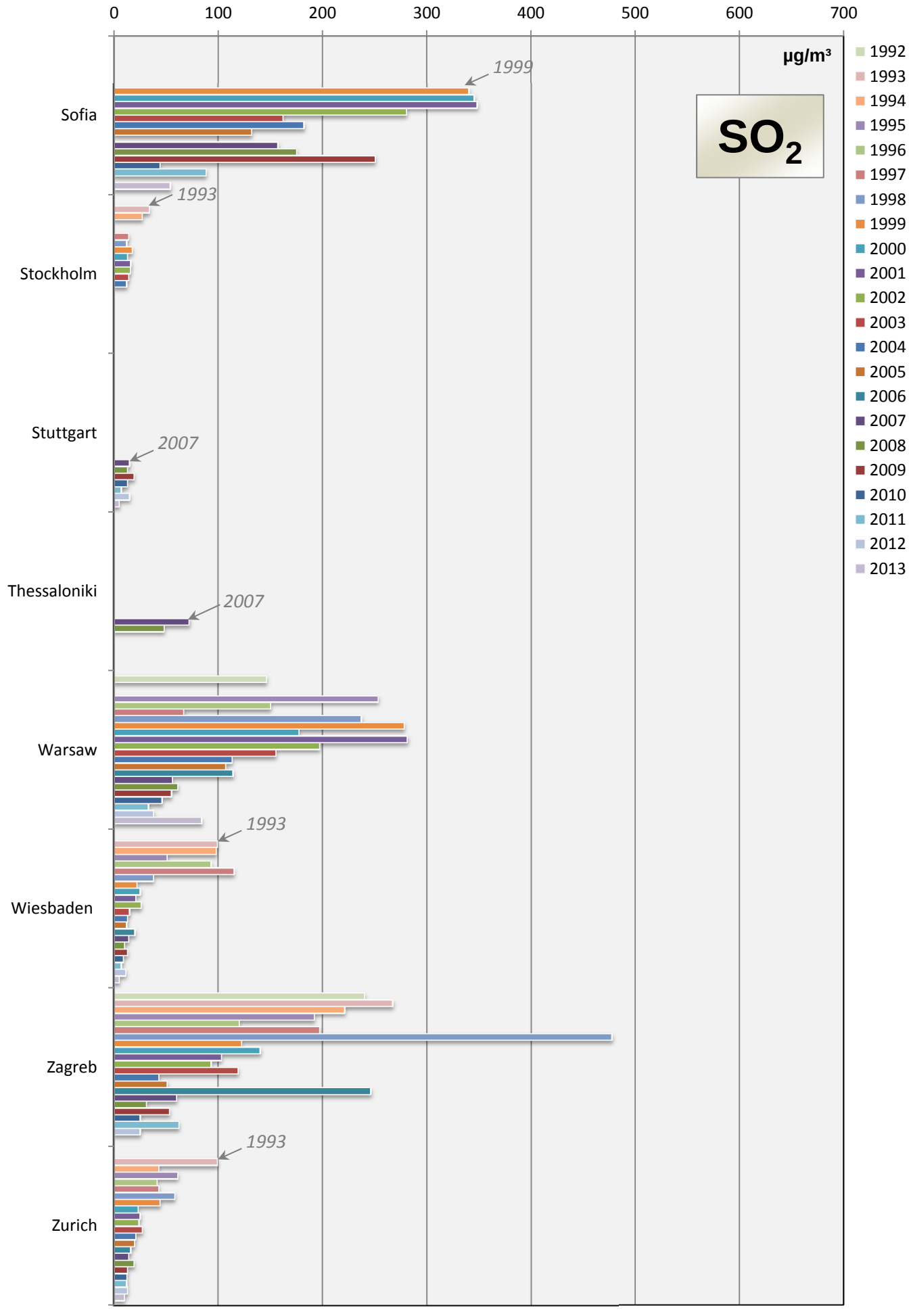
Comparison of The Air Quality 1992 - 2013

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

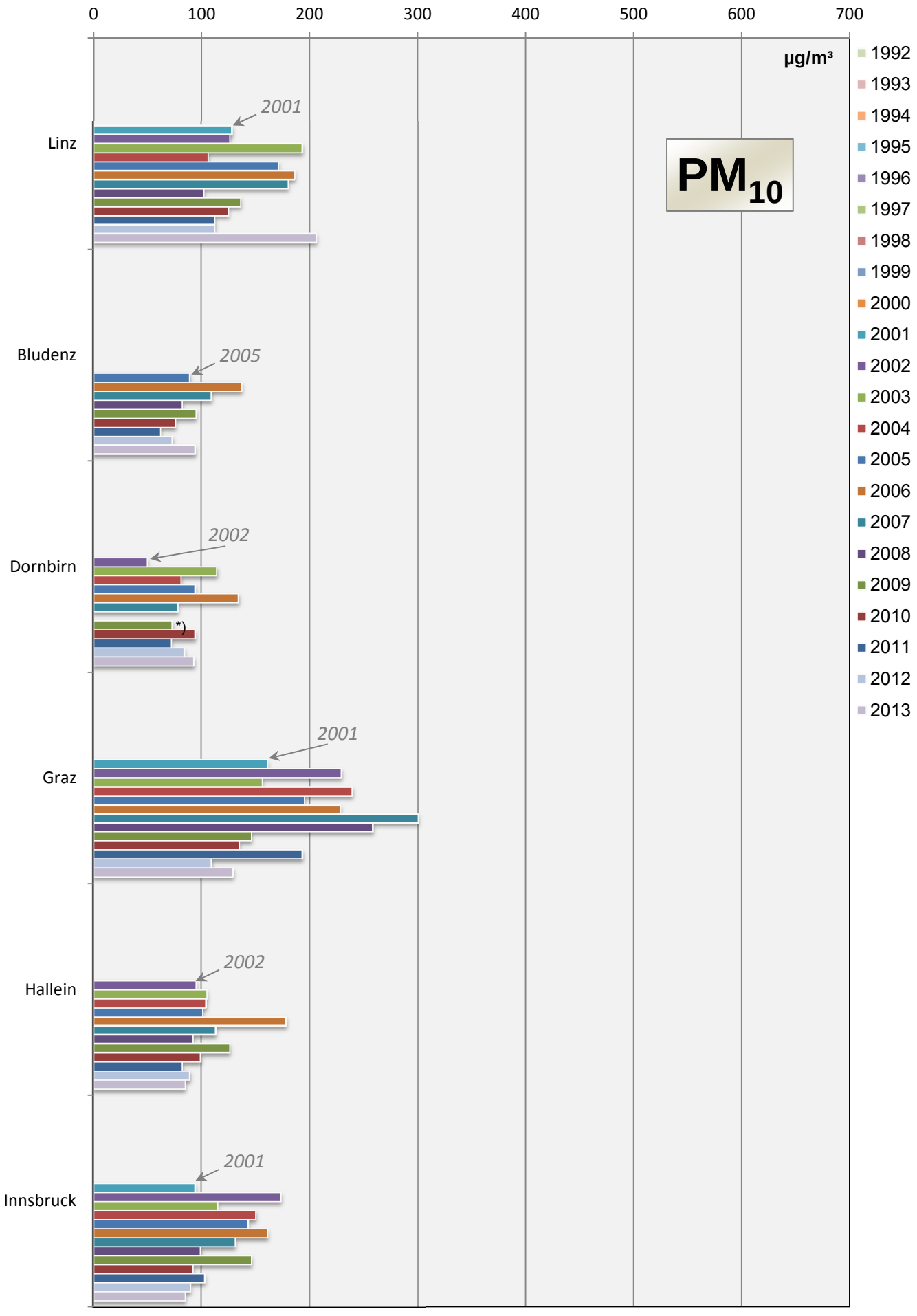


Comparison of The Air Quality 1992 - 2013

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



Comparison of The Air Quality 1992 - 2013
max. daily mean values (peak-stressed monitoring station)



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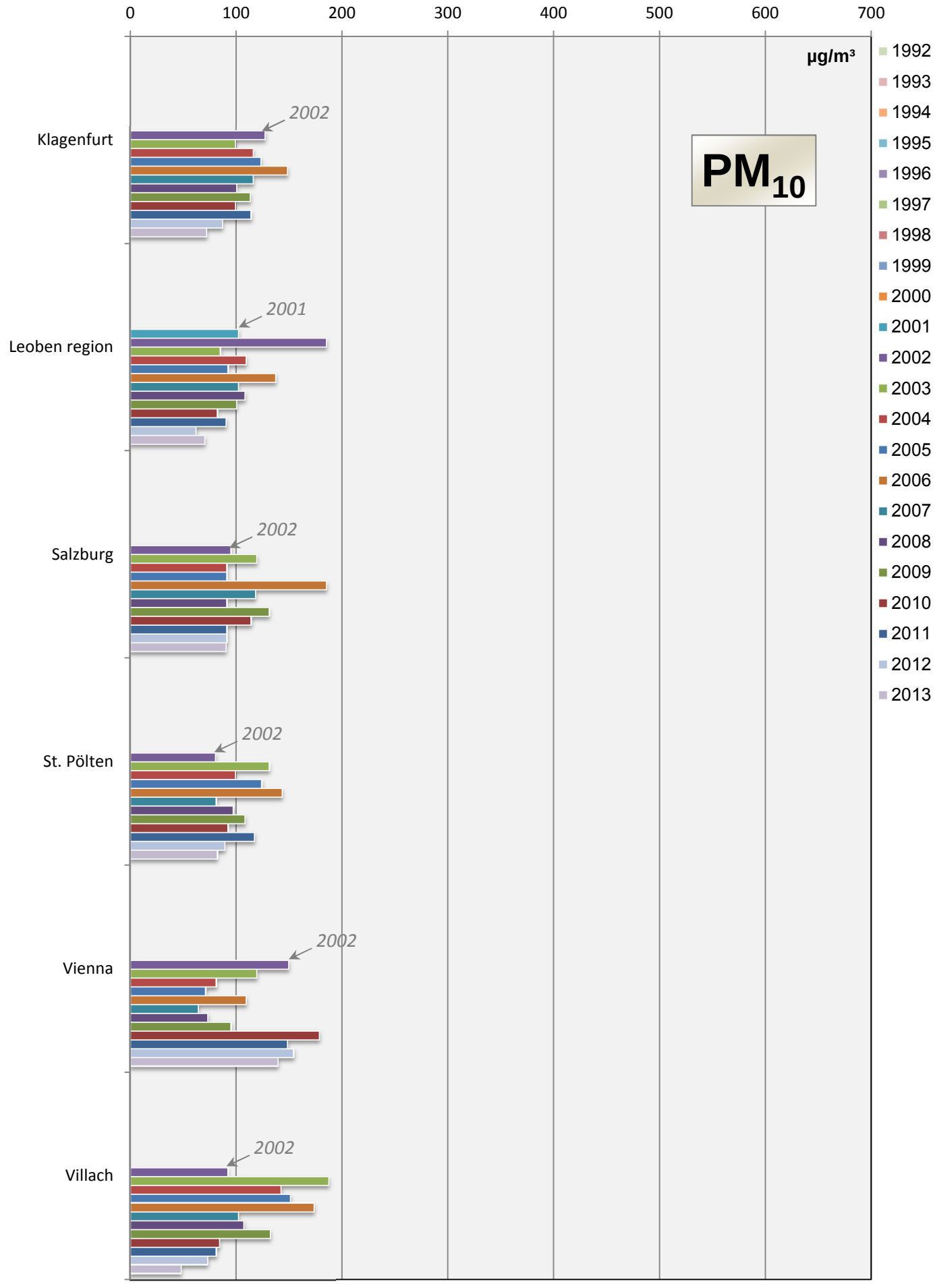
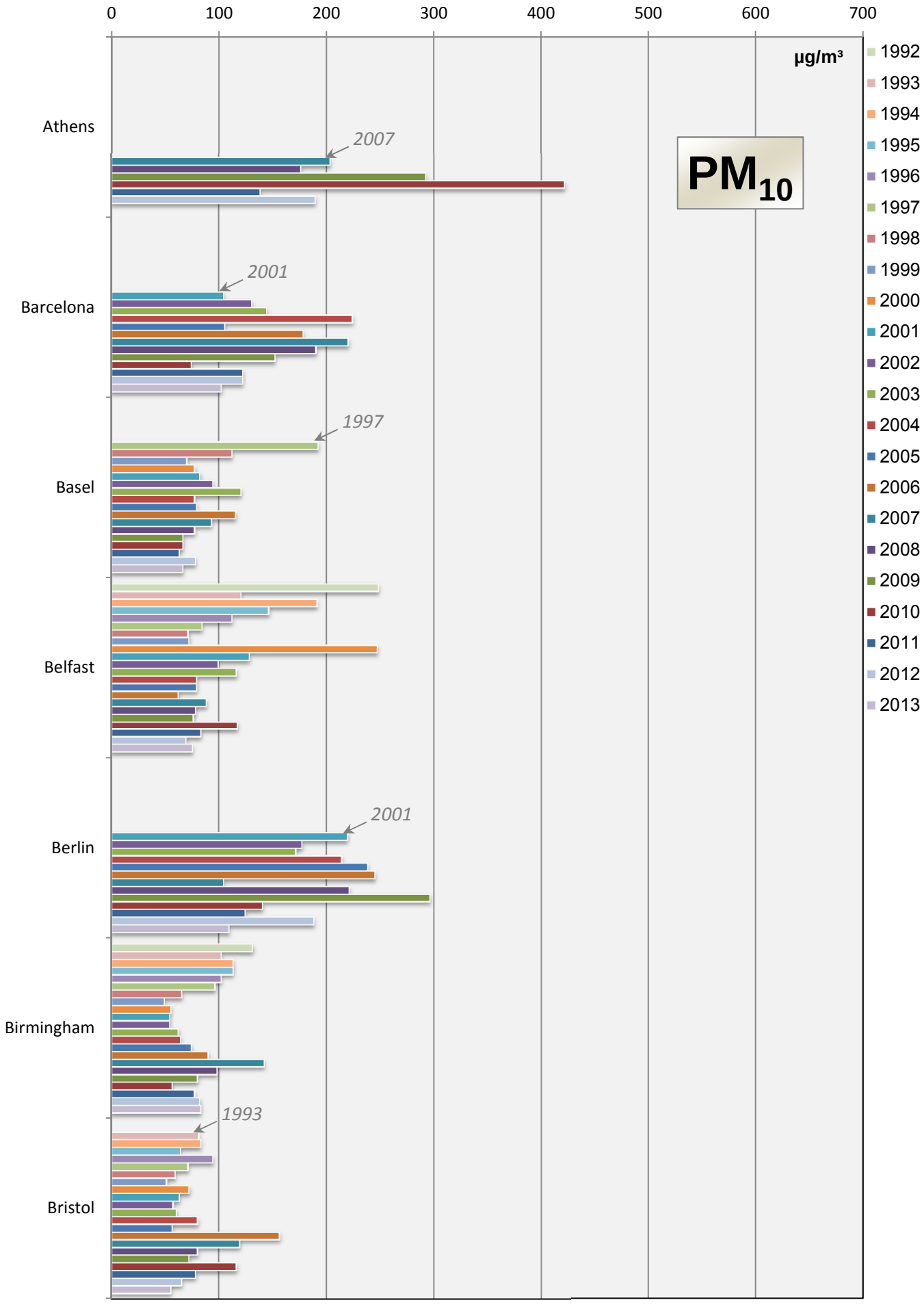
Comparison of The Air Quality 1992 - 2013

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



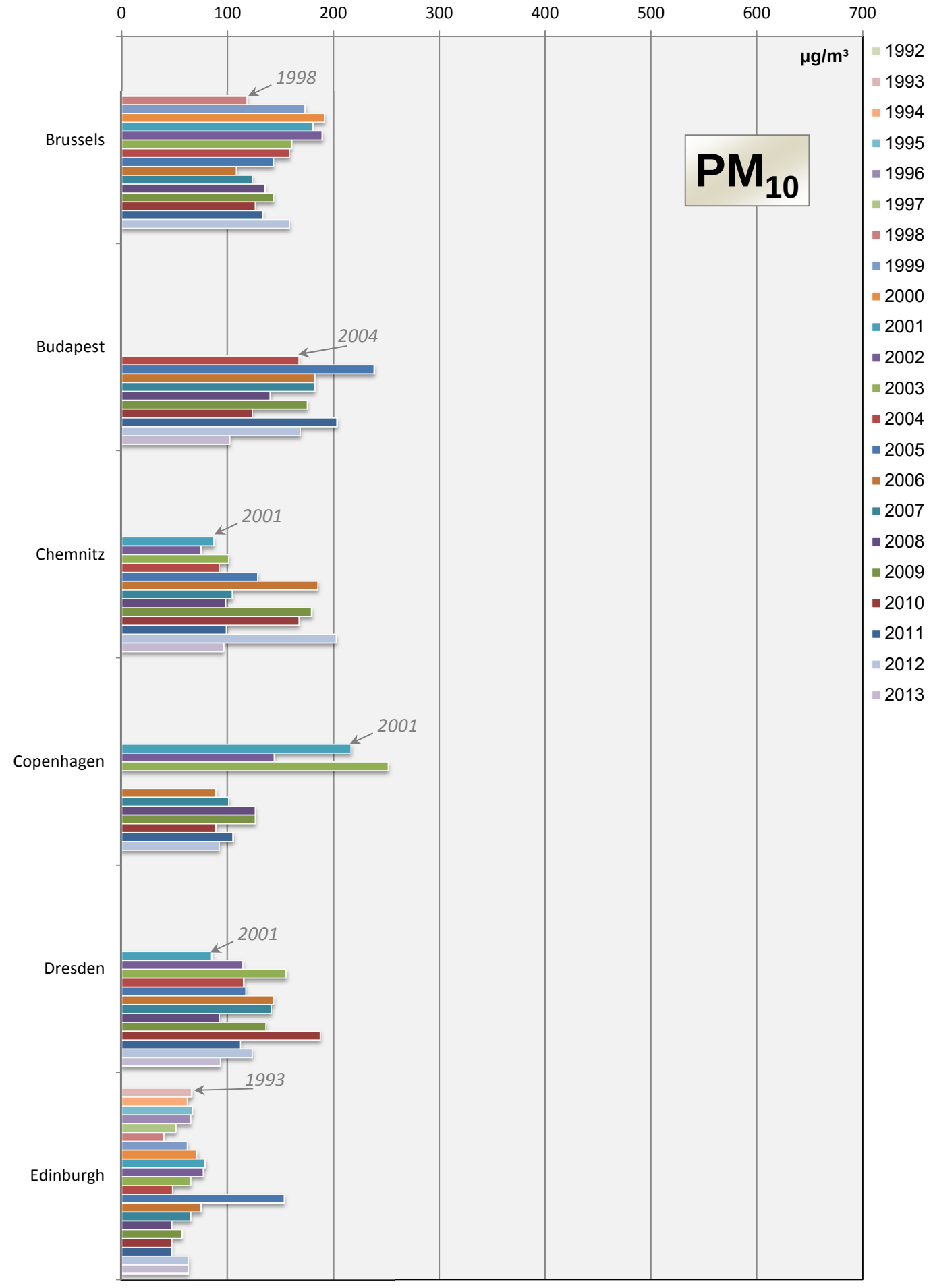
Comparison of The Air Quality 1992 - 2013

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



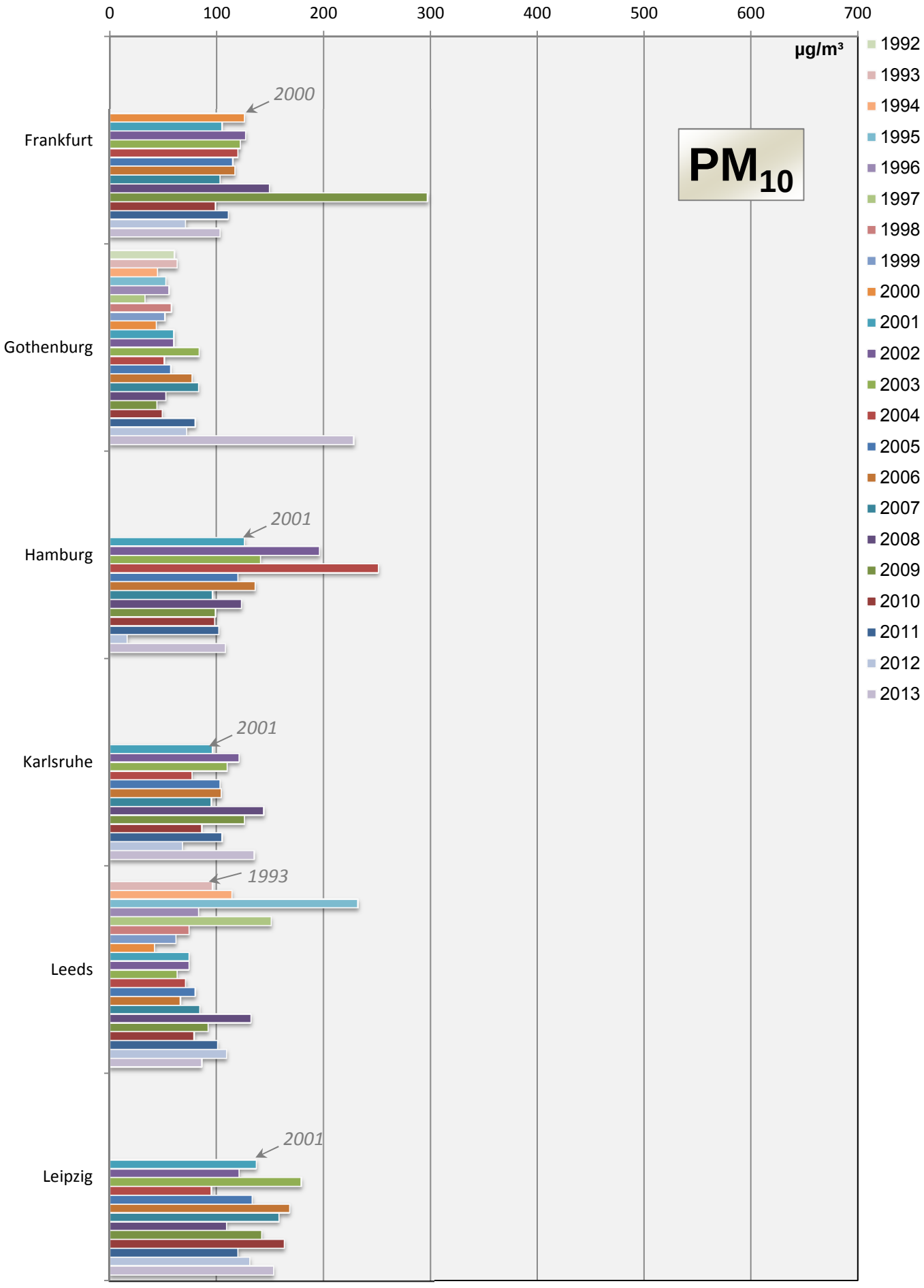
Comparison of The Air Quality 1992 - 2013

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



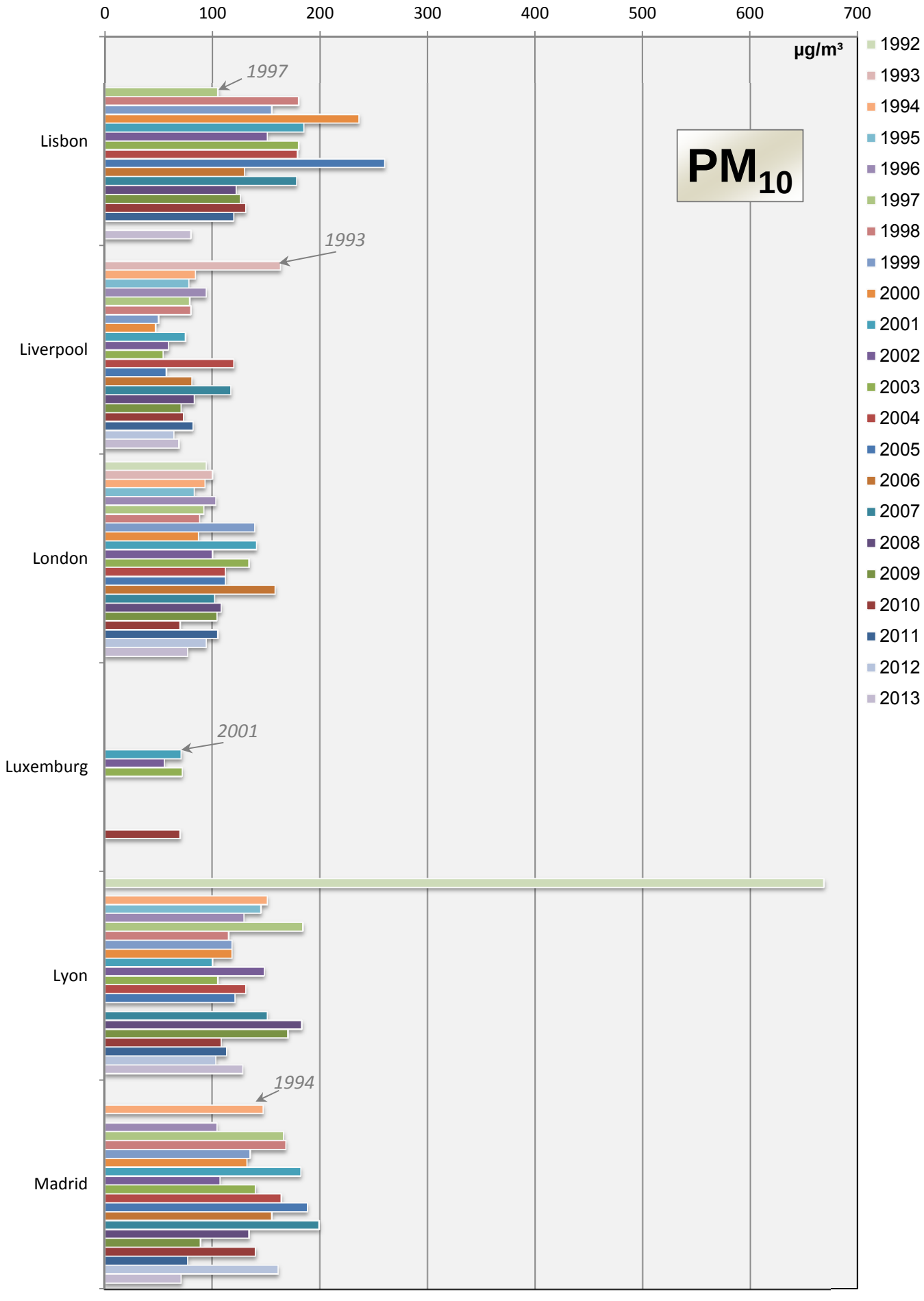
Comparison of The Air Quality 1992 - 2013

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



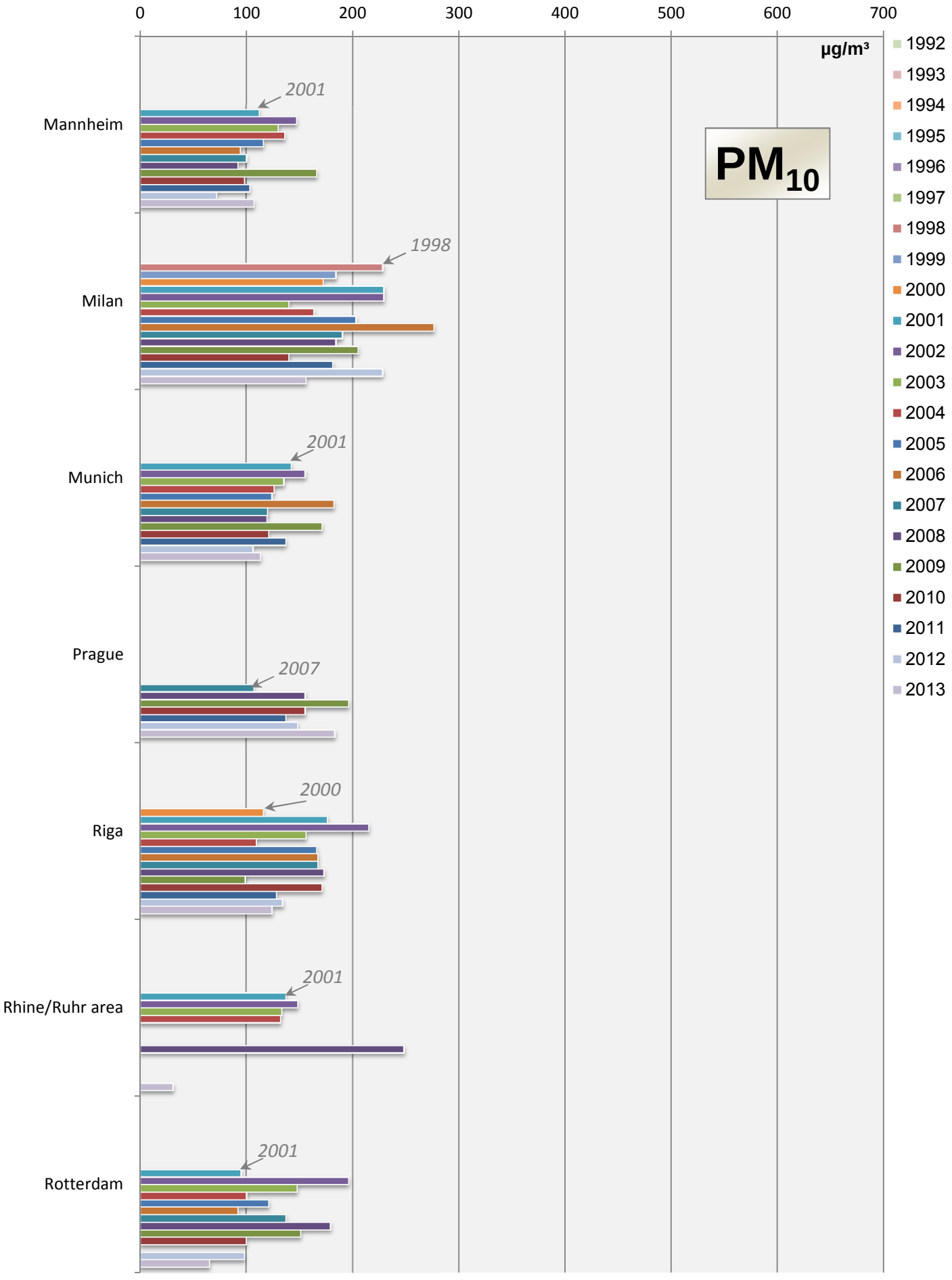
Comparison of The Air Quality 1992 - 2013

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



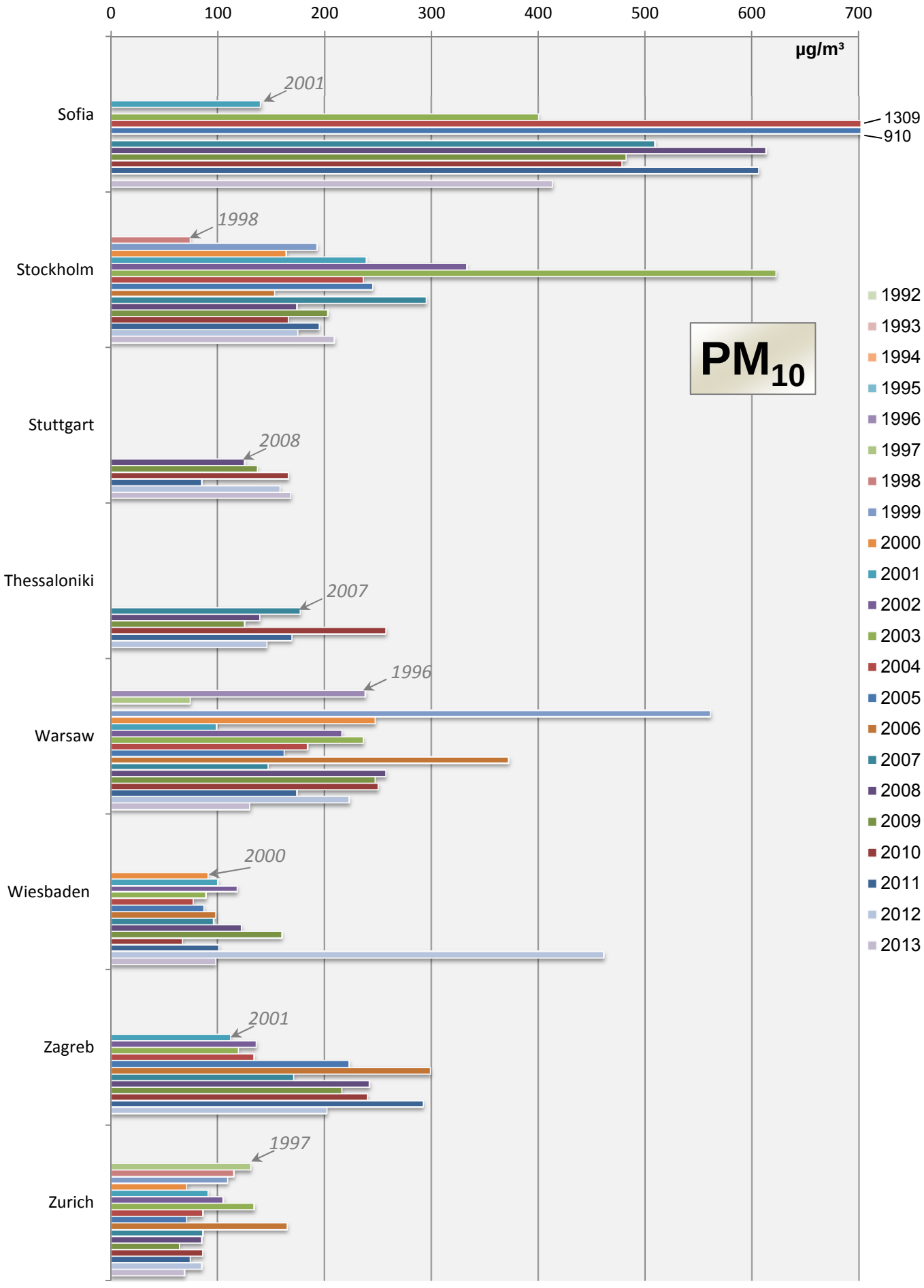
Comparison of The Air Quality 1992 - 2013

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



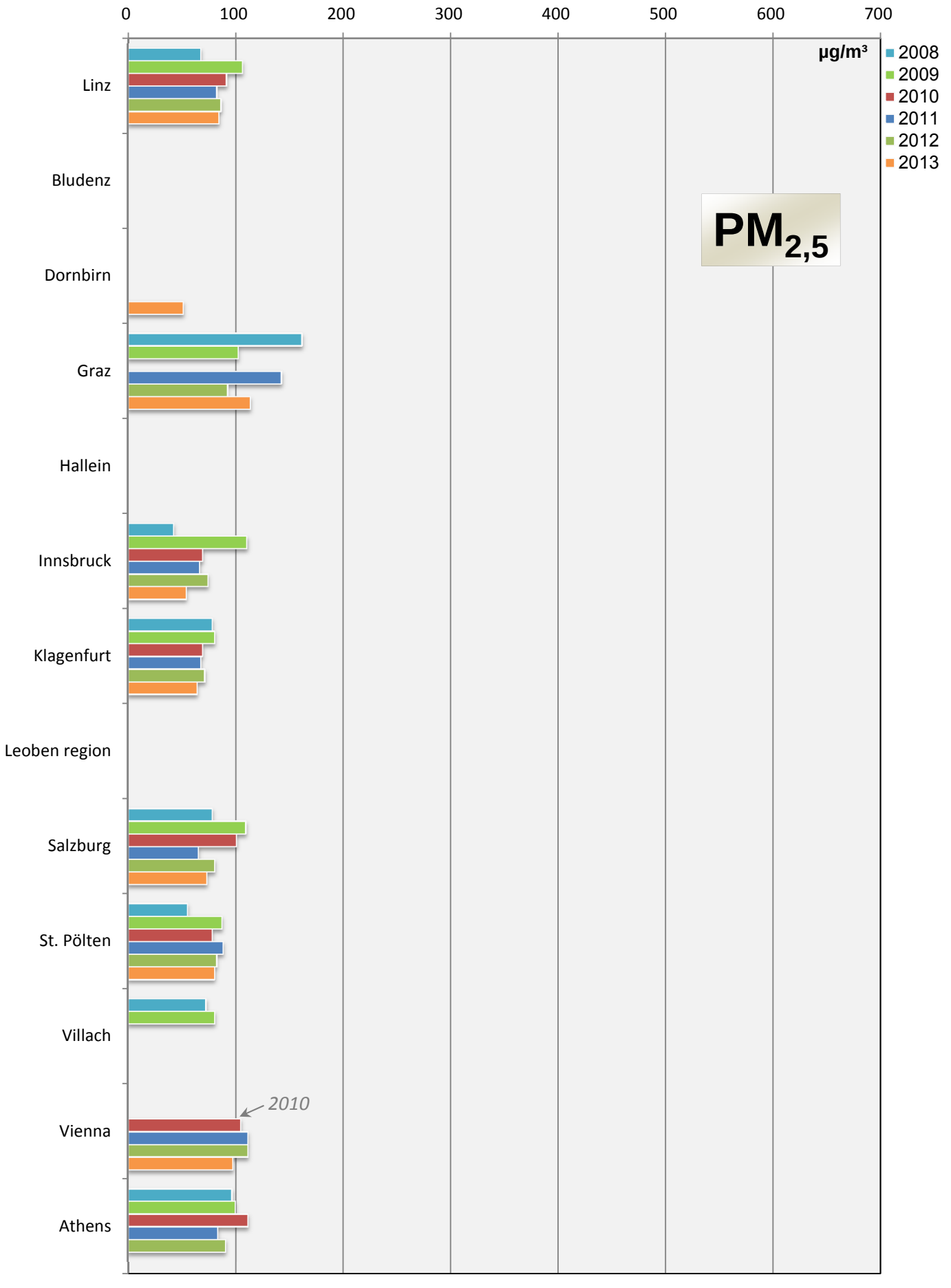
Comparison of The Air Quality 1992 - 2013

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



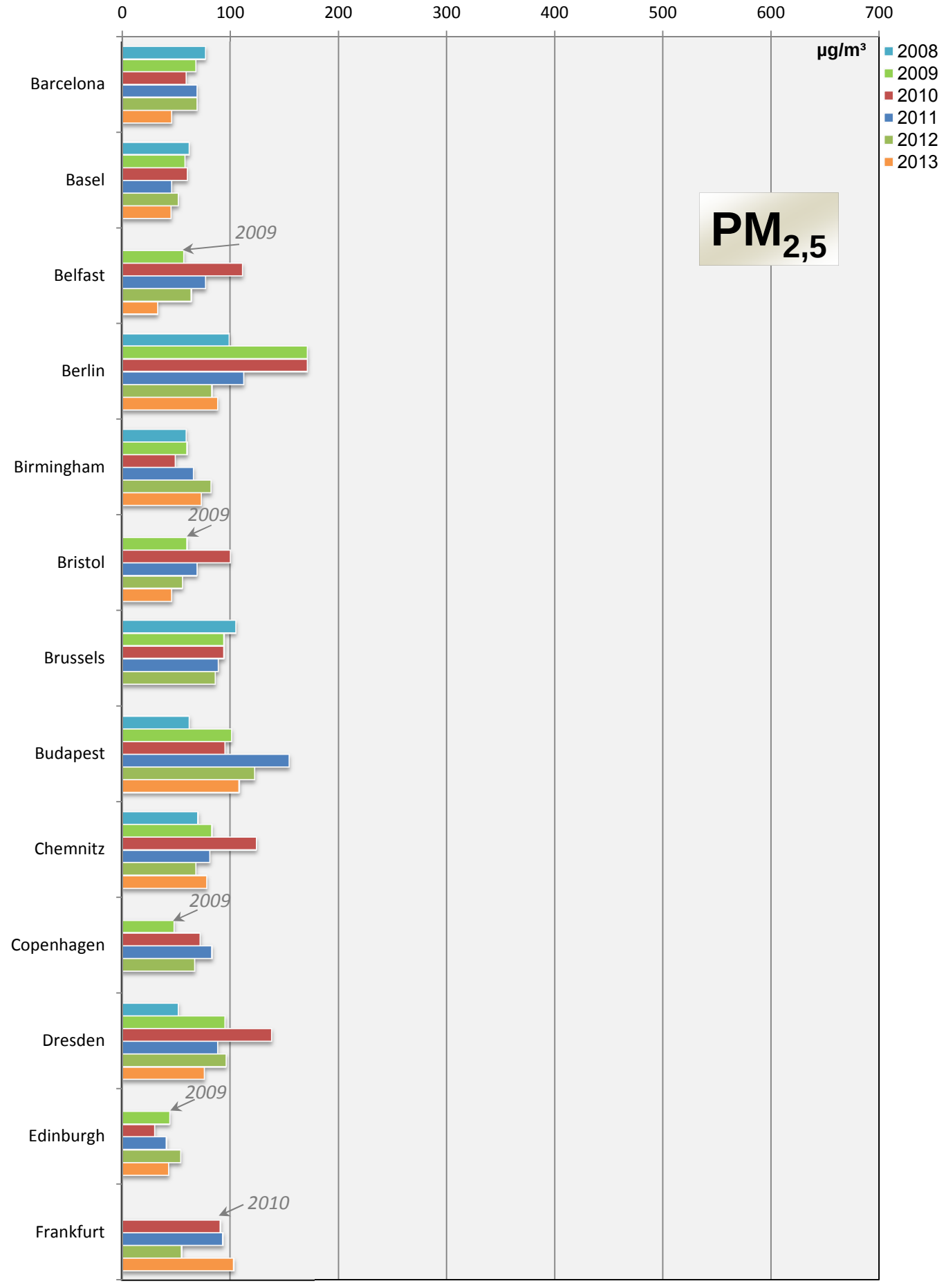
Comparison of The Air Quality 2008 - 2013

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



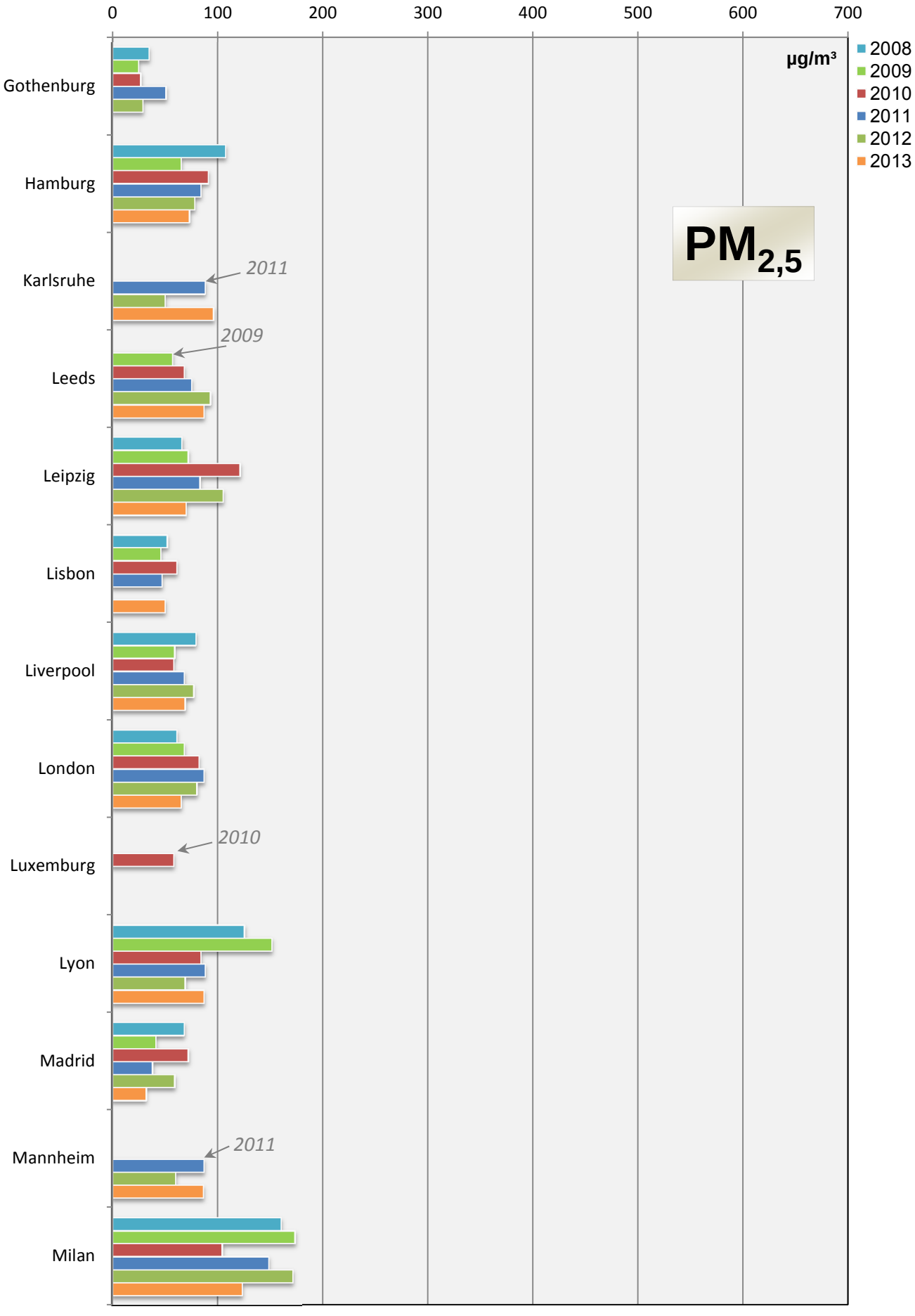
Comparison of The Air Quality 2008 - 2013

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



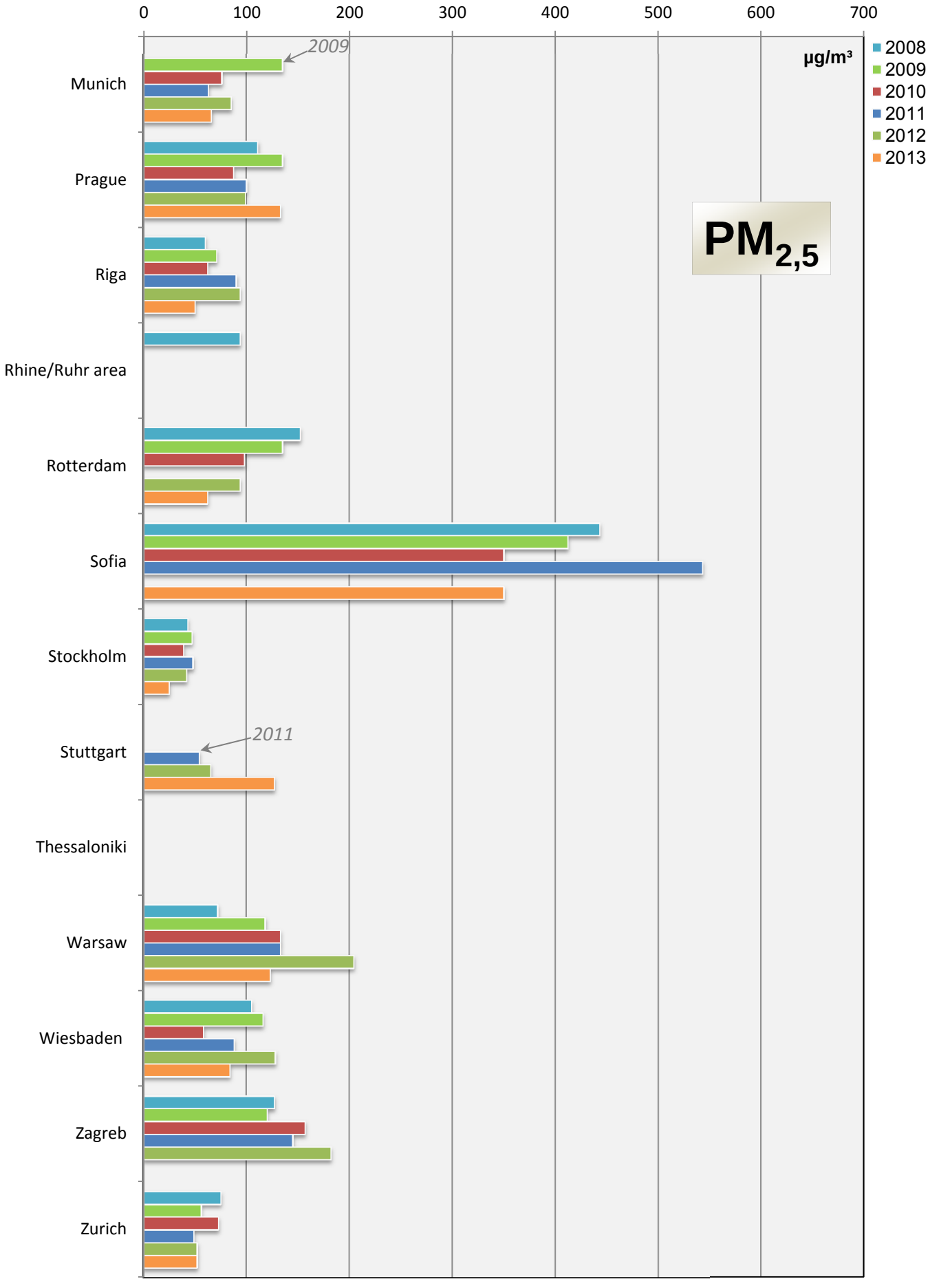
Comparison of The Air Quality 2008 - 2013

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



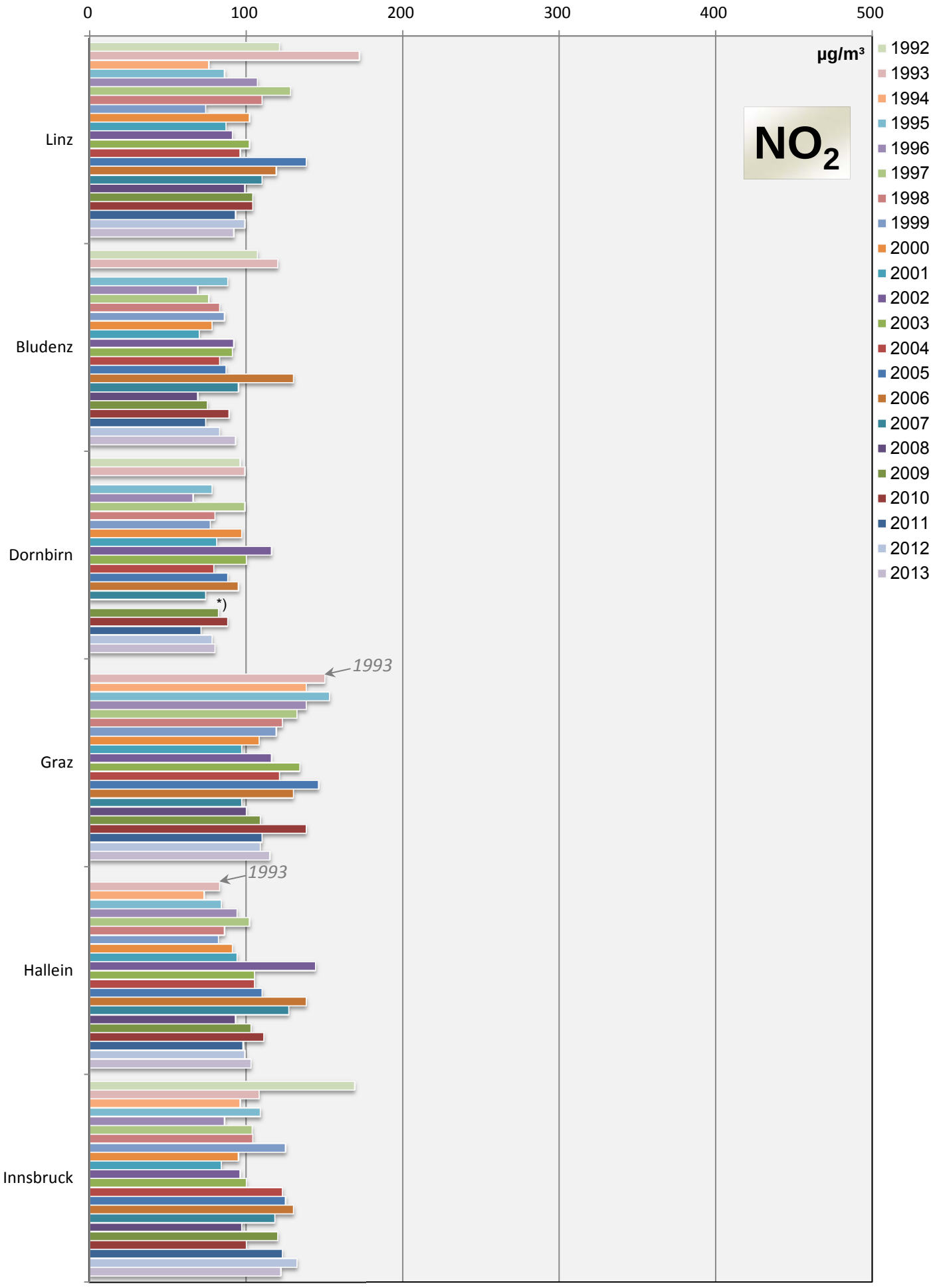
Comparison of The Air Quality 2008 - 2013

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



Comparison of The Air Quality 1992 - 2013

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



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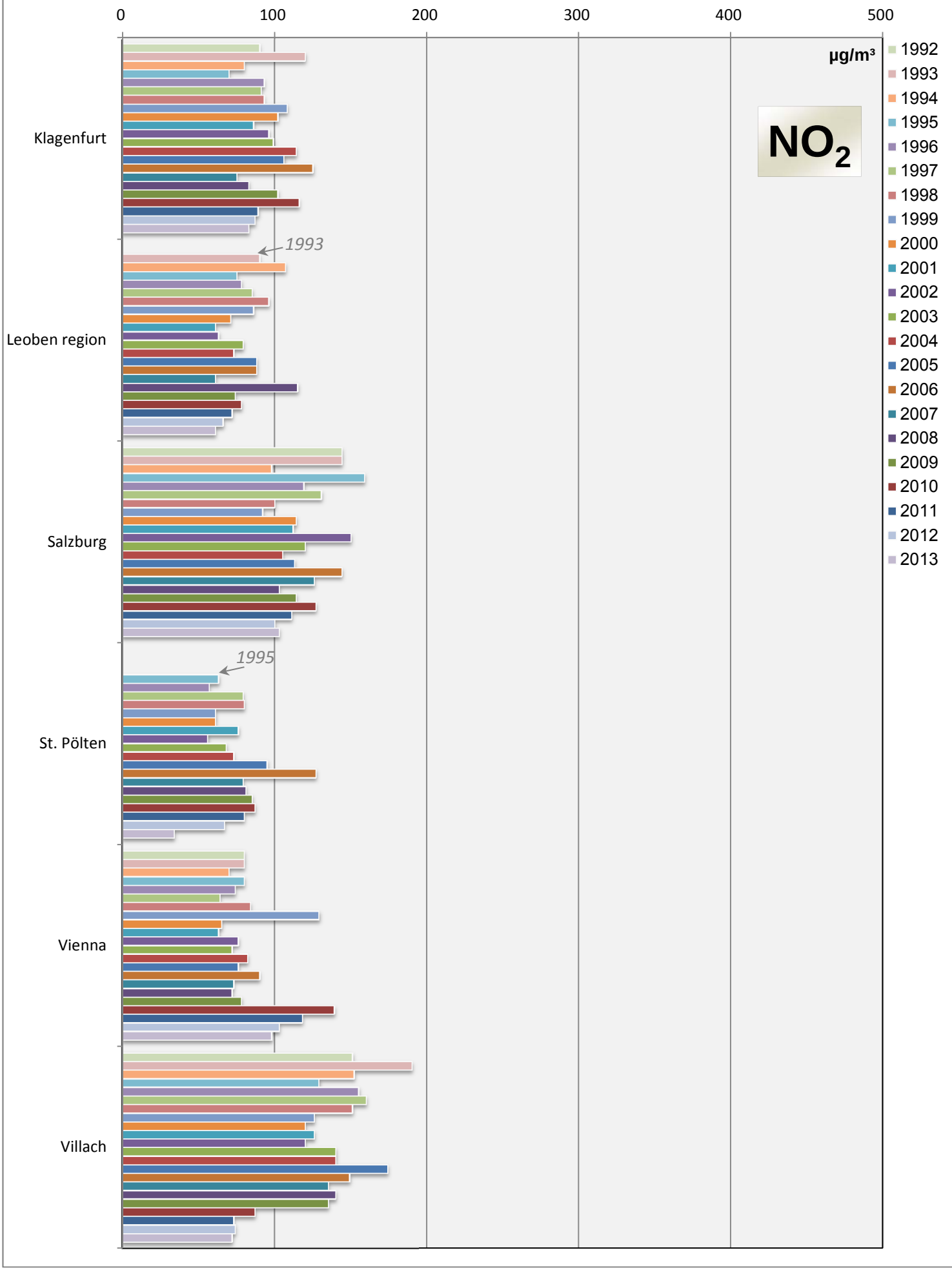
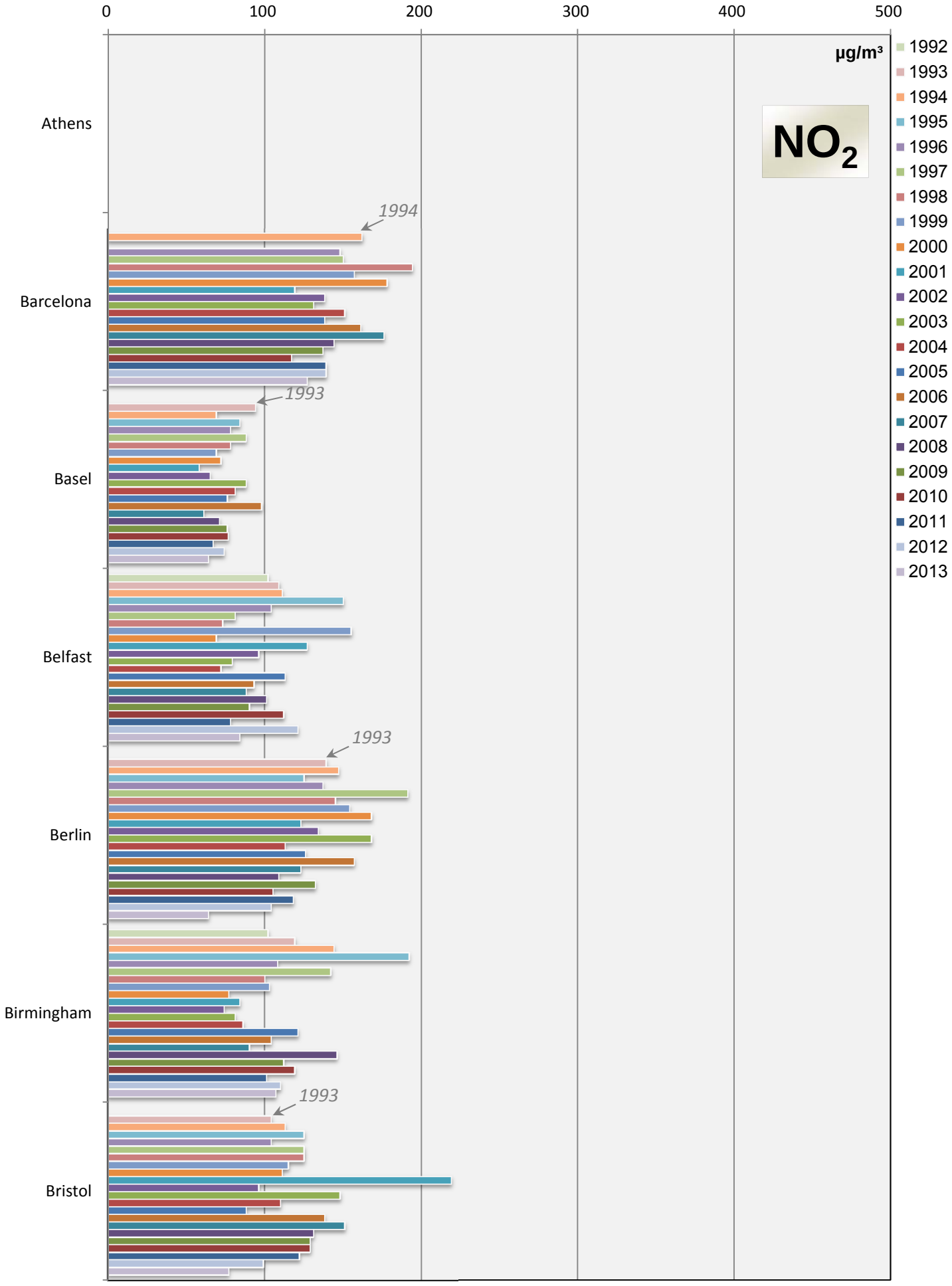
Comparison of The Air Quality 1992 - 2013

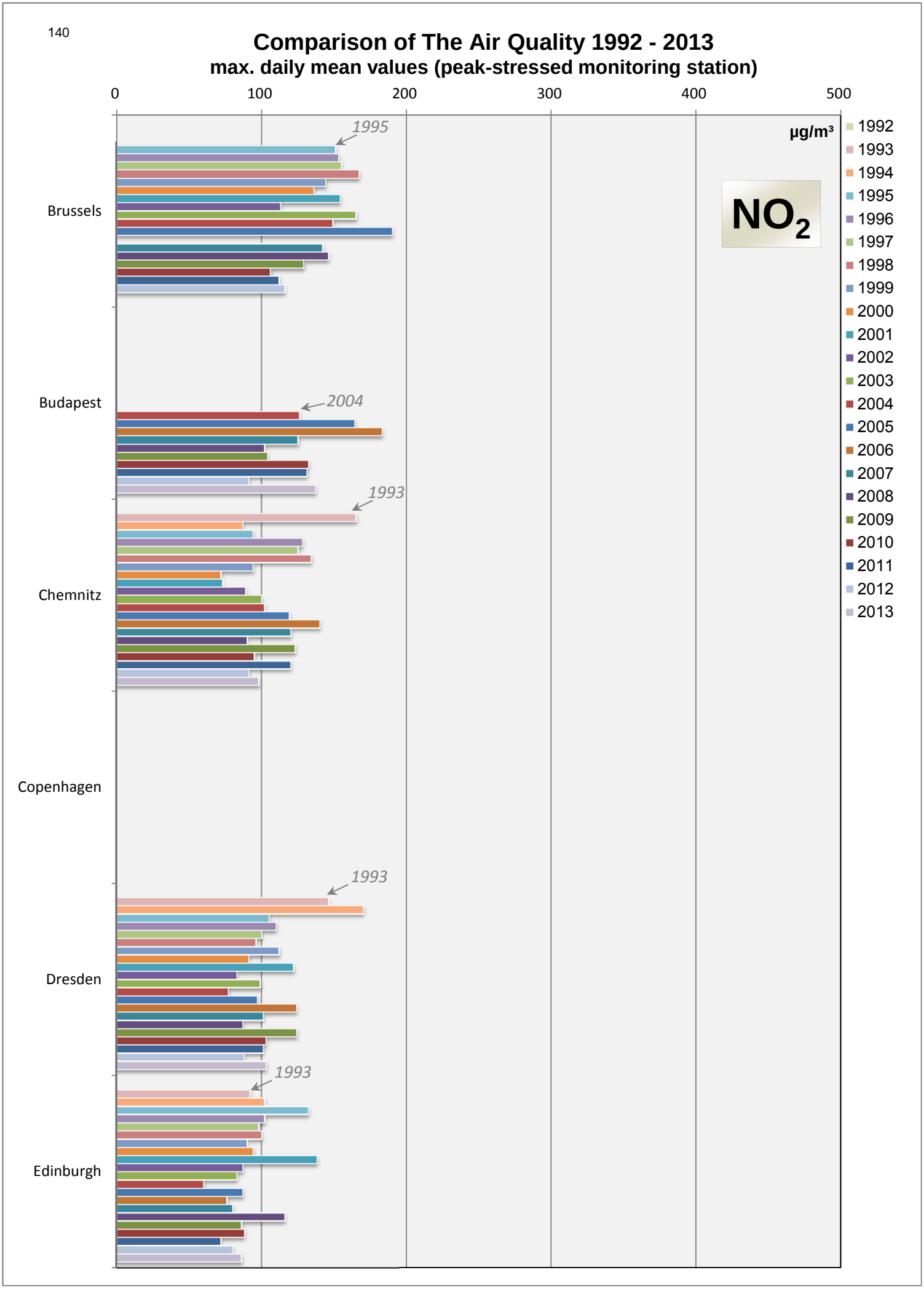
max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2013

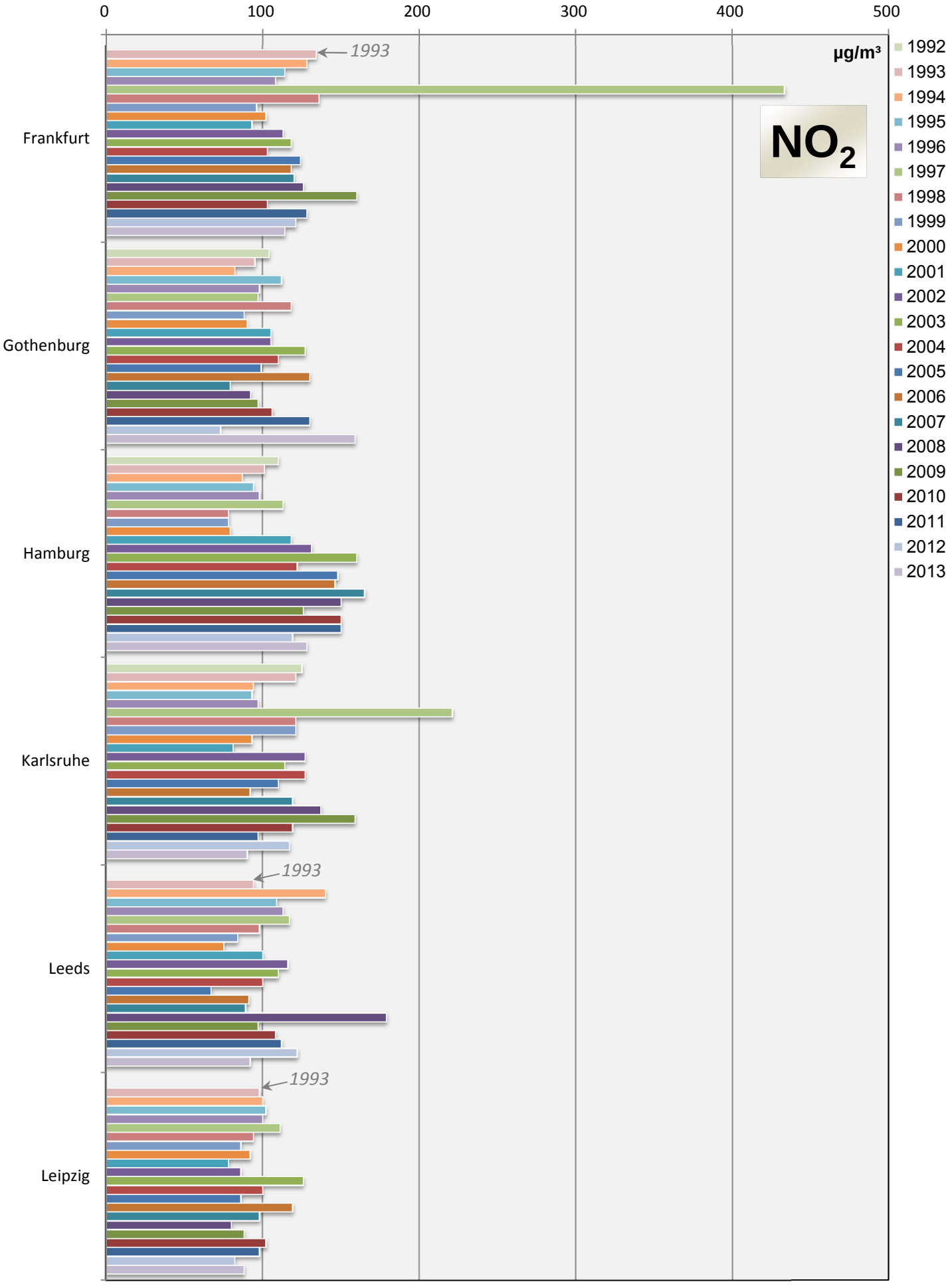
max. daily mean values (peak-stressed monitoring station)




140
Comparison of The Air Quality 1992 - 2013
max. daily mean values (peak-stressed monitoring station)
0
100
200
300
400
500
µg/m³
NO2
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
Brussels
Budapest
Chemnitz
Copenhagen
Dresden
Edinburgh
1995
2004
1993
1993
1993
Magistrat Linz - Umwelt- und Technik-Center

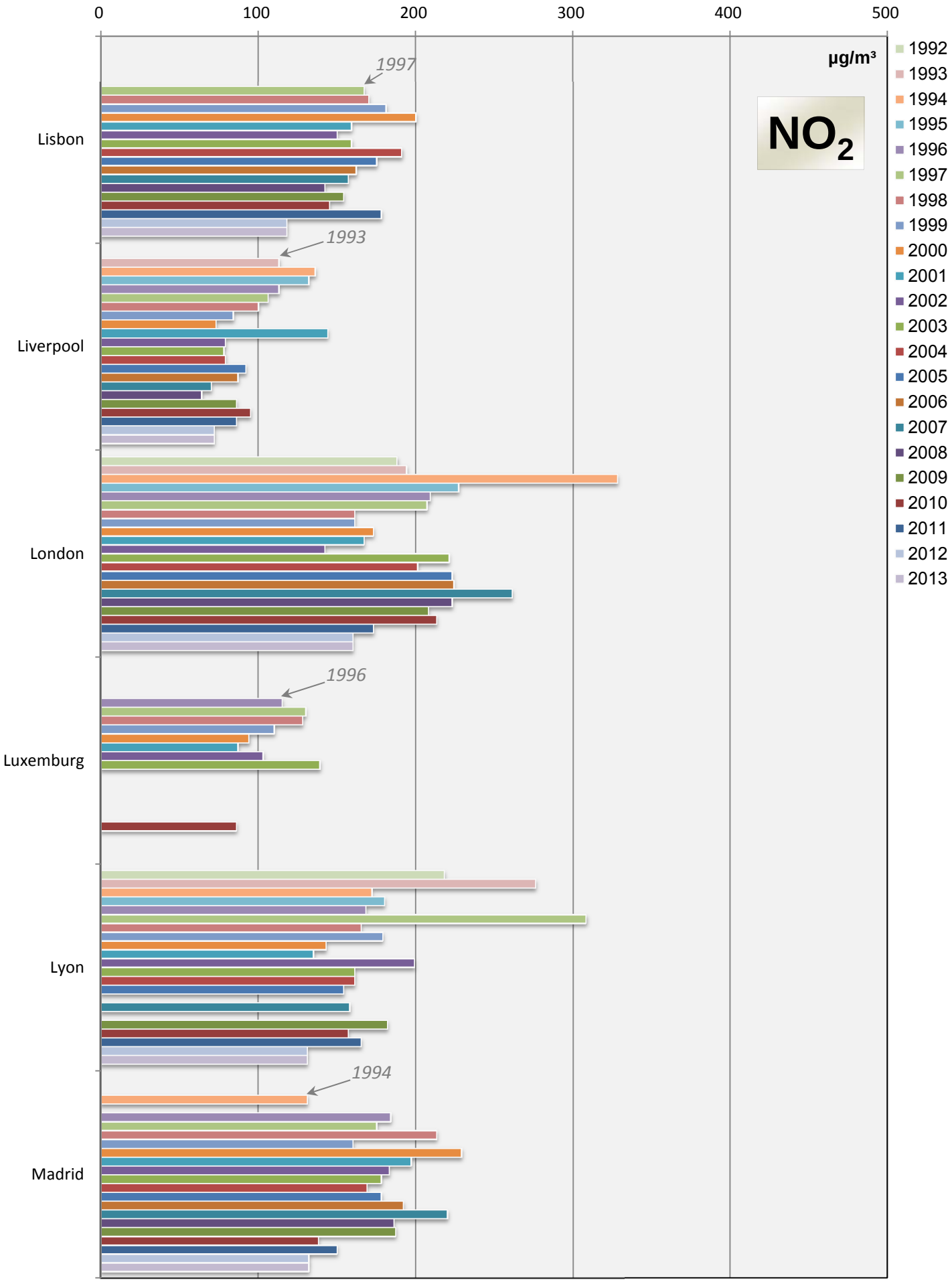
Comparison of The Air Quality 1992 - 2013

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



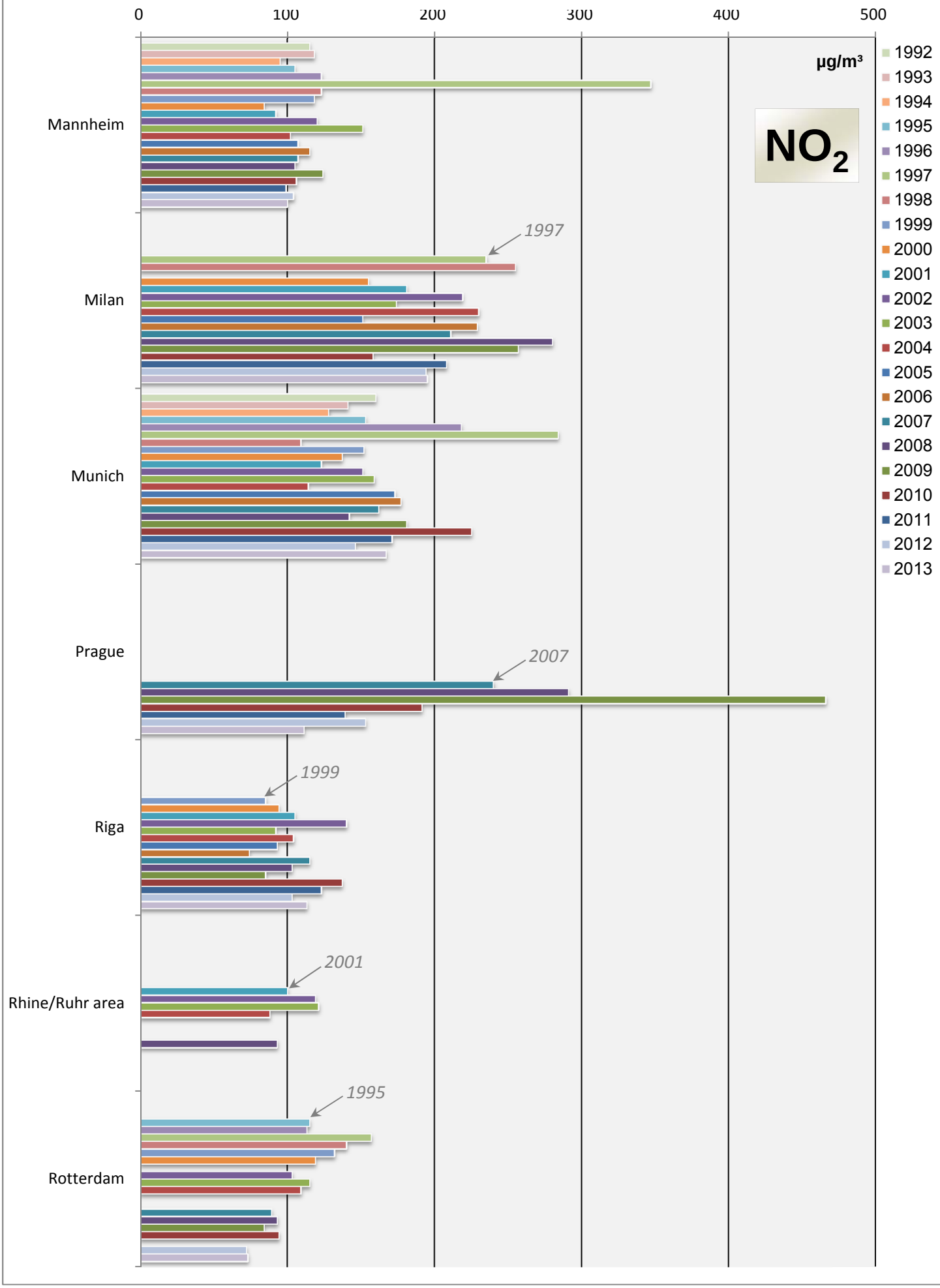
Comparison of The Air Quality 1992 - 2013

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



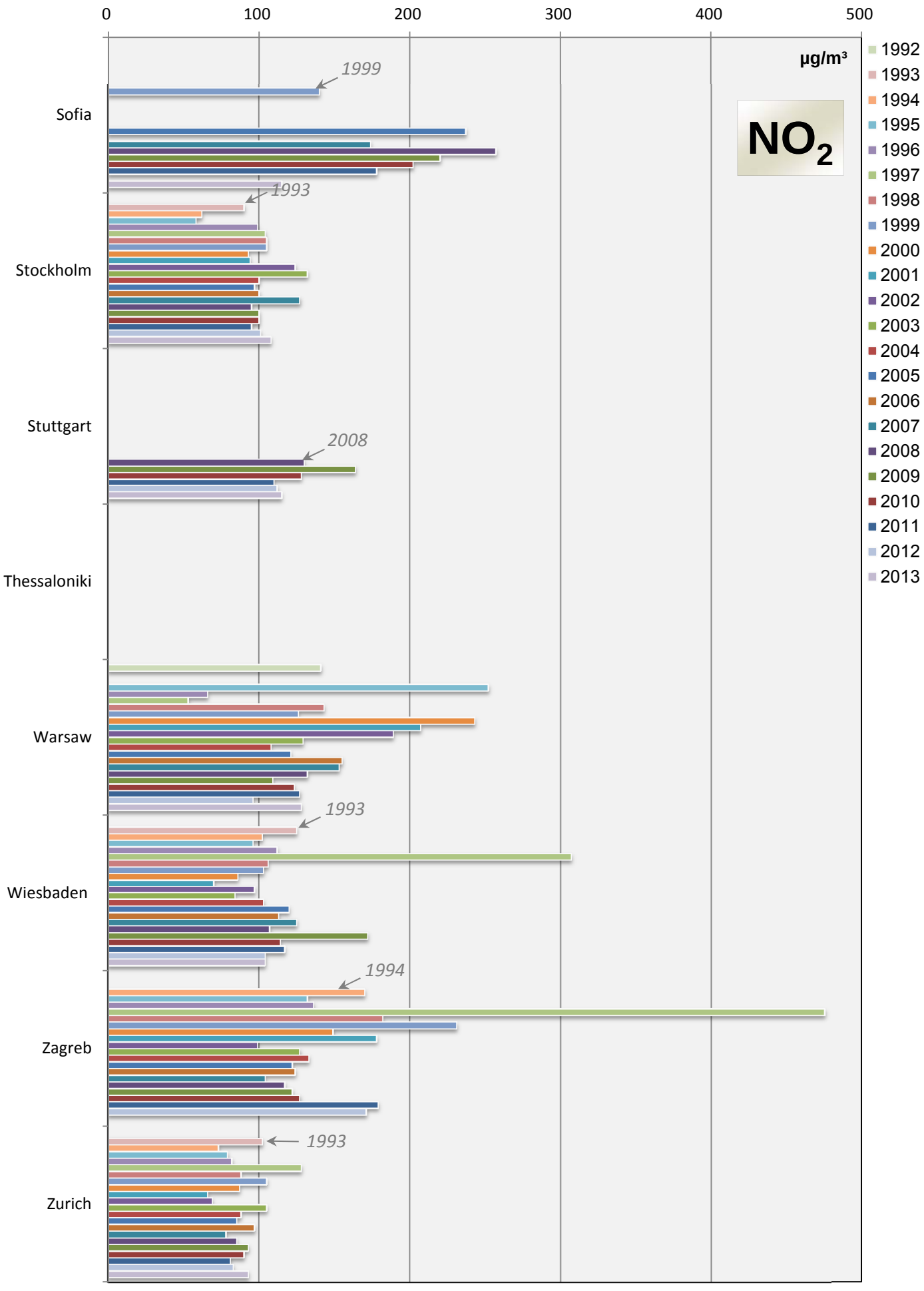
Comparison of The Air Quality 1992 - 2013

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



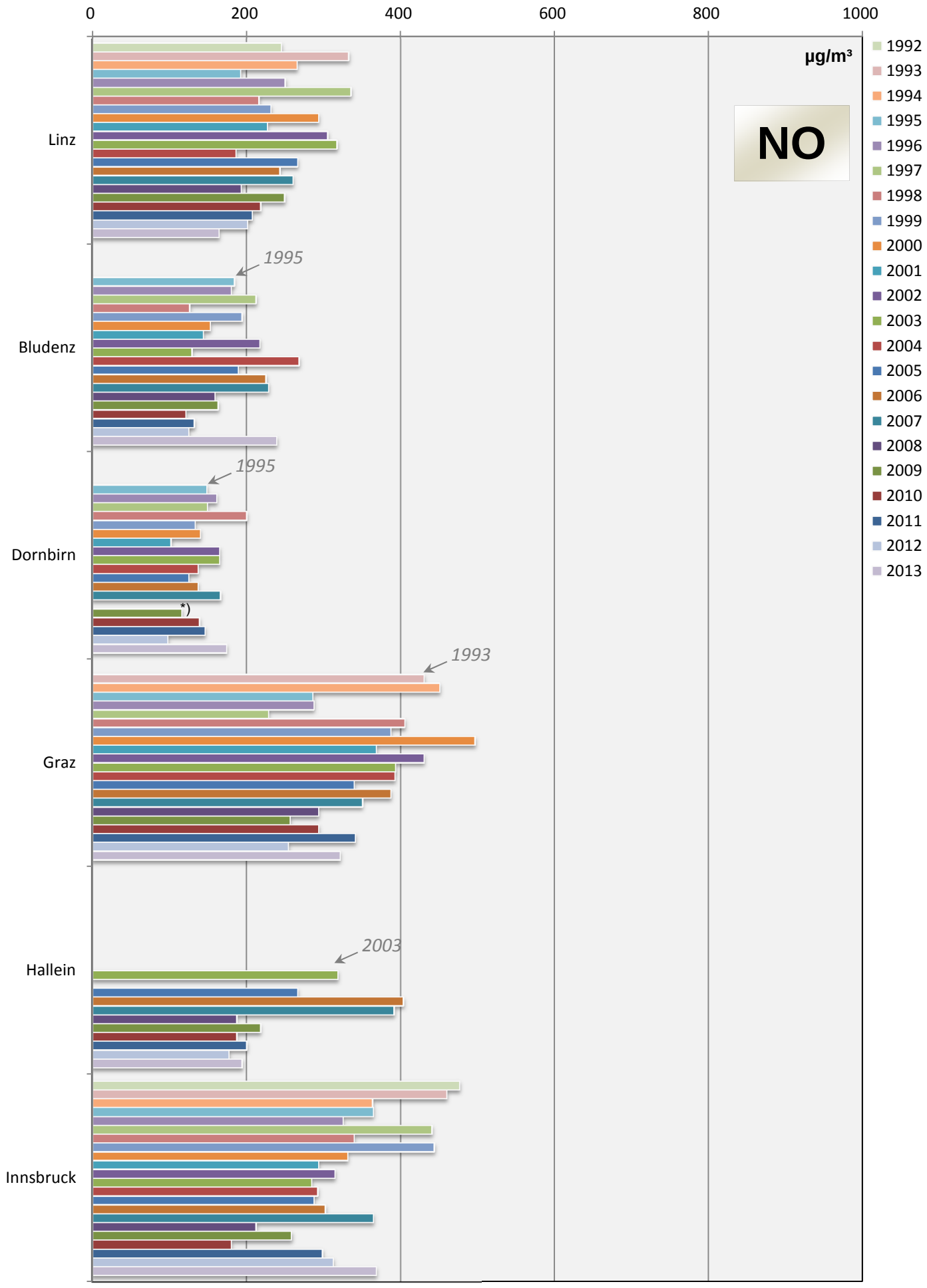
Comparison of The Air Quality 1992 - 2013

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



Comparison of The Air Quality 1992 - 2013

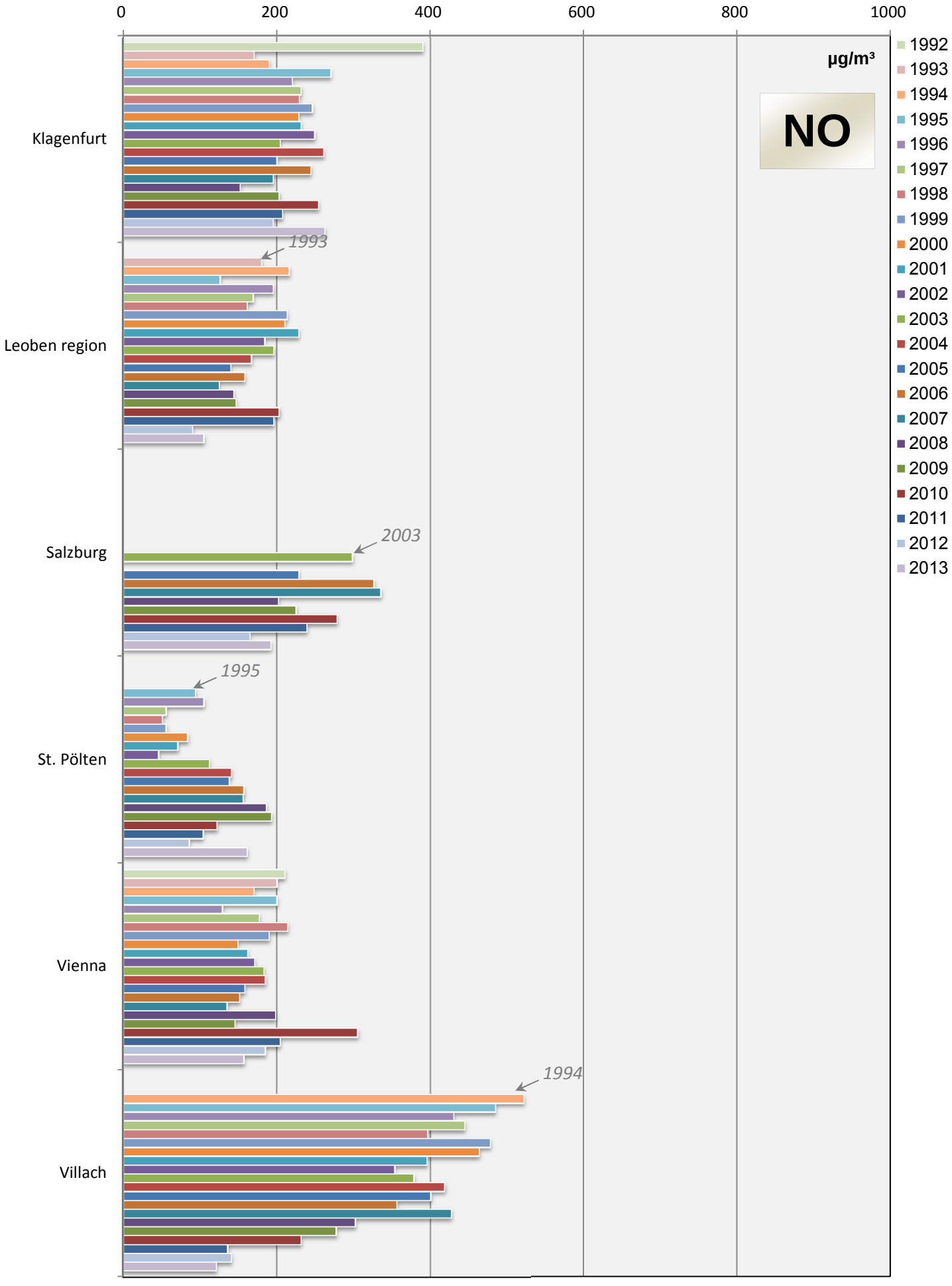
max. daily mean values (peak-stressed monitoring station)



*) data of the year 2008 are not used for the comparison, because the street near the measurment point was closed for 11 months

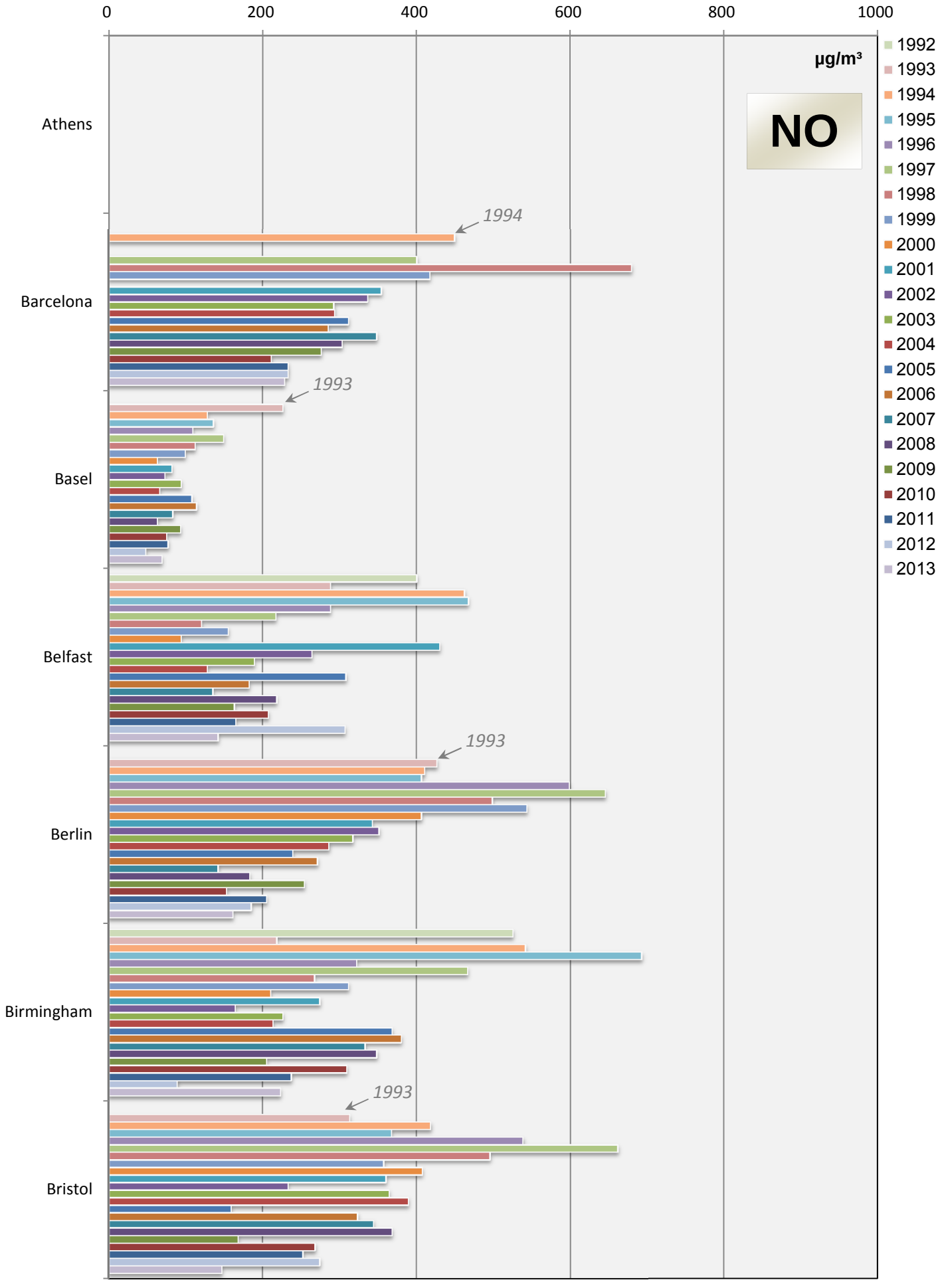
Comparison of The Air Quality 1992 - 2013

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



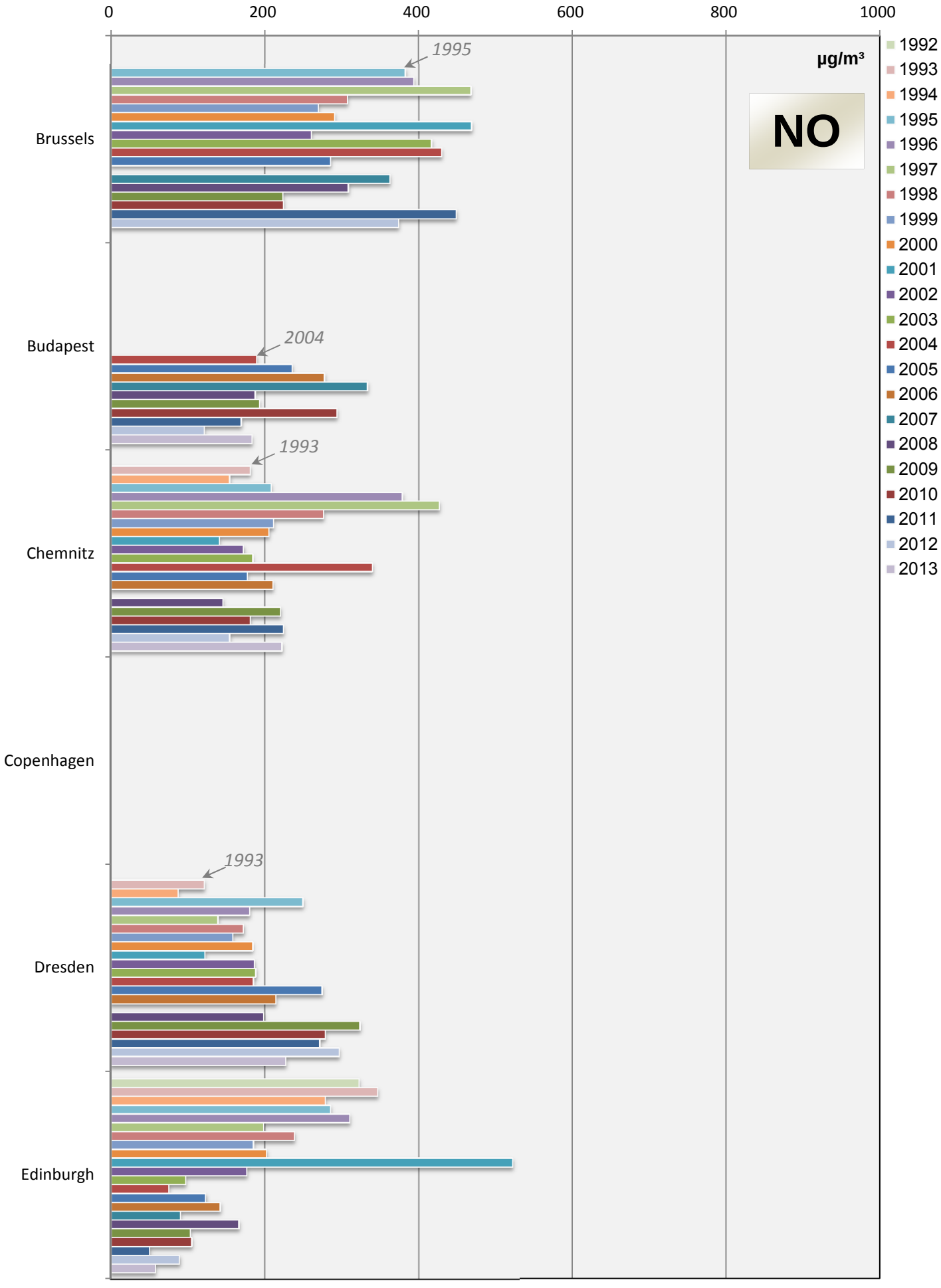
Comparison of The Air Quality 1992 - 2013

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



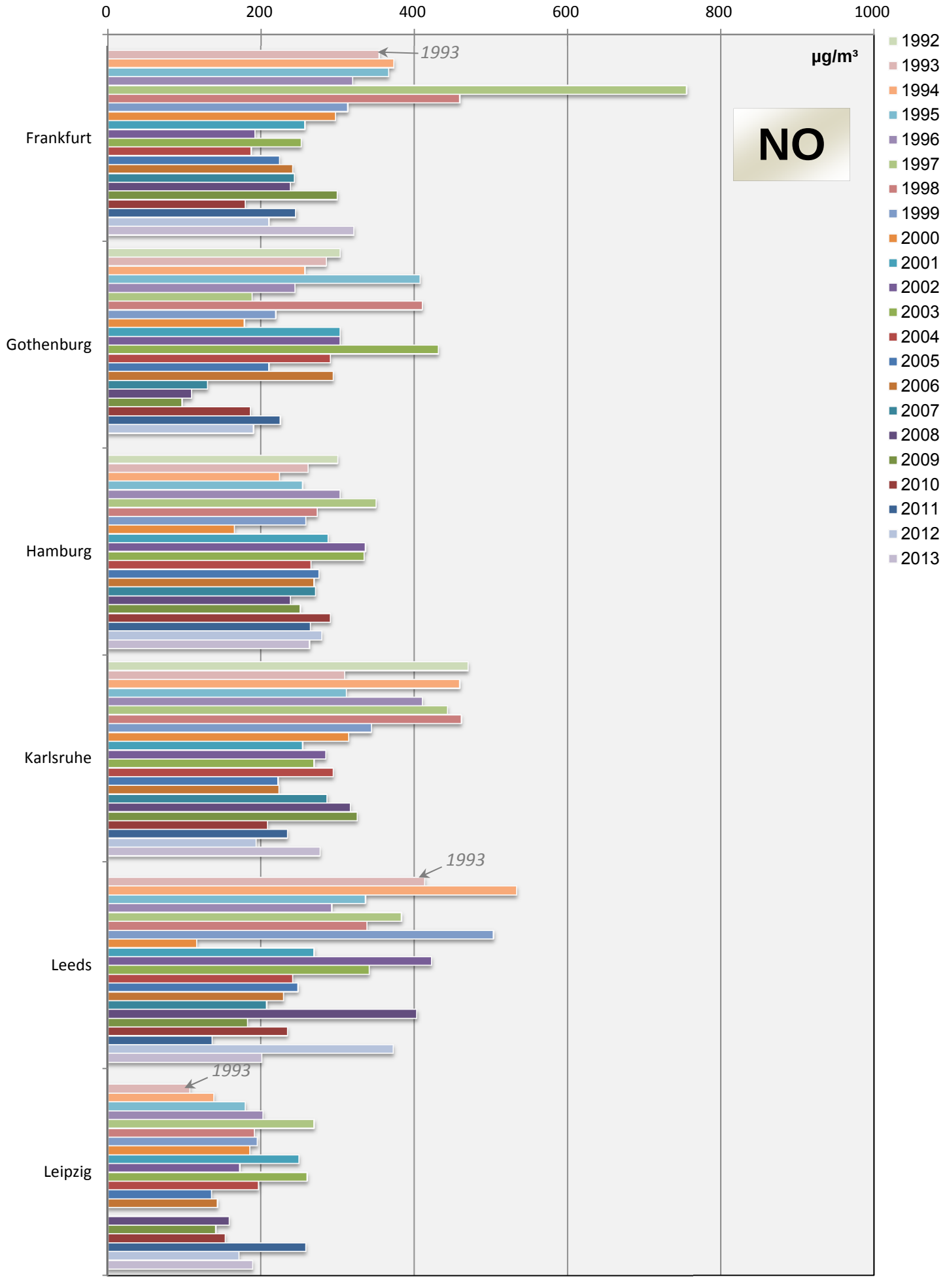
Comparison of The Air Quality 1992 - 2013

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



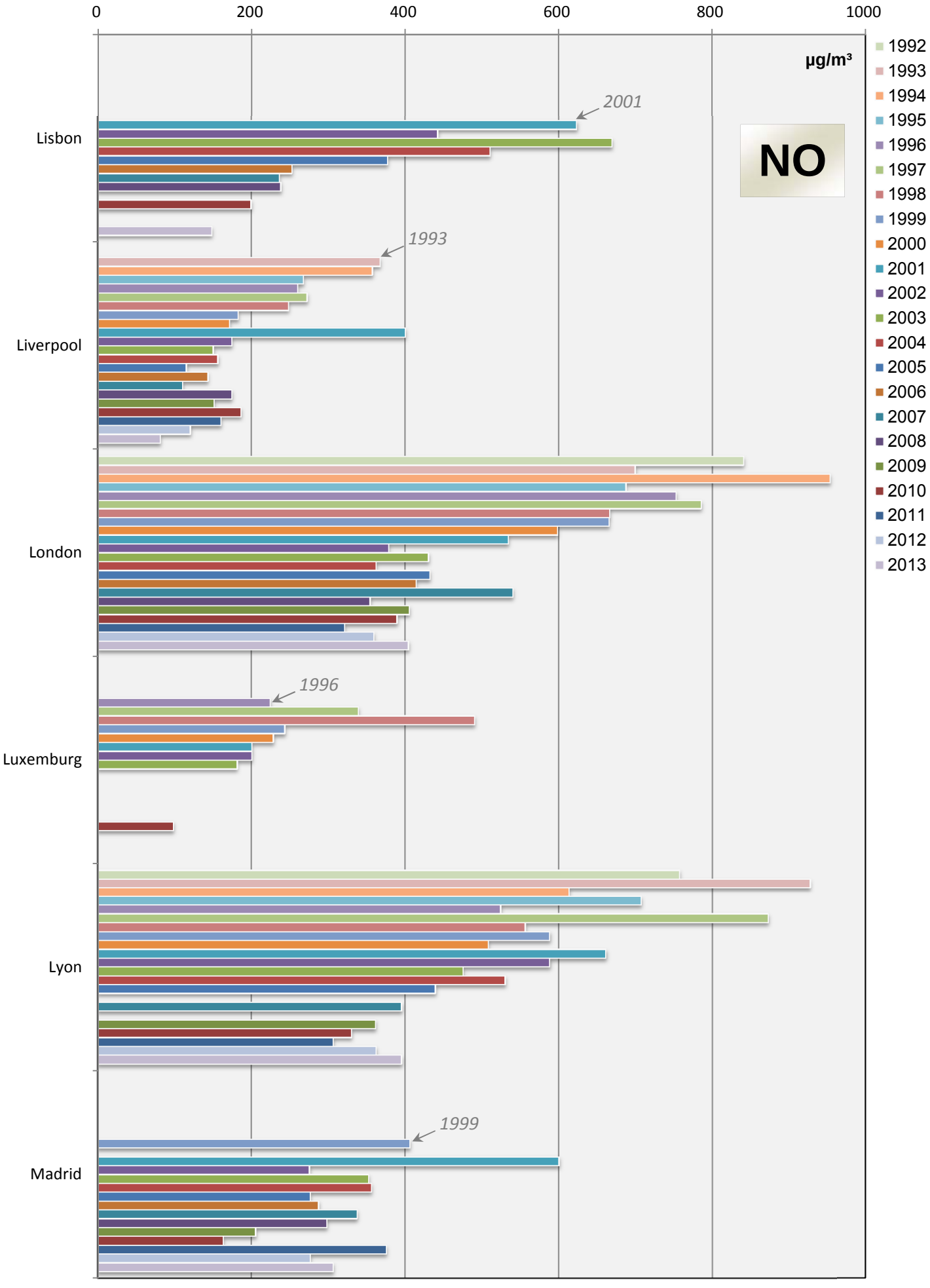
Comparison of The Air Quality 1992 - 2013

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



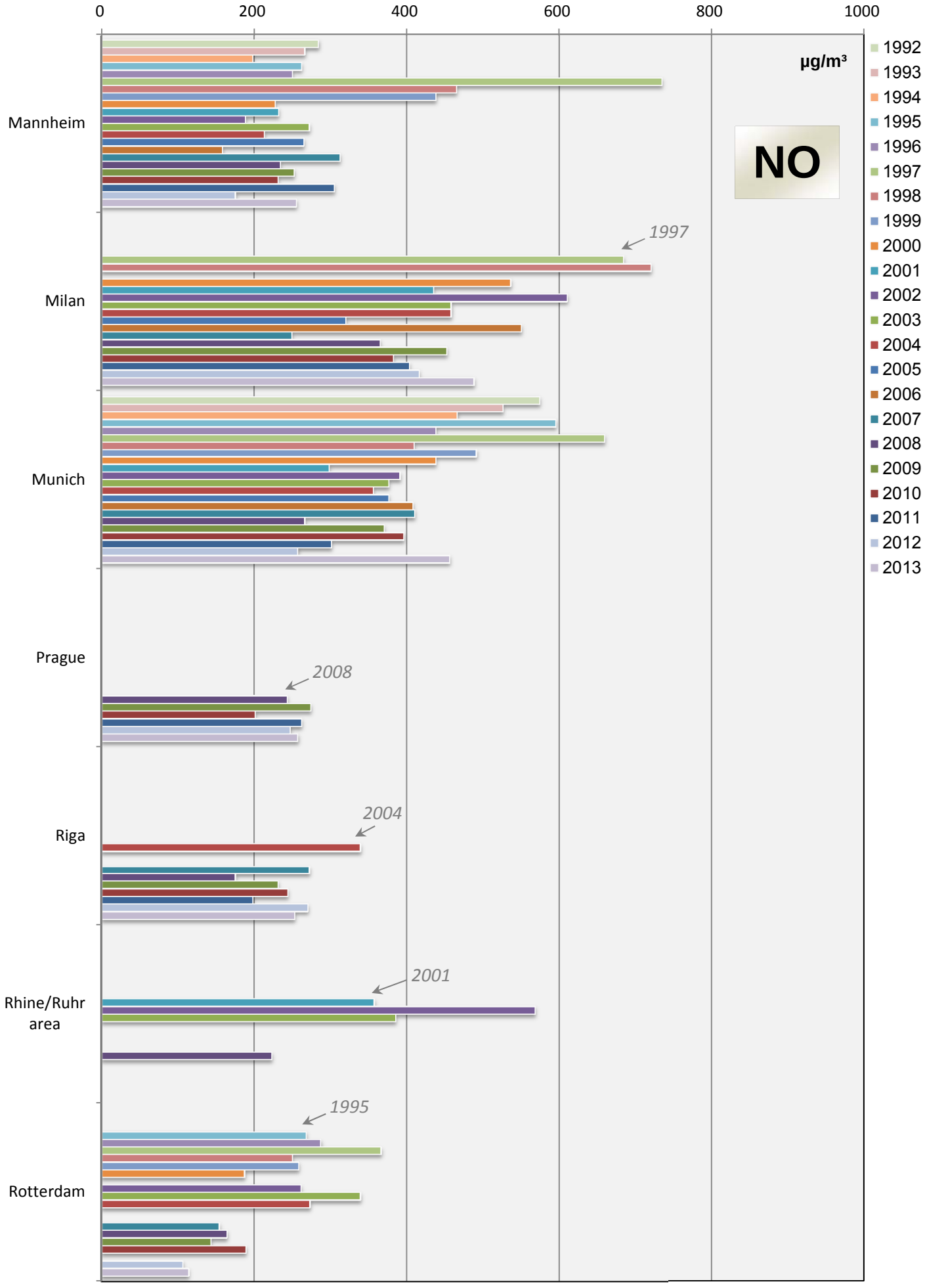
Comparison of The Air Quality 1992 - 2013

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



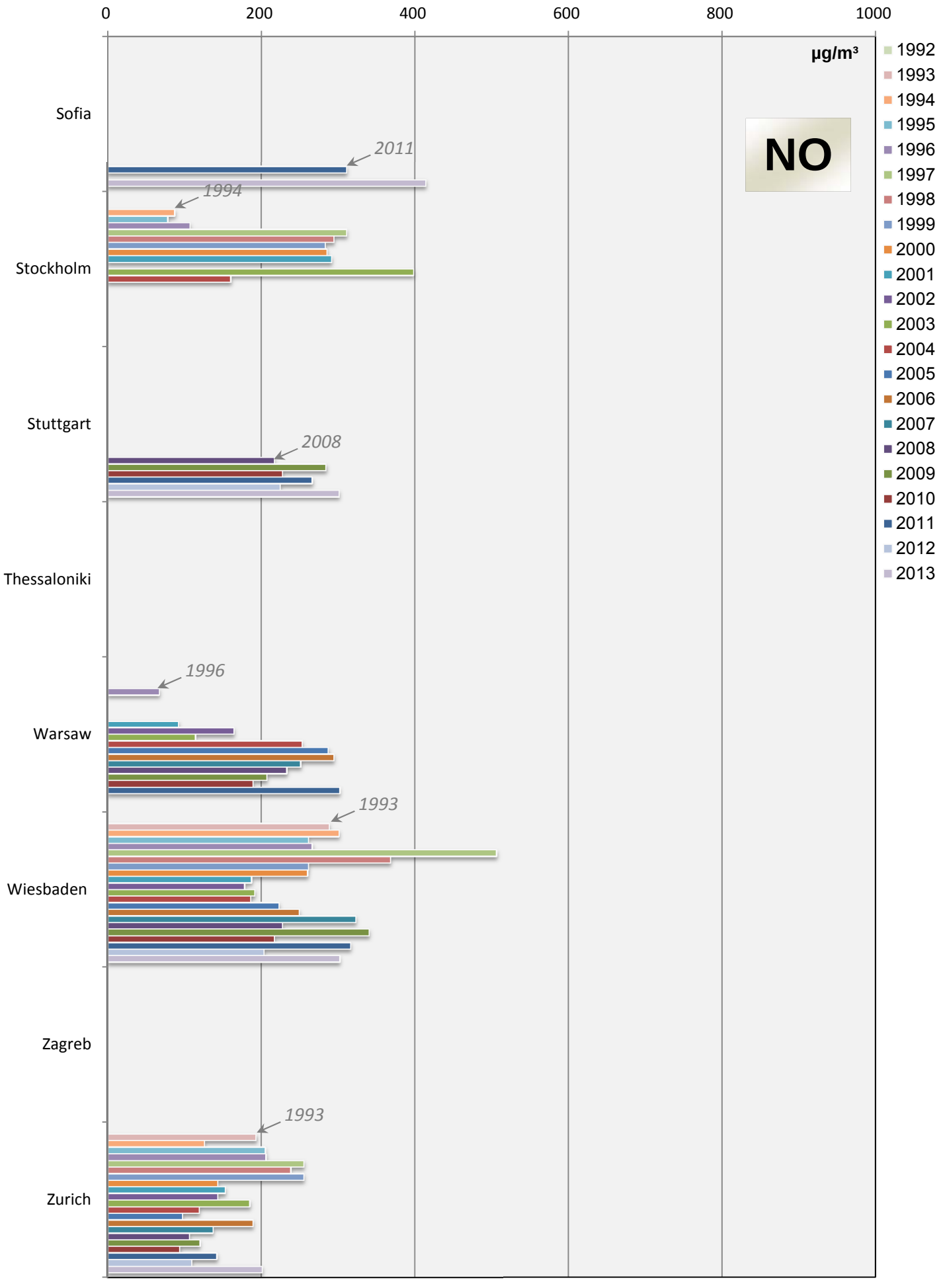
Comparison of The Air Quality 1992 - 2013

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



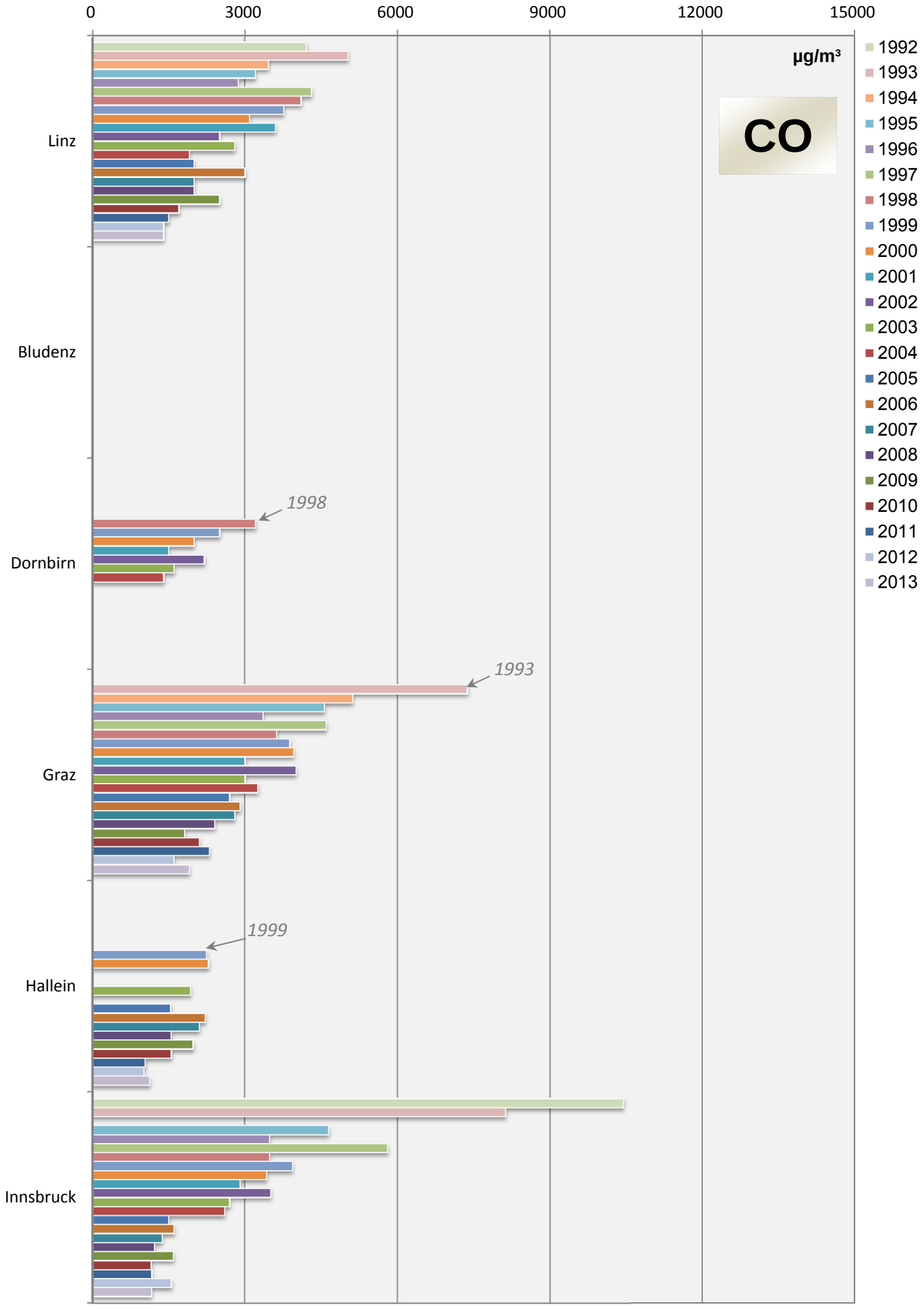
Comparison of The Air Quality 1992 - 2013

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



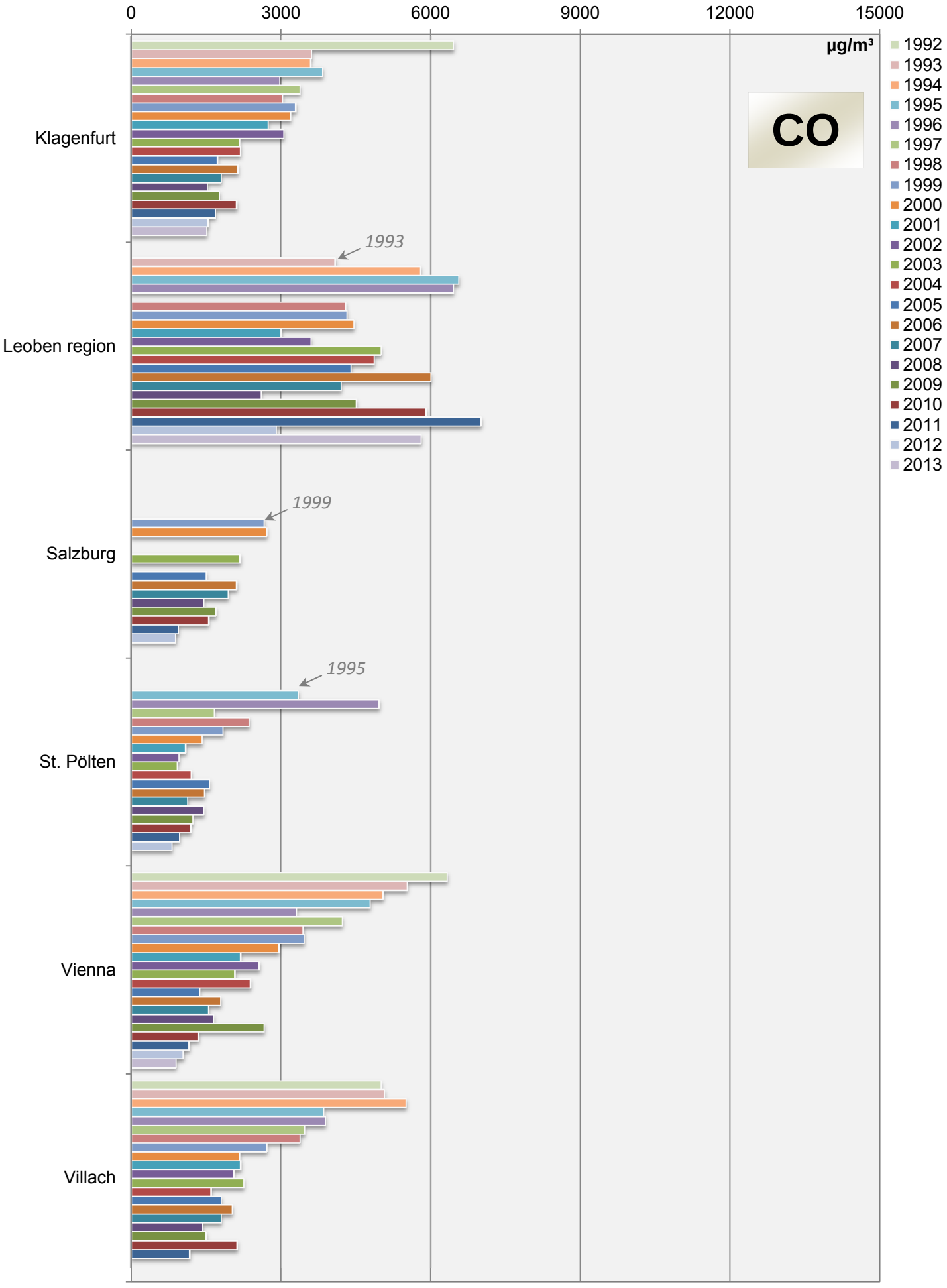
Comparison of The Air Quality 1992 - 2013

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



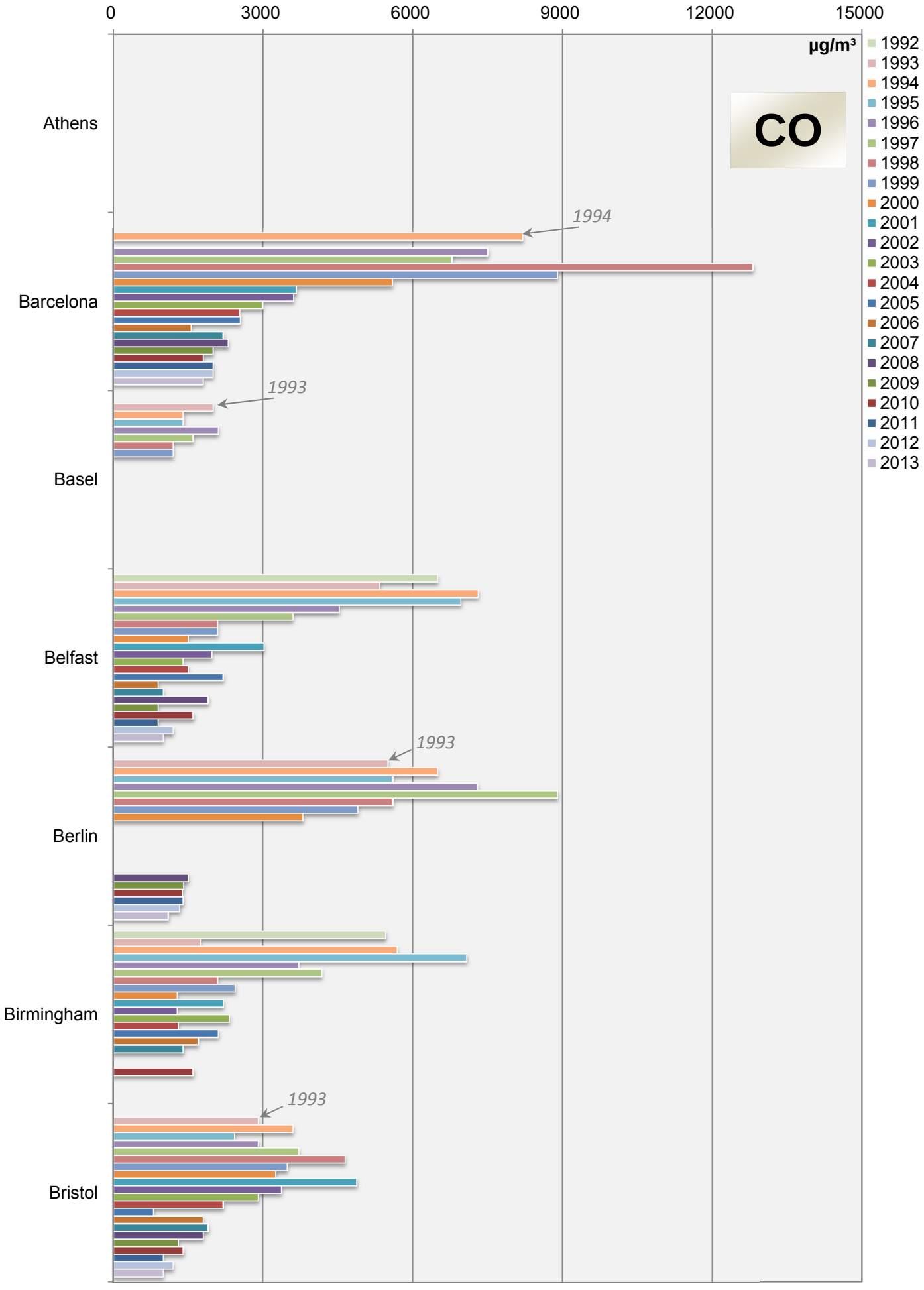
Comparison of The Air Quality 1992 - 2013

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



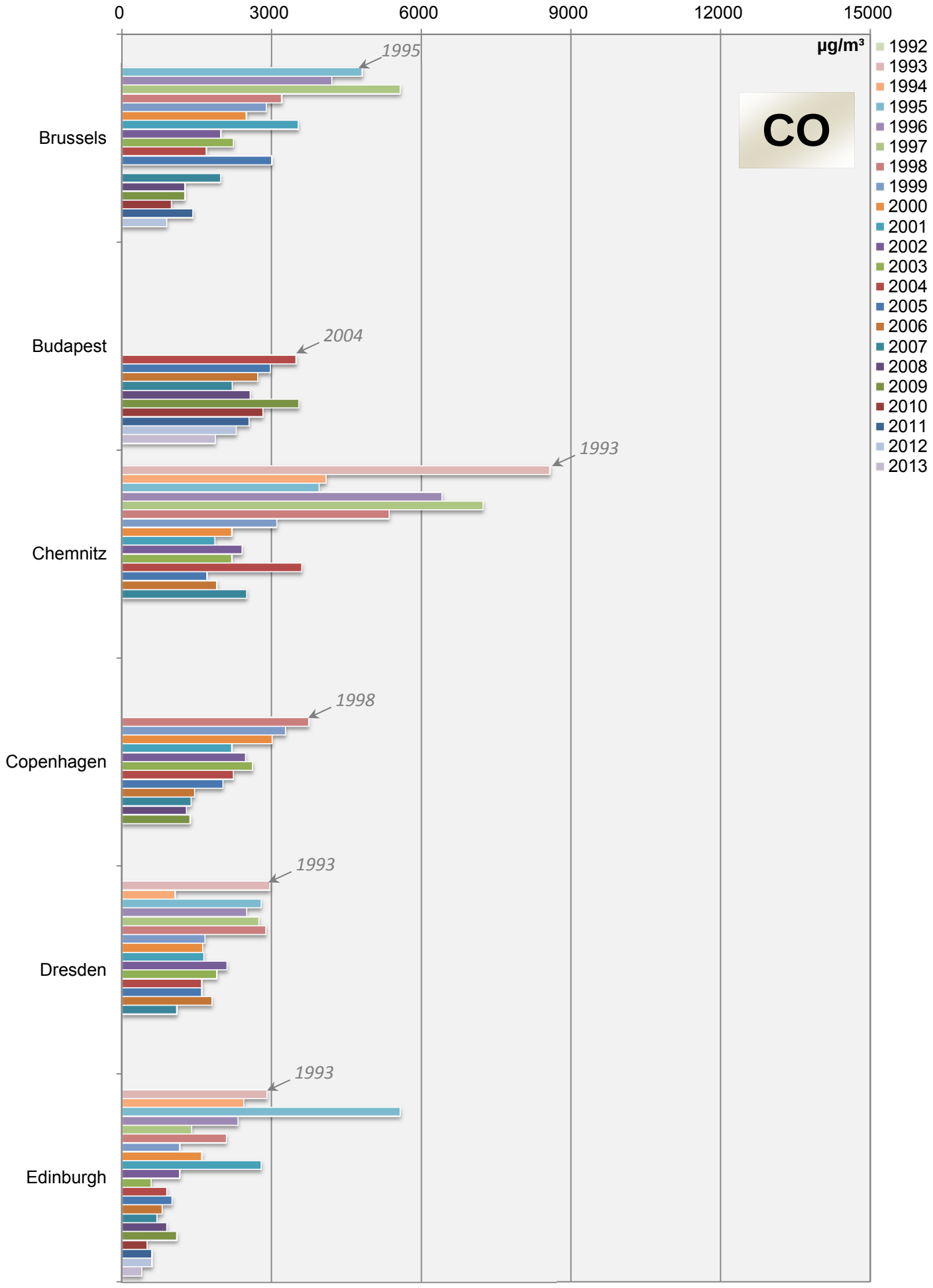
Comparison of The Air Quality 1992 - 2013

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



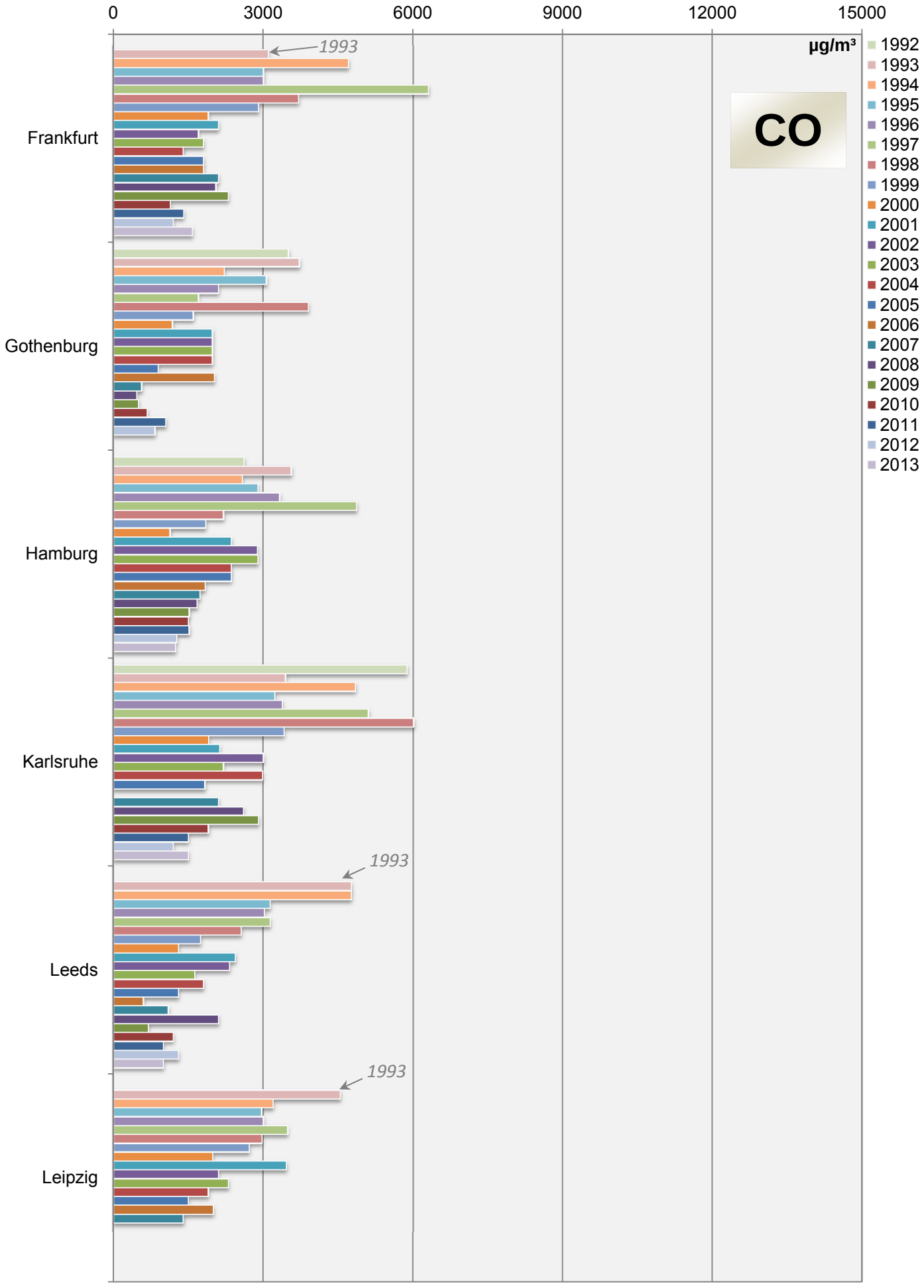
Comparison of The Air Quality 1992 - 2013

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



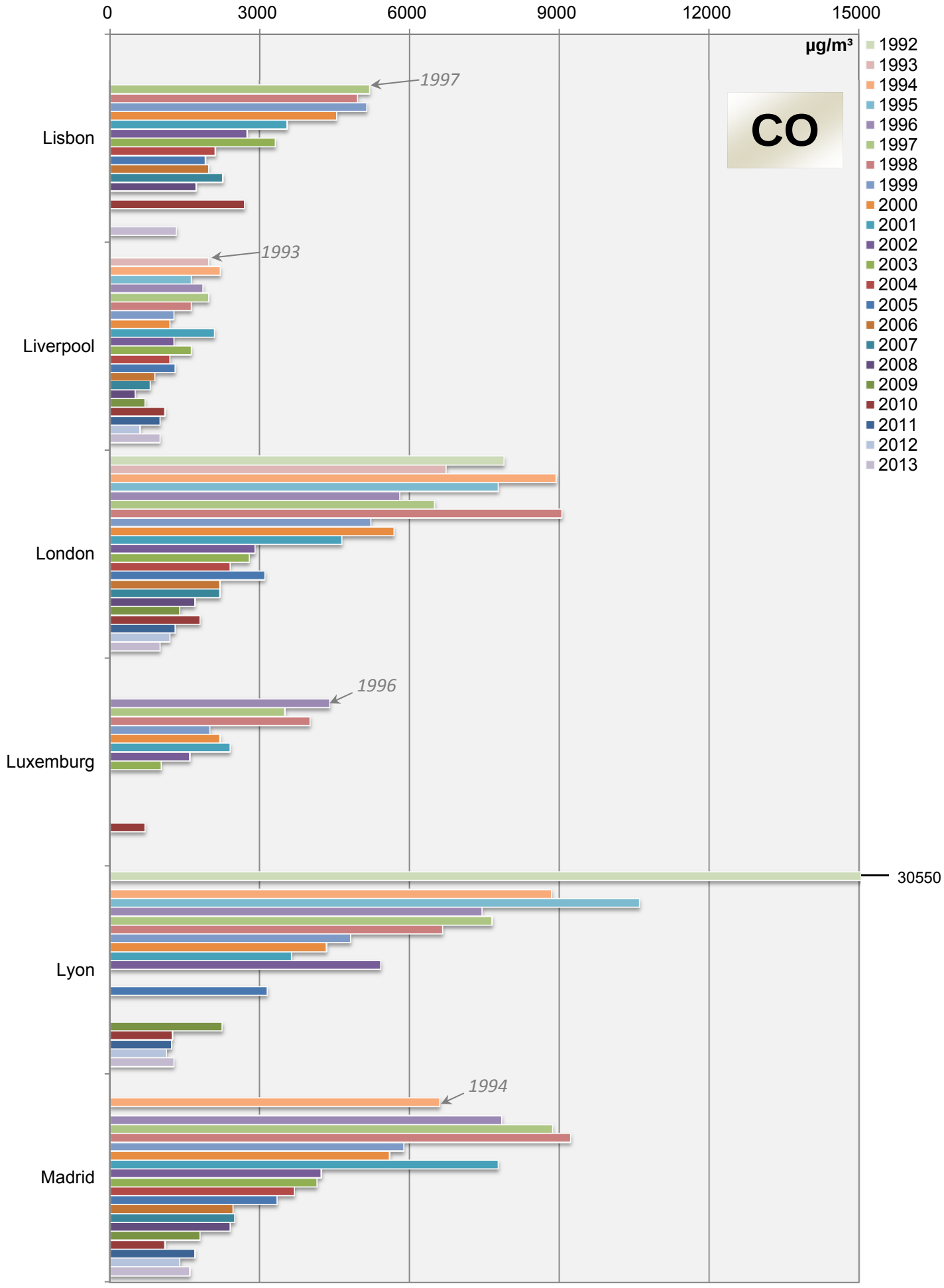
Comparison of The Air Quality 1992 - 2013

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



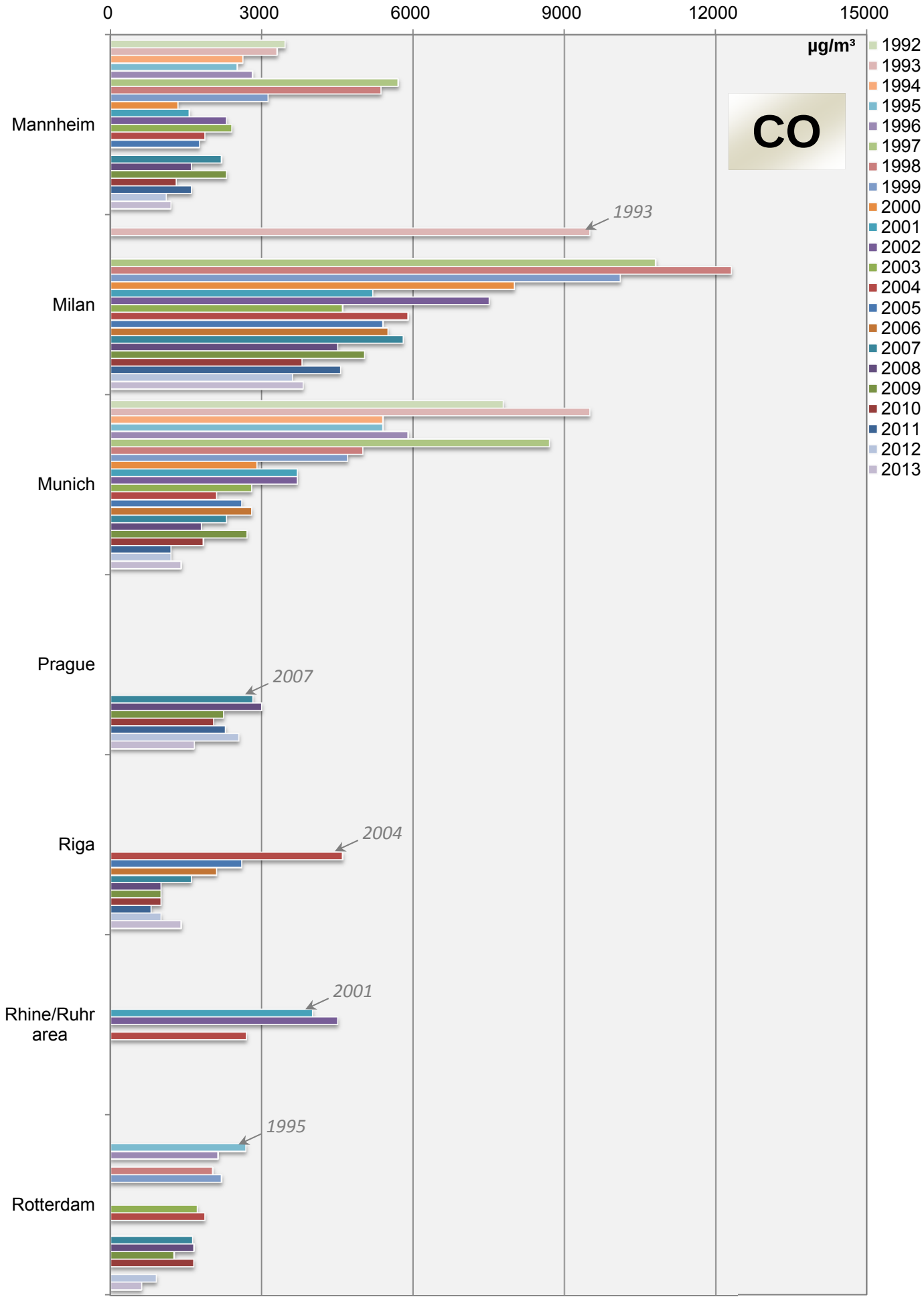
Comparison of The Air Quality 1992 - 2013

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



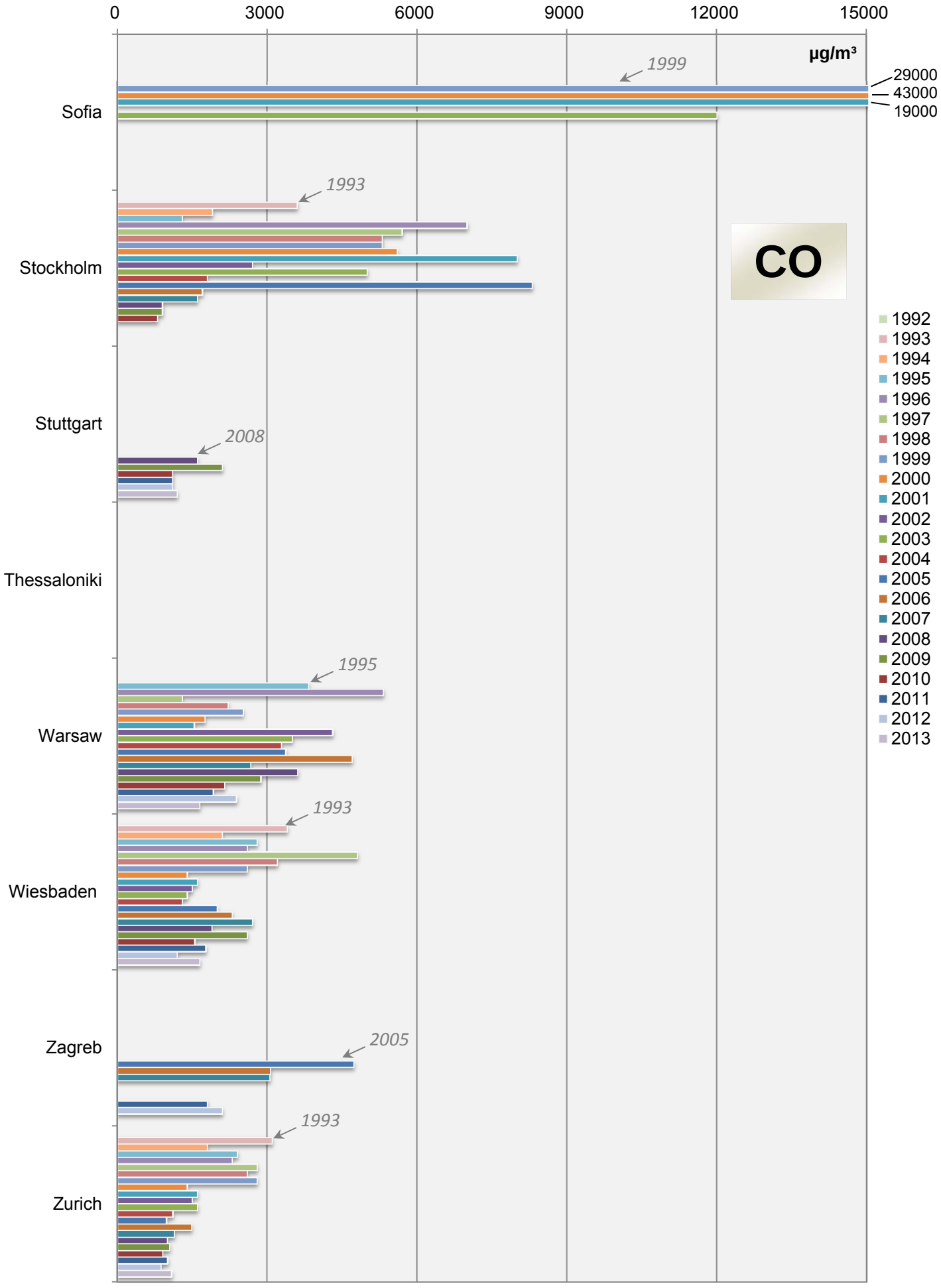
Comparison of The Air Quality 1992 - 2013

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



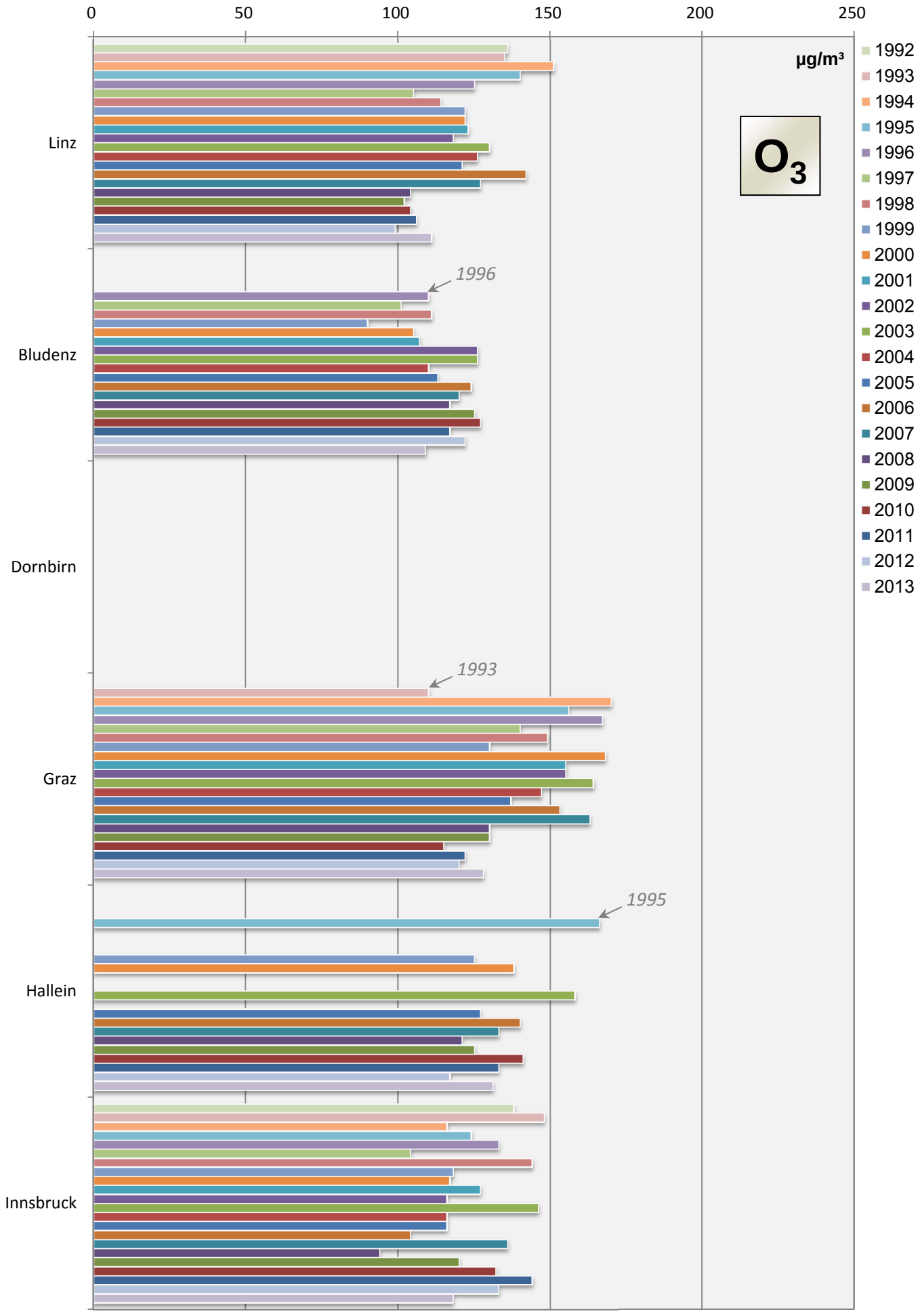
Comparison of The Air Quality 1992 - 2013

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



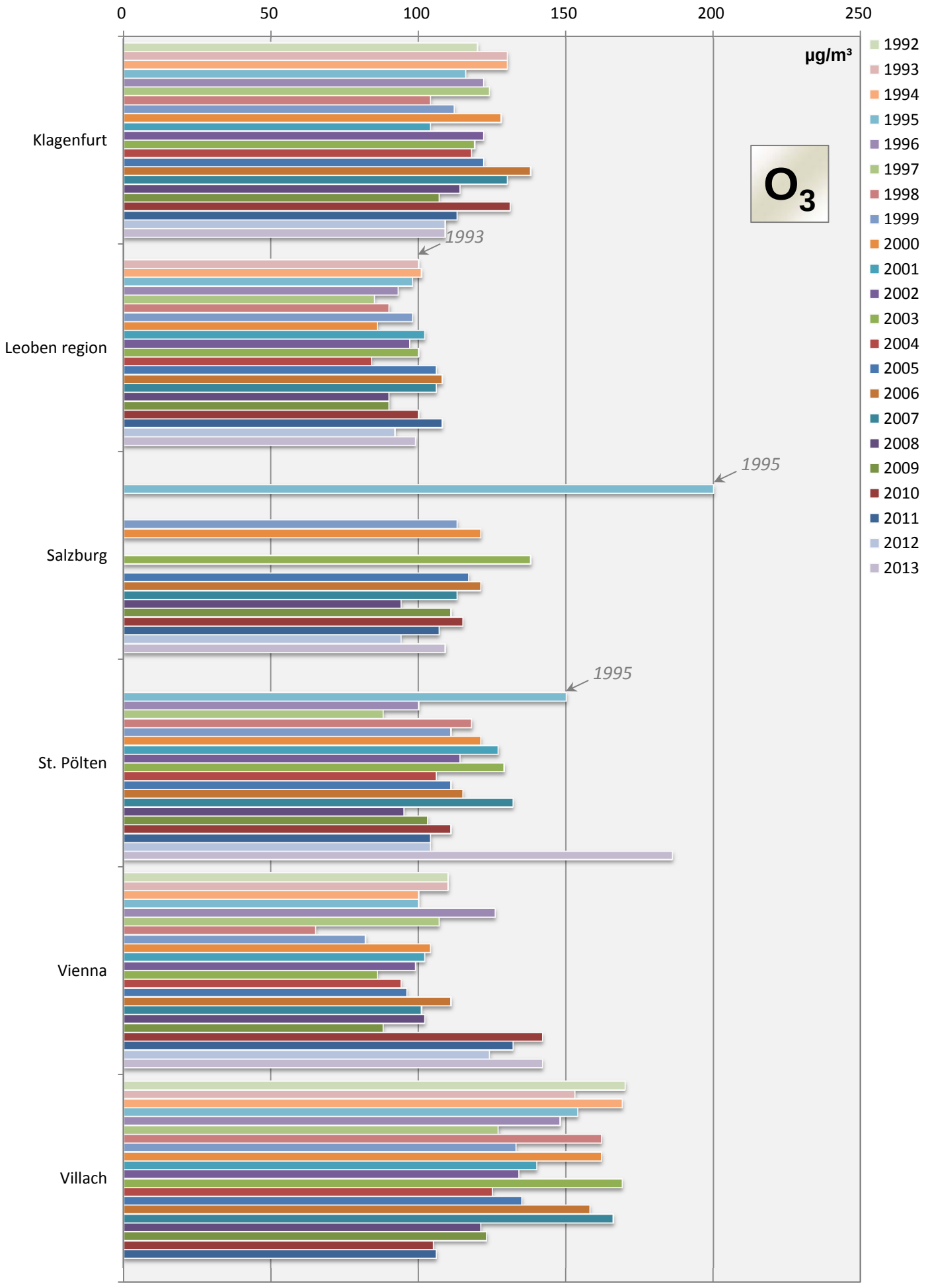
Comparison of The Air Quality 1992 - 2013

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



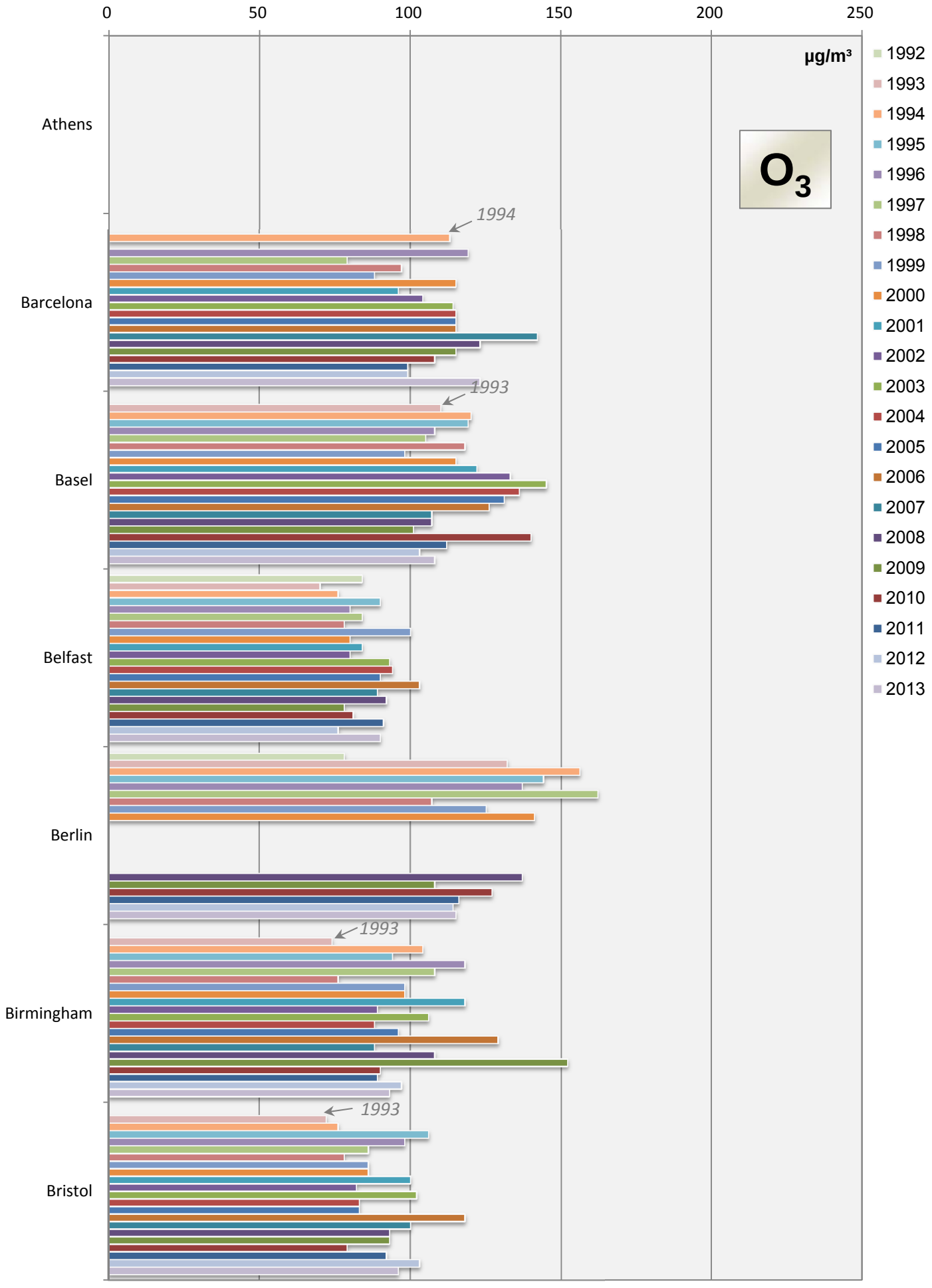
Comparison of The Air Quality 1992 - 2013

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



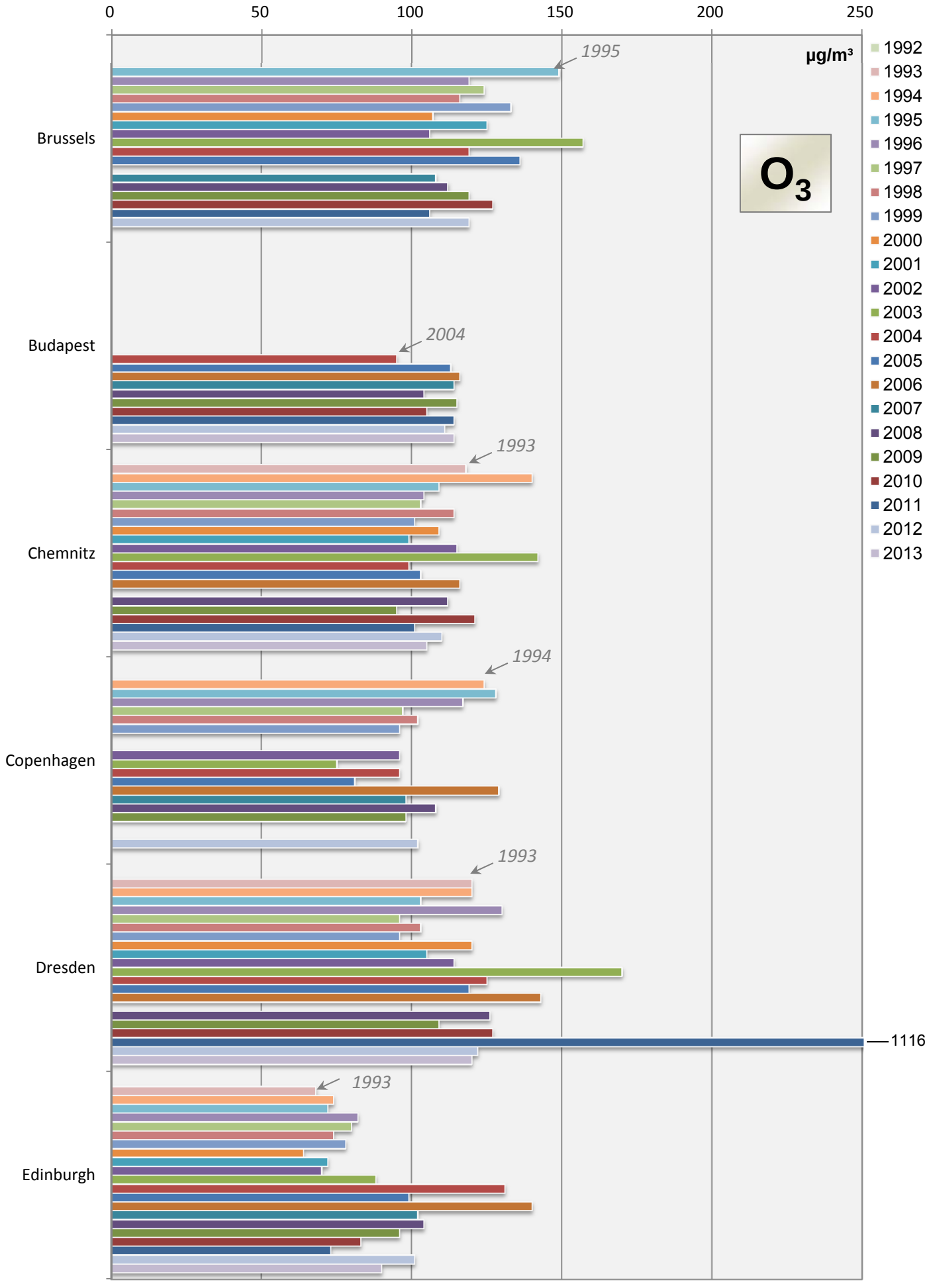
Comparison of The Air Quality 1992 - 2013

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



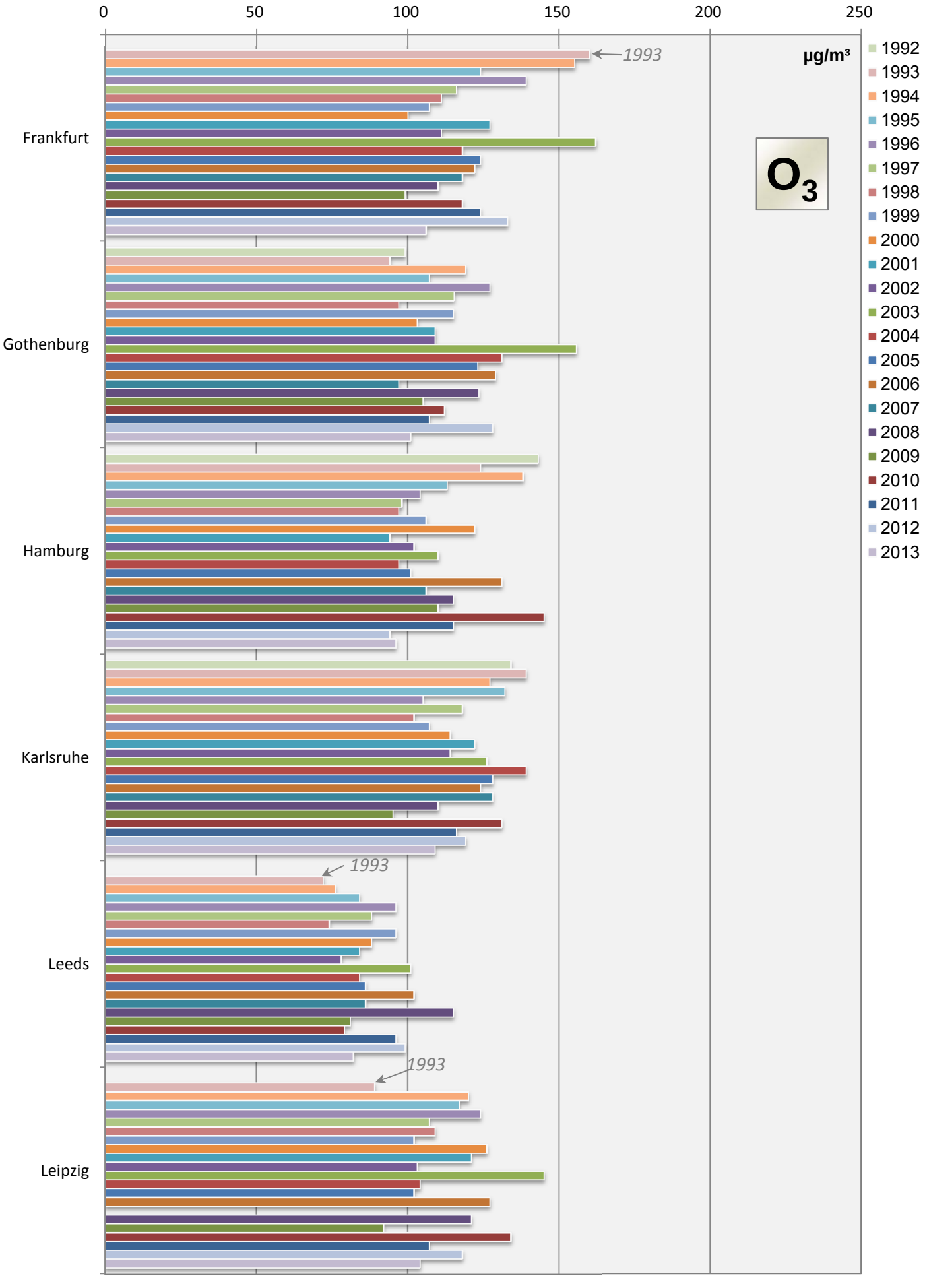
Comparison of The Air Quality 1992 - 2013

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



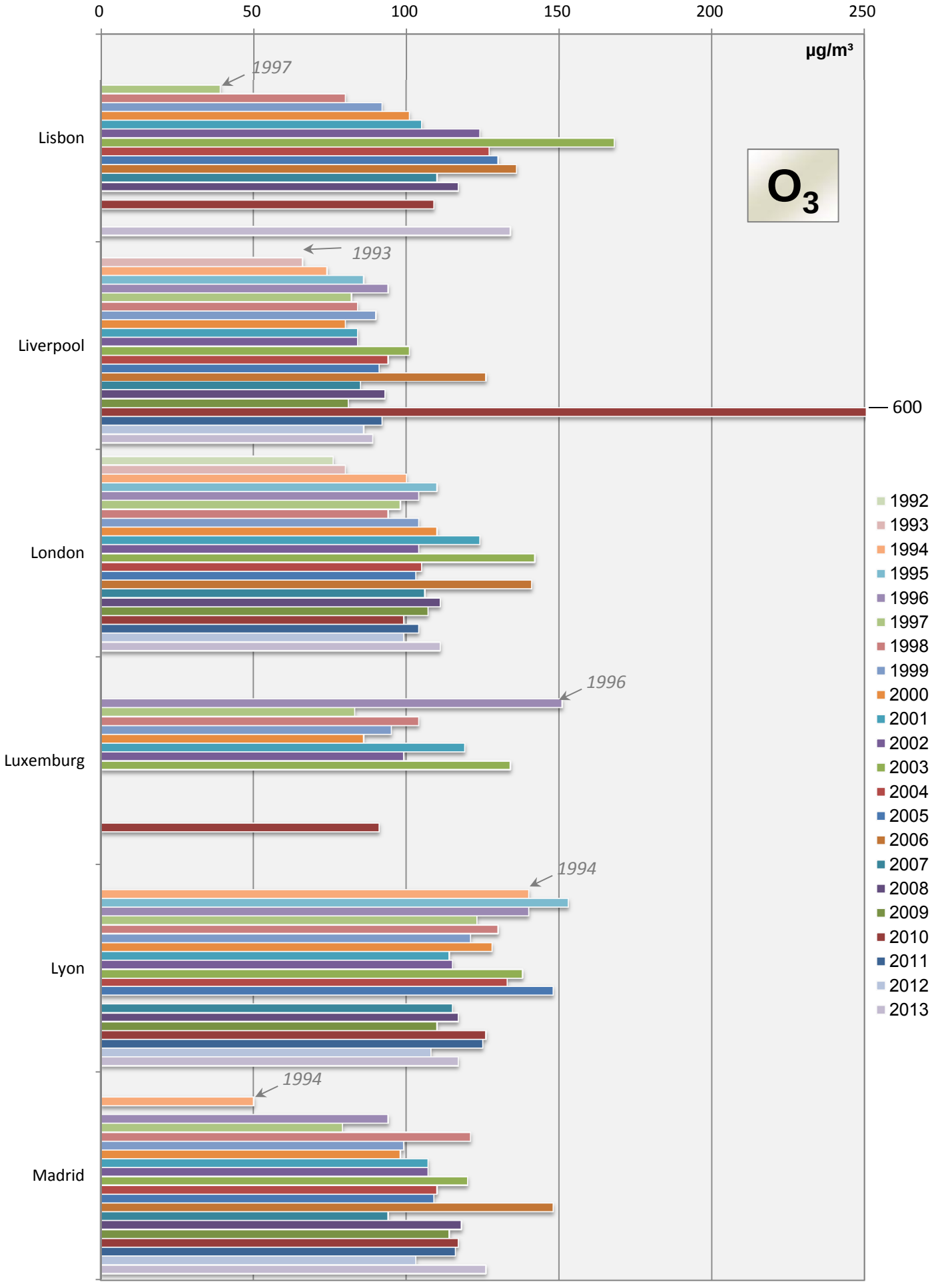
Comparison of The Air Quality 1992 - 2013

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



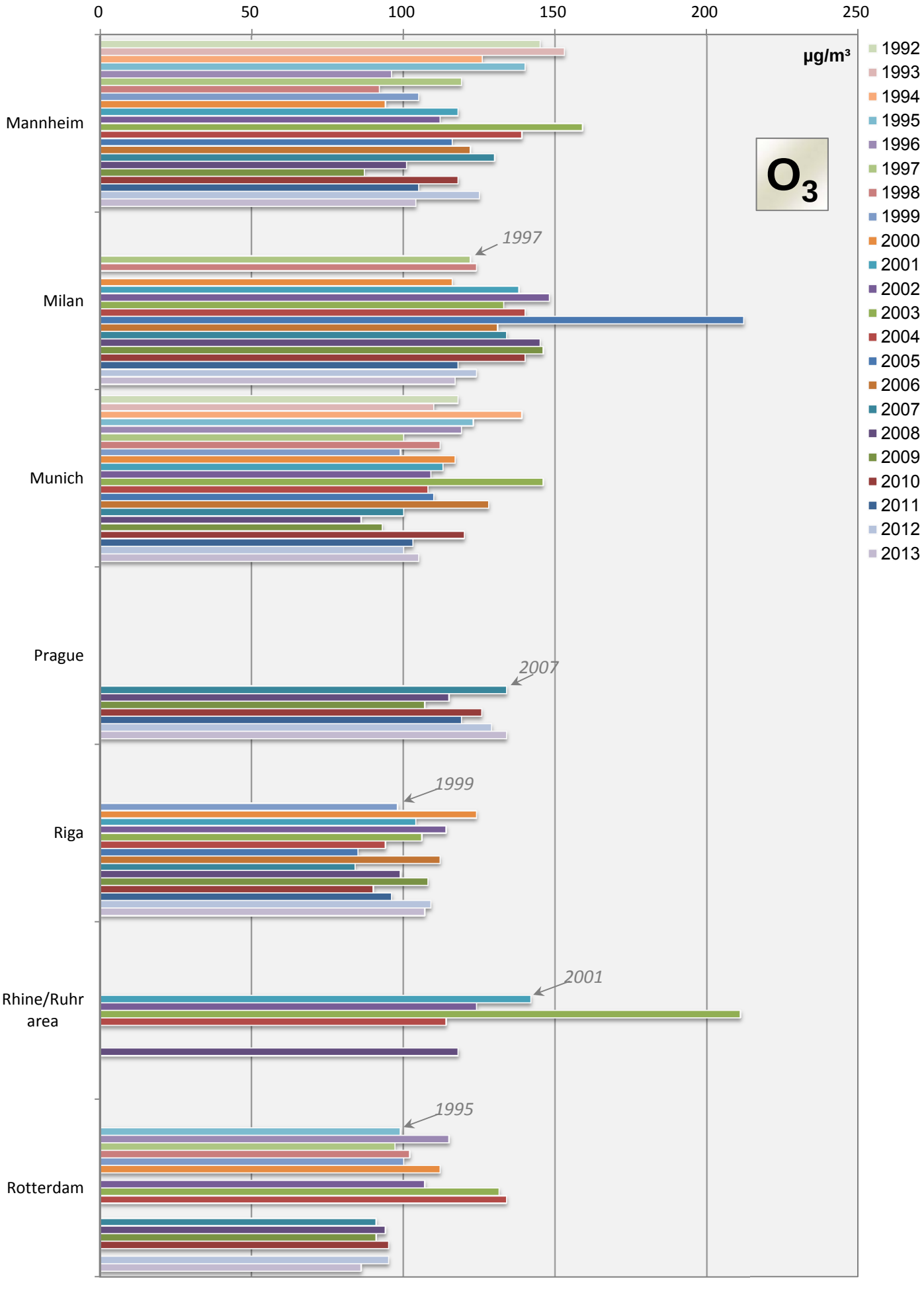
Comparison of The Air Quality 1992 - 2013

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



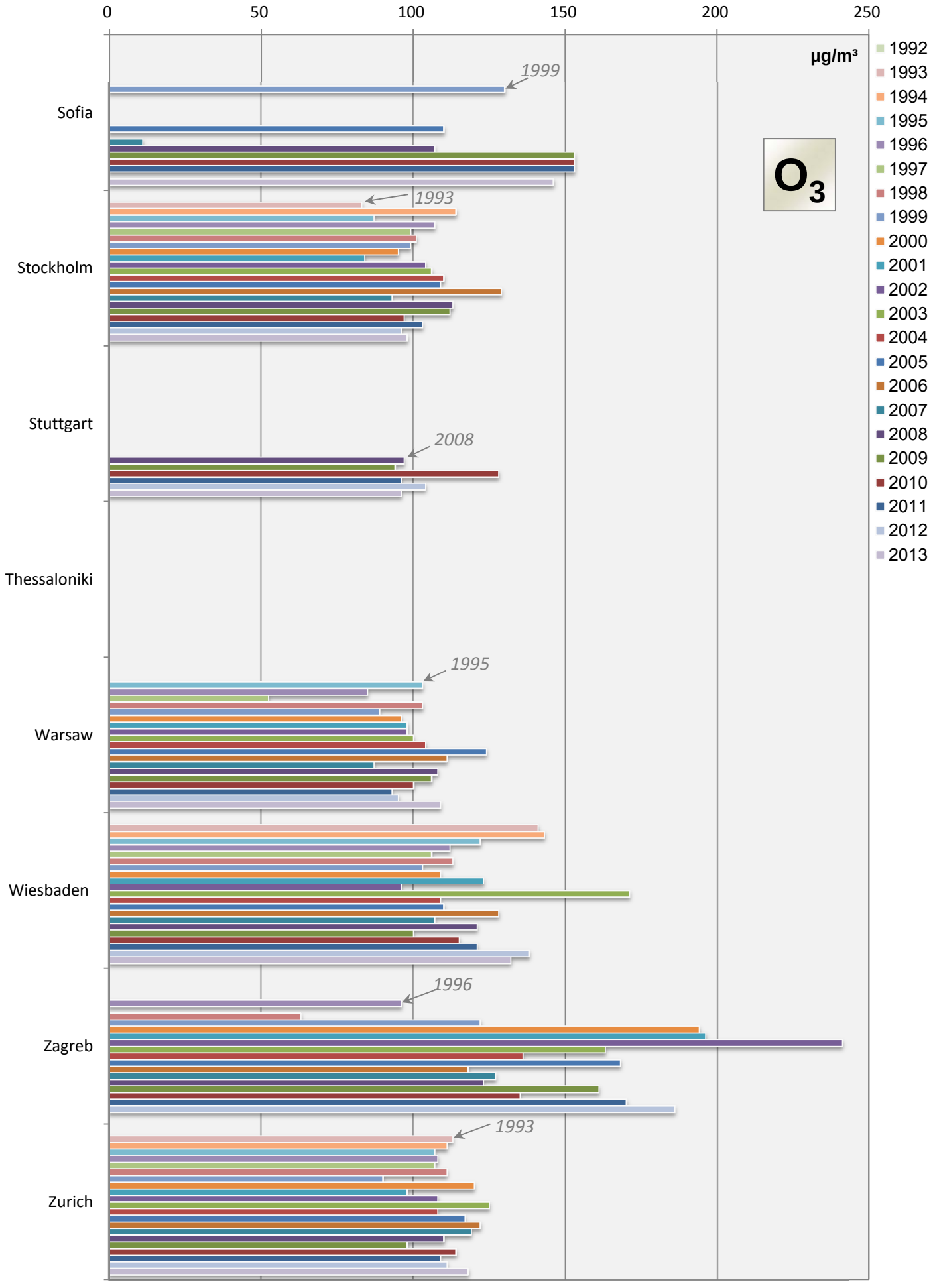
Comparison of The Air Quality 1992 - 2013

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



Comparison of The Air Quality 1992 - 2013

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



Jahresvergleich

1993 - 2013

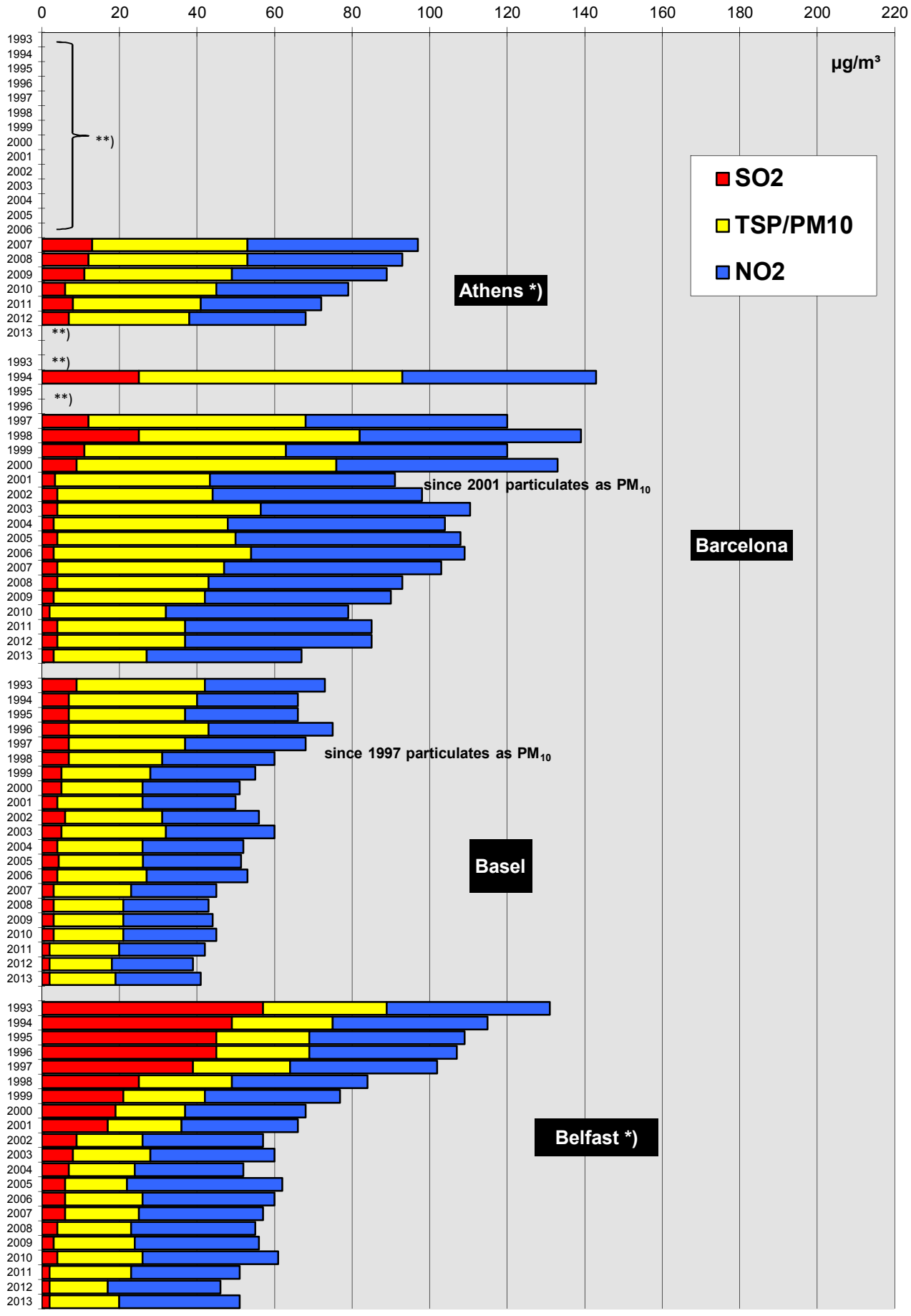
Jahresmittelwerte, Σ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality

1993 - 2013

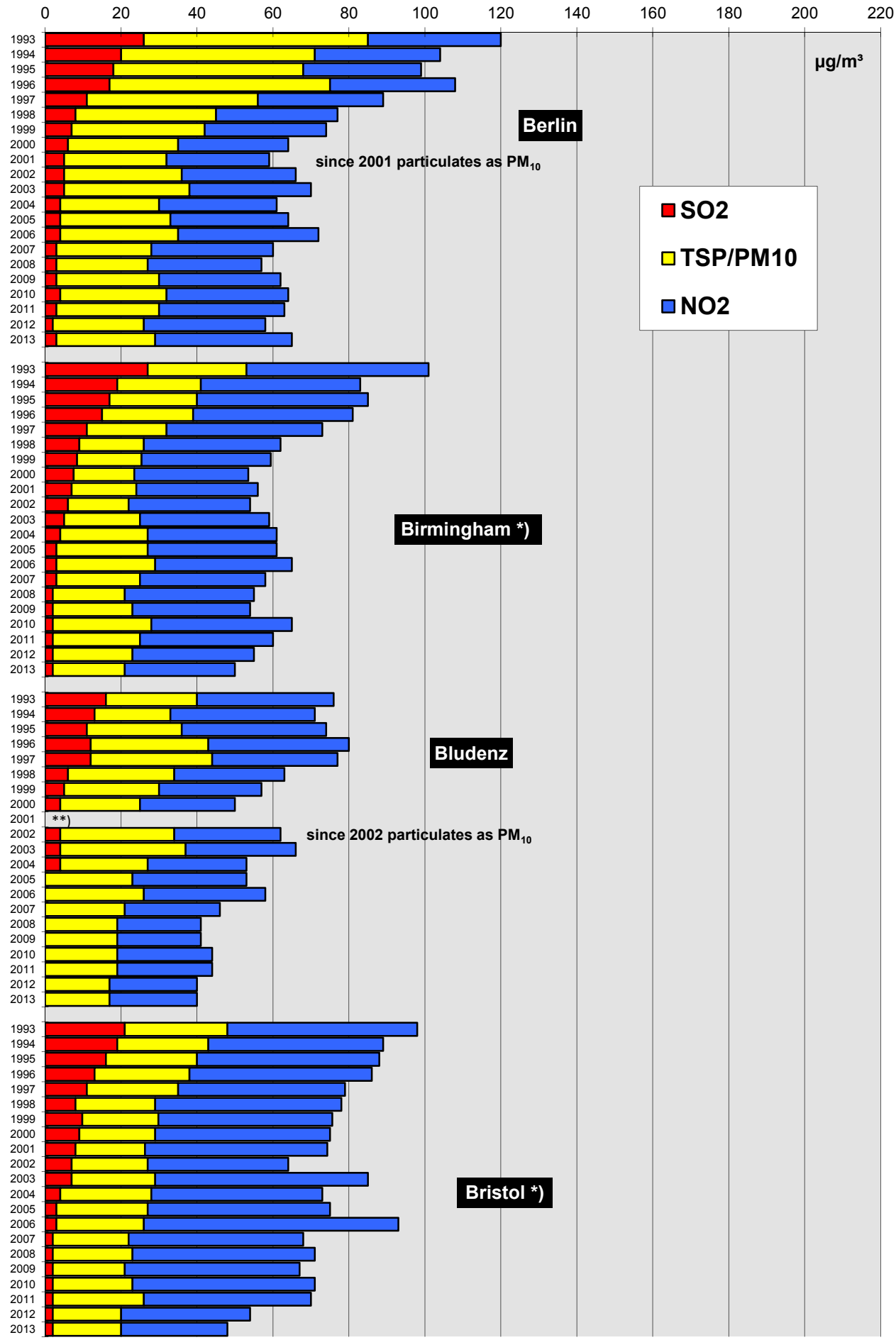
Annual Mean Values, Σ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)

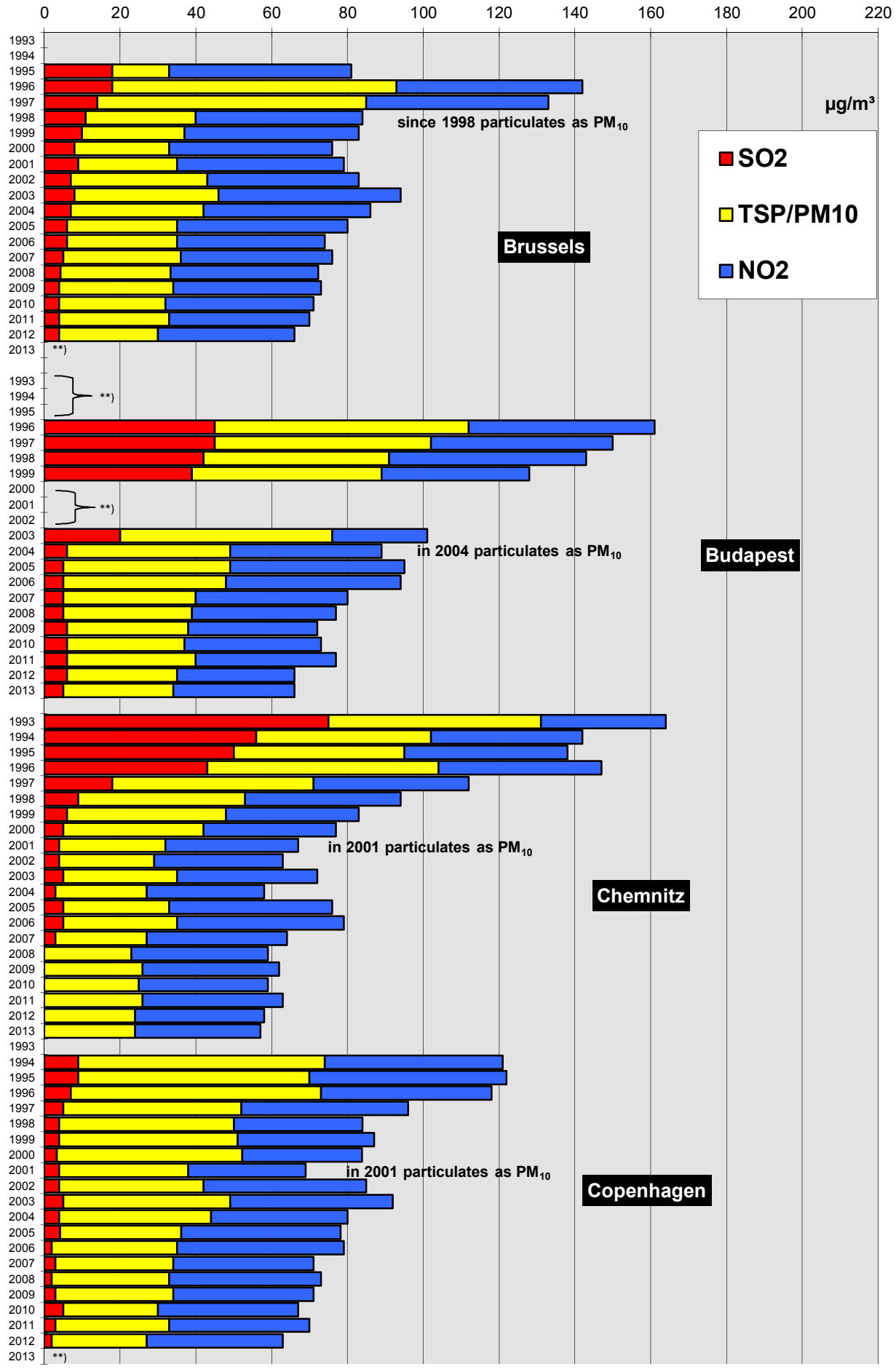


*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2013

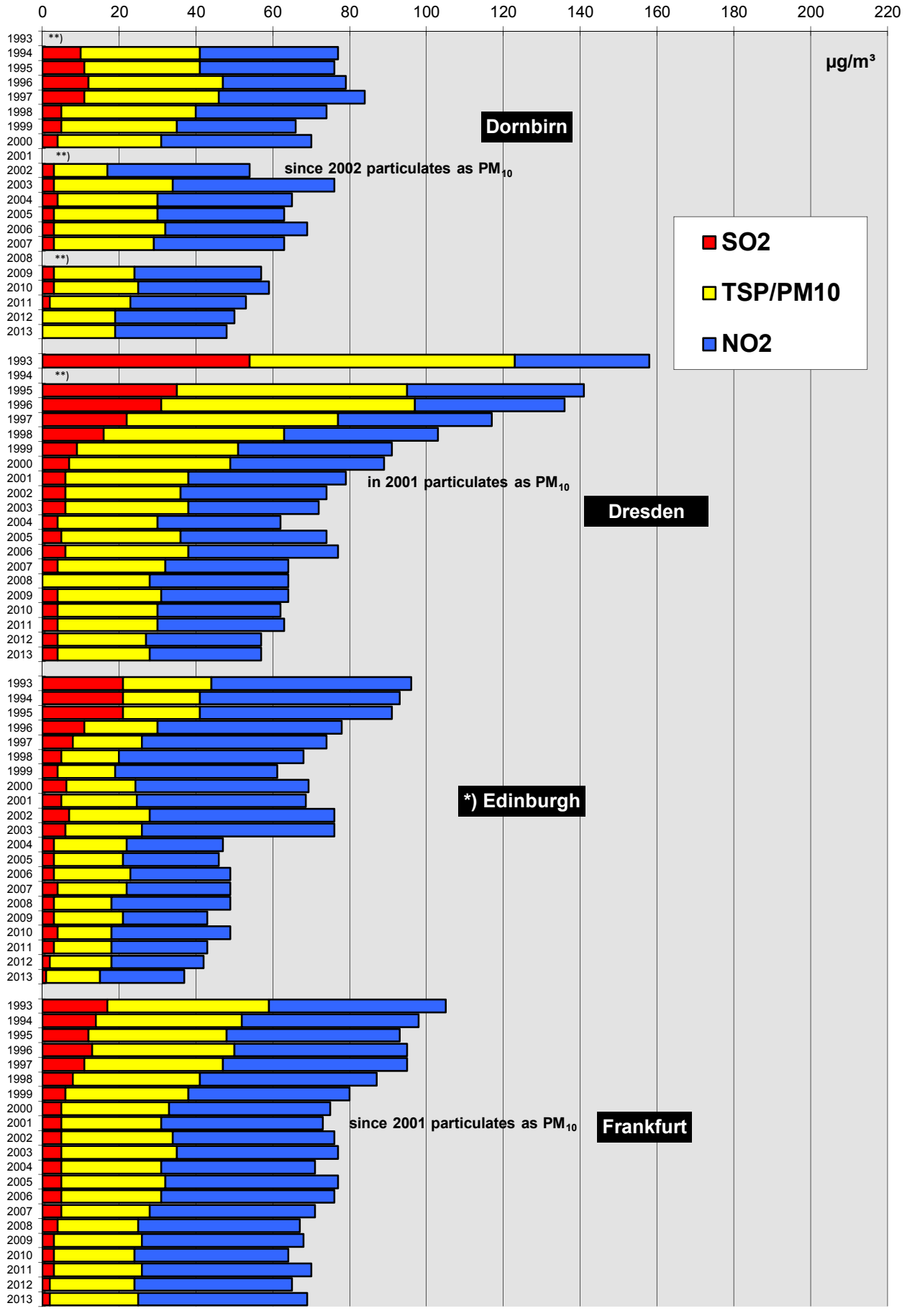
Development of the annual mean values Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)



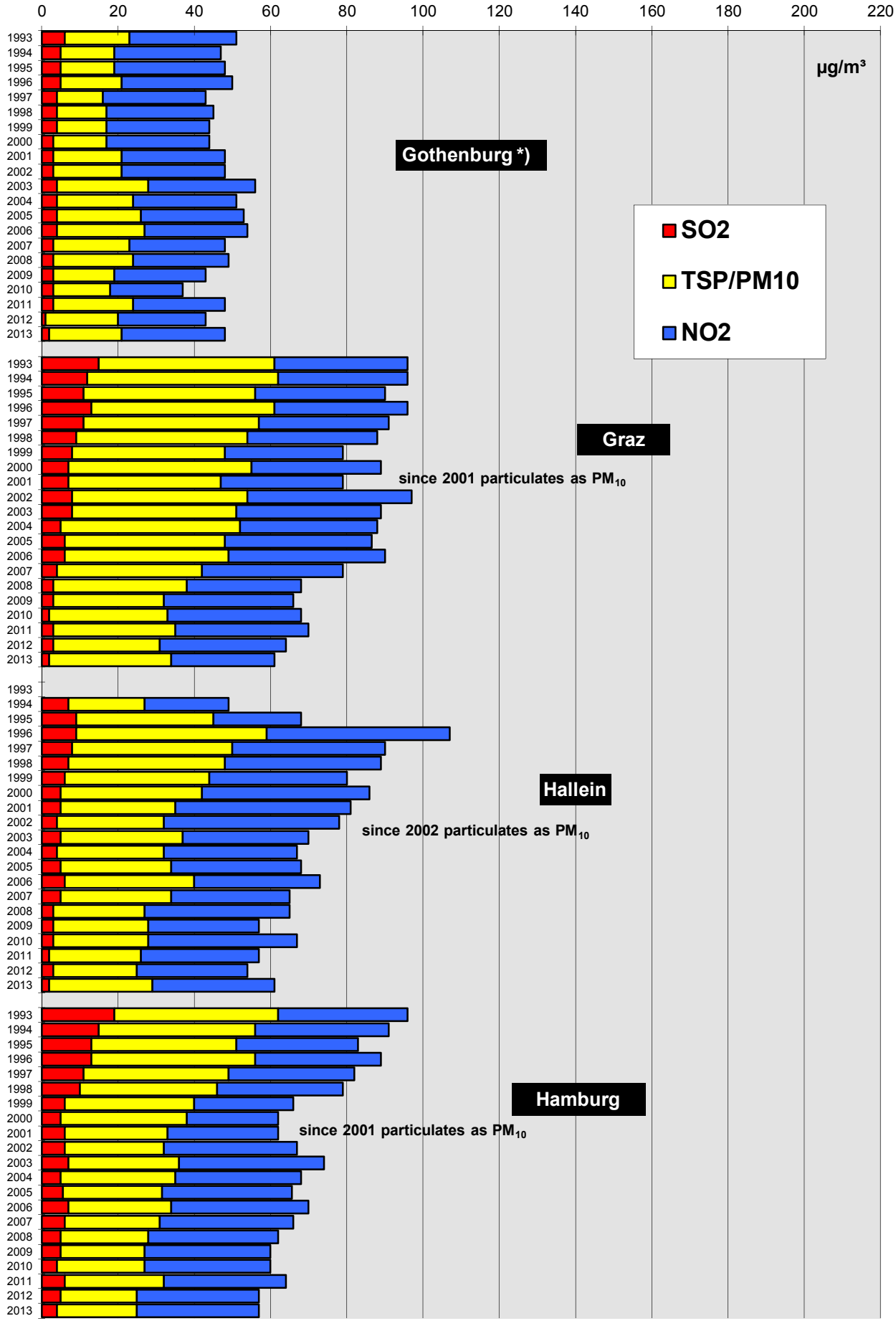
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



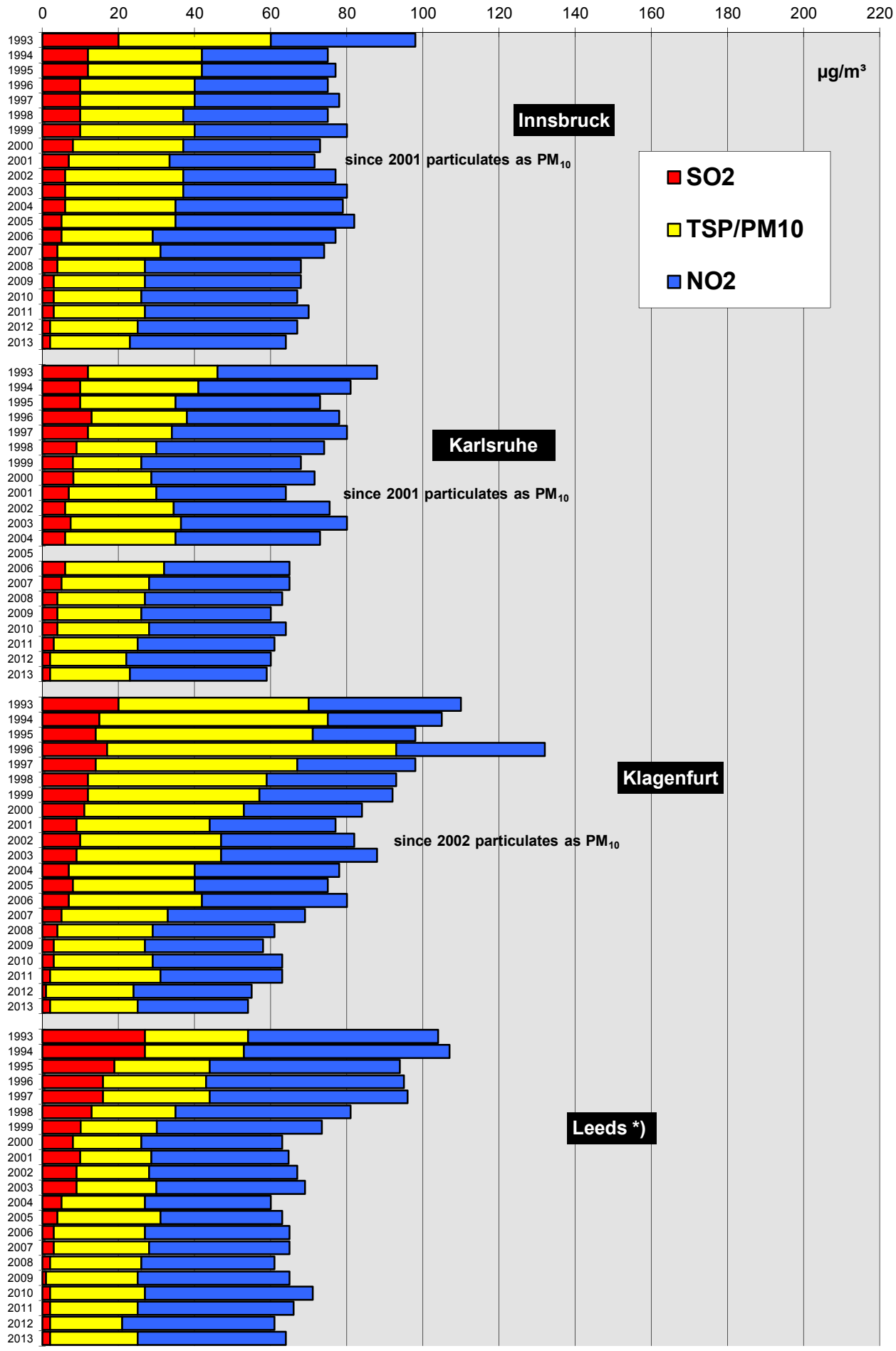
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



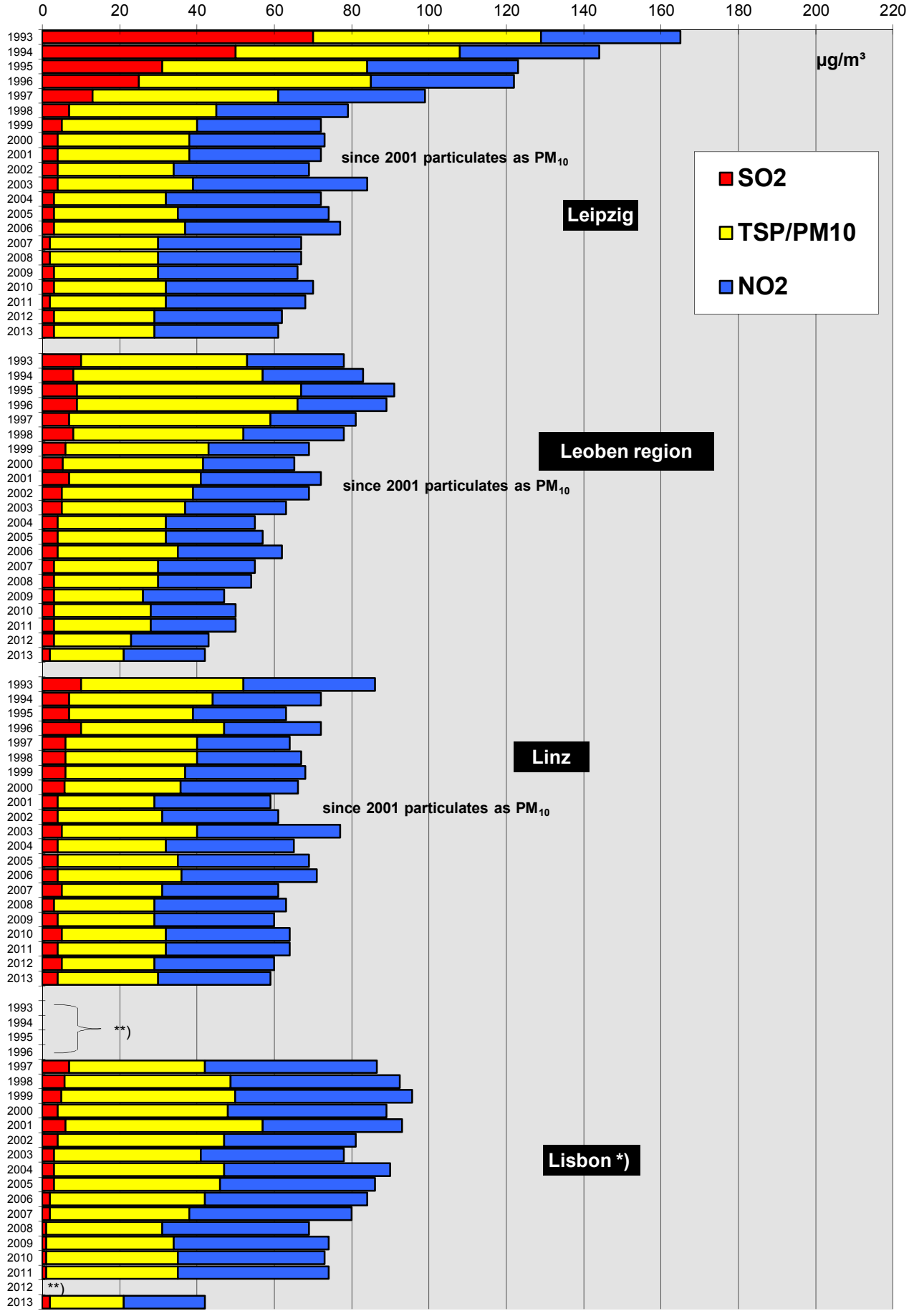
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



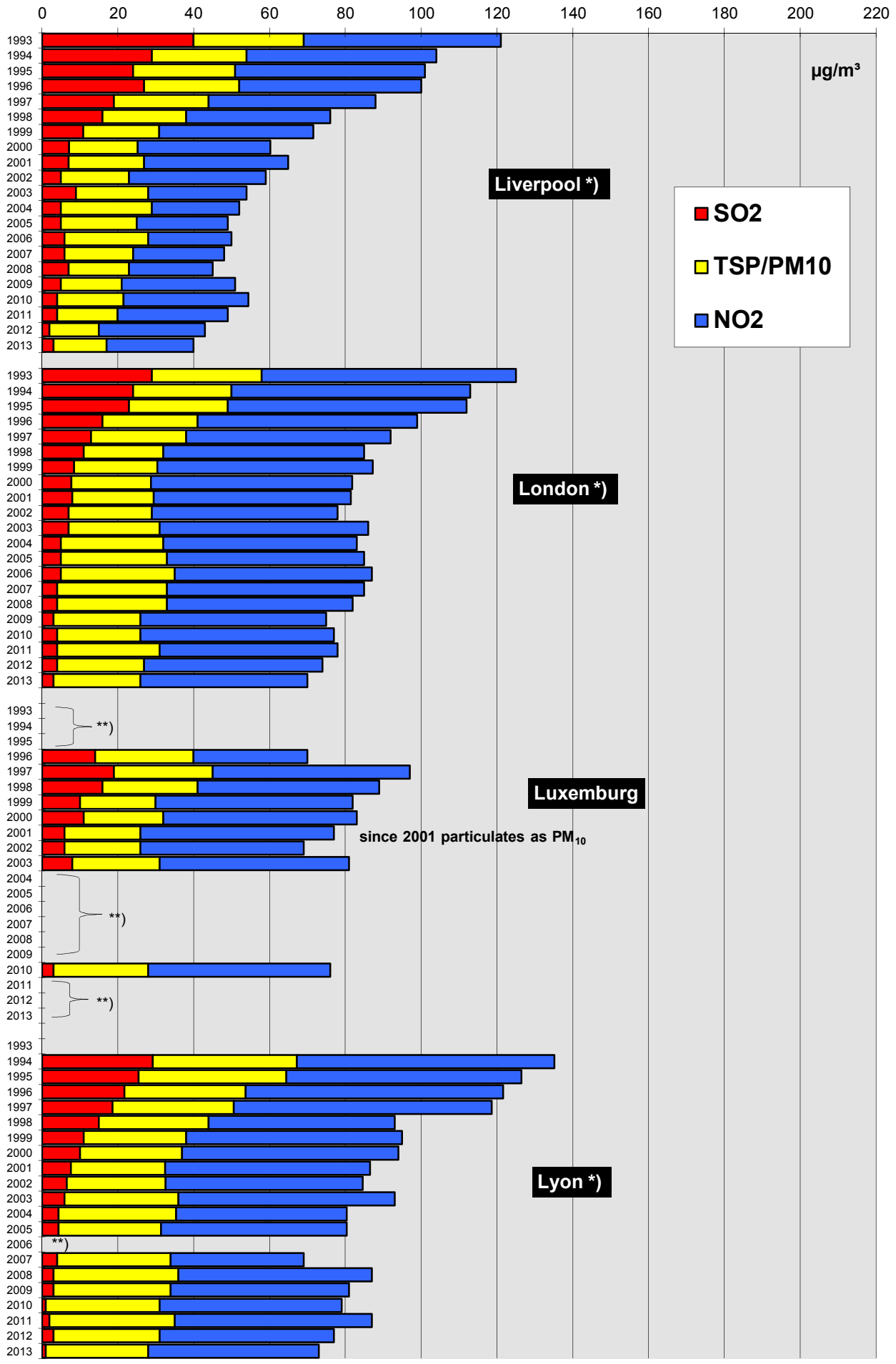
*) particulates calculated as PM_{10}

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10} **) no data

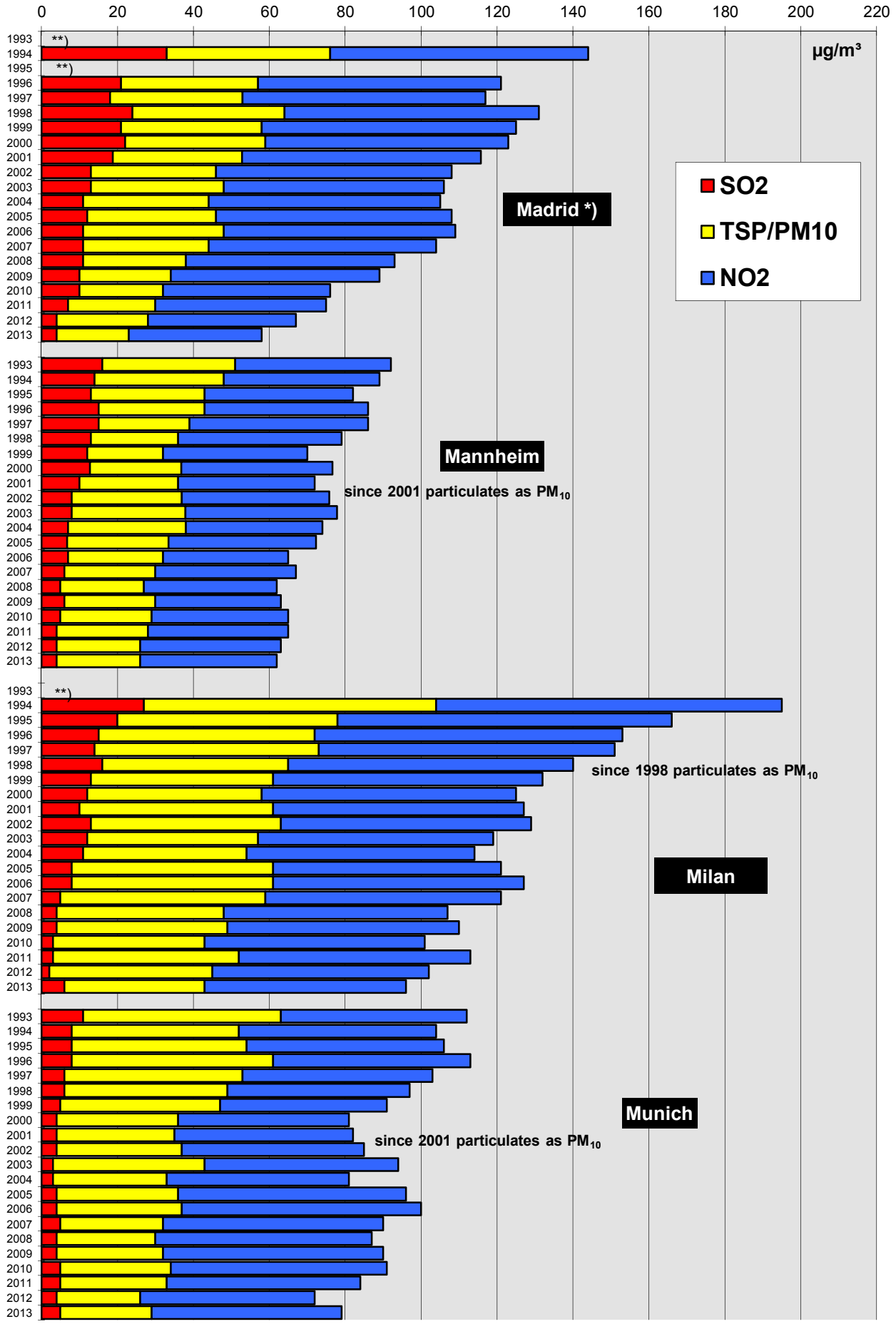
Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10} **) no data

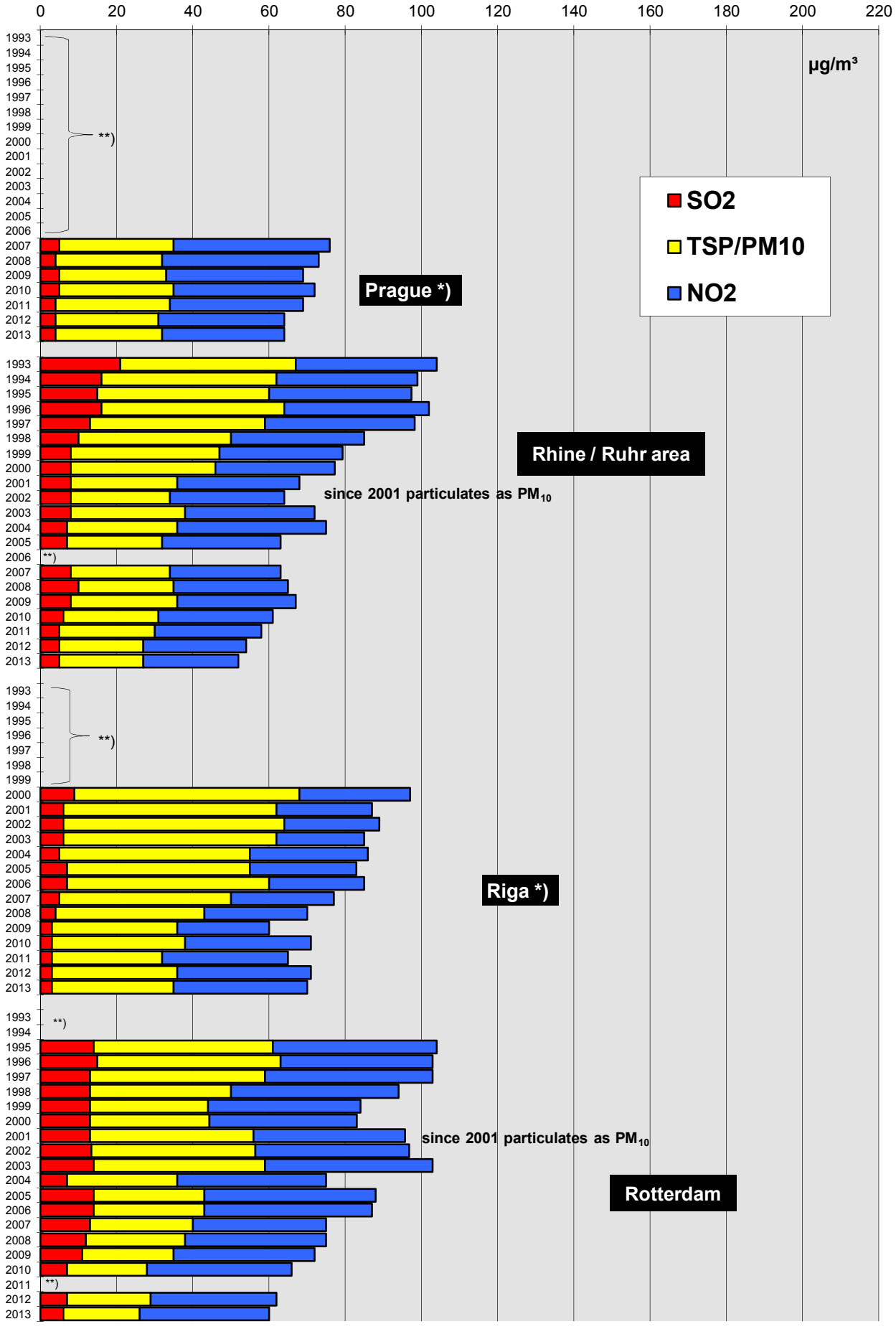
MAGISTRAT LINZ, Umwelt- und Technik-Center

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



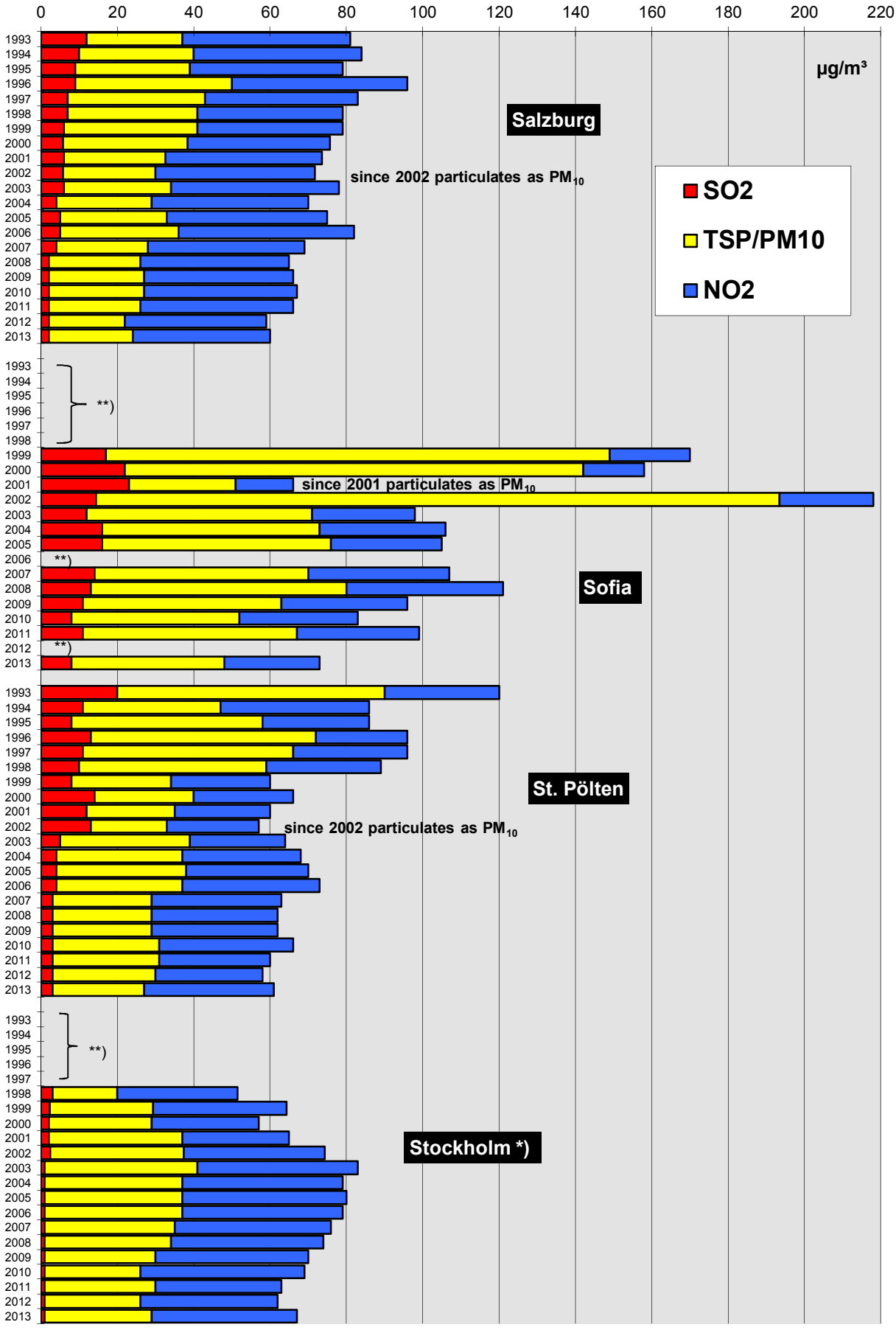
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



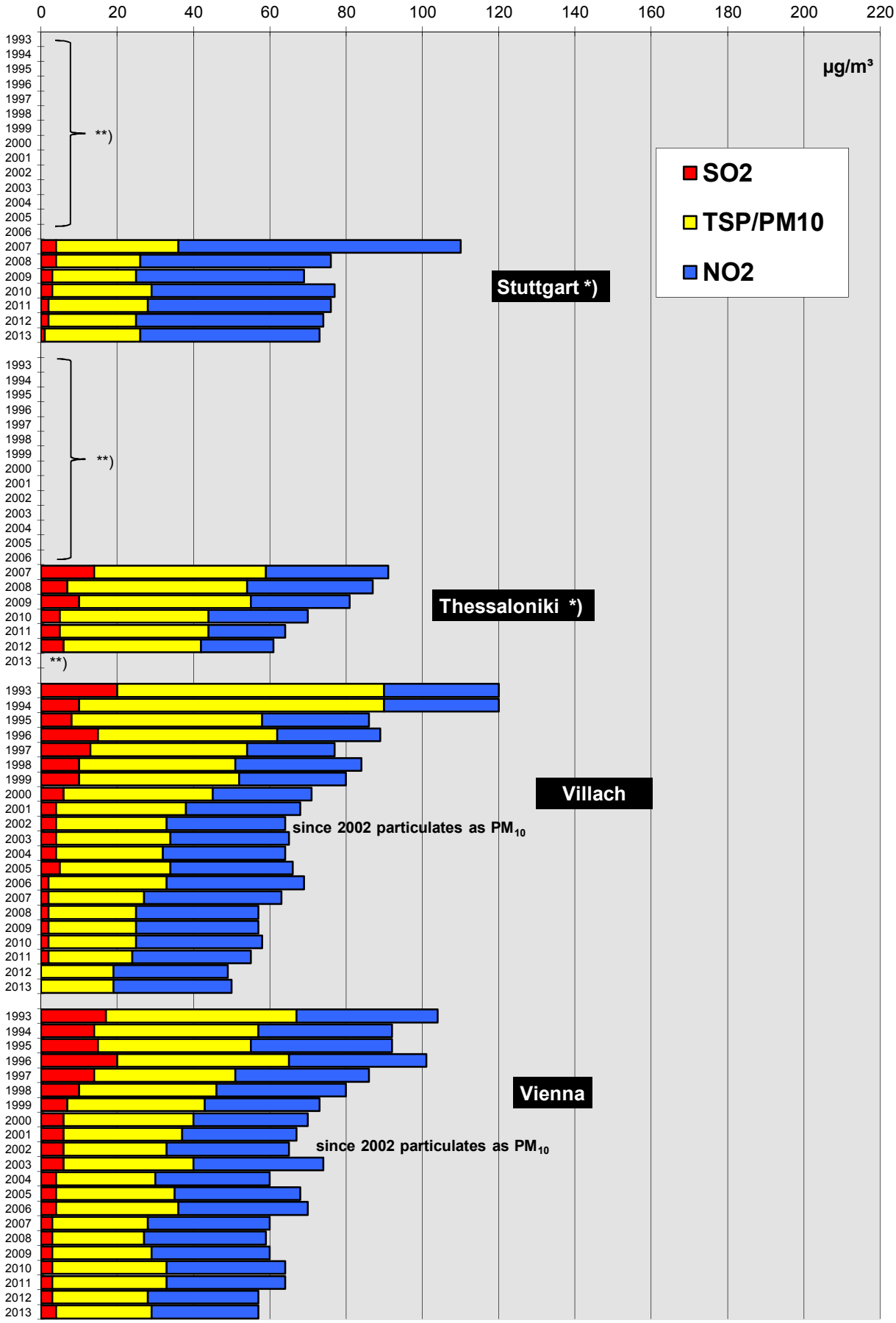
*) particulates calculated as PM_{10} **) No data

Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10} **) no data

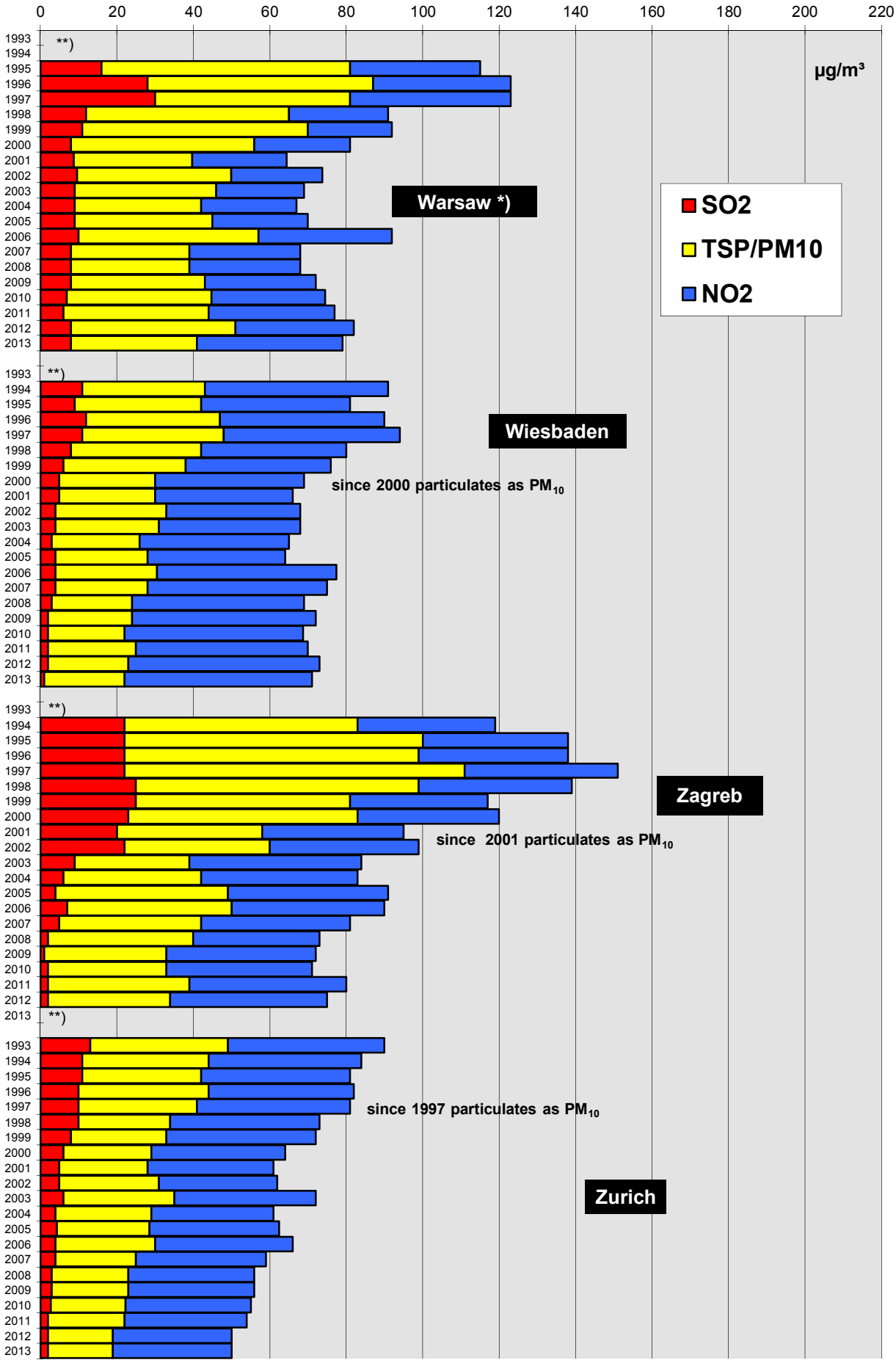
Comparison Of The Air Quality 1993-2013
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2013

Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2 (mean of all monitoring stations)



*) particulates calculated as PM_{10} **) no data

Luftgütekennzahlen 2013

der einzelnen

Vergleichsregionen

Immission Reference Values 2013

Of All Compared Regions

Comparison of The Air Quality in 2013

Athens

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

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2								
PM_{10}								
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

No Data for 2013!

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if appliccable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Barcelona

immission area: 101,4 km^2 population: 1 611 822

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]**	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]***
SO_2	4	3	5	20	64	73	N/A	10
PM_{10} (A)	10	24	37	102	N/A	N/A	N/A	50
$PM_{2,5}$ (A)	6	15	23	46	N/A	N/A	N/A	34
NO	7	17	69	228	665	810	N/A	162
NO_2	7	40	70	127	231	253	N/A	122
CO	4	0,5	0,8	1,8	4,7	6,8	N/A	1,6
O_3	5	48	78	123	150	154	N/A	115

PM_{10}	Monitoring method(s) used:	Gravimetry
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	7 (IJ-BARCELONA (GRACIA-SANT GERVASI)), (ES1480A , 8019044) P90.4=36.8
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	3 (IJ-BARCELONA (GRACIA-SANT GERVASI), ES1480A,8019044) P99.8=159

Comments:

(A) Gravimetric method
(B) Static average (not moving average)
(C) Maximum 98 percentile of hourly values, except PM_{10} and $PM_{2.5}$, daily mean values
(D) Station: ID_BARCELONA, 42 exceedances after subtraction of natural contribution
(E) Exceedances after subtraction of natural contribution
(F) Station: IJ-BARCELONA (GRACIA-SANT GERVASI)

Area and population of the municipalities of Barcelona (not metropolitan areas)
Minimum data capture of 75%, except for gravimetric PM_{10} and $PM_{2.5}$ with a minimum data capture of 45%

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

Comparison of The Air Quality in 2013

Basel

immission area: 557 km^2 population: 501 285

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	3	7	17	44	74	7
PM_{10}	1	17	30	66	120	181	187	52
$PM_{2,5}$	1	14	26	45	-	-	-	-
NO	1	6	20	69	95	120	120	54
NO_2	1	22	36	64	85	91	92	62
CO	-	-	-	-	-	-	-	-
O_3	1	48	84	108	172	177	182	133

PM_{10}	Monitoring method(s) used:	β-Meter-Messung, kalibriert mit gravimetrischer Messung alle 4 Tage.
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	5
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Belfast

immission area: 115 km^2 population: 280 500

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2		2	3	10	-	-	-	6
PM_{10}		18	26	75	-	-	-	45
$PM_{2,5}$		12	17	33	-	-	-	63
NO		11	23	142	-	-	-	43
NO_2		39	94	160	-	-	-	131
CO		200	300	1000	-	-	-	400
O_3		42	64	90	-	-	-	81

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Berlin (outskirt stations)

immission area: 892 km^2 population: 3 489 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2								
PM_{10}	3	19	27	82		216		54
$PM_{2,5}$ (A)	1	14	23	73				47
NO	5	3	7	35		124		19
NO_2	5	13	20	45		77		42
CO								
O_3	5	49	72	111		176		112

PM_{10}	Monitoring method(s) used:	PM10 Beta-Absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,21
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	12
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

(A) $PM_{2,5}$: mean or max. values from daily values (gravimetric measurment)

Berlin (urban stations)

immission area: 892 km^2 population: 3 489 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	10		30		11
PM_{10}	3	23	30	97		648		59
$PM_{2,5}$	3	16	25	78				52
NO	5	7	16	60		231		55
NO_2	5	25	32	64		123		66
CO								
O_3	2	45	64	115		162		109

PM_{10}	Monitoring method(s) used:	PM10 Beta-Absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,21
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	15
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

(A) $PM_{2,5}$: mean or max. values from daily values (gravimetric measurment)

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

Comparison of The Air Quality in 2013

Berlin (traffic stations)

immission area: 892 km^2 population: 3 489 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	9		85		9
PM_{10}	6	27	37	109		1263		64
$PM_{2,5}$ (A)	1	18	28	88				58
NO	5	46	70	161		743		181
NO_2	5	52	60	110		208		114
CO	2	420	530	1100		4800		1000
O_3								

PM_{10}	Monitoring method(s) used:	PM10 Beta-Absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,21
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	28
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	8

(A) $PM_{2,5}$: mean or max. values from daily values (gravimetric measurment)

Birmingham

immission area: 268 km^2 population: 1 085 417

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2		2	3	13	-	-	-	6
PM_{10}		19	30	83	-	-	-	58
$PM_{2,5}$		14	26	73	-	-	-	49
NO		19	72	223	-	-	-	141
NO_2		29	59	107	-	-	-	84
CO		-	-	-	-	-	-	-
O_3		40	63	93	-	-	-	85

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Bludenz

immission area: 3 km^2 population: 13 858

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	1	17	30	94	-	-	-	57
$PM_{2,5}$	0	-	-	-	-	-	-	-
NO	1	15	82	239	455	487	489	150
NO_2	1	23	51	93	137	147	155	84
CO	0	-	-	-	-	-	-	-
O_3	1	42	73	109	162	163	164	122

PM_{10}	Monitoring method(s) used:	grav.
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	12
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Bristol

immission area: 110 km^2 population: 432 451

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2		2	2	10	-	-	-	5
PM_{10}		18	25	55	-	-	-	43
$PM_{2,5}$		13	21	46	-	-	-	37
NO		13	40	147	-	-	-	89
NO_2		28	44	77	-	-	-	58
CO		400	600	1000	-	-	-	1000
O_3		43	61	96	-	-	-	78

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Bratislava

immission area: 367, 7 km² population: 4 173 89

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	9	16	29	32		14
PM_{10}	4	27	44	86	103	192		82
$PM_{2,5}$								
NO	3	13	44	113	180	313		124
NO_2	3	28	45	91	160	207		105
CO	1	658	975	1686	1849	1949		1490
O_3	2	55	99	134	166	217		134

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if	60
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	2

Brussels

immission area: 161 km² population: 1 138 854 (01.2012)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per day, hour [µg/m³]
SO_2								
PM_{10}								
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

No Data for 2013!

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Budapest

immission area: 525 km^2 population: 1 735 711

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	10	5	10	22	41	56	-	16
PM_{10}	12	29	50	102	183	324	-	106
$PM_{2,5}$	1	25	42	108	182	202	-	89
NO	12	14	56	183	401	463	-	159
NO_2	12	32	72	137	212	234	-	119
CO	12	521	876	1874	2787	3288	-	1501
O_3	10	39	83	114	169	178	-	132

PM_{10}	Monitoring method(s) used:	β-absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	64
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	5

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

Comparison of The Air Quality in 2013

Chemnitz

immission area: 220,86 km^2 population: 242 428[5]

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	2	24	41	96	369	895	895	83
$PM_{2,5}$	1	17	30	78	-	-	-	-
NO	2	26	77	222	222	222	606	200
NO_2	2	33	51	98	98	98	184	104
CO	0	-	-	-	-	-	-	-
O_3	1	47	66	105	105	105	173	117

PM_{10}	Monitoring method(s) used:	HVS Gravimetrie, Gravitationsmikrowaage
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	siehe Kommentar
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	32
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments:
*Equivalent factors for the PM_{10} – monitoring method:

station	PM_{10}-HVS	PM_{10}-TEOM
Chemnitz-Leipziger Straße	1.10	1.20 + f (temperature, humidity)
Chemnitz-Mitte	1.05	1.10 + f (temperature, humidity)
Chemnitz-Nord	1,10	1.14 + f (temperature, humidity)

The measurement of SO_2 on station “Chemnitz-Mitte” stopped on 1.1.2008.
The measurement of all components on station “Chemnitz-Nord” stopped on 1.1.2012.

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

Comparison of The Air Quality in 2013

Copenhagen

immission area: 88 km^2 population: 528 208

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2								
PM_{10}								
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

No Data for 2013!

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if 196pplicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

Dornbirn

immission area: 13 km^2 population: 46 883

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	1	19	31	93	-	-	-	53
$PM_{2,5}$	1	13	24	51	-	-	-	43
NO	1	24	68	174	394	453	457	128
NO_2	1	29	47	80	131	140	143	82
CO	0	-	-	-	-	-	-	-
O_3	0	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	grav.
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if appliccable):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

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

Comparison of The Air Quality in 2013

Dresden

immission area: 328,31 km^2 population: 530 409 [5]

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	4	9	28	41	50	50	17
PM_{10}	4	24	41	93	222	415	415	72
$PM_{2,5}$	3	17	30	76	-	-	-	-
NO	4	25	97	227	227	227	604	265
NO_2	4	29	52	103	103	103	196	113
CO	-	-	-	-	-	-	-	-
O_3	3	46	77	120	120	120	183	118

PM_{10}	Monitoring method(s) used:	HVS Gravimetrie, Gravitationsmikrowaage
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	siehe Kommentar
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	34
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

Comments:

*Equivalent factors for the PM_{10} – monitoring method:

station	PM_{10}-HVS	PM_{10}-TEOM
Dresden-Bergstr.	1.10	1.20 + f (temperature, humidity)
Dresden-Nord.	1.10	1.14 + f (temperature, humidity)
Dresden-Winckelmannstr.	1.00	1.00 + f (temperature, humidity)
Dresden-Wahnsdorf	1.05	1.00 + f (temperature, humidity)

The measurement of CO (station Dresden-Nord) and SO_2 (station Radebeul-Wahsdorf) stopped on 1.1.2008.

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

Comparison of The Air Quality in 2013

Edinburgh (St. Leonhards)

immission area: 262 km^2 population: 482 640

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	1	3	11	-	-	-	4
PM_{10}	1	14	19	63	-	-	-	32
$PM_{2,5}$	1	8	11	43	-	-	-	23
NO	1	6	13	58	-	-	-	29
NO_2	1	22	37	86	-	-	-	61
CO	1	200	300	400	-	-	-	500
O_3	1	49	69	90	-	-	-	83

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Frankfurt (urban stations)

immission area: 248 km^2 population: 693.342

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	2	5	15	31	45	7
PM_{10}	2	22	36	97	148	195	199	65
$PM_{2,5}$	1	16	27	88	-	-	-	-
NO	2	25	61	292	388	491	567	141
NO_2	2	39	53	89	123	141	155	90
CO	0	-	-	-	-	-	-	-
O_3	2	37	71	106	164	182	187	117

PM_{10}	Monitoring method(s) used:	gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	12
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments: * = monitoring method: gravimetrically
** = value is form 1.1.2012 (New Year's Eve fire works)

Frankfurt (traffic station)

immission area: 248 km^2 population: 693.342

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	1	26	41	103	309	729	1027	75
$PM_{2,5}$	1	18	31	92	206	406	499	58
NO	1	43	66	321	473	489	563	192
NO_2	1	55	63	114	187	226	248	121
CO	1	430	530	1580	2260	2480	2770	1100
O_3	0	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	21
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

Comment: ** = value registered Jan. 1 2012 (due to New Years Eve fire works)

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

Comparison of The Air Quality in 2013

Gothenburg

immission area: 72 164* km^2 population: 526 054

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile year [µg/m³]
SO_2**	3	2	3	5	-	16	-	6
PM_{10}**	3	19	35	228	-	2048	-	82
$PM_{2,5}$***	-	-	-	-	-	-	-	-
NO	-	-	-	-	-	-	-	-
NO_2	5	27	58	159	-	289	-	133
CO**	-	-	-	-	-	-	-	-
O_3**	2	52	70	101	-	124	-	95

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	17
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	17

Comments:

* According to the Gothenburg annual book of statistics the area of Gothenburg is 72 164 square kilometres. This is divided into land area (45 023 km^2) and aquatic area (27 141 km^2) excluding territorial sea.

** Somewhat poor data coverage (between 80 and 90 percent).

*** PM2.5 is no longer measured at the background station.

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

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

Comparison of The Air Quality in 2013

Graz (urban stations)

immission area: 127,58 km^2 population: 265 318

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	3	2,5	7	10	27	33	47	10
PM_{10}*	2*	24	44	129	-	-	-	70**
$PM_{2,5}$*	2*	19	39	113	-	-	-	61**
NO	5	18	82	237	431	456	548	195
NO_2	5	29	49	97	143	157	169	84
CO	2	400	900	1900	2800	3300	3400	1600
O_3	4	48	95	128	167	174	175	130

PM_{10}	Monitoring method(s) used:	kontinuierlich, gravimetrisch*
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	31*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	-

Comments:

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

* PM_{10}: gravimetric monitoring method

** Max. 98-Percentile per year is calculated from daily mean values

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

Comparison of The Air Quality in 2013

Graz (traffically influenced Don Bosco)

immission area: 128 km^2 population: 265 318

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³] ***	max. 1h mean value [2] [µg/m³] ****	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	8	14	18	24	8
PM_{10}*	1*	32	50	124	-	-	-	74**
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	52	113	321	529	627	712	265
NO_2	1	48	60	115	152	186	193	104
CO	1	500	900	1900	2500	2700	2700	1400
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	kontinuerlich, gravimetrisch*
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	44*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	-

Comments:

* PM_{10}: gravimetric monitoring method

** Max. 98-Percentile per year is calculated from daily mean values.

*** Max 3h-mean value = moving average,

**** Max 1h-mean value = static average

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

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

Comparison of The Air Quality in 2013

Hallein

immission area: 26,99 km^2 population: 20 378

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	34	5	19	63	125	227	10
PM_{10}	1	24	44	85				
$PM_{2,5}$	0							
NO	2	28	91	194	383	428	483	217
NO_2	2	30	66	103	135	143	151	95
CO	1	400	680	1130	1600	1810	2290	1120
O_3	1	59	93	131	179	181	181	129

PM_{10}	Monitoring method(s) used:	Digitel
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	gemäß österreichischen Äquivalenztest
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	27 **
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments:

** PM_{10} – exeedances of limit values: 4 Days due to winter services on the streets
The „Winterstreuverordnung (BGBl. II Nr.131/2012)“ regulates the deduction of PM_{10} - exeedances of limit values caused by winter services like road salt and grit. In 2012 there are deducted two days on station “Hallein B159”.

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

Comparison of The Air Quality in 2013

Hamburg (area monitoring stations)

immission area: 755 km^2 population: 1 743 00

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	5	4	9	113	172	270	483	38
PM_{10}	8	20	32	108	267	506	521	62
$PM_{2,5}$	3	13	20	73	232	525	412	47
NO	13	9	38	263	708	865	939	128
NO_2	13	24	44	76	142	189	193	82
CO	2	209	314	647	1207	1701	1834	536
O_3	6	46	69	96	156	161	165	106

PM_{10}	Monitoring method(s) used:	β-absorption (1 station); TEOM (7 stations)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	TEOM: 1,0 β-absorption: 1,0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	9
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	-

Hamburg (traffic stations)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile peryear [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	3	23	31	90	144	180	250	67
$PM_{2,5}$	1	16	22	66	85	87	120	48
NO	4	60	109	351	581	796	957	315
NO_2	4	56	72	128	239	249	263	143
CO	4	422	623	1246	1948	3749	5839	1295
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	β-absorption (1 station); TEOM (3 stations)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	TEOM: 1,0 β-absorption: 1,0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	5

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

Comparison of The Air Quality in 2013

Innsbruck

immission area: 105 km^2 population: 148 551

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	10	15	17	19	7
PM_{10}	2	21	51	85				
$PM_{2,5}$	1	14	35	54				
NO	3	33	94	368	540	580	604	196
NO_2	3	41	65	122	176	189	197	103
CO	1	421	703	1164	1624	1756	1877	1055
O_3	3	46	83	118	154	157	159	123

PM_{10}	Monitoring method(s) used:	Gravimetrisch (Digitel HVS)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if appliccable):	25
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

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

Comparison of The Air Quality in 2013

Karlsruhe (urban station)

immission area: 173 km^2 population: 296 033*

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	-	18	-	95	-	-
PM_{10}	1	19	-	71	-	-	-	-
$PM_{2,5}$	1	14	-	67	-	-	-	-
NO	1	10	-	189	-	427	-	-
NO_2	1	23	-	71	-	155	-	-
CO	-	-	-	-	-	-	-	-
O_3	1	45	-	109	-	202	-	-

PM_{10}	Monitoring method(s) used:	Gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	7
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comment: * 2012; source: Statistisches Landesamt Baden-Württemberg

Karlsruhe (traffic station)

immission area: 173 km^2 population: 297 488*

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	23	-	135	-	-	-	-
$PM_{2,5}$	1	15	-	96	-	-	-	-
NO	1	39	-	277	-	483	-	-
NO_2	1	48	-	90	-	179	-	-
CO	1	400	-	1500	-	2600	-	-
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	Gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	13
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments: * 2012; source: Statistisches Landesamt Baden-Württemberg

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

Comparison of The Air Quality in 2013

Klagenfurt immission area: 120 km^2 population: 95 928

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	3	10	31	32	35	6
PM_{10}	2	23	42	72	-	-	-	-
$PM_{2,5}$	2	14	33	64	-	-	-	-
NO	2	25	91	262	453	497	531	186
NO_2	2	29	56	83	138	145	149	86
CO	1	447	868	1510	2313	2524	2613	1336
O_3	2	45	87	109	146	155	157	124

PM_{10}	Monitoring method(s) used:	Kontinuierlich (Sharp 5030)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if appliccable):	11 (21)*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	-

Comments: *) The high value (1-HMW>200µg/m³) is caused by road works close to the monitoring station.

**) In Parentheses: Including the contribution of salt strewing

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

Comparison of The Air Quality in 2013

Leeds

immission area: 552 km^2 population: 474 632

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	20	30	24	-	-	-	8
PM_{10}	2	20	27	86	-	-	-	46
$PM_{2,5}$	2	15	21	87	-	-	-	45
NO	2	28	55	201	-	-	-	101
NO_2	2	39	54	92	-	-	-	79
CO	1	200	1000	1000	-	-	-	1000
O_3	1	40	57	82	-	-	-	77

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Leipzig

immission area: 297,39 km^2 population: 530 761 [5]

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	5	10	19	29	29	10
PM_{10}	3	26	49	153	495	1218	1218	89
$PM_{2,5}$	2	16	32	70	-	-	-	-
NO	3	28	73	189	189	189	707	175
NO_2	3	32	52	88	88	88	210	93
CO	-	-	-	-	-	-	-	-
O_3	1	48	67	104	104	104	167	112

PM_{10}	Monitoring method(s) used:	HVS Gravimetrie, Gravitationsmikrowaage
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	siehe Kommentar
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	41
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	1

Comments:

*Equivalent factors for the PM_{10} – monitoring method:

station	PM_{10}-HVS	PM_{10}-TEOM
Leipzig-Lützner Str.	1.10	1.20 + f (temperature, humidity)
Leipzig-Mitte	1.10	1.14+ f (temperature, humidity)
Leipzig-West	1.05	1.00+ f (temperature, humidity)

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

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

Comparison of The Air Quality in 2013

Leoben (Leoben, Donawitz, Göß)

immission area: 108 km^2 population: 24 645

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	2	4	21	52	78	102	17
PM_{10} *	1*	19	25	70	-	-	-	44*/*
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	3	10	38	105	210	269	286	94
NO_2	3	21	39	61	84	94	128	65
CO	1	700	1300	5800	12200	15900	17000	2900
O_3	1	41	76	99	170	173	177	128

PM_{10}	Monitoring method(s) used:	Kontinuierlich, gravimetrically*
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	4 *
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	-

Comments:

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

* PM_{10}: gravimetrically monitoring method

** Max. 98-Percentile per year is calculated from daily mean values.

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

Comparison of The Air Quality in 2013

Linz

immission area: 96 km^2 population: 193 486

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	5	4	11	42	94	174	311	37
PM_{10}	6	26	44	206	498	723	821	79
$PM_{2,5}$	3	21	33		-	-	-	49
NO	6	18	61	164	409	482	511	179
NO_2	6	29	53	92	188	217	270	116
CO	5	340	620	1400	3000	3400	3900	1485
O_3	3	40	65	111	170	179	181	123

PM_{10}	Monitoring method(s) used:	TEOM, GRIMM (Gravimetrically)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	TEOM; various
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if	33
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	3

Lisbon

immission area: 85 km^2 population: 550 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	1		6		26		5
PM_{10}	5	26		80		133		66
$PM_{2,5}$	2	12		50		69		29
NO	6	17		148		464		171
NO_2	6	36		118		223		144
CO	4	278		1329		2510		817
O_3	4	61		134		218		130

PM_{10}:	Monitoring method(s) used:	TEOM (2 stations), β-absorption (3 stations)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.18 (traffic stations) 1.11 (background stations)
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	38
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	15

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

Comparison of The Air Quality in 2013

Liverpool

immission area: 112 km^2 population: 465 700

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	4	13	-	-	-	9
PM_{10}	1	14	22	69	-	-	-	39
$PM_{2,5}$	1	12	20	69	-	-	-	38
NO	1	6	11	81	-	-	-	31
NO_2	1	23	31	72	-	-	-	54
CO	1	300	300	1000	-	-	-	4000
O_3	1	48	0	89	-	-	-	79

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

London

immission area: 1 572 km^2 population: 8 308 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	5	3	8	16	-	-	-	13
PM_{10}	7	23	43	87	-	-	-	70
$PM_{2,5}$	10	16	27	68	-	-	-	51
NO	13	26	182	404	-	-	-	305
NO_2	13	44	94	160	-	-	-	131
CO	3	300	700	1000	-	-	-	900
O_3	8	35	68	111	-	-	-	91

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	28
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	60

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

Comparison of The Air Quality in 2013

Lyon (urban site)

immission area: 47,9 km^2 population: 445 274

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	1		6		32		5
PM_{10}	2	25		89		162		78
$PM_{2,5}$	1	18		81		149		65
NO	3	16		232		514		179
NO_2	3	33		112		183		96
CO	0							
O_3	3	42		117		185		122

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	FDMS
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2012 (measured values **including** equivalent factor, if applicable):	29
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2012:	0

Lyon (traffic site)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0							
PM_{10}	3	31		128		244		114
$PM_{2,5}$	1	23		87		129		73
NO	4	54		395		931		323
NO_2	4	54		131		244		174
CO	1	388		1277		2474		1142
O_3	0							

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	FDMS
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	69
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	33

Comment: * station near a highway

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

Comparison of The Air Quality in 2013

Madrid

immission area: 604 km^2 population: 3 207 247

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]*	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year** [µg/m³]
SO_2	10	4	13	40	75	89	N/A	35
PM_{10}	12	19	38	71	179	232	N/A	75
$PM_{2,5}$	6	10	15	32	53	63	N/A	32
NO	24	20	121	306	958	1081	N/A	305
NO_2	24	35	80	132	338	388	N/A	155
CO	10	300	700	1600	7400	10400	N/A	1200
O_3	14	50	95	126	217	226	N/A	140

PM_{10}	Monitoring method(s) used:	Oscillating microbalance
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	Summer: 1,29 Winter: 0,85 Autumn/Spring: 1,07
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	8 [1)]
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	37 [2)]

Comments:

* Static average (not moving average)
** Maximum 98 percentile of 1-hour values
*** Station: Castellana; 16 exceedances after subtraction of natural contribution/ P90.4=51
**** Station: Barrio del Pilar
1) Station: Escuelas Aguirre 90.4-Percentile = 38
2) Station: Fernández Ladreda 99.8-Percentile = 221

Area and population of the municipalities of Madrid (not metropolitan areas)

Minimum data capture of 75%

In 2010, Madrid Air Quality Network has been restructured in order to meet the new obligations of Directive 2008/50/EC, Due to this fact, the number of stations have changed significantly

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

Comparison of The Air Quality in 2013

Mannheim (urban station)

immission area: 145 km^2 population: 294 627*

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	4	-	18	-	103	-	-
PM_{10}	2	20	-	98	-	-	-	-
$PM_{2,5}$	1	14	-	73	-	-	-	-
NO	2	12	-	191	-	289	-	-
NO_2	2	28	-	83	-	162	-	-
CO	-	-	-	-	-	-	-	-
O_3	2	43	-	104	-	223	-	-

PM_{10}	Monitoring method(s) used:	gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	Keiner, da grav.
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Mannheim (traffic station)

immission area: 145 km^2 population: 294 627*

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2 **	-	-	-	-	-	-	-	-
PM_{10}	1	26	-	107	-	-	-	-
$PM_{2,5}$	1	17	-	86	-	-	-	-
NO	1	36	-	255	-	528	-	-
NO_2	1	51	-	100	-	186	-	-
CO	1	0,4	-	1,2	-	2,6	-	-
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	Keiner, da grav
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	17
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments:
* 2012: source: Statistisches Landesamt Baden-Württemberg
** SO_2 emitter is near the monitoring station MA-Nord

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

Comparison of The Air Quality in 2013

Milan

immission area: 182 km^2 population: 1 126 2101

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year* [µg/m³]
SO_2	1	6		14		86		12
PM_{10}	3	37		156		n.a.		113
$PM_{2,5}$	2	30		123		n.a.		92
NO	8	39		488		739		333
NO_2	8	53		195		275		146
CO	4	1153		3817		7054		3179
O_3	3	40		117		193		151

PM_{10}	Monitoring method(s) used:	Beta attenuation
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	None
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if	81
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	35

Comments: * SO_2, PM_{10}, $PM_{2,5}$: Max 98-percentile per year of daily mean value
NO, NO_2, CO, O_3: Max 98-percentile per year of 1 h mean value

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

Comparison of The Air Quality in 2013

Munich

immission area: 310 km^2 population: 1 390 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	5	6	13	19	26	26	11
PM_{10}	4	24	46	113	218	340	631	86
$PM_{2,5}$	4	16	30	66	92	96	132	56
NO	4	45	171	456	828	1060	1077	358
NO_2	4	50	93	167	284	316	325	171
CO	3	400	700	1400	2000	2800	3000	1200
O_3	3	37	75	105	159	169	170	122

PM_{10}	Monitoring method(s) used:	ß-Absorption / ß-Absorption mit Nephelometer / Oszillierende Mikrowaage
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,25 / 1,0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if	39 (30)
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	50

Comments:

PM_{10} / $PM_{2,5}$: The values from Jan. 1 2012 are not considered, because of very high single data due to fireworks during the New Year's Eve. But these values are included when calculating the number of violations of the daily mean limiting standard.

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

Comparison of The Air Quality in 2013

Prague

immission area: 496 km^2 population: 1 260 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile from daily mean per year [µg/m³] **
SO_2	3	4	12	35	-	56	-	20
PM_{10}	17	28	54	183	-	925	-	93
$PM_{2,5}$	6	18	40	133	-	192	-	75
NO	12	18	77	257	-	676	-	136
NO_2	15	32	63	111	-	284	-	88
CO	3	477	1152	1660	-	2289	-	1315
O_3	7	43	77	134	-	189	-	97

PM_{10}	Monitoring method(s) used:	3x Gravimetry, 13x Radiometry, 1x Optoelectronic
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	55
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	6

Comments:

** Max. 98-Percentiles of all monitoring stations are calculated from daily means.

* The correction factor for the PM_{10} and $PM_{2.5}$ measured data from the database = 1. The correction factor built in the PM_{10} and $PM_{2.5}$ analyzer (beta absoption) is set to the value 1.3.

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

Comparison of The Air Quality in 2013

Riga (urban station)

immission area: 307,2 km^2 population: 643 368

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	3	4	8	12	20	21	7
PM_{10}	1	21	29	60	-	-	-	49
$PM_{2,5}$	1	17	23	50	-	-	-	40
NO	-	-	-	-	-	-	-	-
NO_2	2	27	44	9	139	171	185	134
CO	-	-	-	-	-	-	-	-
O_3	2	58	84	107	121	124	126	106

PM_{10}	Monitoring method(s) used:	β-absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	0
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

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

Riga (traffic station)

immission area: 307,2 km^2 population: 643 368

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	2	40	59	124	132	134	138	104
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	94	120	253	462	509	538	296
NO_2	1	51	64	113	166	178	186	121
CO	1	400	500	1400	1800	1800	1900	700
O_3	1	30	50	90	112	114	147	82

PM_{10}	Monitoring method(s) used:	β-absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.0
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	48
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

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

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

98-percentiles: $PM_{2,5}$: 98%-value of the daily means

Comparison of The Air Quality in 2013

Rhine/Ruhr area

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

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	7	5	-	-	-	152	-	58
PM_{10}	24	22	-	31	-	-	-	-
$PM_{2,5}$	14	16	-	-	-	-	-	-
NO	23	10	-	-	-	617	-	115
NO_2	24	25	-	-	-	-	-	-
CO	-	-	-	-	-	-	-	-
O_3	19	41	-	-	-	218	-	117

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

Comment: Traffic stations are not included in the calculation.

Rotterdam

immission area: 803 km^2 population: 1 200 000

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	6	5.5	13.5	56.1	N/A	287	N/A	25
PM_{10}	3	20	27	65	N/A	211	N/A	57
$PM_{2,5}$	3	13	N/A	62	N/A	N/A	N/A	45
NO	3	12	16	114	N/A	484	N/A	93
NO_2	3	34	38	73	N/A	143	N/A	81
CO	3	264	364	618	N/A	3215	N/A	595
O_3	3	36	54	86	N/A	183	N/A	91

PM_{10}	Monitoring method(s) used:	BAM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0.96
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	5
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

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

Comparison of The Air Quality in 2013

Salzburg

immission area: 65,6 km^2 population: 147 825

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	2	2	4	8	20	26	43	6
PM_{10}	3	22	41	90				
$PM_{2,5}$	2	16	33	73				
NO	3	26,9	111	192	394	533	584	215
NO_2	3	36,3	65	103	148	160	198	112
CO	2	360	570	990	1530	2110	2560	970
O_3	2	40,5	74	109	161	163	164	121

PM_{10}	Monitoring method(s) used:	Digitel und Sharp
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	gemäß österreichischen Äquivalenztest
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if appliccable):	24 (davon 1 Tage durch Winterdienst)
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Sofia

immission area: 1 344 km^2 population: 1 249 665

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	6	8	17	54	-	186	-	32
PM_{10}	7	40	131	413	-	-	-	266
$PM_{2,5}$	2	22	97	350	-	-	-	-
NO	6	18	109	414	-	883	-	283
NO_2	6	25	52	115	-	211	-	97
CO	4	801	2368	-	-	-	-	-
O_3	5	54	121	146	-	177	-	142

PM_{10}	Monitoring method(s) used:	β-absorption (6 stations), gravimetric (1 station)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	(X+1.89)/0.83
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if appliccable):	1
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

St. Pölten, urban station

immission area: 108,52 km² population: 52 322

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	3	5	11			25	9
PM_{10}	1	22	40	82			257	69
$PM_{2,5}$	1	18	37	80			214	65
NO	1	6	13	45			191	42
NO_2	1	24	35	61			105	60
CO	-	-	-	-			-	-
O_3	1	47	74	186			170	128

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	21
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

St. Pölten, traffically influenced

immission area: 108, 52 km² population: 52 322

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	8			20	7
PM_{10}	1	24	40	75			199	69
$PM_{2,5}$	-	-	-	-			-	-
NO	1	21	35	161			659	114
NO_2	1	34	46	75			219	82
CO	1	340	510	-			-	780
O_3	1	39	58	178			152	107

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,3
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	21
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

Comparison of The Air Quality in 2013

Stockholm

immission area (inner city): 48 km^2 population (inner city): 308 920
area (Stockholm): 220 km^2 population (Stockholm): 832 641

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per hour/daily [µg/m³]
SO_2	1	1	1					
PM_{10}	5	28	100	209		494		
$PM_{2,5}$	4	7	15	25		268*		
NO	-							
NO_2	5	38	59	108		239		115/85
CO	2		1			15		
O_3	1	51	73	98		113		

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	x1.19+15
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	52
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	2

Comments: * Dust from housrenovation, second max= 563
all stations are situated in the innercity of Stockholm; SO_2: roof level, Diffusive samplers - only per month PM_{10}, $PM_{2,5}$, NO_2, CO: street level, O_3: roof level

Stuttgart (urban station)

immission area: 207 km^2 population: 597 939*

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	1	-	5	-	26	-	-
PM_{10}	1	20	-	89	-	-	-	-
$PM_{2,5}$	1	15	-	74	-	-	-	-
NO	1	16	-	182	-	338	-	-
NO_2	1	32	-	83	-	113	-	-
CO	-	-	-	-	-	-	-	-
O_3	1	39	-	95	-	182	-	-

PM_{10}	Monitoring method(s) used:	gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	Keiner, da grav.
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comment: * 2012; source: Statistisches Landesamt Baden-Württemberg

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

Comparison of The Air Quality in 2013

Stuttgart (traffic station)

immission area: 207 km^2 population: 597 939*

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	30	-	168	-	-	-	-
$PM_{2,5}$	1	16	-	127	-	-	-	-
NO	1	68	-	301	-	746	-	-
NO_2	1	62	-	115	-	234	-	-
CO	1	400	-	1200	-	2700	-	-
O_3	1	30	-	96	-	164	-	-

PM_{10}	Monitoring method(s) used:	Gravimetrisch
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	Keiner, da grav.
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	27
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	4

Comments:

* 2012; source: Statistisches Landesamt Baden-Württemberg

** The max. 1h-mean value of NO_2 is measured by the station „Stuttgart Arnulf-Klett Platz“. The value 473 µg/m³ exceeds the alert thresholds. But there was no exceedance because you have to measure 400 µg/m³ over three consecutive hours at locations representative of air quality over at least 100 km² or an entire zone or agglomerativon, whichever is the smaller.

Thessaloniki

immission area: 129 km^2 population: 794 330

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per hour [µg/m³]
SO_2								
PM_{10}								
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

No Data for 2013!

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

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

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

Comparison of The Air Quality in 2013

Vienna

immission area: 415 km^2 population: 1 714 246

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 99,9 Percentile 3h-mean value [2] [µg/m³]	max. 99,9 Percentile 1h-mean value [2] [µg/m³]	max. 99,9 Percentile 1/2h-mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	7	4	7	25	35	35	35	13
PM_{10}	13	25	40	139	247	304	330	99
$PM_{2,5}$	5	18	33	97	97	96	96	60
NO	17	11	80	157	315	358	374	215
NO_2	17	28	62	98	150	162	165	124
CO	4	346	553	894	1204	1296	1291	892
O_3	5	52	96	142	178	181	181	137

PM_{10}	Monitoring method(s) used:	5 Stationen sowohl gravimetrisch als auch mit äquivalentem kontinuierlichen Verfahren; 8 Stationen nur mit äquivalenten kontinuierlichen Verfahren
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	siehe Kommentar
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	35 (Kendlerstraße)
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments:

PM_{10} – equivalence functions für 2013 depending on the monitoring method:

PM_{10}-monitoring station	Valid from/to	Type of monitor	Calibration funktion
Tfromorstraße	to 28.3.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1,43) / 0,8$
Tfromorstraße	from 28.3.	Grimm EDM-180	$y_{equivalent} = 0,955*y_{roh} + 0,945$
AKH	to 29.3.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1,43) / 0,8$
AKH	from 29.3.	Grimm EDM-180	$y_{equivalent} = 0,955*y_{roh} + 0,945$
Belgradplatz	from 1.1.	Grimm EDM-180	$y_{equivalent} = 0,955*y_{roh} + 0,945$
Laaer Berg	to 28.3.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1,43) / 0,8$
Laaer Berg	from 28.3.	Grimm EDM-180	$y_{equivalent} = 0,955*y_{roh} + 0,945$
Kaiser-Ebersdorf	from 1.1.	Grimm EDM-180	$y_{equivalent} = 0,955*y_{roh} + 0,945$
Rinnböckstraße	from 1.1.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1,43) / 0,8$
Gaudenzdorf	from 1.1.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1,43) / 0,8$
Kendlerstraße	to 29.3.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1,43) / 0,8$

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

Kendlerstraße	from 29.3.	Grimm EDM-180	$y_{equivalent} = 0{,}955 * y_{roh} + 0{,}945$
Schafberg	from 1.1.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1{,}43) / 0{,}8$
Gerichtsgasse	from 1.1.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1{,}43) / 0{,}8$
Lobau	to 28.3.	Eberline FH62 I/R	$y_{equivalent} = (y_{roh} + 1{,}43) / 0{,}8$
Lobau	from 28.3.	Grimm EDM-180	$y_{equivalent} = 0{,}955 * y_{roh} + 0{,}945$
Stadlau	from 1.1.	Grimm EDM-180	$y_{equivalent} = 0{,}955 * y_{roh} + 0{,}945$
Liesing-Gewerbegebiet	from 1.1.	Grimm EDM-180	$y_{equivalent} = 0{,}853 * y_{roh} + 0{,}55$

Bold printed monitoruing stations: additionally gravimetrical method used

- $PM_{2,5}$ – equivalence functions for continuous monitoring methods in 2013::

$PM_{2,5}$-monitoring station	Valid from/to	Type of monitor	Calibration funktion
Tfromorstraße	to 28.3.	Eberline FH62 I/R	$y_{equivalent} = y_{roh} / 0{,}824$
Tfromorstraße	from 28.3.	Grimm EDM-180	$y_{equivalent} = 0{,}866 * y_{roh} + 0{,}661$
AKH	to 29.3.	Eberline FH62 I/R	$y_{equivalent} = y_{roh} / 0{,}824$
AKH	from 29.3.	Grimm EDM-180	$y_{equivalent} = 0{,}866 * y_{roh} + 0{,}661$
Rinnböckstraße	from 26.1.	Grimm EDM-180	$y_{equivalent} = 0{,}866 * y_{roh} + 0{,}661$
Kendlerstraße	from 29.3.	Grimm EDM-180	$y_{equivalent} = 0{,}866 * y_{roh} + 0{,}661$
Lobau	from 28.3.	Grimm EDM-180	$y_{equivalent} = 0{,}866 * y_{roh} + 0{,}661$
Stadlau	from 1.1.	Grimm EDM-180	$y_{equivalent} = 0{,}866 * y_{roh} + 0{,}661$

Bold printed monitoruing stations: additionally gravimetrical method used

- 99.9-Percentile values (HMW, MW1 and MW3) of PM_{10} and $PM_{2,5}$ are from continuous measure (including station factor). This is also for station with continuous and gravimetrical measurements, because the gravimetric method delivers only daily mean values.
- All other particulates values (annual mean, max. MMW and max. daily mean) are derived preferably from gravimetric monitoring.

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

Comparison of The Air Quality in 2013

Villach

immission area: 135 km^2 population: 59 646

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	11							
PM_{10}	1	19	27	48	-	-	-	-
$PM_{2,5}$	0							
NO	1	24	58	121	286	331	372	133
NO_2	1	31	52	72	117	126	132	79
CO	0							
O_3	0							

PM_{10}	Monitoring method(s) used:	continuously (Sharp 5030)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	-
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	-

Warsaw

immission area: 517,22 km^2 population: 1 715 517

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per day [µg/m³]
SO_2	2	8	12	89	182	259	-	27
PM_{10}	5	33	53	130	266	299	-	82
$PM_{2,5}$	3	26	42	123	146	210	-	73
NO	-	-	-	-	-	-	-	-
NO_2	4	38	66	128	249	265	-	97
CO	3	550	807	1647	3282	3759	-	1154
O_3	3	44	69	109	164	168	-	90

[1]

PM_{10}	Monitoring method(s) used:	**automatic TEOM+FDMS, Beta-ray, manual gravimetric method**
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	TEOM/FDMS: 1,0 β-ray: 1.04
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	75 traffic station TEOM+FDMS automatic
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	8

Comments: In this report the values from PM_{10} and $PM_{2,5}$ from the traffic stations are not included because the monitor has broken down.

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

Comparison of The Air Quality in 2013

Wiesbaden (urban stations)

immission area: 204 km^2 population: 279 578

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	1	2	5	15	35	55	7
PM_{10}	1	20	30	93	157	190	297	62
$PM_{2,5}$	1	14	26	84	-	-	-	-
NO	1	15	43	256	473	643	665	122
NO_2	1	32	41	83	118	143	162	82
CO	0	-	-	-	-	-	-	-
O_3	1	42	74	132	181	195	202	125

[1]

PM_{10}	Monitoring method(s) used:	gravimetrically
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	9
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

Comments: * = method: gravimetrically
** = value from Jan. 1 2012 (New Year's Eve fire works)

Wiesbaden (traffic station)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	2	22	34	98	609	1044	1092	65
$PM_{2,5}$	1	17	28	83	511	939	1006	55
NO	2	58	107	304	568	678	708	238
NO_2	2	57	66	104	179	218	242	132
CO	1	540	750	1650	2790	3220	3440	1400
O_3	0	-	-	-	-	-	-	-

[1]

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013	1

Comments: ** = value from Jan. 1 2012 (New Year's Eve fire works)

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

Comparison of The Air Quality in 2013

Zagreb

immission area: 641 km^2 population: 790 017

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2								
PM_{10}								
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

No Data for 2013!

PM_{10}	Monitoring method(s) used:	
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	

Zurich

immission area: 1 086 km^2 population: 1 185 214

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	10	16	26	49	8
PM_{10}	1	19	32	69	157	203	211	59
$PM_{2,5}$	1	15	26	52	-	-	-	-
NO	1	12	54	201	319	329	339	102
NO_2	1	31	52	93	117	126	126	81
CO	1	312	503	1087	1547	1586	1637	774
O_3	1	47	89	118	171	179	181	133

PM_{10}:	Monitoring method(s) used:	β-Meter calibrated by gravimetrical measurements every 4th day
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	-
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2013 (measured values **including** equivalent factor, if applicable):	11
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2013:	0

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