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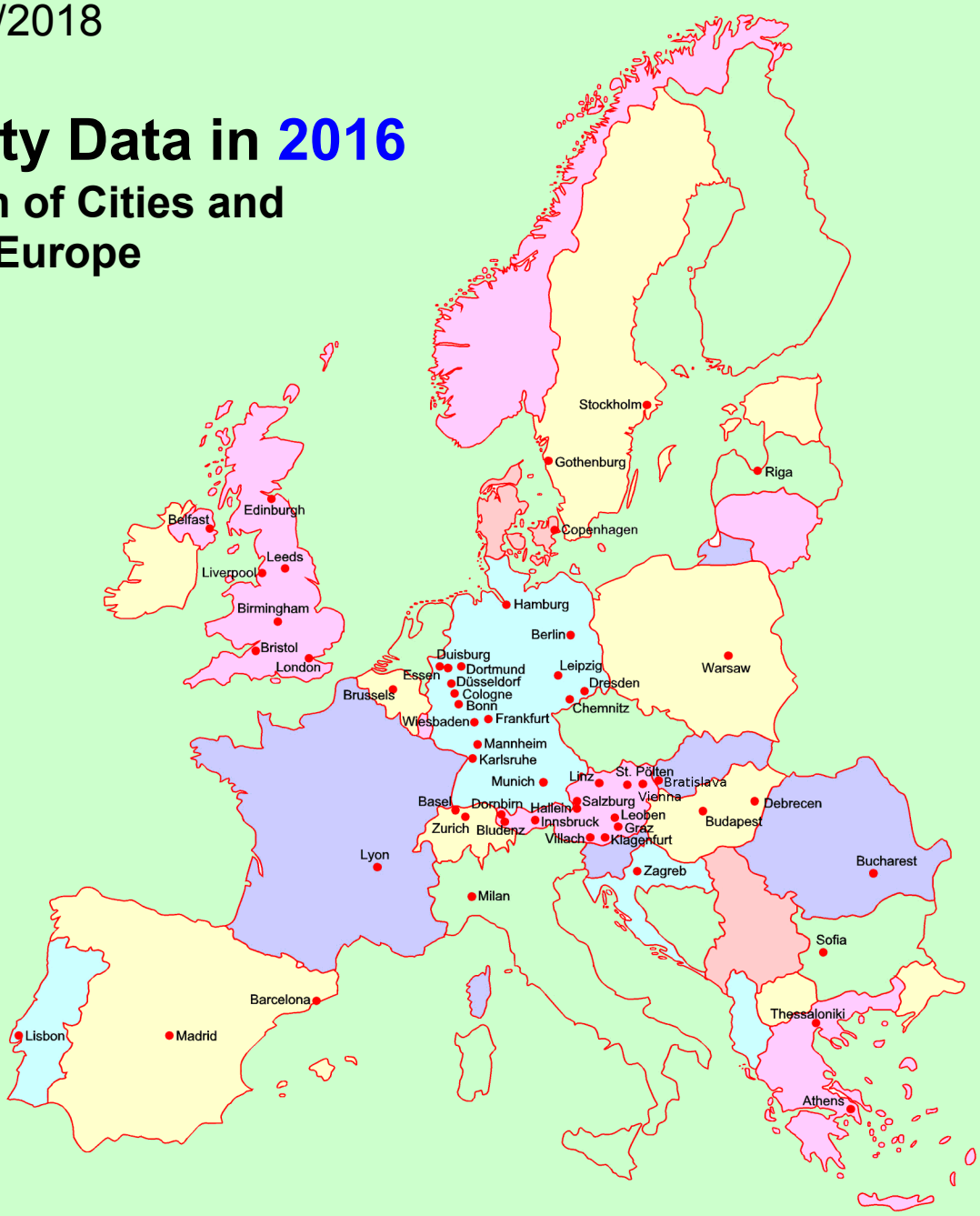
Air Quality Data in 2016

Comparison of Cities and Regions in Europe



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Inhalt

Contents

Luftgütedaten 2016 Nationaler und europäischer Städtevergleich

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 $PM_{2,5}$) 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 mehr als 3 Jahrzehnten installiert, sodass bei einer Verfolgung der Luftschadstoffdaten über mehrere Jahre ein Trend zur Verbesserung (oder auch Verschlechterung) der Luftbelastung herauslesbar ist. Sanierungsmaßnahmen in Betrieben und bei anderen Emittentengruppen müssen sich 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 organisations concerned with environmental affairs, such as national and local authorities are dealing with. Attempts are made to get air pollution under control and increase the air quality step by step establishing regional or national air-cleaning programmes. During the last years the pollutant stress of fine particulates (PM_{10} and $PM_{2,5}$) and nitrogen oxides has become more important, since the European air quality standards of these pollutants are exceeded in most of the agglomerations.

To prove the success of measurements of redevelopment at all, the observation of the concentrations concerning 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 for more than 3 decades. By 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 can be recognized. Measurements of redevelopment in companies, factories and other groups of emission sources should be visible as a reduced immission stress of air pollutants.

It is absolutely necessary to determine the trends of pollution throughout a *longer period of time*, because various meteorological influences can cause an extreme alteration of the immission stress. For instance, a month with mostly rainy weather conditions and high wind speeds will lead to a much lower immission stress in comparison with a month, when the formation of inversion layers can be observed frequently.

Luftgütevergleiche werden durch die Stadt Linz 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 2016 wurden Städte bzw. Regionen aus Österreich, Deutschland, Großbritannien, Frankreich, Belgien, Schweden, Italien, Schweiz, Spanien, Polen, Dänemark, Tschechien, Ungarn, Lettland, Portugal und Kroatien mit einbezogen. Die Städte Bratislava, Luxemburg, Rotterdam und Sofia lieferten für das Jahr 2016 keine Daten.	Comparisons of the air quality have been carried out by the City of Linz already for a number of years, exactly since 1989. At first only Austrian Cities were compared. The comparison was extended to other European cities and regions during the last year as a result of growing interest in such studies. The comparison of the air quality of the year in 2016 comprised cities and regions of Austria, Germany, cities from Great Britain, France, Belgium, Sweden, Italy, Switzerland, Spain, Poland, Denmark, Czech Republic, Hungary, Latvia, Portugal, Slovakia and Croatia. We did not receive data from the city of Bratislava, Luxemburg, Rotterdam and Sofia in 2016.
Die Stadt Bukarest liefert seit 16 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 16 years. In case a delivery will follow, it will be taken into account for future reports in terms of time series.
Seit 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 has been extended by 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 17 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 is very different (see table on page 17 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 this comparative study are thoroughly conscious of these facts, but despite the raised objections there are also some arguments of the activities:

1. The way of measurement of air pollutants is carried out by the same or 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 Immissionsgebiete. Die Daten von Städten bzw. Regionen, die erst seit kurzem im Städtevergleich integriert sind, wurden dabei auch so weit wie möglich nachgeführt.	3. In the end the evaluations are put to a more objectified basis, when long term developments are observed and thereof the trends of the pollutant immission can be derived. 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 values since 1993 for the immission regions. The data of cities or regions which only have been participating the comparison for 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 vor dem Jahr 2006. Seit damals wurden die grafischen Darstellungen für die Perzentile, die max. 3-Stunden-Mittelwerte, die max. Halbstundenmittelwerte und die max. Monatsmittelwerte, da sie im Allgemeinen von weniger 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.

Regarding the graphical evaluations of immission reference data the present report has been shortened as already done in the latest reports. 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, as a result of minor public interest. On the other hand the max. 1h mean values are graphically presented now, since they are a widely-used evaluation standard for short term stress.

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 2016 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 Belastungen (Jahresmittelwerte) einzelner Regionen und Städte haben sich einander sehr angenähert. Einige Städte/Regionen ragen allerdings noch deutlich heraus.
4. 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

A good impression of the development of air pollutant stress can be received by the graphical evaluations. Therefor the immission stress for the area of each participating city and region from 1993 through 2016 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 small number of stations.
2. Due to this fact the comparability between regions is limited.
3. The range of the annual mean immission stress between the cities/regions has become lower and lower since 1993. But some cities/regions are still remarkably higher stressed than the rest.
4. In some cities it can be seen that in regions where pollution stress was relatively high in 1993, a significant decrease could be observed, while in cities with low immission stress compared to other cities and regions there was hardly any change of air pollution.

5. 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 werden daher seit einigen Jahren nicht mehr in die Auswertungen miteinbezogen.

6. 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 geringer belastet

   NO: uneinheitlich, tendenziell gleich bleibend oder *geringer* belastet

   NO_2: uneinheitlich, tendenziell *geringer* belastet oder gleich bleibend

   CO: alle Regionen *geringer* belastet

   O_3: Belastung tendenziell *gleich bleibend oder leicht erhöht*

5. It can be shown that cities and regions do not monitor TSP anymore. These measurements were replaced by monitoring the pollutant PM_{10} which is the reason TSP measurements have not been included in the present report any more for a couple of years.

6. 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 lower stressed

   NO: non-uniform, trend of lower stress or constant

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

   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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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	0	1	0	1	1	0	1
	Dornbirn	0	1	1	1	1	0	1
	Graz	3	3	3	6	6	3	4
	Hallein	2	1	1	2	2	1	1
	Innsbruck	1	2	1	3	3	1	3
	Klagenfurt	1	2	2	2	2	1	2
	Region Leoben	1	1	0	3	3	1	1
	Linz	5	6	6	7	7	5	3
	Salzburg	2	3	1	3	3	1	2
	St. Pölten	1	2	1	2	2	1	2
	Vienna	7	13	6	16	16	3	5
	Villach	0	1	0	1	1	0	0
Belgium	Brussels	6	6	5	9	9	6	6
Bulgaria	Sofia (2015)	6	7	2	6	6	4	5
Croatia	Zagreb	1	6	3	0	6	1	5
Czech Republic	Prague	2	16	6	12	13	2	6
Denmark	Copenhagen	1	3	3	3	3	2	2
France	Lyon	1	6	2	7	7	1	3
Germany	Berlin	2	11	5	16	16	2	7
	Chemnitz	0	2	1	2	2	0	1
	Dresden	1	4	3	4	4	0	3
	Frankfurt	1	3	2	3	3	1	2
	Hamburg	6	11	5	16	16	3	6
	Karlsruhe	1	2	2	2	2	1	1
	Leipzig	1	3	2	3	3	0	1
	Mannheim	1	2	2	2	2	1	1
	Munich	1	4	4	5	5	3	5
	Rhine/Ruhr Area	7	22	12	21	21	0	16
	Stuttgart	1	4	3	4	4	1	1
	Wiesbaden	1	3	2	3	3	1	1
Greece	Athens	5	11	6	14	14	6	13
	Thessaloniki	2	4	0	5	5	2	5
Hungary	Budapest	8	12	1	9	9	10	10
Italy	Milan	1	3	2	8	8	4	3
Latvia	Riga	2	2	1	0	2	1	2
Luxemburg	Luxemburg	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
The Netherlands	Rotterdam (2013)	6	3	3	3	3	3	3
Poland	Warsaw	2	6	4	4	4	3	3
Portugal	Lisbon	2	4	2	6	6	4	4
Slovakia	Bratislava (2015)	1	4	0	3	3	1	2

Country	Monitored Area	SO_2	PM_{10}	$PM_{2,5}$	NO	NO_2	CO	O_3
Spain	Barcelona	4	10	7	7	7	4	5
	Madrid	10	12	6	24	24	10	14
Switzerland	Basel	1	1	1	1	1	0	1
	Zurich	1	1	1	1	1	1	1
Sweden	Gothenburg	2	3	2	5	5	1	2
	Stockholm	1	6	4	0	6	2	2
U.K.	Belfast	1	2	1	2	2	1	1
	Birmingham	1	2	3	3	3	0	3
	Bristol	0	1	1	1	1	0	1
	Edinburgh	1	1	1	1	1	1	1
	Leeds	1	2	2	2	2	1	1
	Liverpool	1	1	1	2	2	0	1
	London	3	5	9	12	12	2	8

\- no monitoring station

n.d. no data

Immissionsgebiete und Bevölkerung Immission area and population

Country	Monitored Area	Immission area [km²]	Population
Austria	Bludenz	30	14.005
	Dornbirn	121	47.420
	Graz	128	283.869
	Hallein	27	21.043
	Innsbruck	105	132.236
	Klagenfurt	120	99.790
	Region Leoben	108	24.915
	Linz	96	203.957
	Salzburg	66	153.766
	St. Pölten	108	54.557
	Vienna	415	1.840.226
	Villach	135	61.662
Belgium	Brussels	161	1.187.890
Bulgaria	Sofia	1 311	1.256.667
Croatia	Zagreb	641	790.017
Czech Republic	Prague	496	1.270.000
Denmark	Copenhagen	86	602.481
France	Lyon	48	500.715
Germany	Berlin	892	3.520.000
	Chemnitz	221	248.645
	Dresden	328	543.825
	Frankfurt	248	729.624
	Hamburg	755	1.860.000
	Karlsruhe	173	304.619
	Leipzig	298	560.472
	Mannheim	145	316.265
	Munich	310	1.530.000
	Rhine/Ruhr Area	5 770	9.963.000
	Stuttgart	207	611.802
	Wiesbaden	204	289.544
Greece	Athens	1 948	3.551.370
	Thessaloniki	129	794.330
Hungary	Budapest	525	1.759.407
Italy	Milan	182	1.351.562
Latvia	Riga	307	641.007
Luxemburg	Luxemburg	51	115.227
The Netherlands	Rotterdam	803	631.155
Poland	Warsaw	517	1.753.977
Portugal	Lisbon	85	547.733

Country	Monitored Area	Immission area [km²]	Population
Slovakia	Bratislava	368	422.932
Spain	Barcelona	101	1.608.746
	Madrid	604	3.165.883
Switzerland	Basel	557	501.285
	Zurich	1 086	1.185.214
Sweden	Gothenburg	1 031	572.779
	Stockholm (inner city)	48	923.516
U.K.	Belfast	115	339.600
	Birmingham	268	1.101.000
	Bristol	110	454.200
	Edinburgh	262	492.700
	Glasgow	176	596.000
	Leeds	552	751.500
	Liverpool	112	465.700
	London	1 572	8.788.000

Übersicht über die Entwicklung der Schadstoffbelastungen 1993 - 2016 [1)]

Beurteilungsbasis: Jahresmittelwerte über alle Stationen einer Region

Overview over the development of the stress of air pollutants from 1993 through 2016 [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 2016	Stress in 1993 [2)]	Trend last 5 years	Stress in 2016	Stress in 1993 [2)]	Trend last 5 years	Stress in 2016	Stress in 1993 [2)]	Trend last 5 years	Stress in 2016	Stress in 1993 [2)]	Trend last 5 years	Stress in 2016
Linz		==			==			↘			==			==	
Bludenz		n.d.	n.d.	1994	==			==		-	n.d.	n.d.	1994	==	
Dornbirn		n.d.	n.d.	1994	==			↗		1998	n.d.	n.d.	2015	n.d.	
Graz		==		1994	==			↘			==			==	
Hallein		==		2003	↘			↘			↘			==	
Innsbruck		==			↘			↓			==			↘	
Klagenfurt		==			==			↓			↘			==	
Region Leoben		==			==			==			↓			n.d.	n.d.
Salzburg		==		2003	↘			↘			↘			==	
St. Pölten	1994	==		**1994**	==		1994	==		1994	↘		1994	↘	
Vienna		==		**1994**	==			↘			↘			==	
Villach		n.d.	n.d.		==			↘			n.d.	n.d.		n.d.	n.d.

[1)] TSP measurements are mostly replaced by PM_{10} monitoring (see page 24). 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

	SO_2			NO			NO_2			CO			O_3		
	Stress in 1993 [3]	Trend last 5 years	Stress in 2016	Stress in 1993 [3]	Trend last 5 years	Stress in 2016	Stress in 1993 [3]	Trend last 5 years	Stress in 2016	Stress in 1993 [3]	Trend last 5 years	Stress in 2016	Stress in 1993 [3]	Trend last 5 years	Stress in 2016
Athens	2007	==		2007	↗		2007	==		2007	↘		2007	↘	
Barcelona	1994	↘		1994	↘		1994	↓			↘		1994	↗	
Basel		==			==			↘			n.d.	n.d.		==	
Belfast		==			↑			↑			↘			==	
Berlin		==			==			↗			↘			==	
Birmingham		==			↘			↘			n.d.	n.d.		↗	
Bratislava	2013	n.d.	n.d.	2013	n.d.	n.d.		n.d.	n.d.		n.d.	n.d.		n.d.	n.d.
Bristol		==			↓.			↘			n.d.	n.d.		==	
Brussels	1995	↘		1995	↗		1995	==.			==		1995	==	
Budapest	1996	↘		2003	↗		2003	==.			↘		2003	↘	
Chemnitz		n.d.	n.d.		↓.			↓			n.d.	n.d.		==	
Copenhagen		==		1994	n.d.	n.d.	1995	↘		1998	↘		1994	↗	
Dresden		==			==			↘			n.d.	n.d.		==	
Edinburgh		==			==			==			==			↘	
Frankfurt		==			↗			==			==			==	
Glasgow	n.d.	n.d.	n.d.	2014	n.d.		2014	n.d.		n.d.	n.d.	n.d.	2014	n.d.	
Gothenburg		==			n.d.	n.d.		↑			↘			==	
Hamburg		==			==			==			==			==	
Karlsruhe		==			↘			↘			↘			↘	
Leeds		==			↘			↘			↘			↘	
Leipzig		==			↗			==			n.d.	n.d.		==	
Lisbon	1997	==		2001	↗		1997	↘			==		1997	↘	
Liverpool		==			==			==			n.d.	n.d.		↘	
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 2016	Stress in 1993 [4)]	Trend last 5 years	Stress in 2016	Stress in 1993 [4)]	Trend last 5 years	Stress in 2016	Stress in 1993 [4)]	Trend last 5 years	Stress in 2016	Stress in 1993 [4)]	Trend last 5 years	Stress in 2016
Luxemburg	1996	n.d.	n.d.	1996	n.d.	n.d	1996	n.d.	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	n.d.	n.d.	1999	↘		2002	↘		1999	↗	
Rhine/Ruhr Area		==			==			↘			n.d.	n.d.		==	
Rotterdam	1995	n.d.	n.d	1995	n.d.	n.d	1995	n.d.	n.d	2003	n.d.	n.d	1995	n.d.	n.d
Sofia	1999	n.d.	n.d	2003	n.d.	n.d	1999	n.d.	n.d	1999	n.d.	n.d	1999	n.d.	n.d
Stockholm		==		1994	n.d.	n.d.	1994	↗		1994	==			↘	
Stuttgart	2007	==		2008	↑		2007	↑		2007	↘		2007	↗	
Thessaloniki	2007	==		2007	==		2007	↗		2007	==.		2007	↘	
Warsaw	1995	↘		2001	↗		1995	↑		1995	↘		1995	↘	
Wiesbaden		==			==			↘			↘			==	
Zagreb		==		n.d.	n.d.	n.d.	1994	==		2005	==		1999	==	
Zurich		==			==			↘			==			==	

Legend:

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

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 2016	Trend 2012-2016
Linz			↘
Bludenz	2005		↘
Dornbirn			↘
Graz			↘
Hallein			↓
Innsbruck			↘
Klagenfurt			↘
Region Leoben	2003		↘
Salzburg			↘
St. Pölten			↘
Vienna			↘
Villach			==
Athens	2007		==
Barcelona			↘
Basel			==
Belfast			==
Berlin			==
Birmingham			↘
Bratislava	2013	n.d.	n.d.
Bristol			↘
Brussels			↘
Budapest	2004		==
Chemnitz			↘
Copenhagen			↘
Dresden			↘
Edinburgh			↘
Frankfurt			==

	PM10		
	Stress in 2002 [5]	Stress in 2016	Trend 2012-2016
Glasgow	2014		n.d.
Gothenburg			==
Hamburg			==
Karlsruhe			==
Leeds			==
Leipzig			↘
Lisbon			==
Liverpool			==
London			↘
Luxemburg		n.d.	n.d.
Lyon			==
Madrid			↘
Mannheim			==
Milan			==
Munich			==
Prague	2007		↘
Riga			==
Rhine/Ruhr Area			↘
Rotterdam		n.d.	n.d.
Sofia		n.d.	n.d.
Stockholm			↘
Stuttgart	2007		==
Thessaloniki	2007		↘
Warsaw			↘
Wiesbaden			↘
Zagreb			==
Zurich			==

Legend:

	Slightly stressed (PM_{10} < 20 µg/m³)
	Medium stressed (PM_{10} < 40 µg/m³)
	Highly stressed (PM_{10} ≥ 40 µg/m³)
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 2016	Trend 2012-2016
Linz			==
Bludenz	n.d.	n.d.	n.d.
Dornbirn	2013		↘
Graz			==
Hallein	2014		n.d.
Innsbruck			↘
Klagenfurt			==
Region Leoben	n.d.	n.d.	n.d.
Salzburg			↘
St. Pölten			↘
Vienna	2010		↘
Villach		n.d.	n.d.
Athens			↘
Barcelona			↘
Basel			==
Belfast	2009		==
Berlin			==
Birmingham	2009		↘
Bratislava	n.d.	n.d.	n.d.
Bristol	2009		==
Brussels			↘
Budapest	2009		↘
Chemnitz			↘
Copenhagen			==
Dresden			↘
Edinburgh	2009		↘
Frankfurt	2010		↘

	$PM_{2,5}$		
	Stress in 2008 [5]	Stress in 2016	Trend 2012-2016
Glasgow	2014		n.d.
Gothenburg			==
Hamburg			==
Karlsruhe	2011		==
Leeds	2009		↘
Leipzig			↘
Lisbon			==
Liverpool	2009		==
London			↘
Luxemburg	n.d.	n.d.	n.d.
Lyon			↘
Madrid			==
Mannheim	2011		↘
Milan			==
Munich	2009		↘
Prague			==
Riga			↘
Rhine/Ruhr Area			↘
Rotterdam		n.d.	n.d.
Sofia			n.d.
Stockholm			==
Stuttgart	2011		↗
Thessaloniki	n.d.	n.d.	n.d.
Warsaw			↘
Wiesbaden			↘
Zagreb			==
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 2016 [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 2016 [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	2014	2015	2016
Linz	62	66	80	46	68	71	41	47	30	45	45	25	33	27	23	9
Bludenz	-	-	-	-	13	45	16	13	12	17	14	11	12	2	1	5
Dornbirn	-	-	38	21	22	40	18	20	14	21	13	10	11	3	2	1
Graz	159	131	131	117	127	113	76	73	57	69	78	49	44	27	39	39
Hallein	-	28	49	26	27	50	20	13	20	29	19	18	27	6	1	3
Innsbruck	-	50	61	52	55	83	46	28	26	29	46	23	25	8	18	20
Klagenfurt	36	58	74	80	82	79	42	33	34	43	46	27	21	0	17	17
Region Leoben	26	7	42	29	36	49	36	25	19	20	31	3	4	0	1	1
Salzburg	-	34	62	34	39	56	25	34	37	41	31	17	24	10	6	5
St. Pölten	-	-	58	79	87	57	23	20	23	38	39	22	21	13	6	6
Vienna	-	57	95	54	92	108	48	39	40	87	62	35	35	27	14	11
Villach	-	24	35	25	29	45	10	9	17	7	18	2	0	0	5	3

\- No Data

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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	2014	2015	2016
Athens	-	-	-	-	-	-	178	163	122	99	101	40	-	-	89	72
Barcelona	-	86	-	47	74	100	97	72	94	23	43	42	7	19	22	13
Basel	11	22	23	16	15	24	12	6	10	11	8	4	5	2	4	0
Belfast	16	7	33	8	5	7	5	7	3	10	10	7	5	5	4	7
Berlin	60	91	117	62	74	71	30	24	39	46	54	31	55	48	36	18
Birmingham	2	1	5	4	5	9	18	10	7	8	18	17	9	8	6	6
Bratislava	-	-	-	-	-	-	-	-	-	-	-	-	60	41	40	-
Bristol	7	1	9	12	4	6	15	15	7	4	12	8	2	4	3	5
Brussels	52	153	163	127	67	56	56	66	66	45	87	55	-	33	19	16
Budapest	-	-	-	178	160	162	117	96	71	84	86	60	64	60	105	46
Chemnitz	41	20	35	12	59	65	27	19	32	34	39	28	32	36	11	2
Copenhagen	-	59	91	-	-	68	60	59	59	18	46	29	14	26	22	11
Dresden	53	36	53	27	78	49	27	35	42	40	46	22	34	36	21	10
Edinburgh	3	8	2	0	3	2	6	0	3	0	0	2	3	0	0	0
Frankfurt	42	44	51	19	48	24	33	22	36	26	42	19	21	17	18	7
Glasgow	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0	0
Gothenburg	1	10	12	2	7	13	3	4	0	0	21	11	17	12	15	13
Hamburg	33	43	62	20	45	31	26	18	15	26	46	12	11	26	18	7
Karlsruhe	6	33	33	25	22	34	16	10	20	23	18	8	13	12	7	1
Leeds	3	3	9	4	15	10	11	8	16	11	26	18	4	15	13	5
Leipzig	109	63	92	49	82	74	40	40	51	49	69	39	41	43	26	21
London	28	29	61	107	121	157	124	157	47	22	57	23	28	14	10	14
Lisbon	230	222	183	147	180	145	154	82	92	90	113	-	38	31	66	20

- No Data

	PM_{10} number of days >50 µg/m³															
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Liverpool	4	2	1	14	5	8	11	12	6	2	8	4	6	6	1	0
Lyon	-	83	124	71	153	-	142	79	39	81	93	69	29	24	39	32
Madrid	-	98	-	121	159	181	123	65	35	18	41	22	8	12	16	19
Mannheim	25	44	36	41	43	20	26	12	23	24	27	23	17	17	15	1
Milan	148	177	137	139	152	149	132	115	106	85	132	107	81	68	101	73
Munich	64	75	123	59	107	92	53	60	52	65	48	27	39	16	13	7
Prague	-	-	-	-	-	-	132	84	48	71	68	73	55	59	32	27
Riga	57	74	105	160	88	244	148	126	46	31	11	25	48	39	27	24
Rhine/Ruhr Area	40	48	58	38	21	-	71	68	70	54	62	41	-	24	31	10
Rotterdam	98	103	123	54	30	31	26	12	12	12	-	16	5	-	-	-
Sofia	-	-	225	178	162	-	195	199	106	134	134	-	110	105	74	-
Stockholm	101	113	80	80	80	74	75	77	65	46	58	39	52	36	19	22
Stuttgart	-	-	-	-	-	-	110	14	19	40	42	15	27	19	3	63
Thessaloniki	-	-	-	-	-	-	152	155	80	96	87	92	-	-	22	61
Warsaw	-	-	89	184	162	192	136	133	148	151	129	90	75	84	80	85
Wiesbaden	15	35	19	11	18	32	20	8	13	5	25	8	11	8	8	2
Zagreb	-	-	-	75	89	134	108	116	61	73	101	87	-	92	64	75
Zurich	18	23	38	23	15	39	17	11	11	12	11	7	11	3	5	2

- No Data

Anzahl der Überschreitungen des 1h-Grenzwertes für NO_2 von 200 µg/m³ in den Jahren 2004 bis 2016

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 2016
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	2014	2015	2016
Linz	0	1	4	4	1	5	3	6	7	15	1	4	5
Bludenz	0	0	0	0	0	0	0	0	0	0	0	0	0
Dornbirn	-	0	0	0	0	0	0	0	0	0	0	0	0
Graz	0	0	4	0	0	0	1	0	0	0	0	0	0
Hallein	0	0	1	3	0	0	0	0	0	0	0	0	0
Innsbruck	0	0	4	0	0	1	0	0	3	0	0	0	0
Klagenfurt	-	1	1	1	0	0	1	1	1	0	0	0	0
Region Leoben	0	0	0	0	0	0	0	0	0	0	0	0	0
Salzburg	0	0	2	1	2	4	3	0	0	0	0	0	0
St. Pölten	0	0	0	0	1	0	0	0	0	0	-	1	0
Vienna	8	24	26	11	17	4	7	5	0	0	0	3	0
Villach	0	0	0	0	0	0	0	0	0	0	0	0	0
Athens	-	-	-	192	56	35	8	1	0	-	-	1	5
Barcelona	13	-	18	22	13	9	0	12	5	3	1	2	4
Basel	0	0	0	0	0	0	0	0	0	0	0	0	0
Belfast	0	4	5	0	3	0	0	0	0	2	5	7	10
Berlin	-	-	-	6	0	8	6	3	5	8	3	1	3
Birmingham	0	2	0	0	3	0	7	4	0	1	5	1	6
Bratislava	-	-	-	-	-	-	-	-	-	2	0	0	-
Bristol	0	22	13	8	5	11	3	0	0	0	0	0	0
Brussels	24	90	2	2	6	1	1	3	2	-	3	9	3
Budapest	1	25	19	9	1	0	1	3	4	5	1	2	3
Chemnitz	1	0	0	1	0	2	0	2	0	0	0	0	0
Copenhagen	-	-	-	-	-	-	-	-	0	-	-	-	0
Dresden	0	0	0	0	0	0	0	0	0	0	9	5	0
Edinburgh	0	0	0	0	6	0	0	0	0	0	0	-	0
Frankfurt	0	10	3	6	2	16	5	8	5	0	2	12	6
Glasgow	-	-	-	-	-	-	-	-	-	-	14	4	6

- No Data

	NO_2 number of 1 h mean values >200 µg/m³												
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Gothenburg	2	0	7	1	1	0	3	8	1	17	2	2	13
Hamburg	0	0	26	19	30	29	24	10	2	5	11	7	11
Karlsruhe	5	0	0	0	3	3	4	2	8	0	2	1	0
Leeds	0	0	0	0	8	0	1	0	0	0	0	0	0
Leipzig	1	39	0	0	0	0	0	0	0	1	0	1	0
Liverpool	0	458	0	0	0	0	0	0	0	0	0	0	0
Lisbon	52	-	80	39	20	69	21	37	-	15	20	20	14
London	542	139	686	458	822	486	539	229	143	60	60	58	64
Luxemburg	-	267	-	-	-	-	0	-	-	-	-	-	-
Lyon	35	0	-	139	66	28	181	150	66	33	32	34	18
Madrid	83	-	208	267	119	150	76	103	52	37	45	95	46
Mannheim	0	69	0	0	0	0	1	1	0	0	0	3	0
Milan	47	1	123	-	241	101	25	132	99	35	31	57	7
Munich	11	0	103	69	56	95	192	50	27	50	24	30	13
Prague	-	0	-	1	106	98	56	51	4	6	5	16	2
Riga	0	0	0	0	0	0	0	0	0	0	0	2	0
Rhine/Ruhr Area	0	24	-	0	0	0	1	0	0	-	0	0	0
Rotterdam	10	3	2	0	0	0	0	-	0	0	-	-	-
Sofia	7	450	-	24	155	95	30	55	-	1	1	2	-
Stockholm	0	3	1	3	1	0	3	1	0	2	0	1	0
Stuttgart	-	-	-	5	9	22	6	6	3	4	0	0	35
Thessaloniki	-	3	-	3	1	0	0	0	0	-	-	0	0
Warsaw	0	0	5	17	0	0	1	5	1	8	1	6	3
Wiesbaden	0	0	2	3	1	7	1	3	2	1	0	2	0
Zagreb	0	0	0	0	0	0	0	0	0	-	2	1	0
Zurich	0	0	0	0	0	0	0	0	0	0	0	0	0

- No Data

Luftgütevergleich

2016

Jahresmittelwerte (Gebietsmittel)

Comparison of The Air Quality

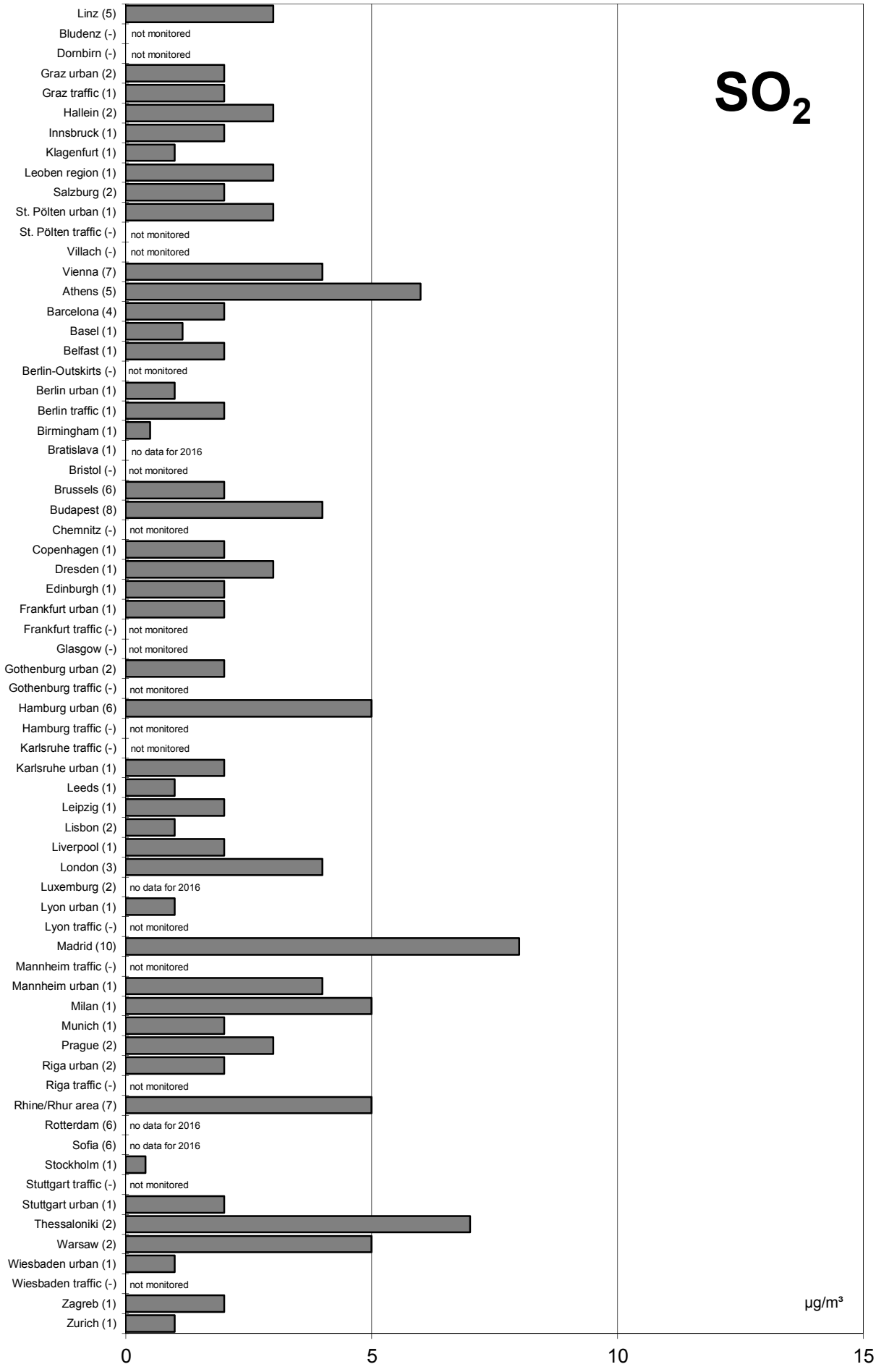
2016

Annual Mean Values

Comparison of The Air Quality in 2016

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

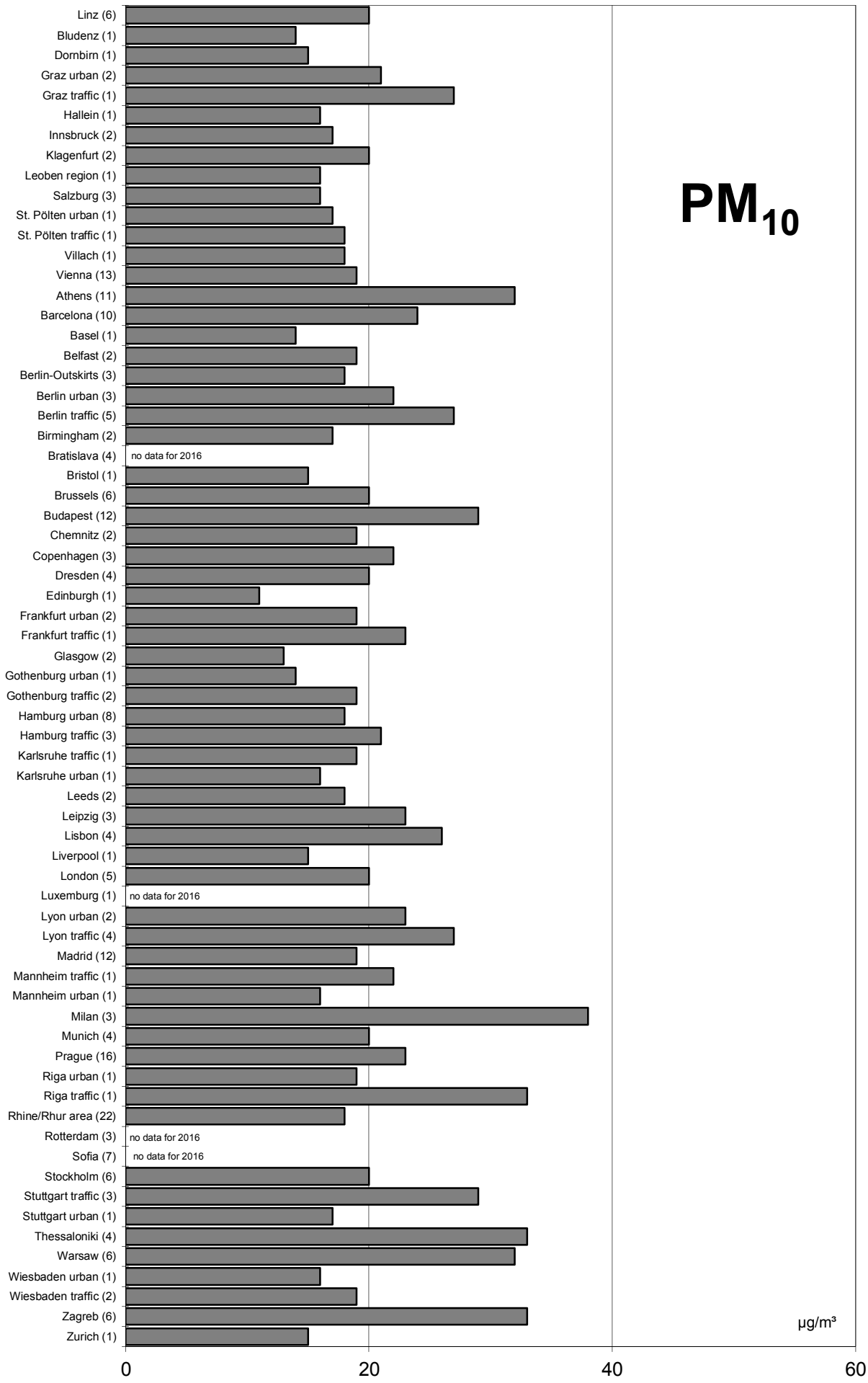
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

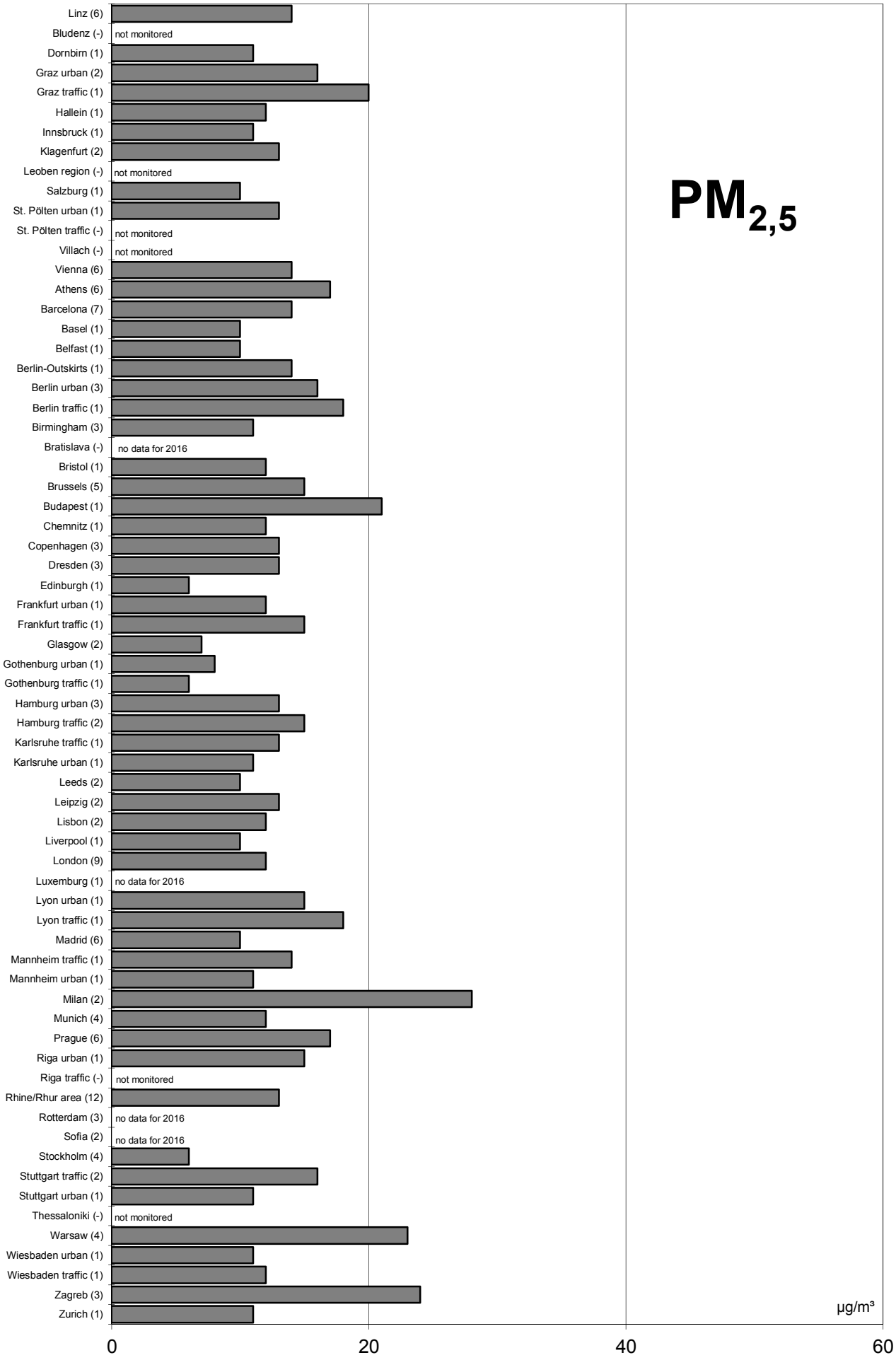
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

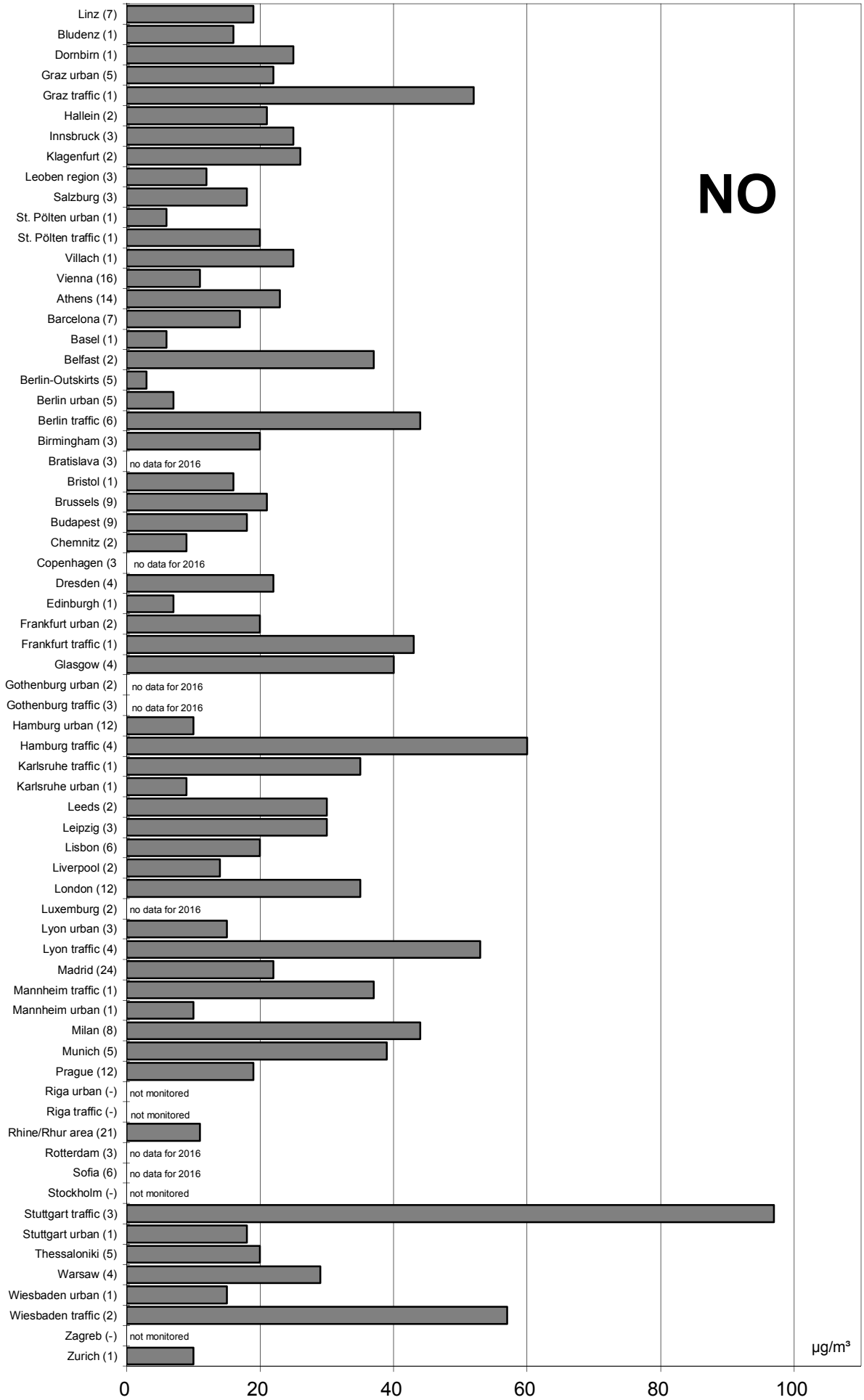
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

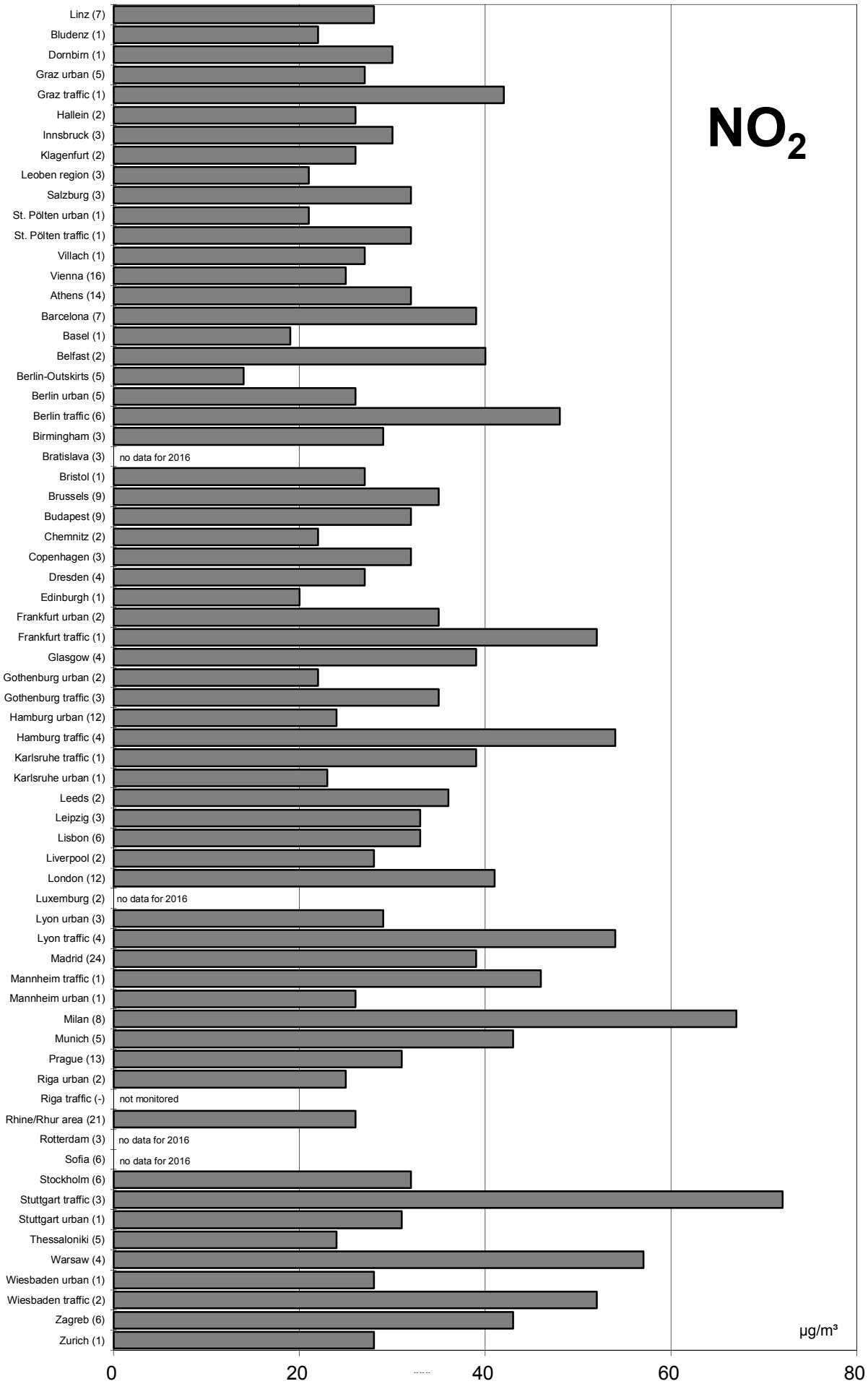
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

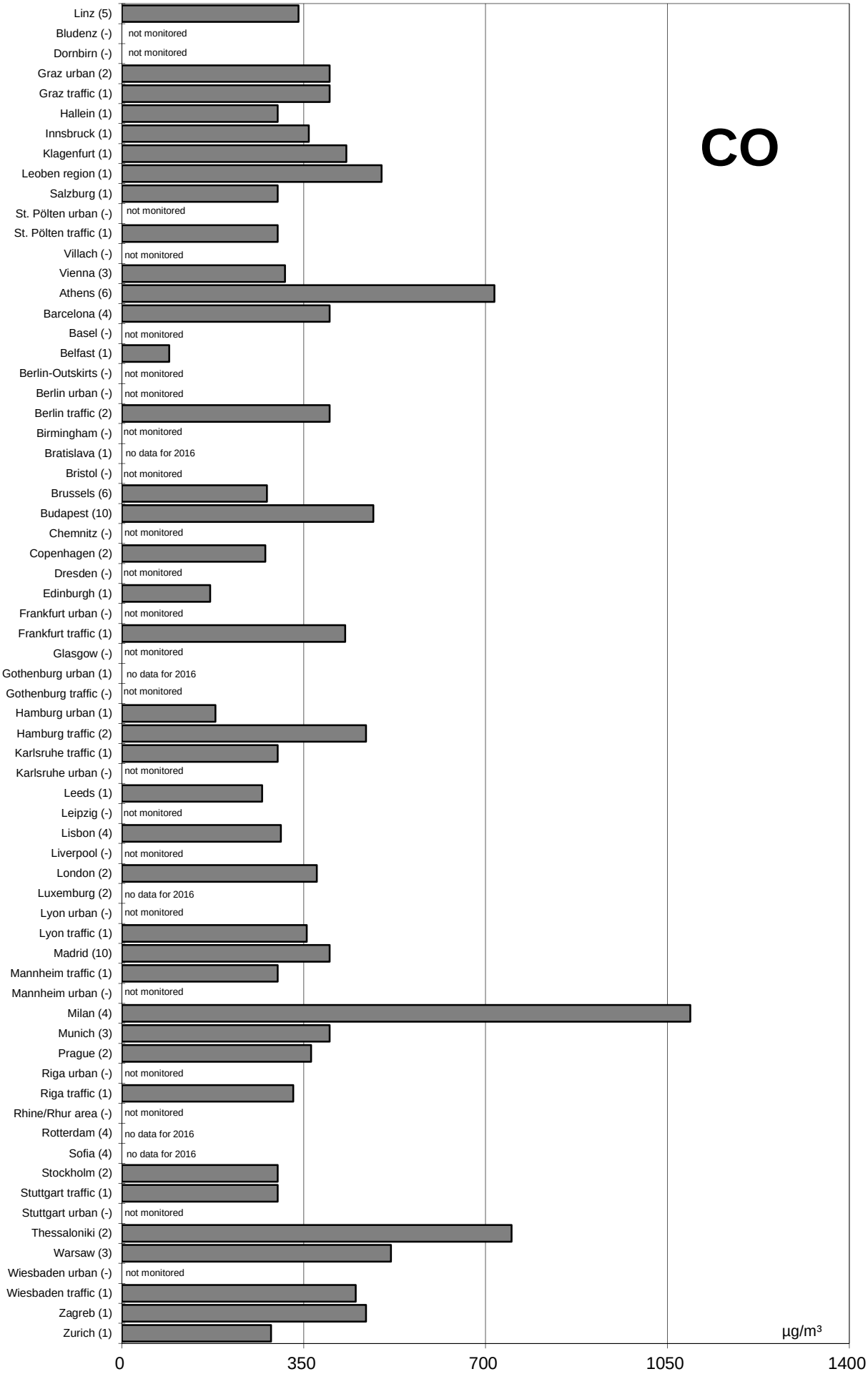
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

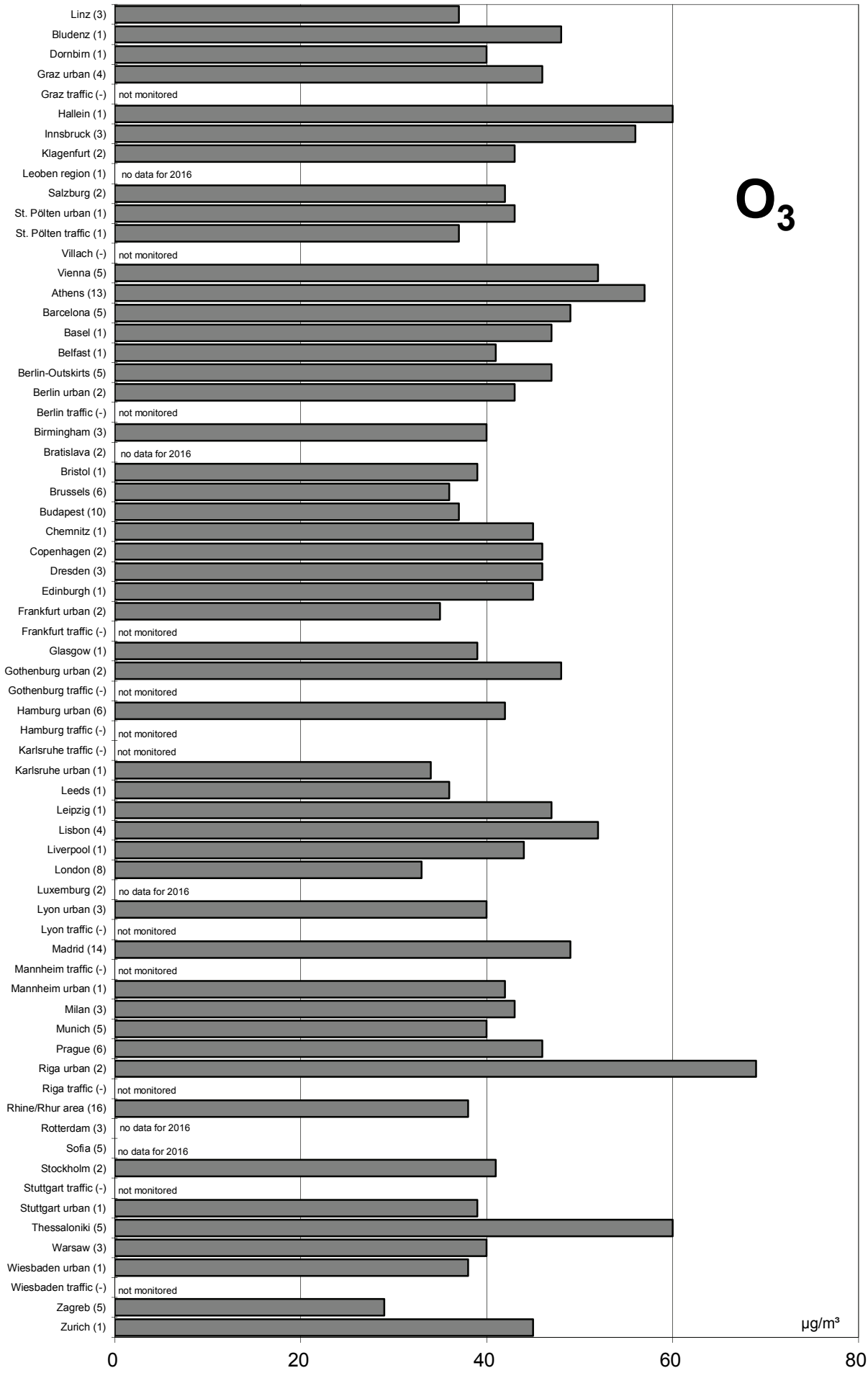
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

(in parentheses: number of monitoring stations)



Luftgütevergleich

2016

max. Tagesmittelwerte

Comparison of The Air Quality

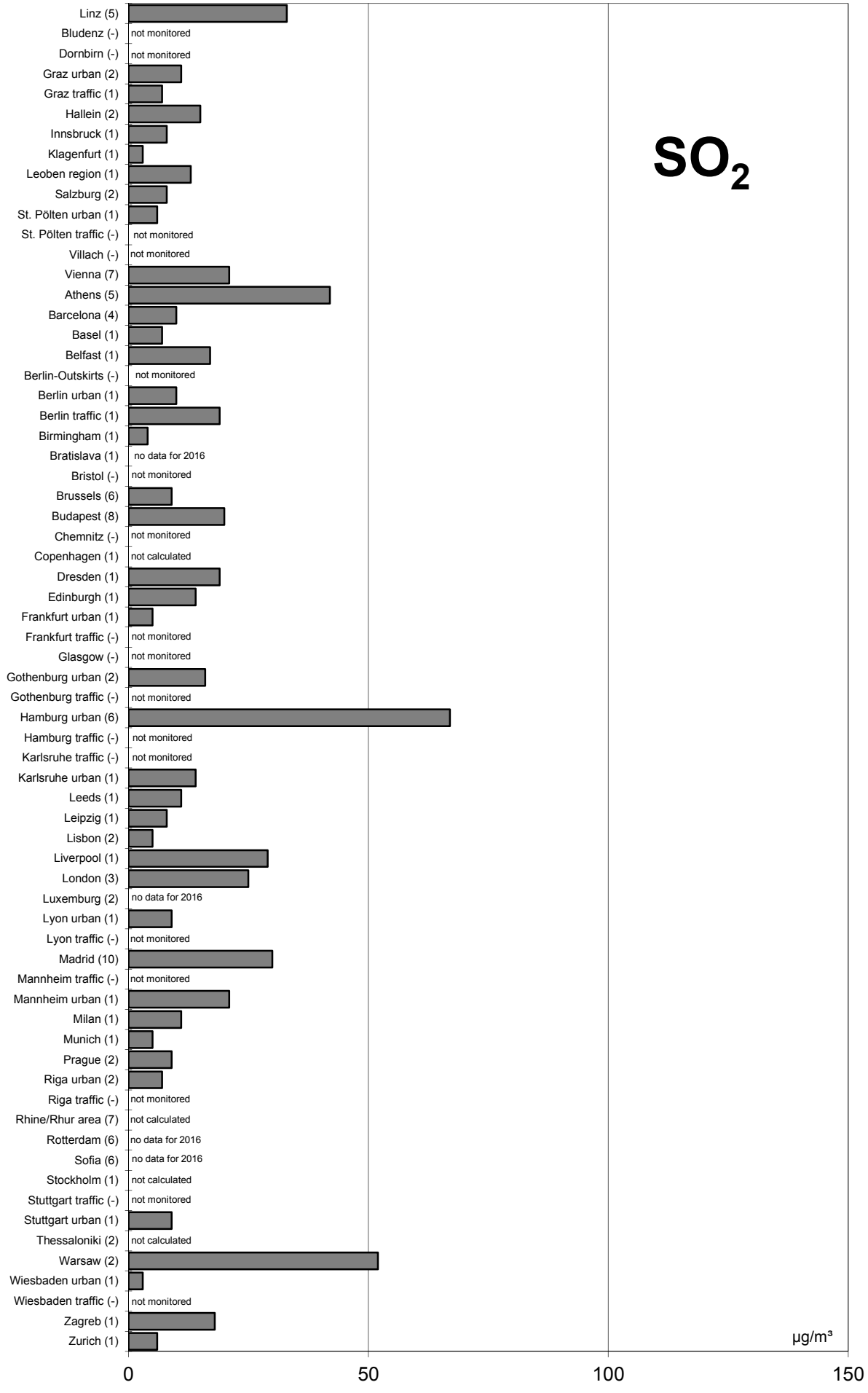
2016

Max. Daily Mean Values

Comparison of The Air Quality in 2016

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

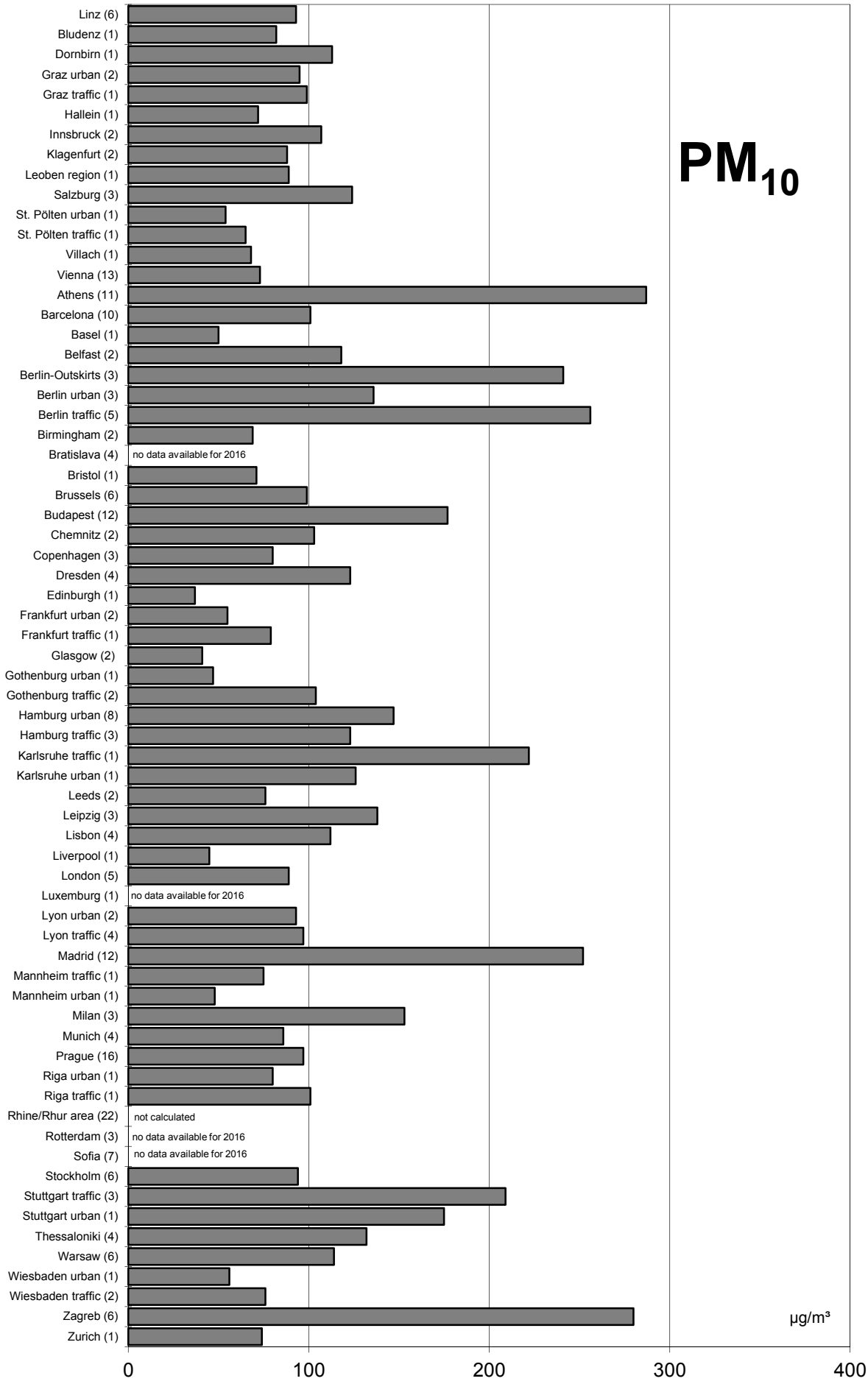
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

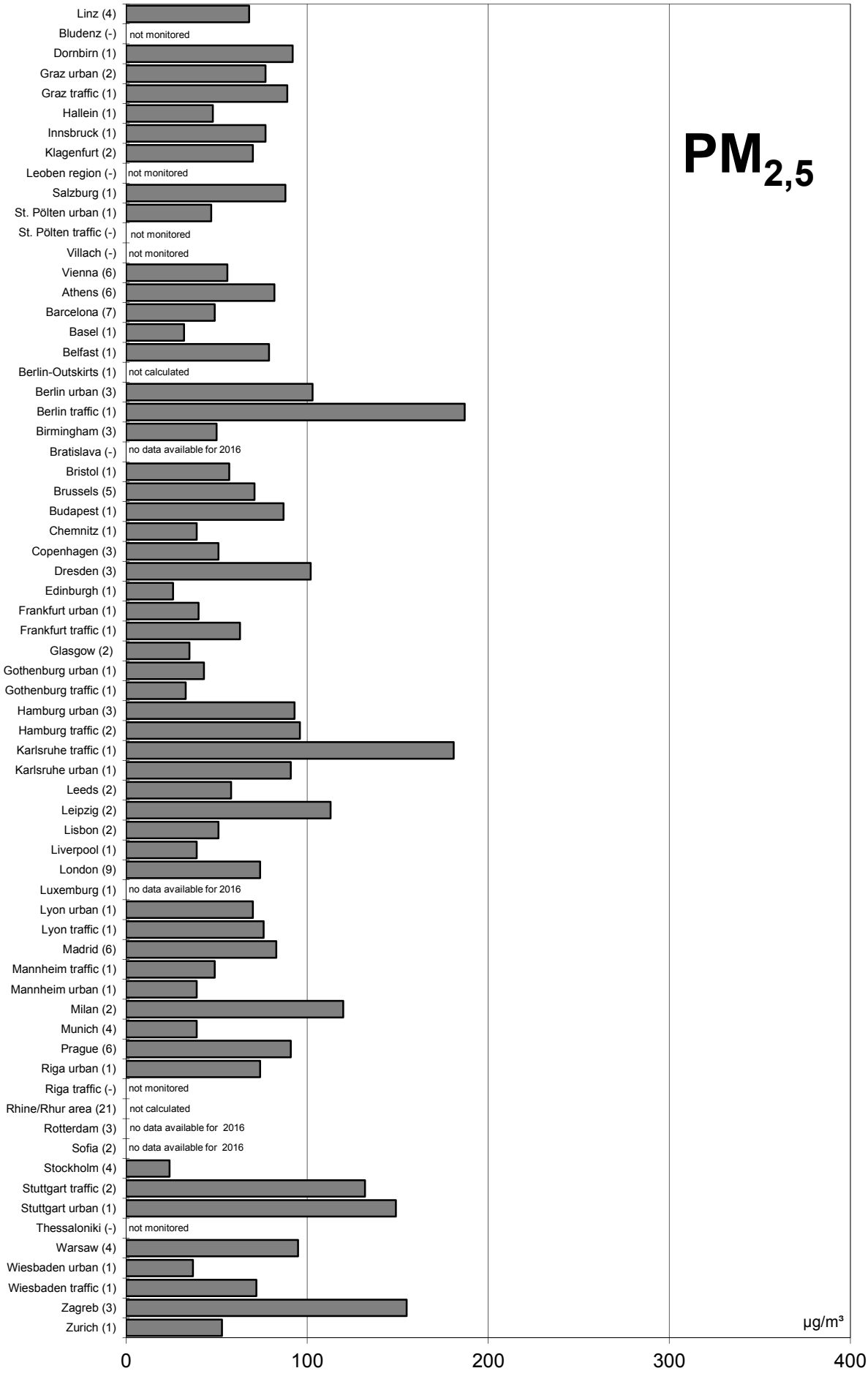
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

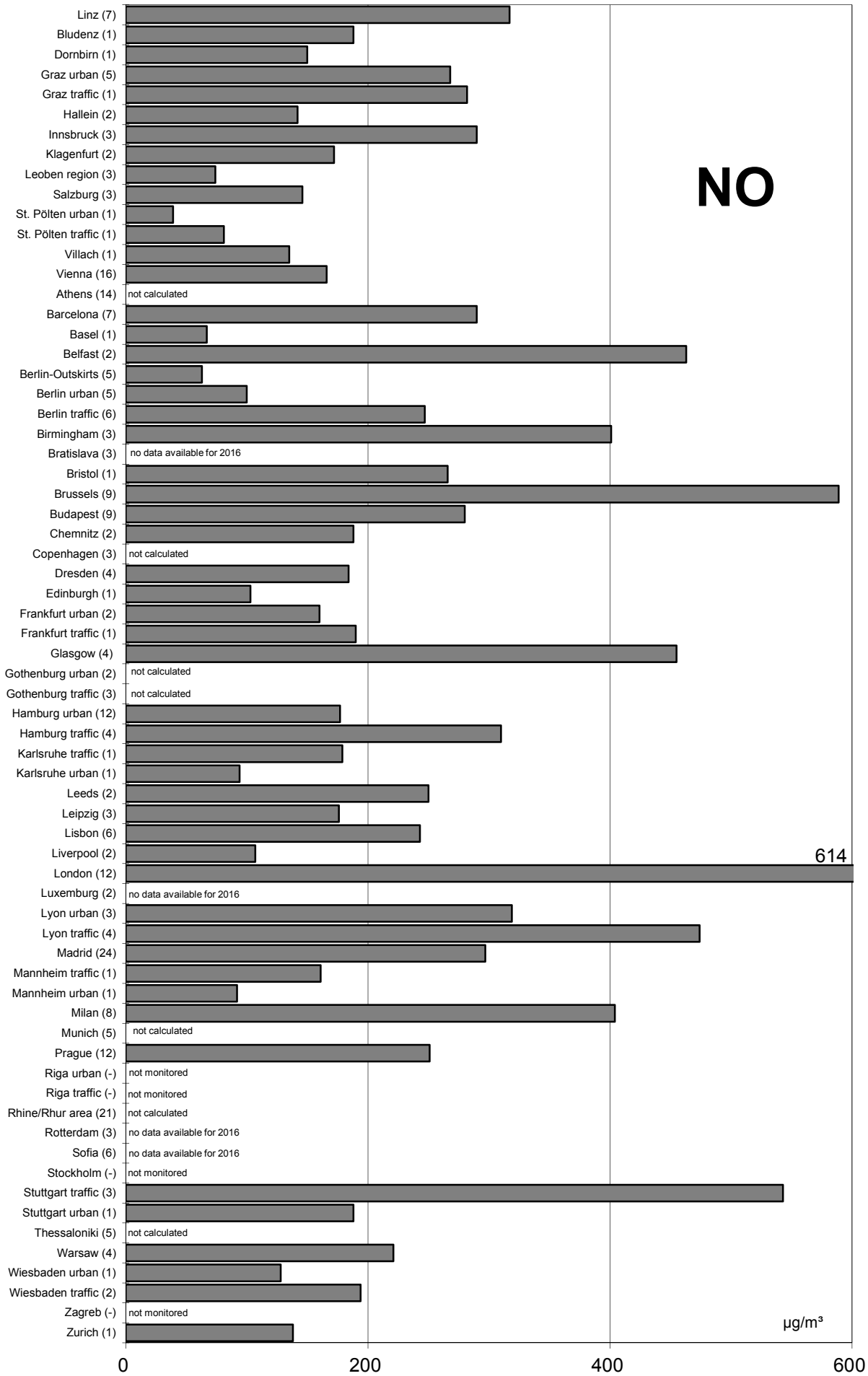
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

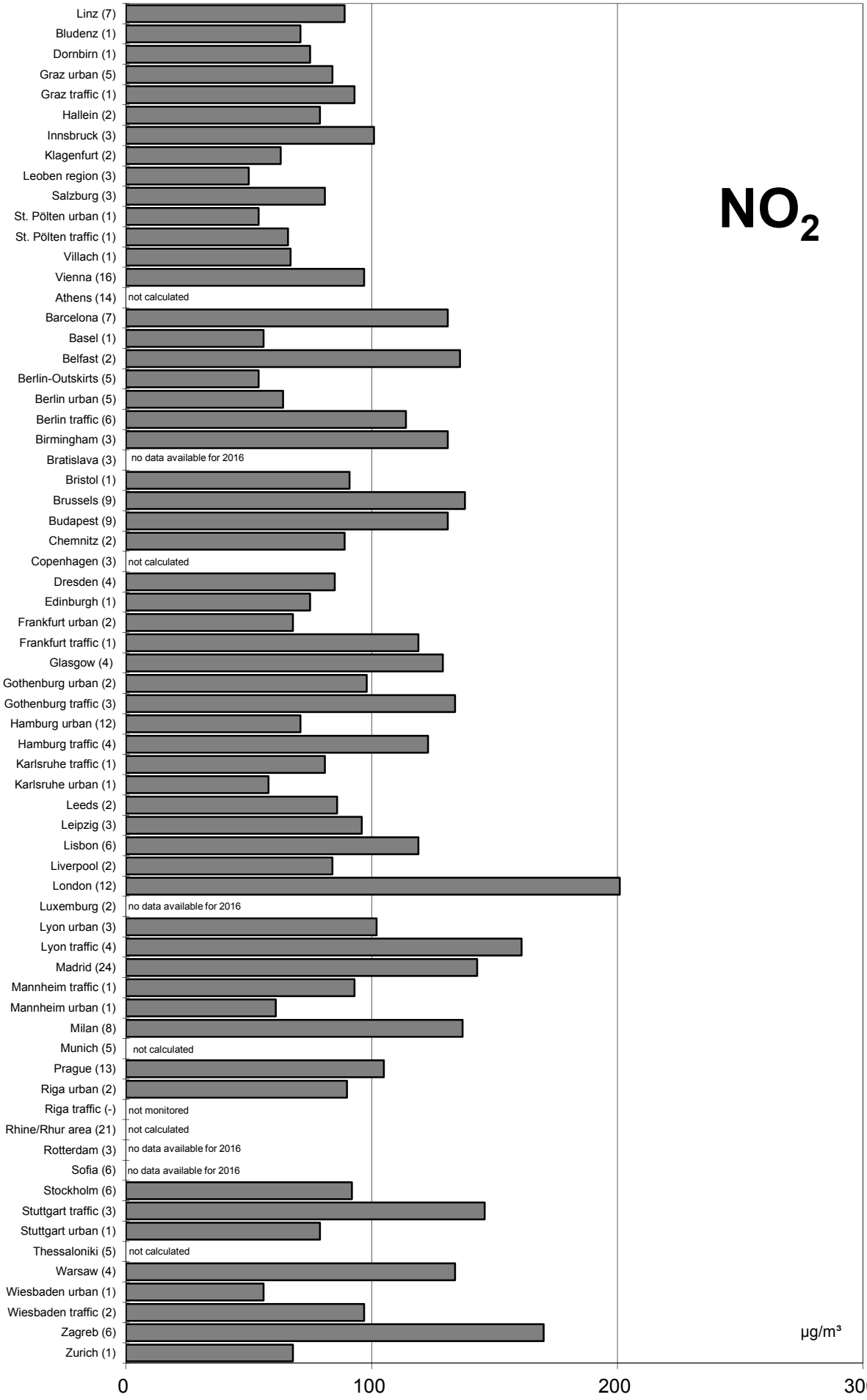
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

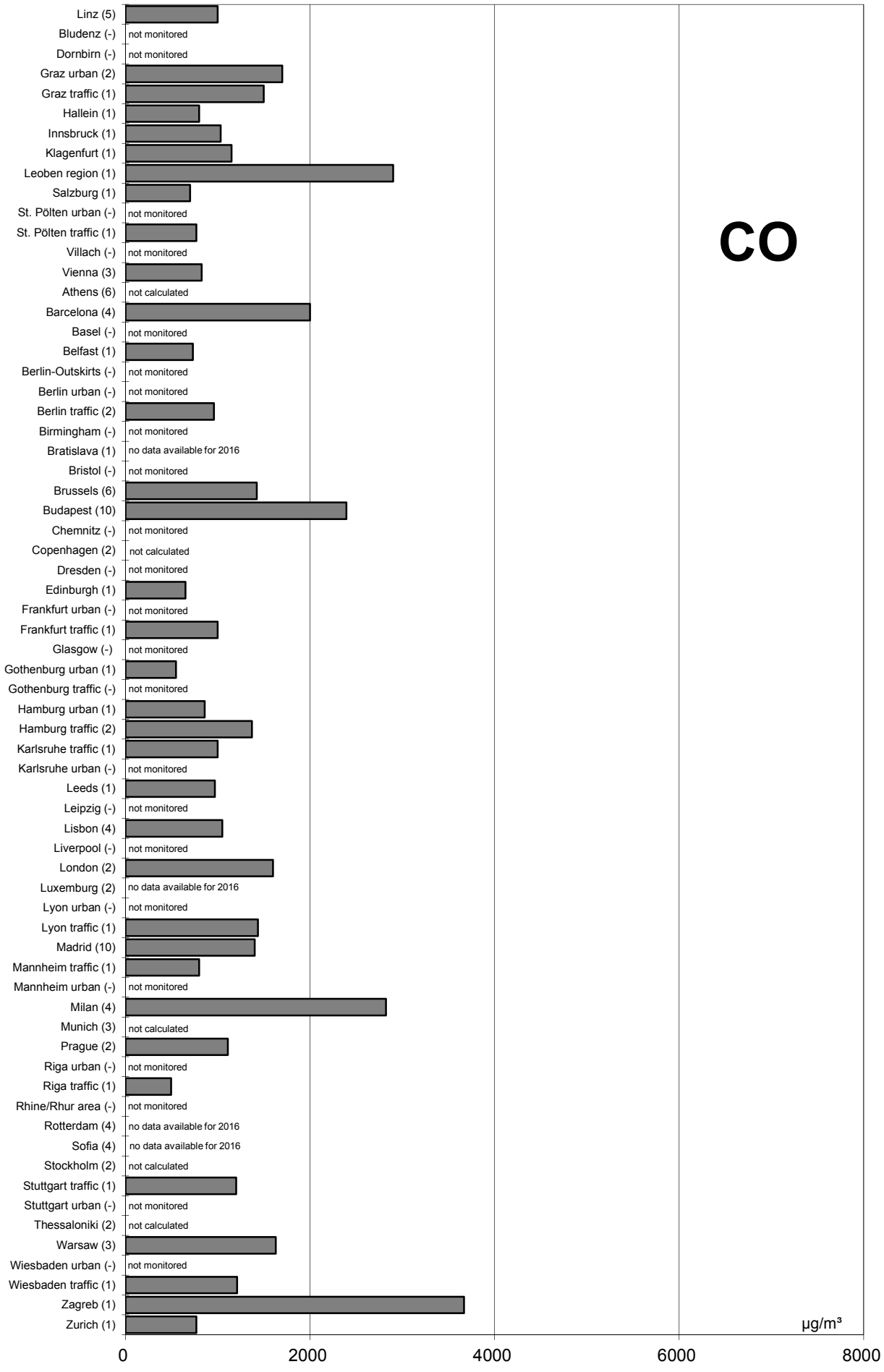
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

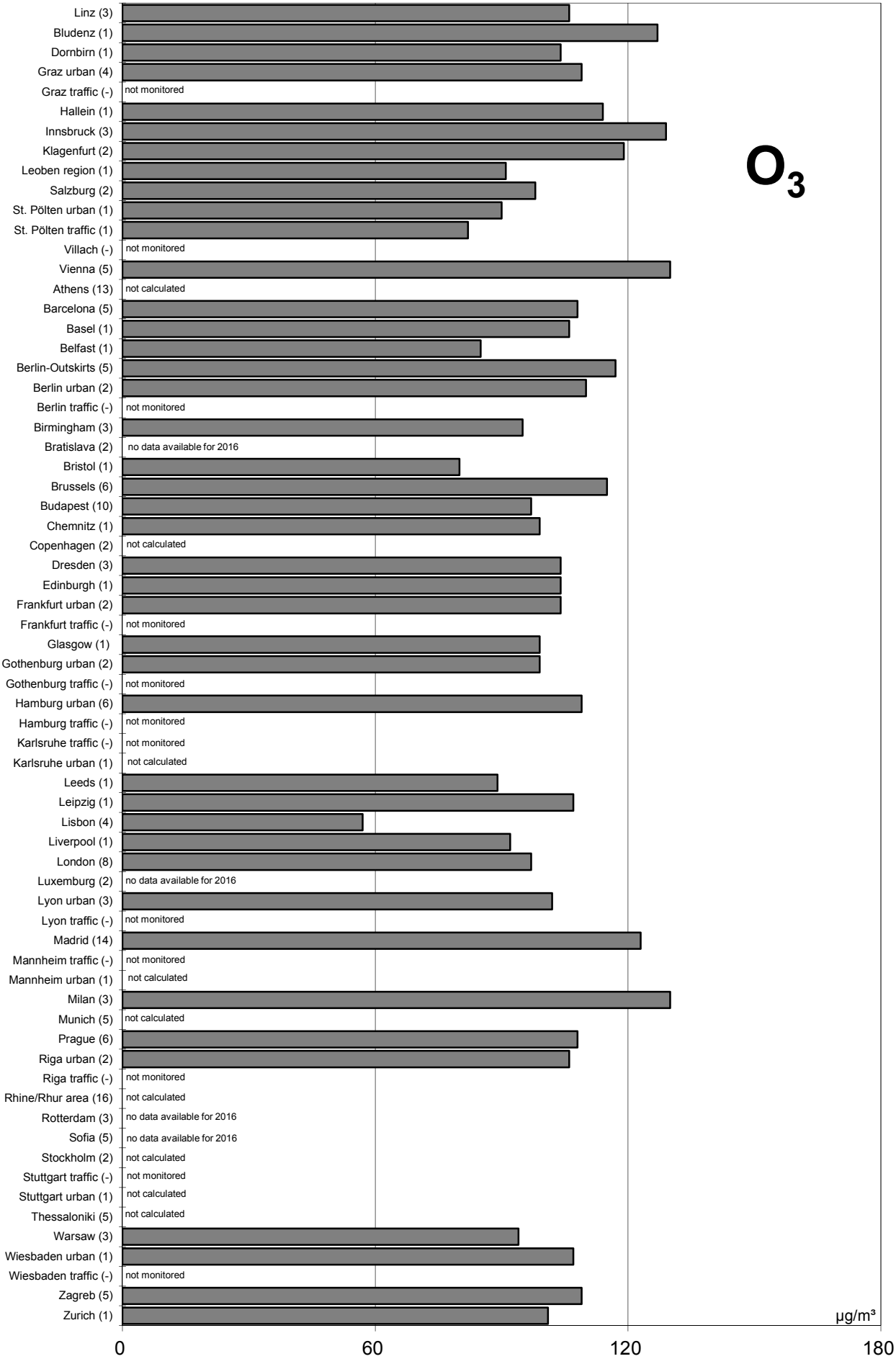
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

(in parentheses: number of monitoring stations)



Luftgütevergleich

2016

max. 1h-Mittelwerte

Comparison of The Air Quality

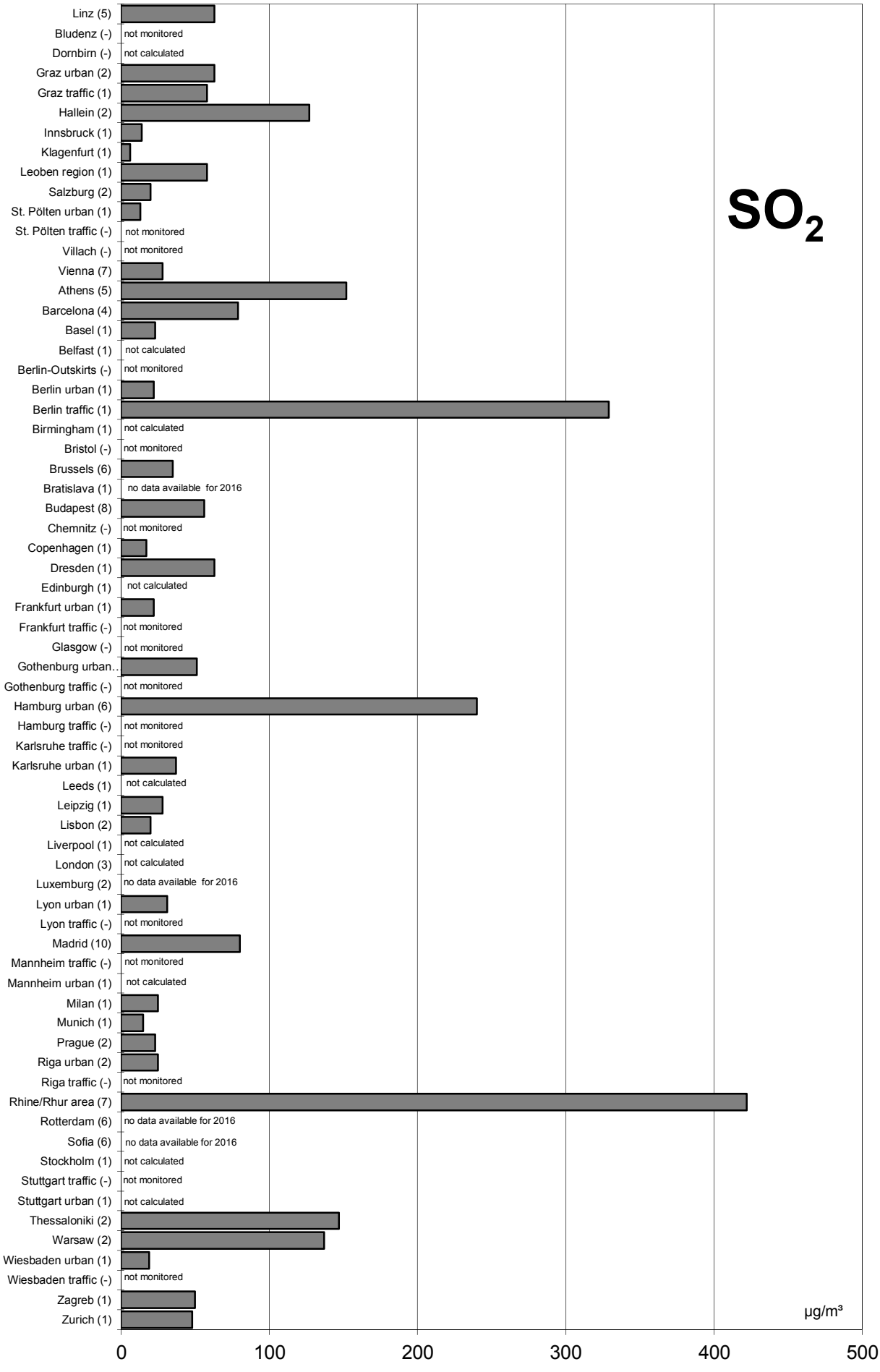
2016

Max. 1h-Mean Values

Comparison of The Air Quality in 2016

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

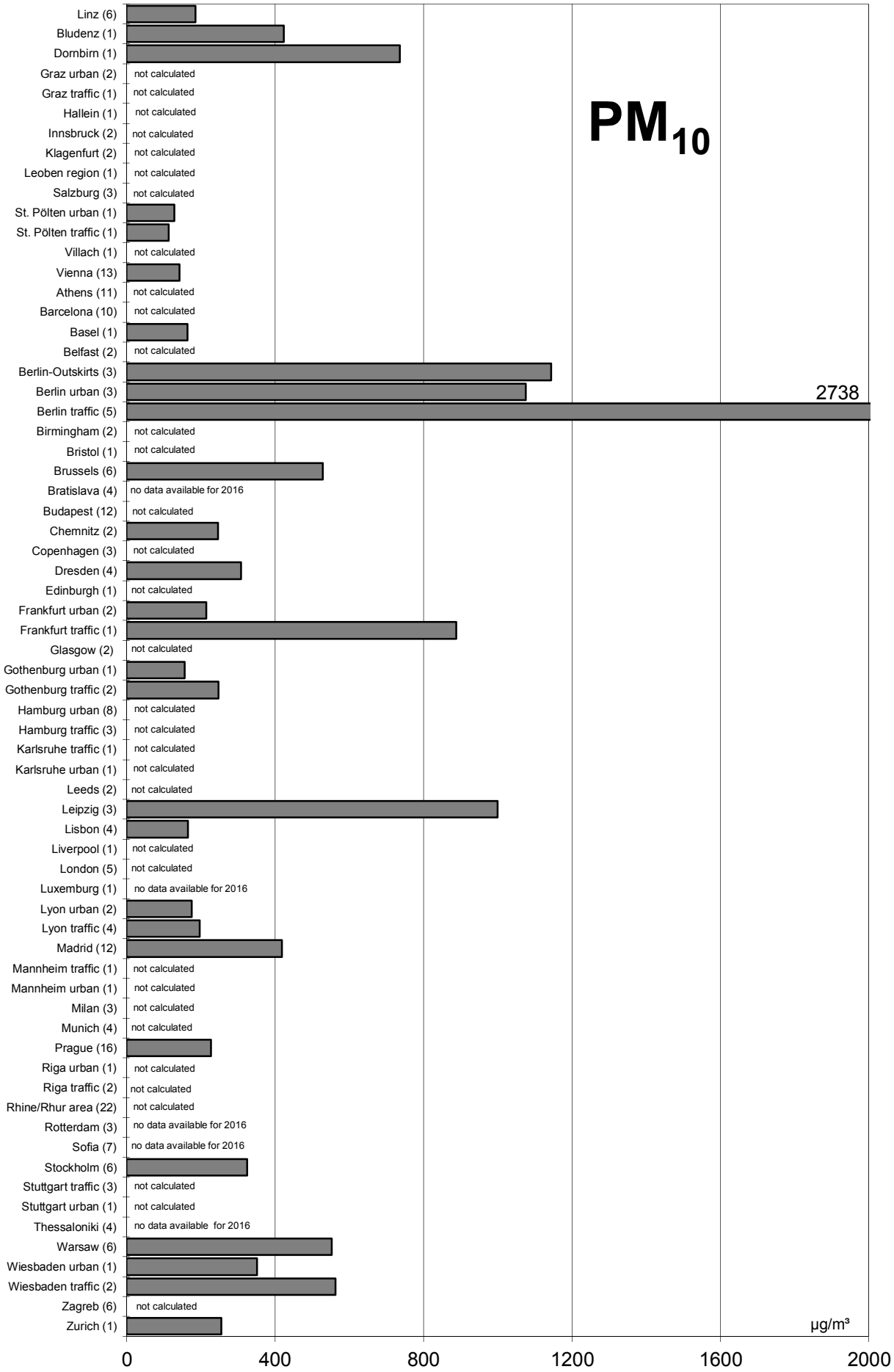
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

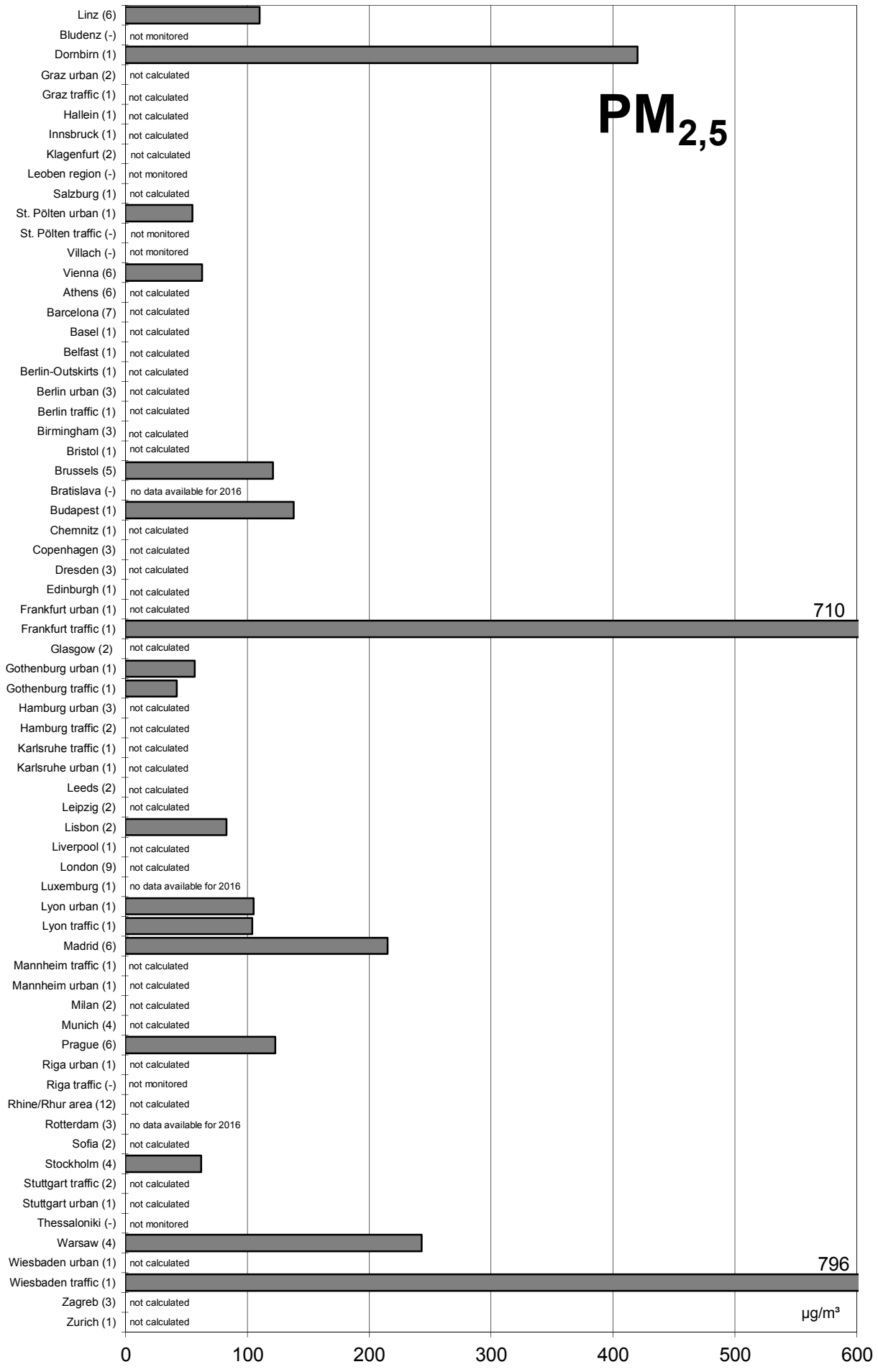
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

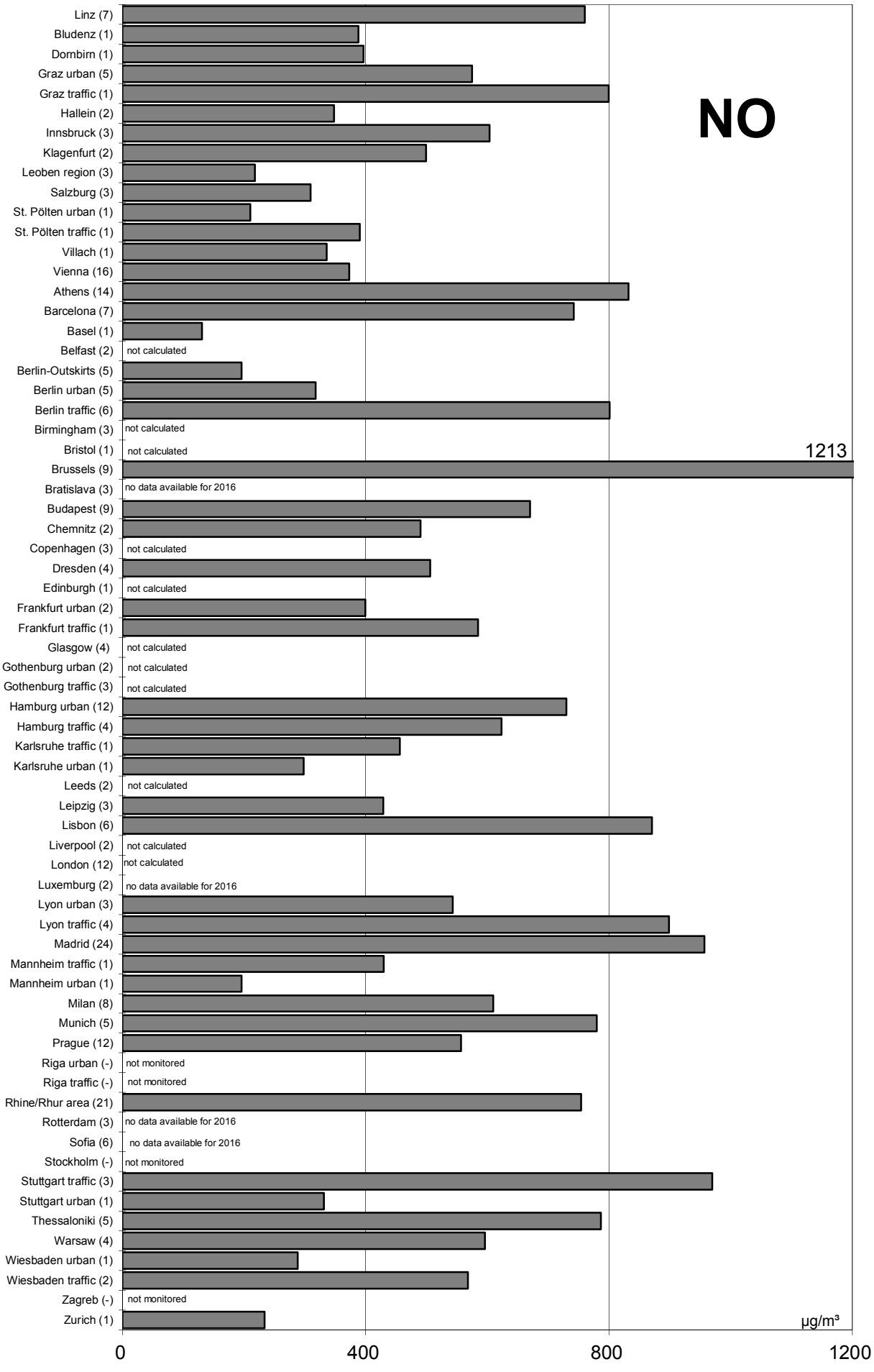
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

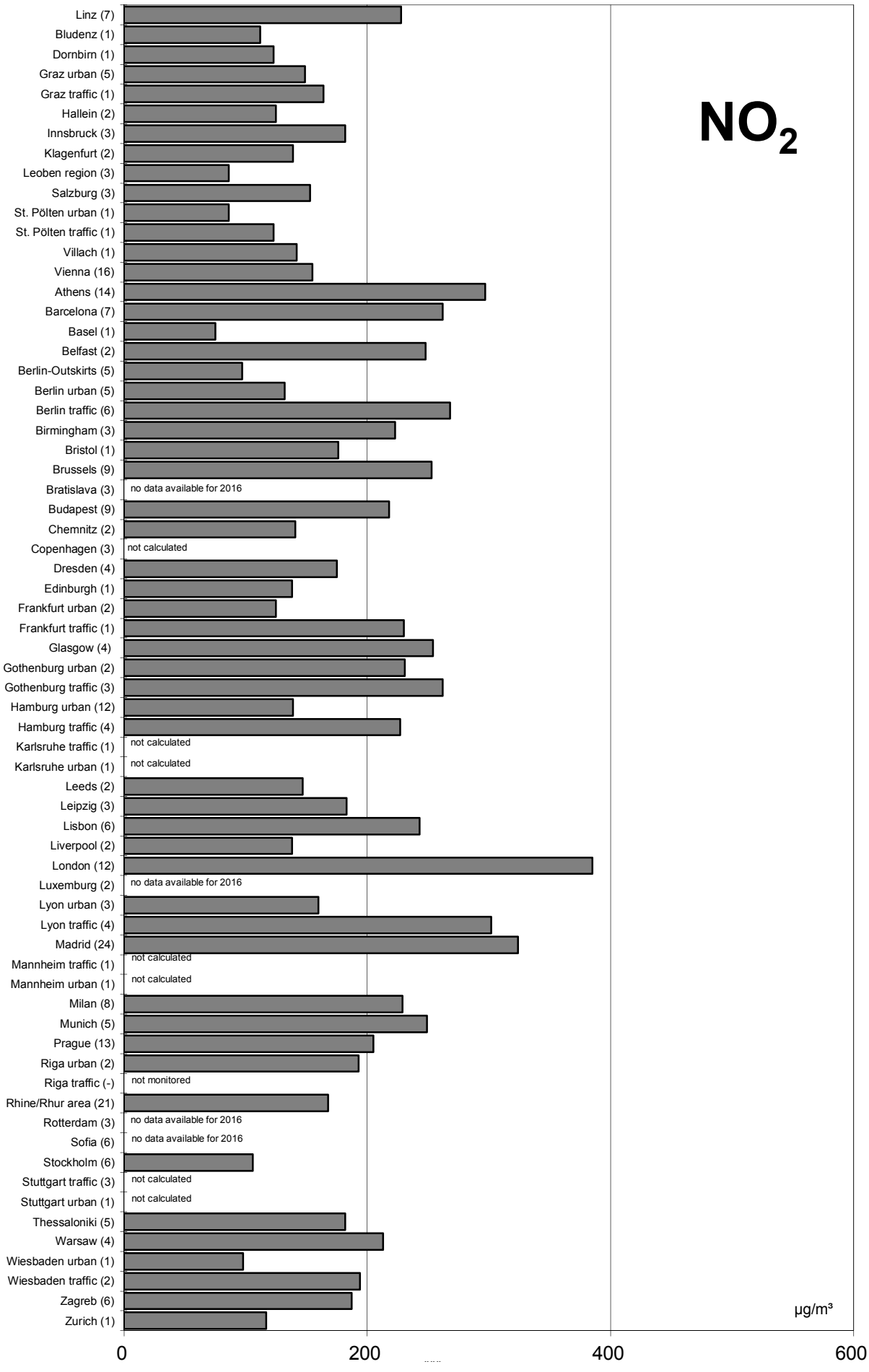
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

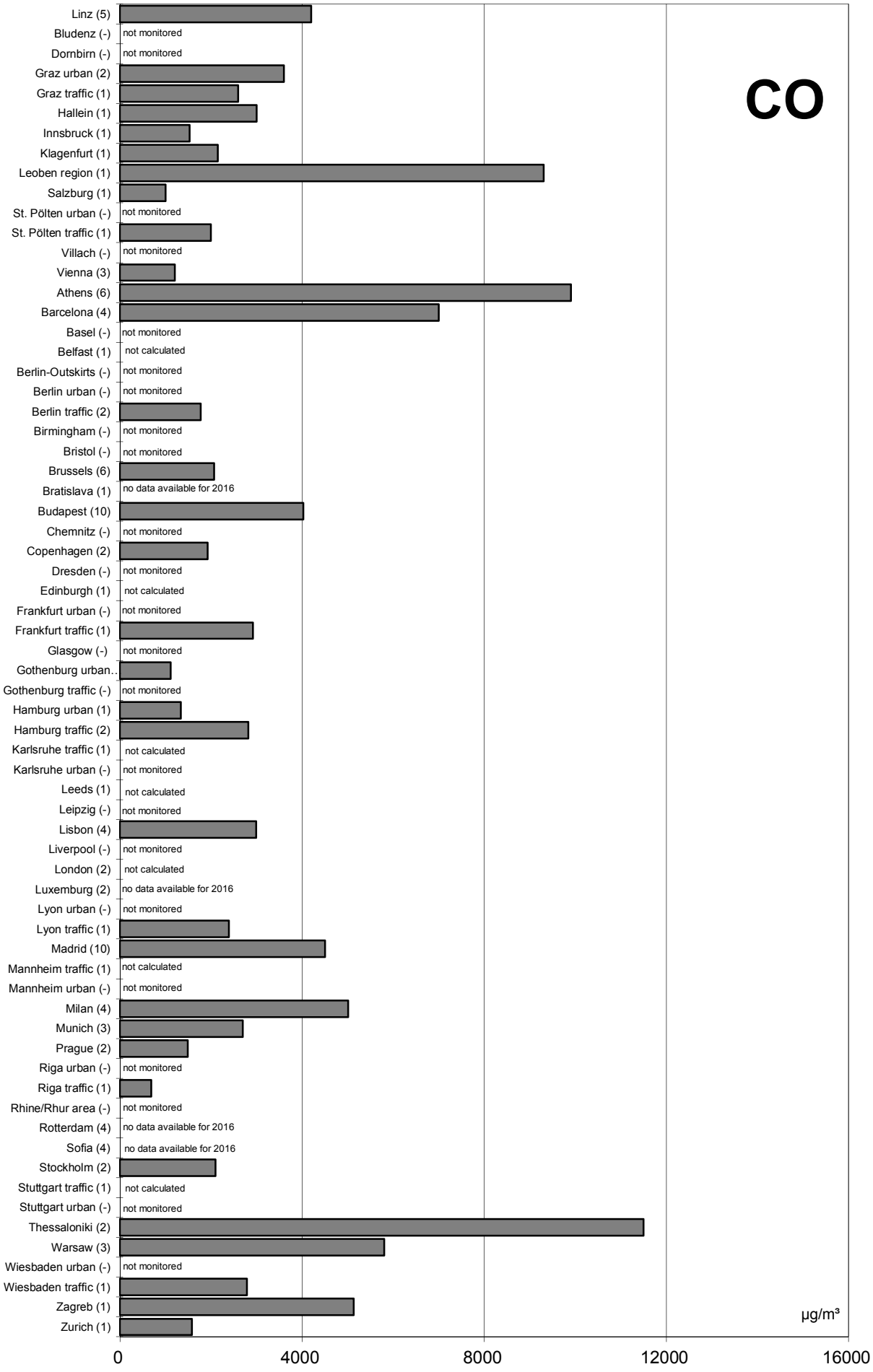
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

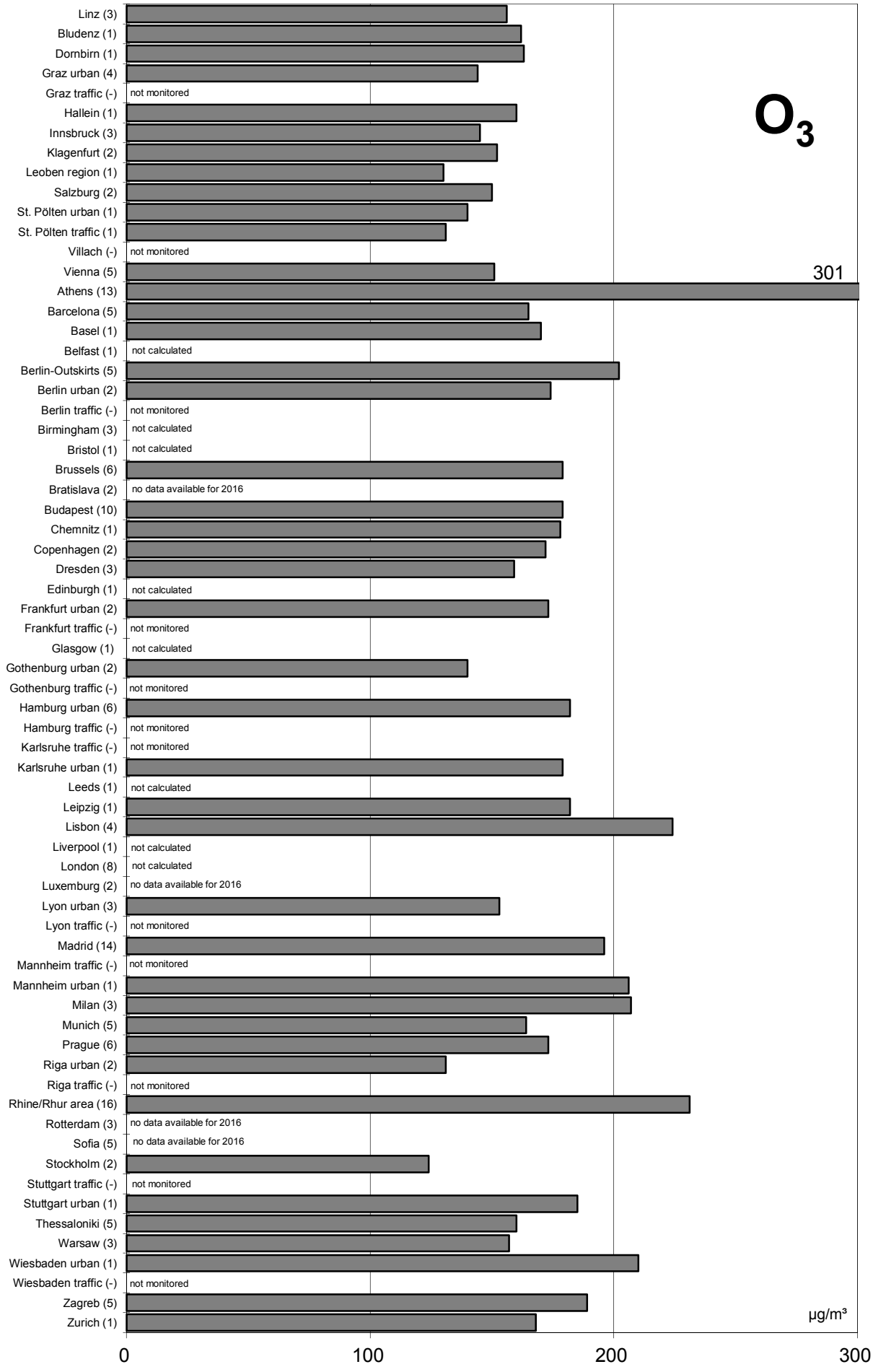
(in parentheses: number of monitoring stations)



Comparison of The Air Quality in 2016

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

(in parentheses: number of monitoring stations)



Jahresvergleich

1992 - 2016

Jahresmittelwerte

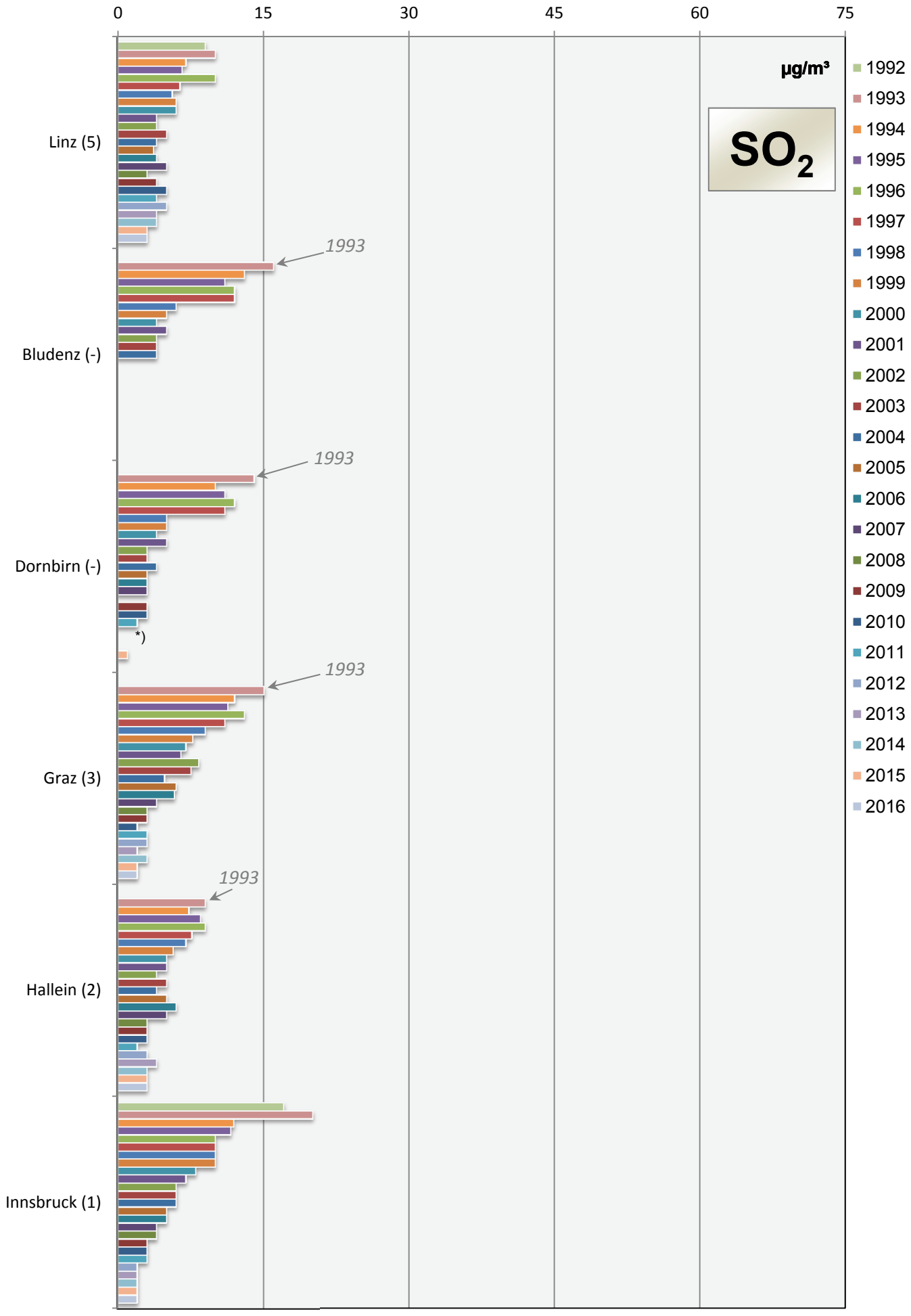
Comparison of The Air Quality Over The Years

1992 - 2016

Annual Mean Values

Comparison of The Air Quality 1992 - 2016

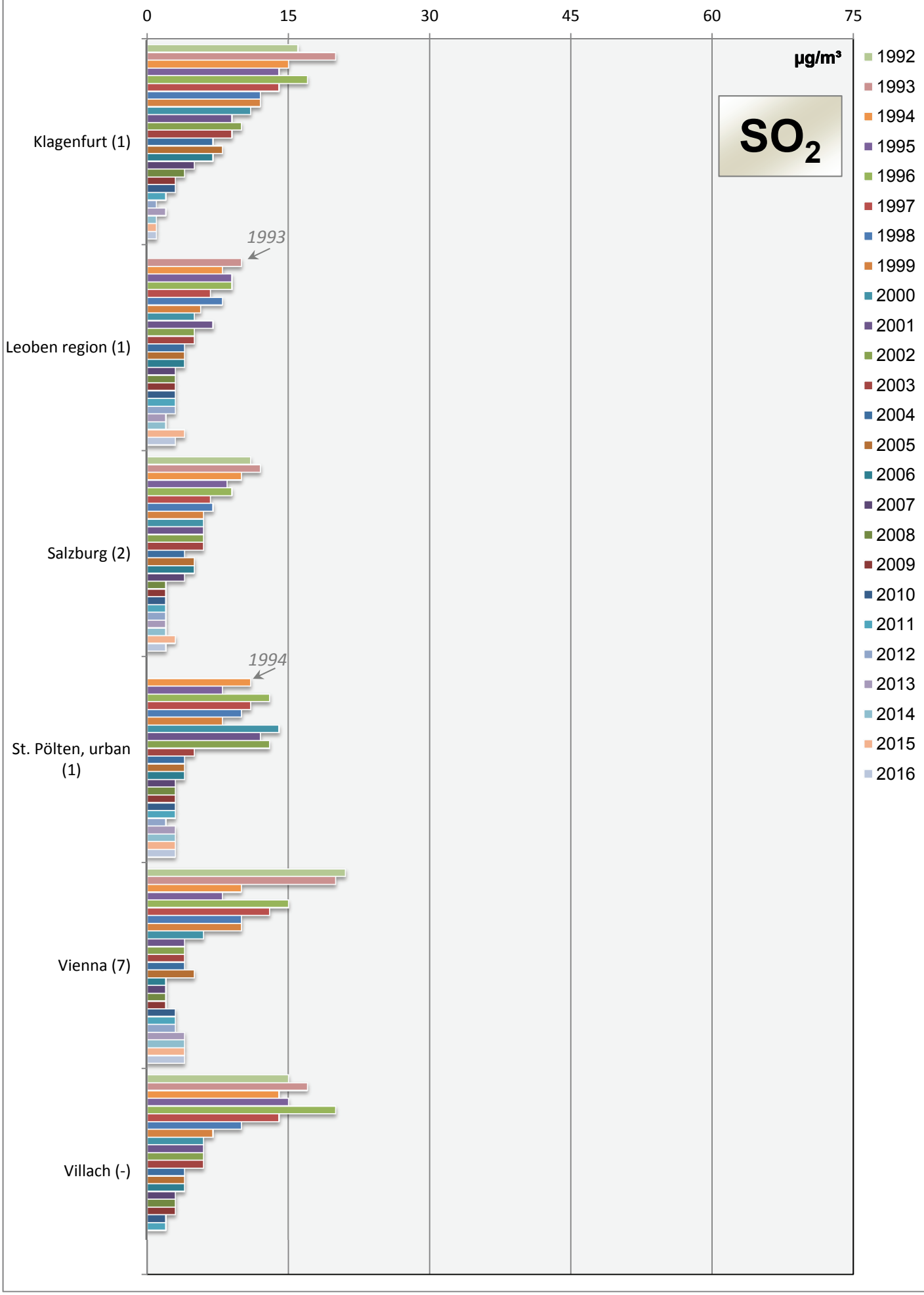
Annual mean values (mean of all monitoring stations)



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

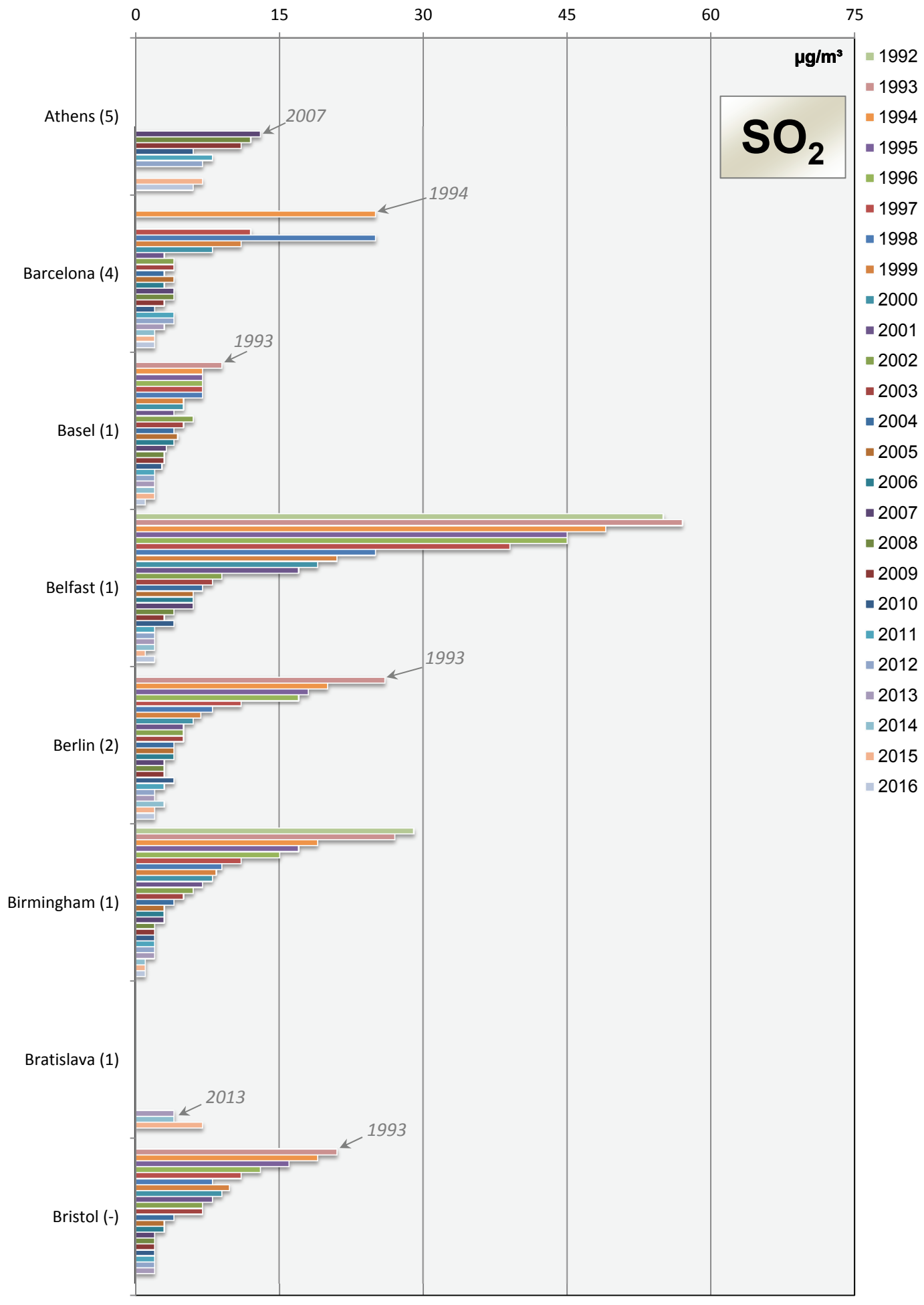
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



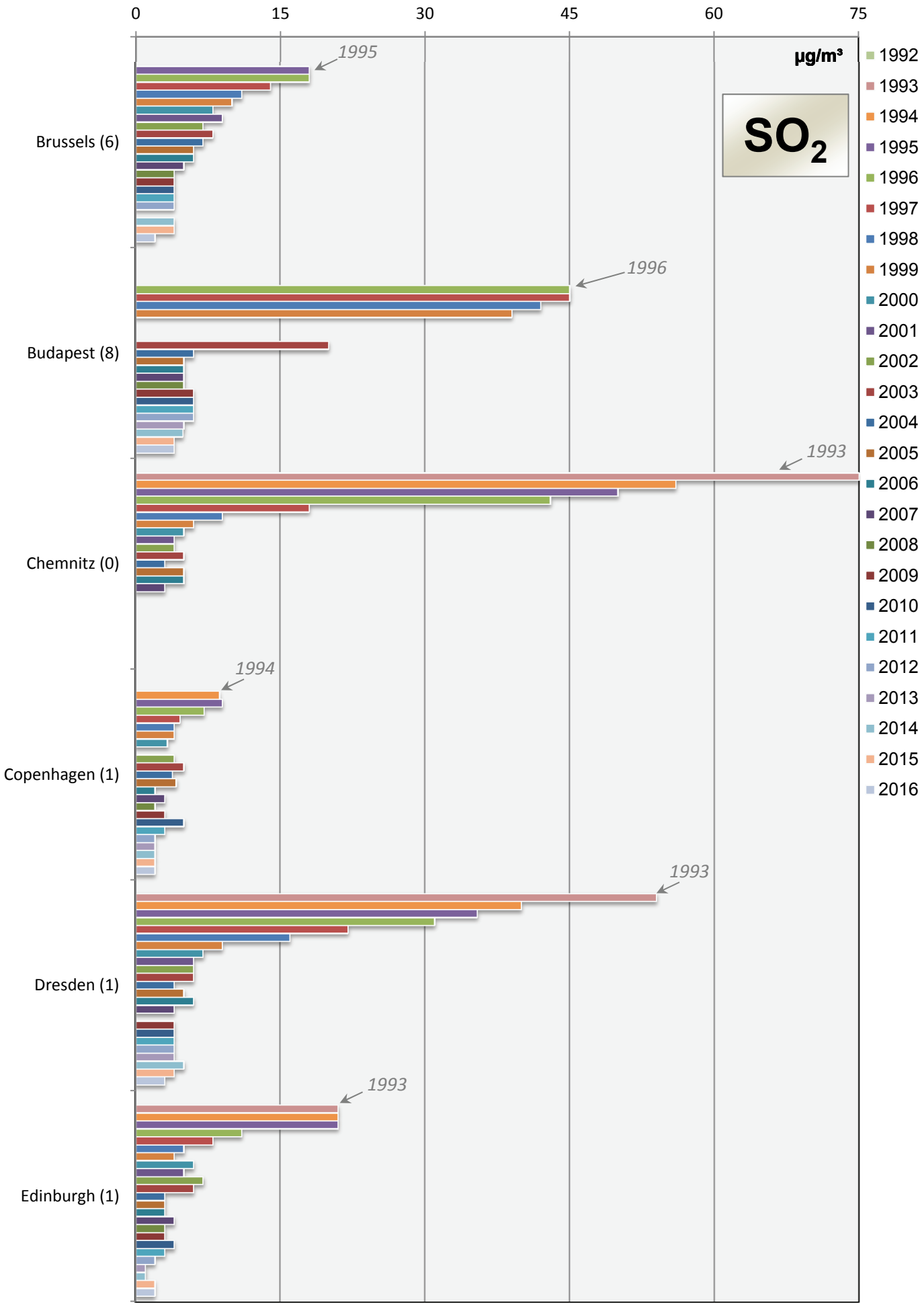
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



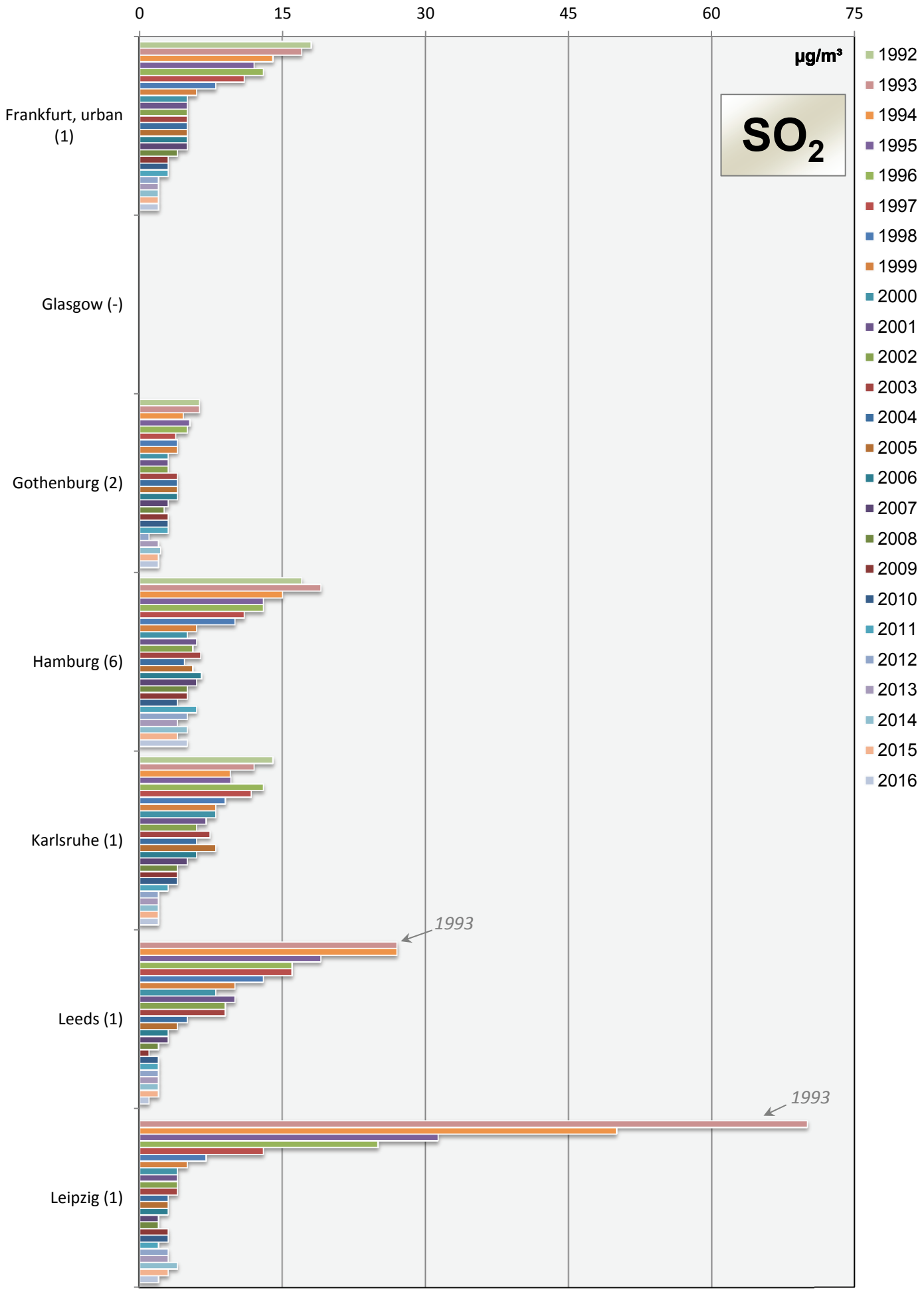
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



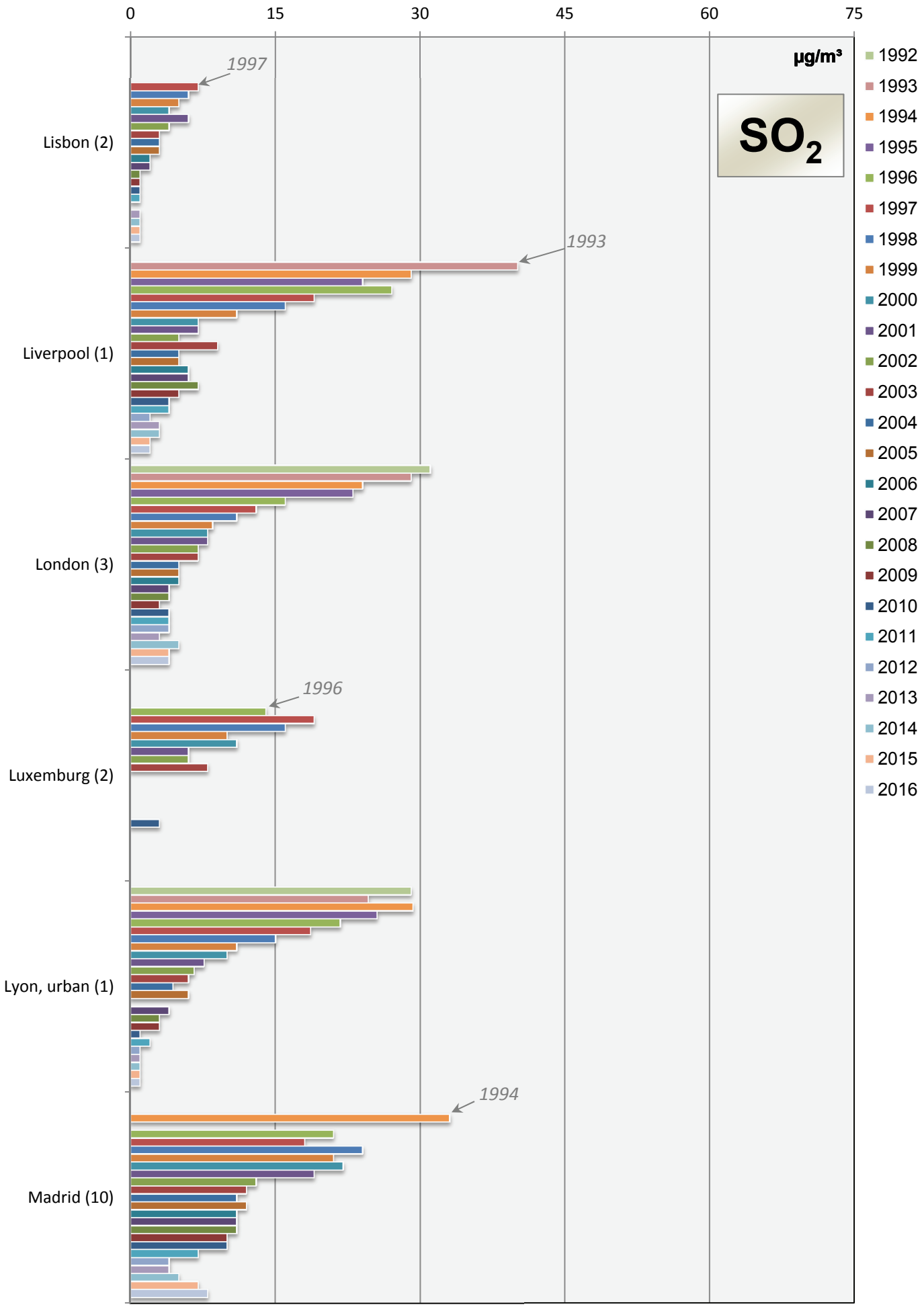
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



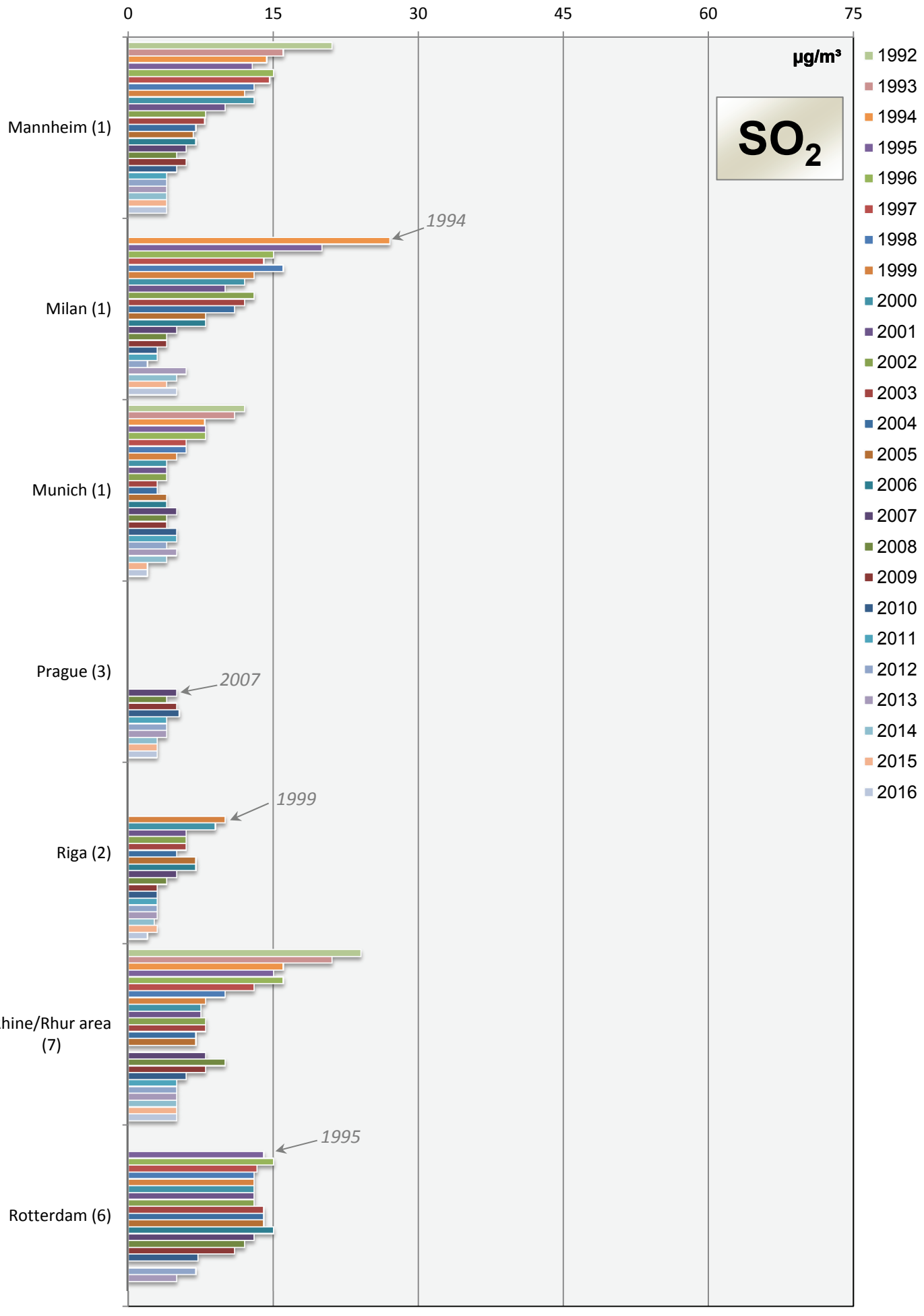
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



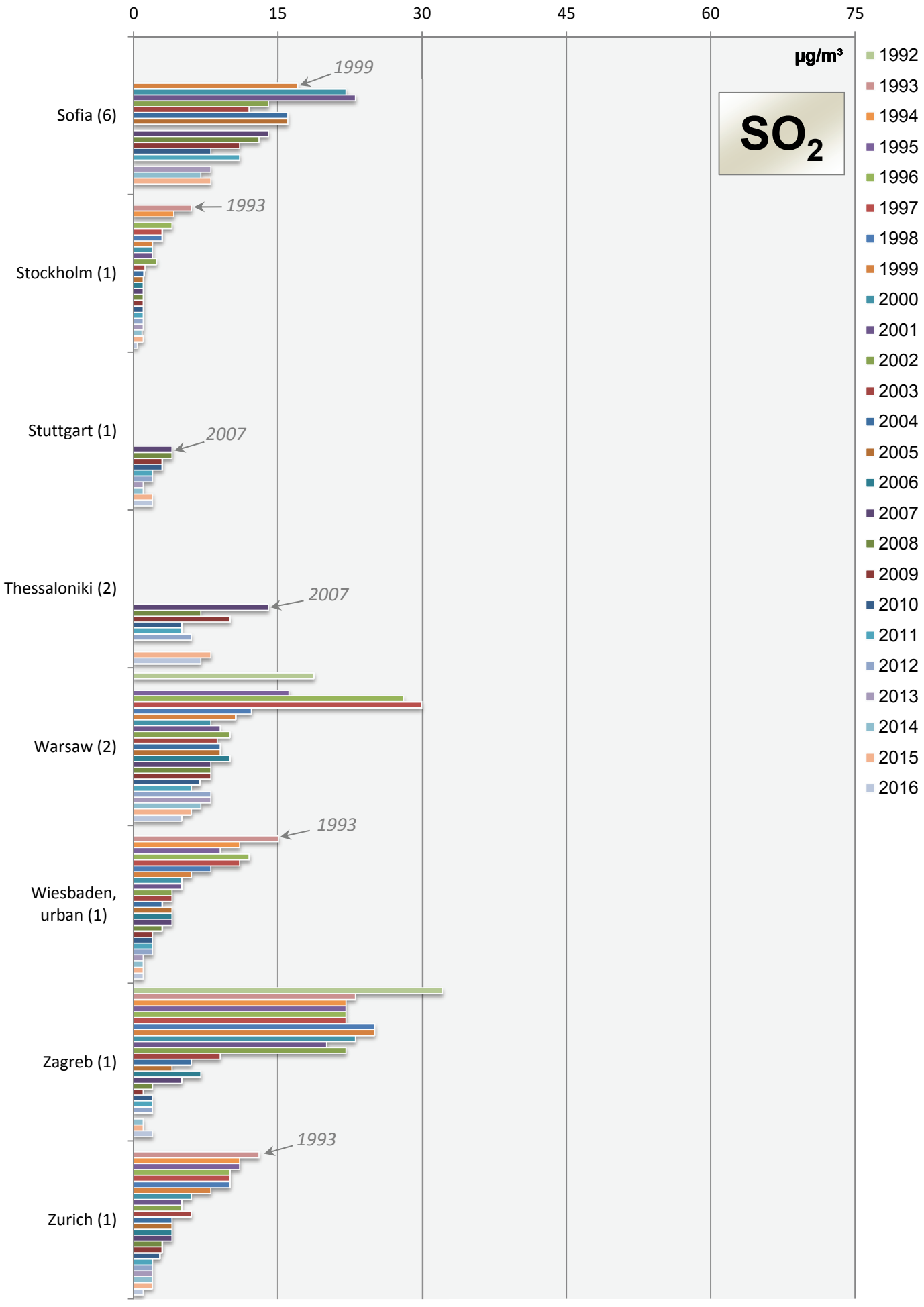
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



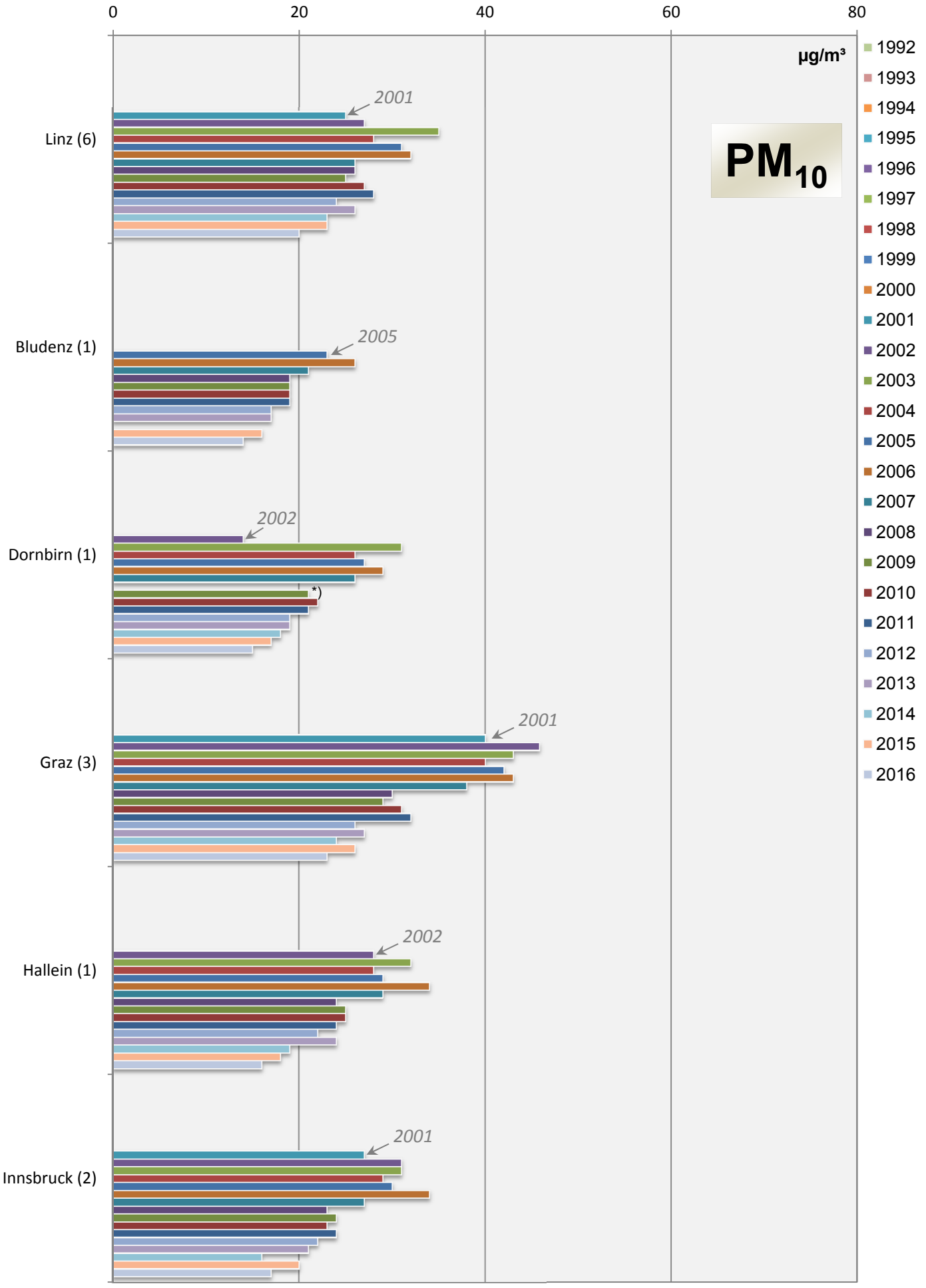
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2016

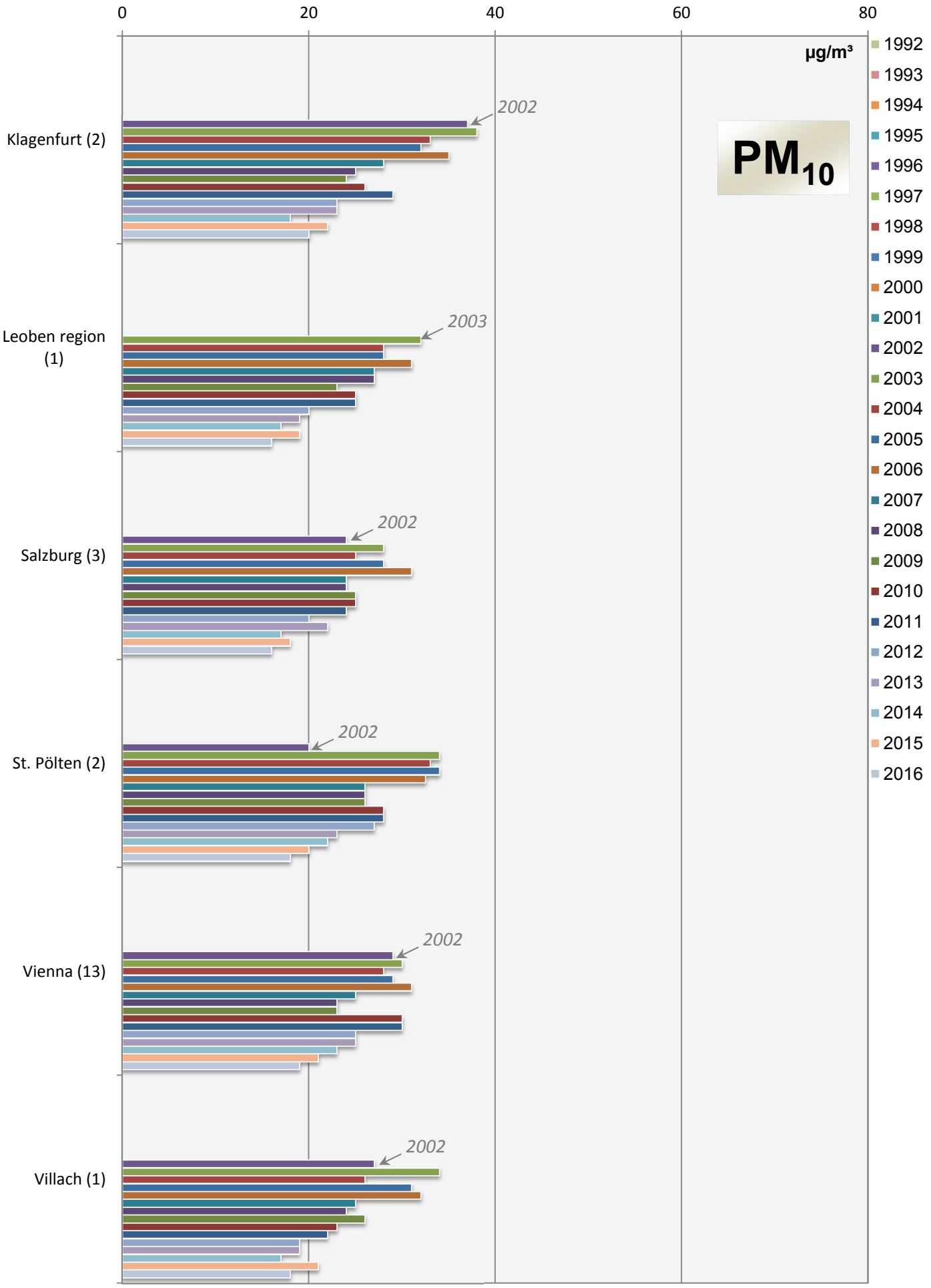
Annual mean values (mean of all monitoring stations)



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

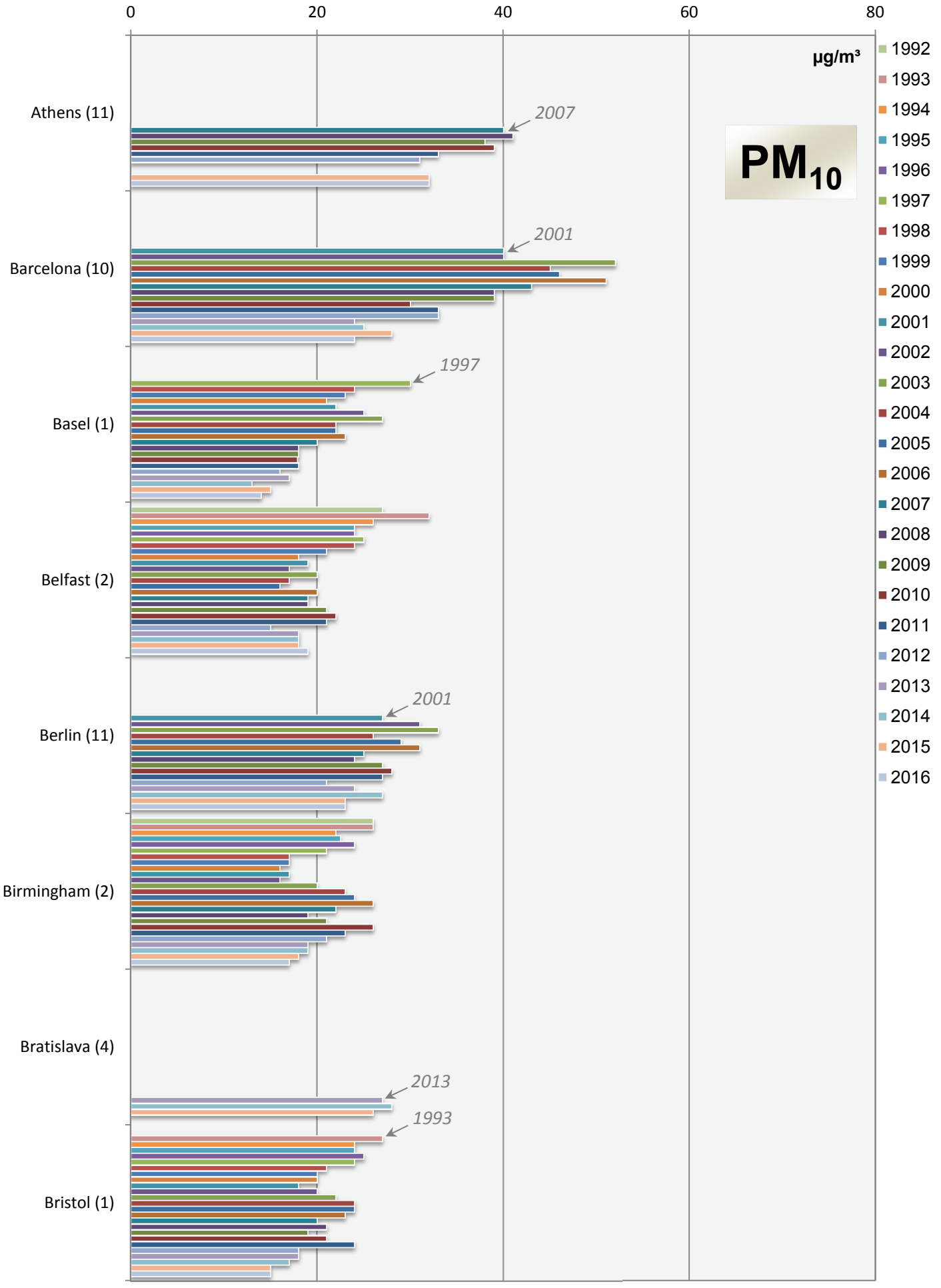
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



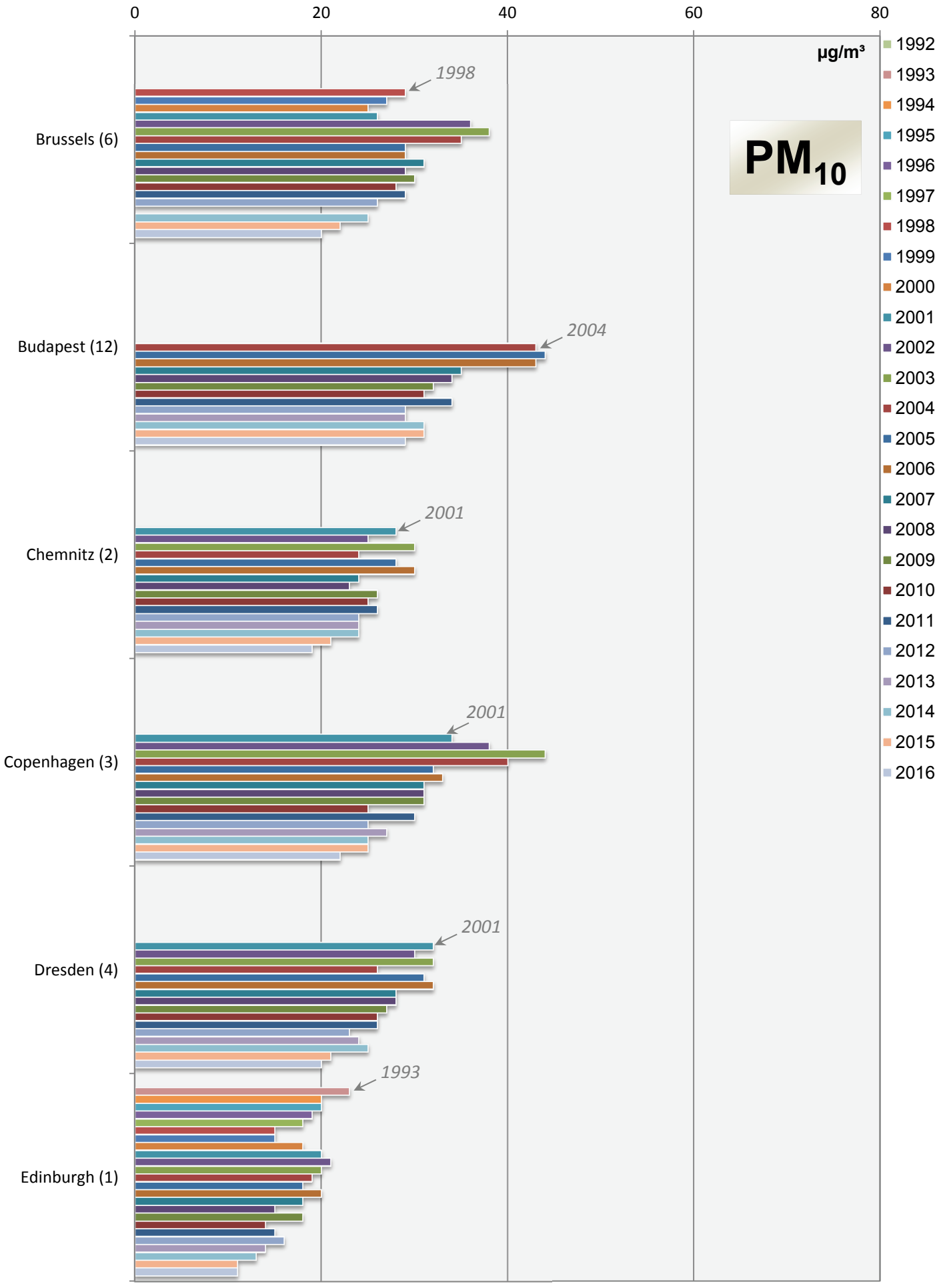
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



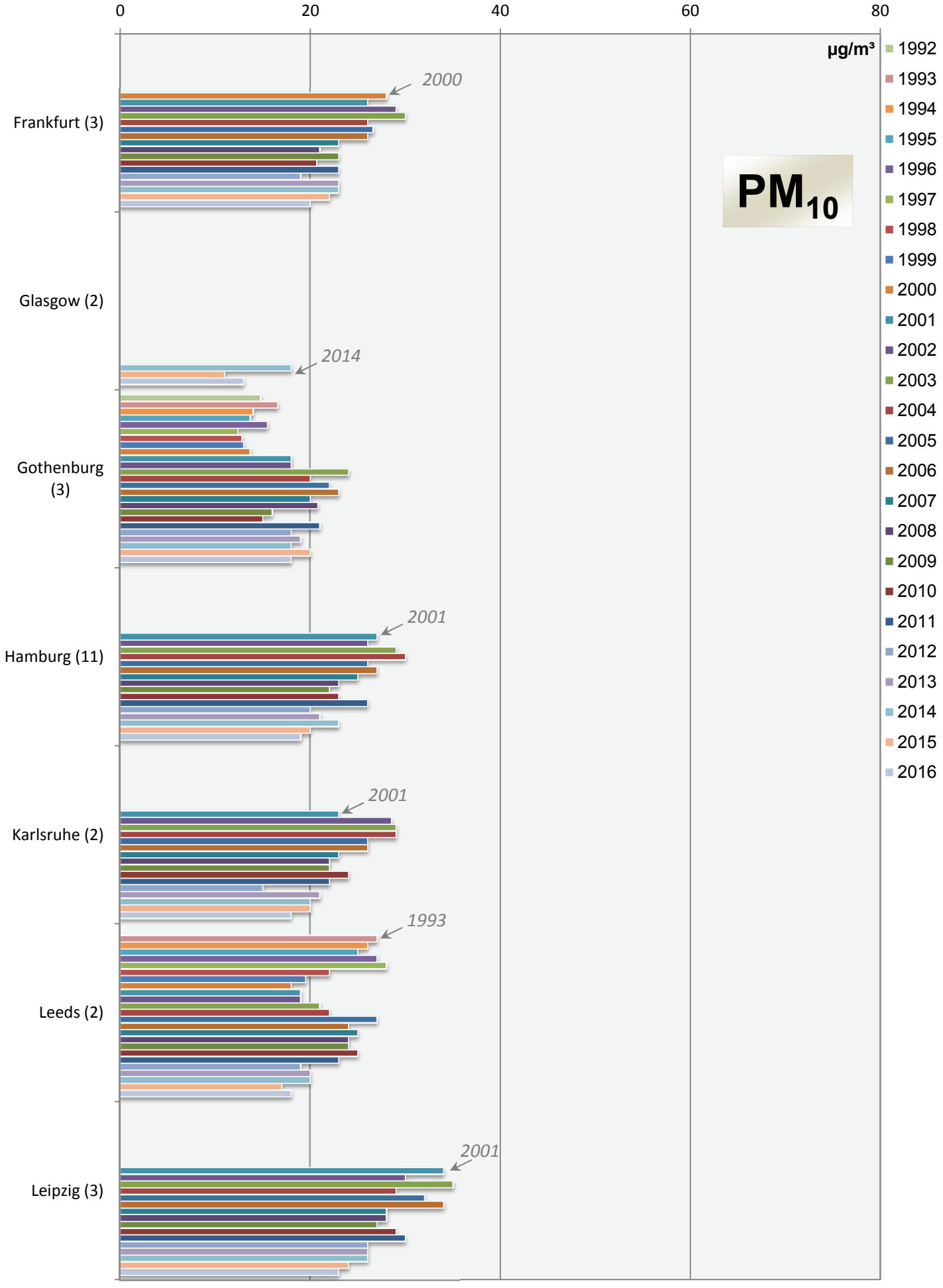
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2016

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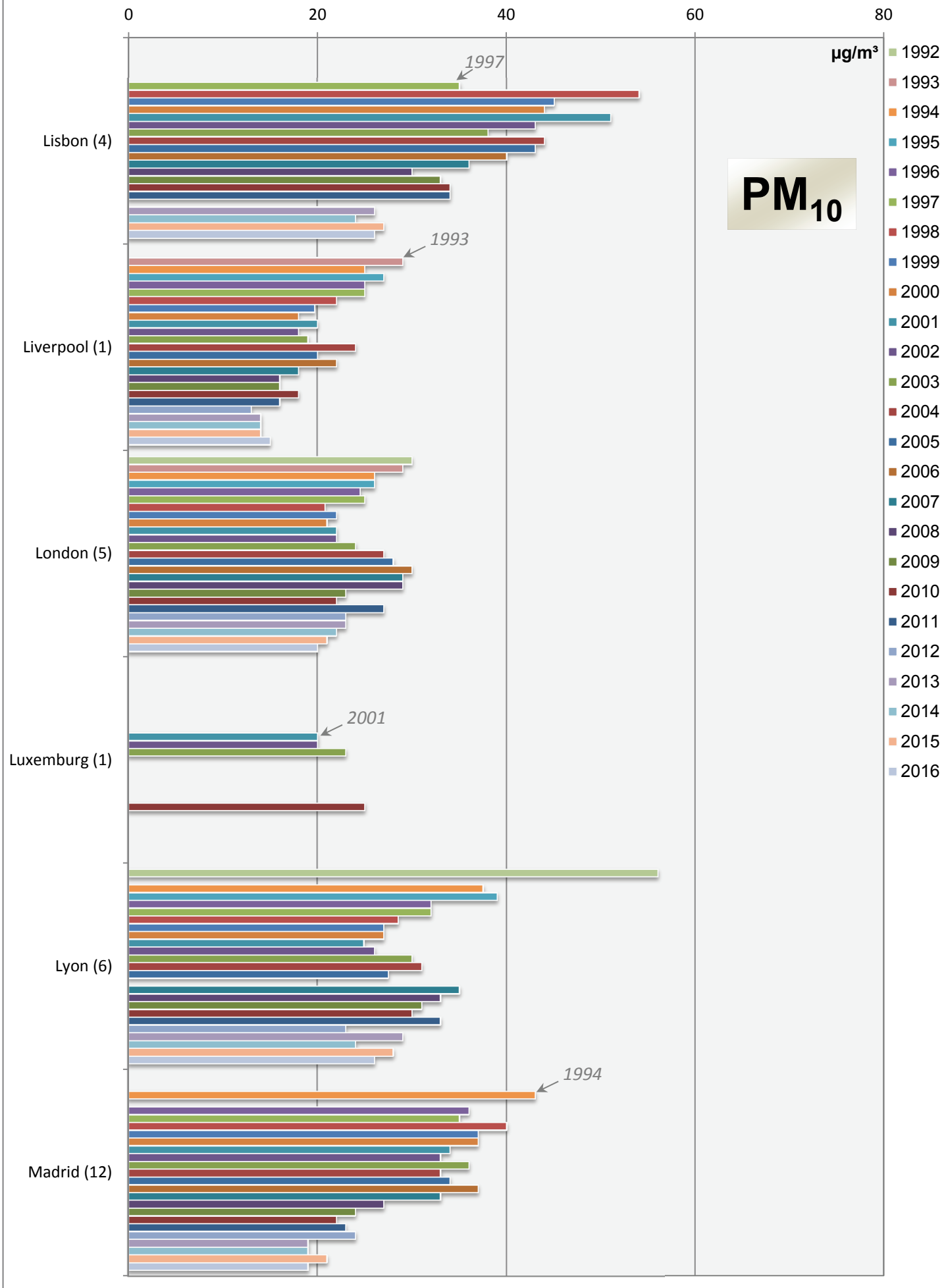
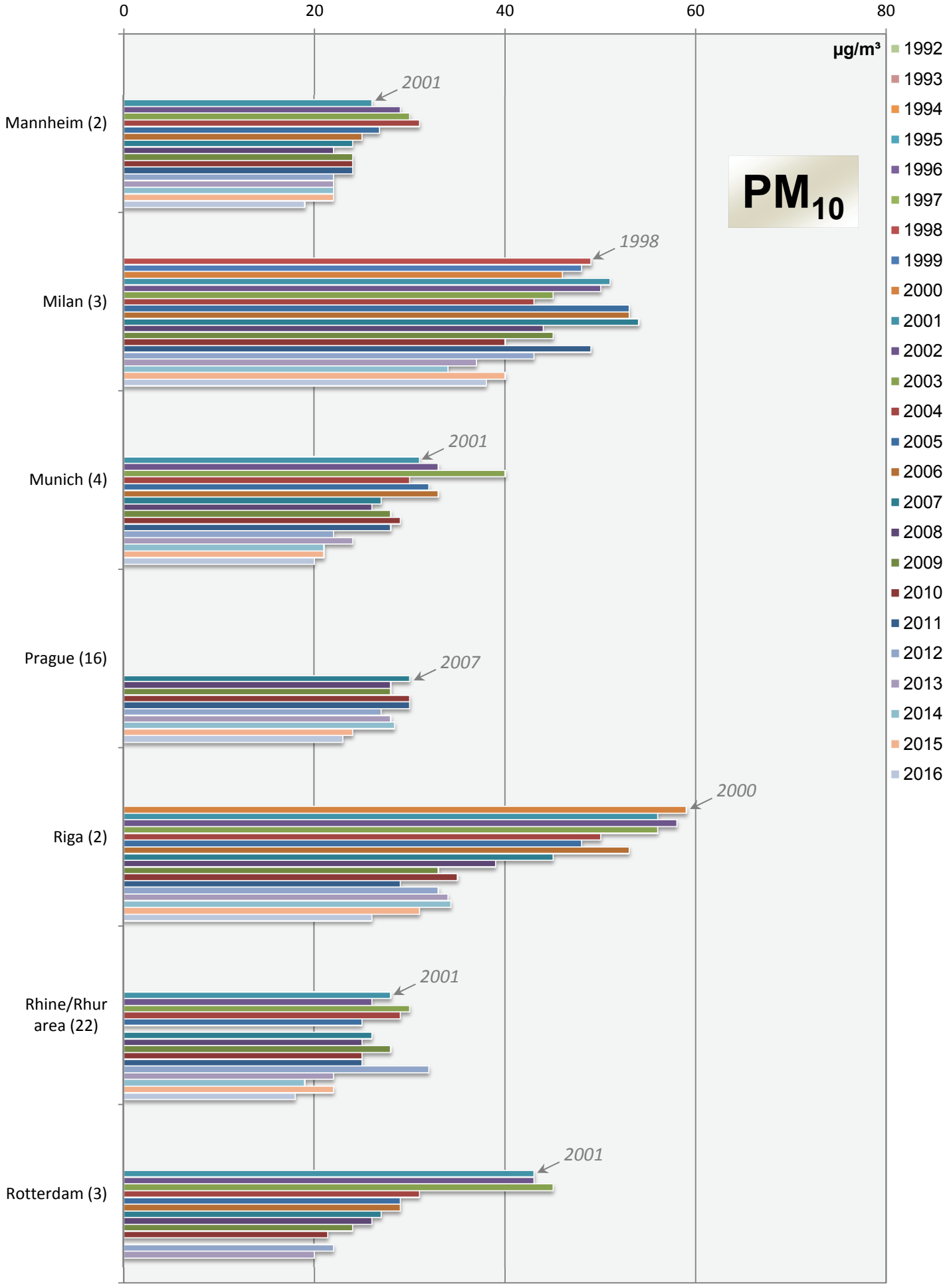


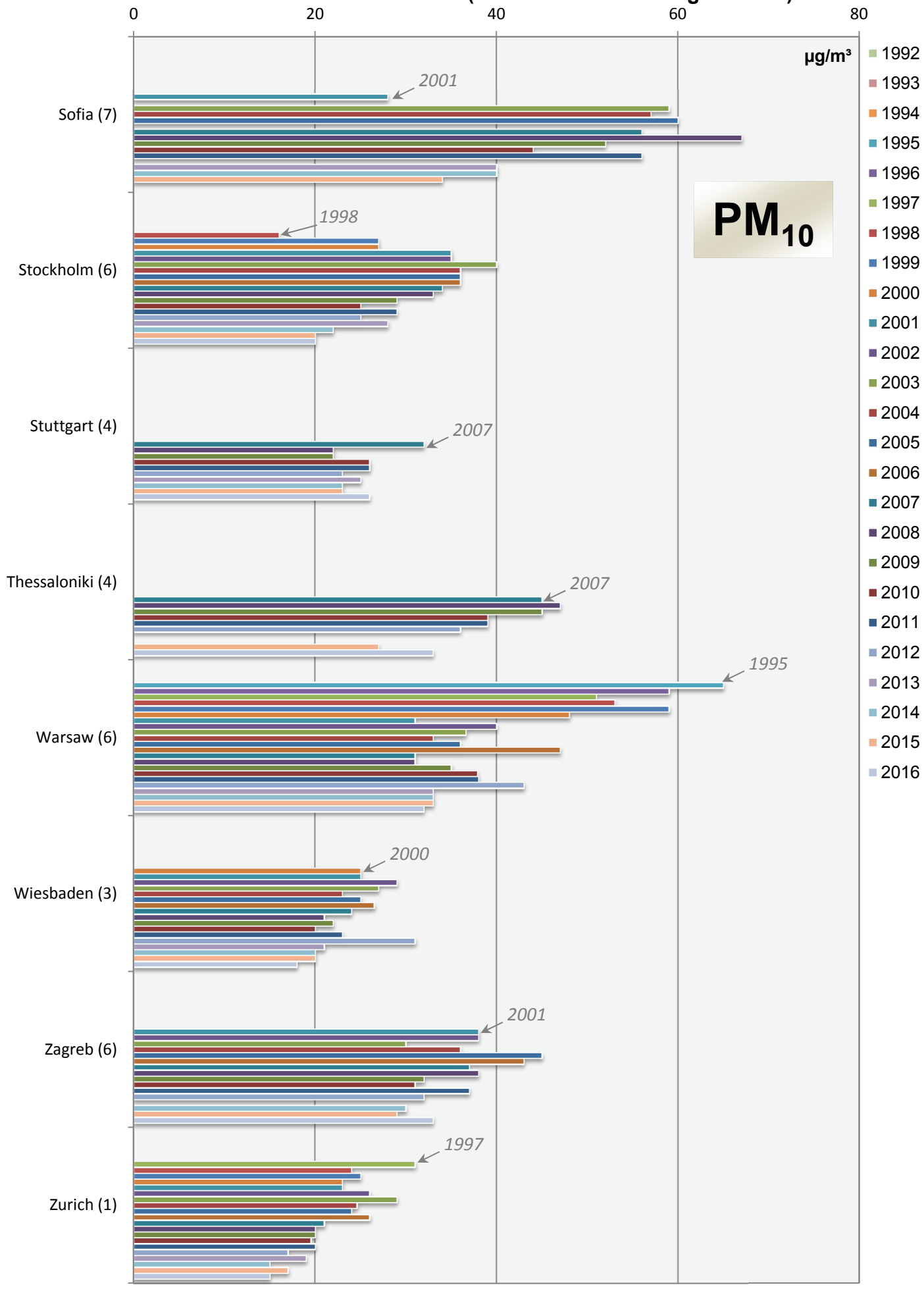
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)

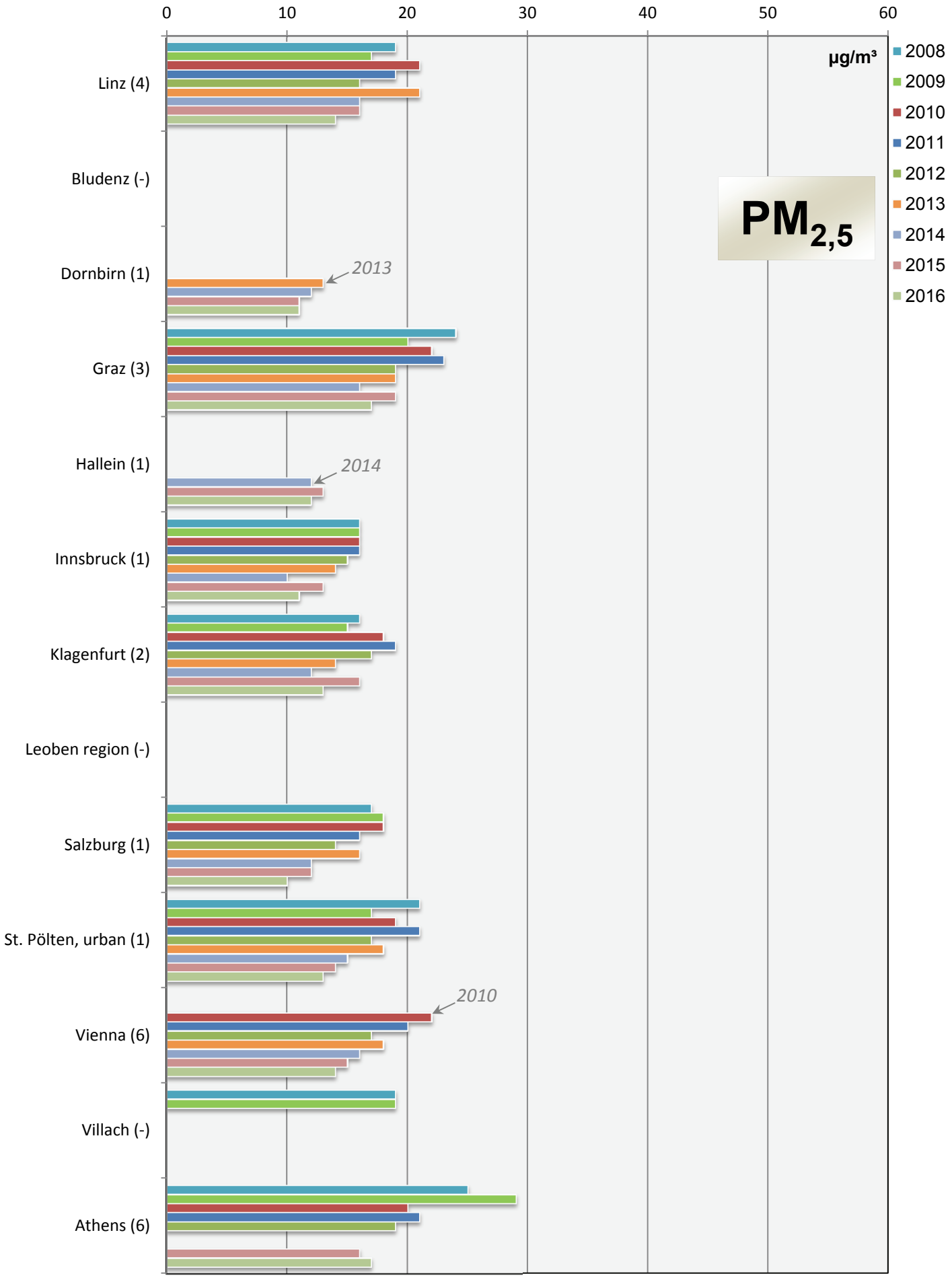


Comparison of The Air Quality 1992 - 2016

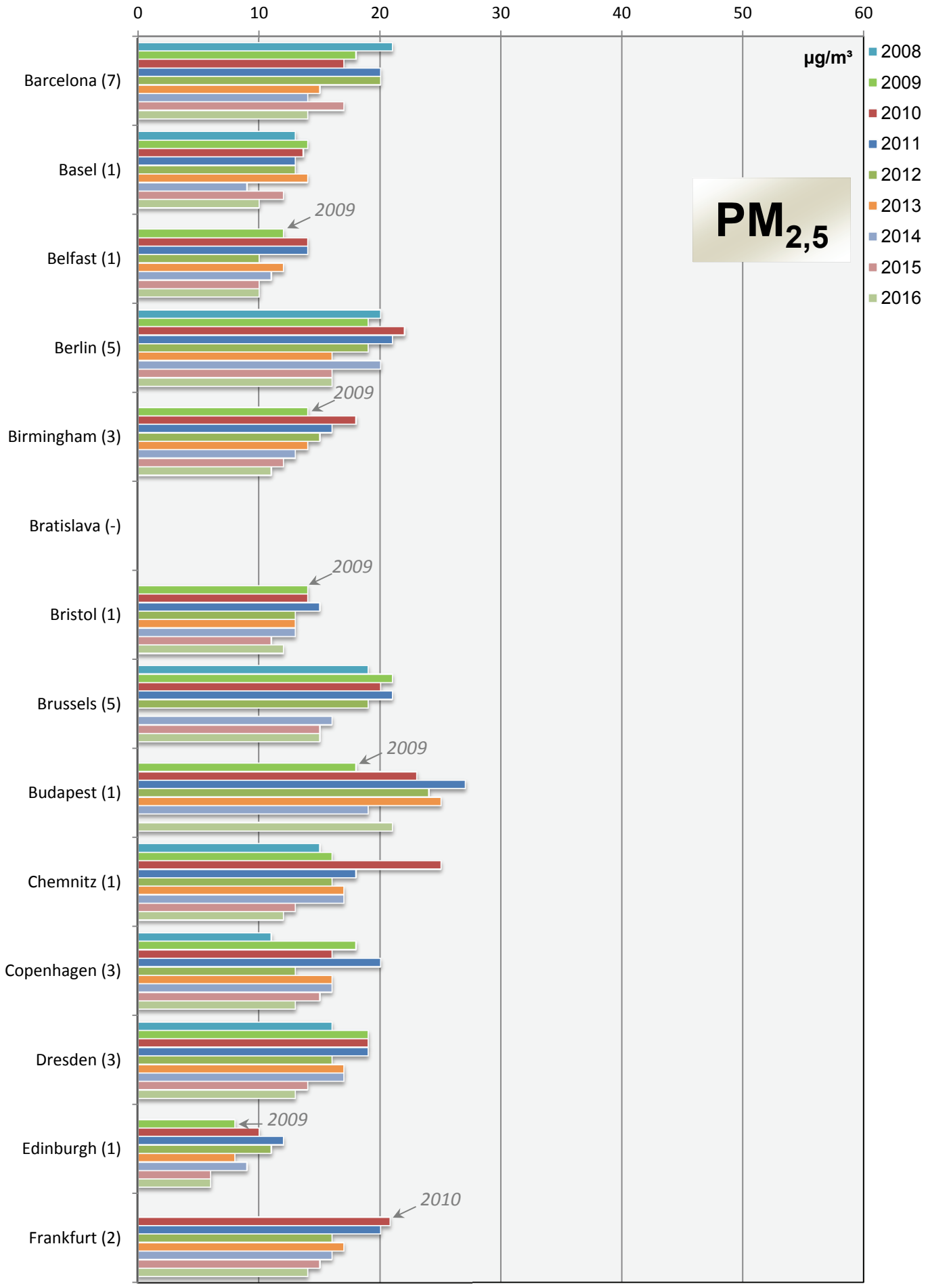
Annual mean values (mean of all monitoring stations)



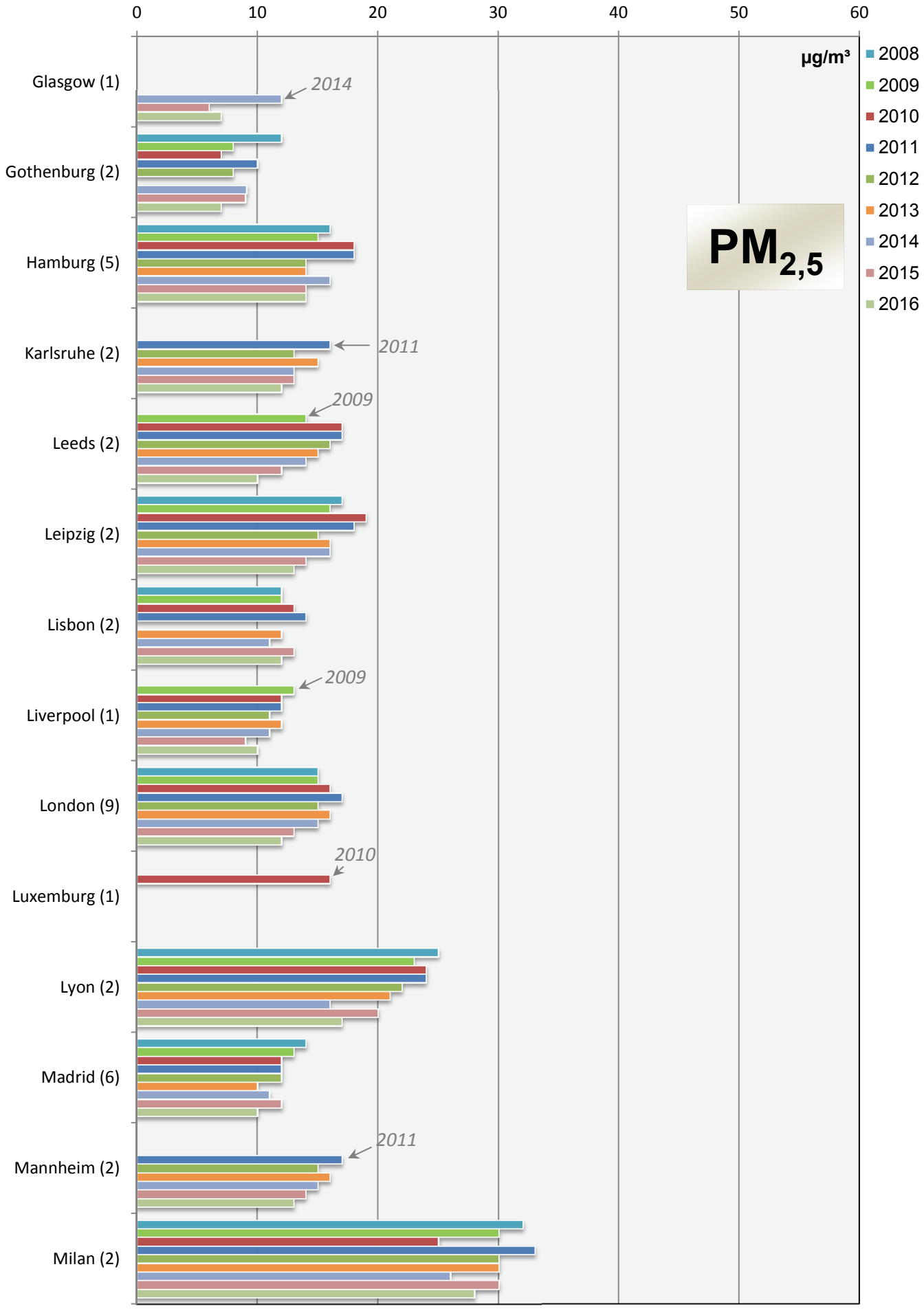
Comparison of The Air Quality 2008 - 2016
Annual mean values (mean of all monitoring stations)



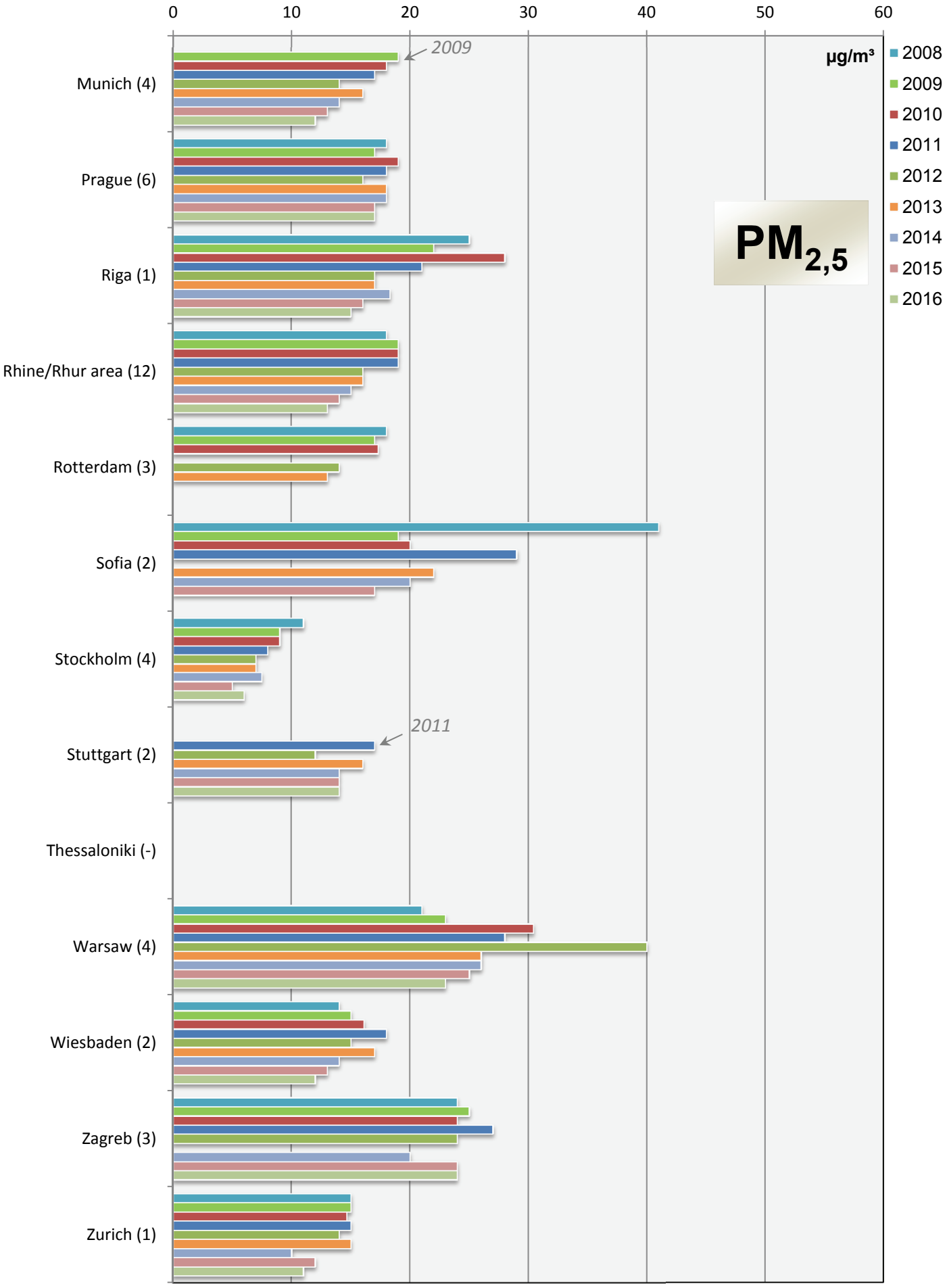
Comparison of The Air Quality 2008 - 2016
Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 2008 - 2016
Annual mean values (mean of all monitoring stations)

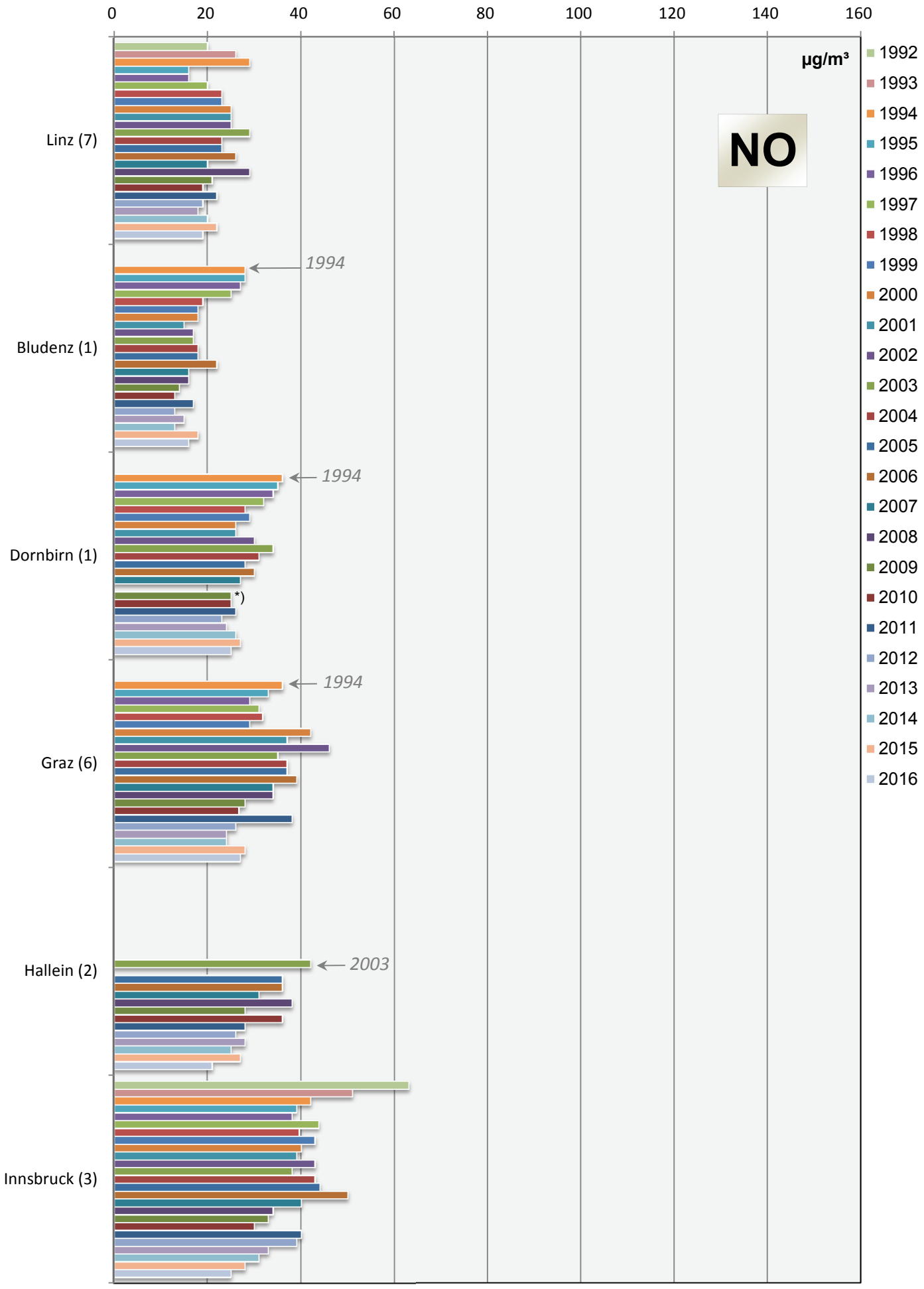


Comparison of The Air Quality 2008 - 2016
Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



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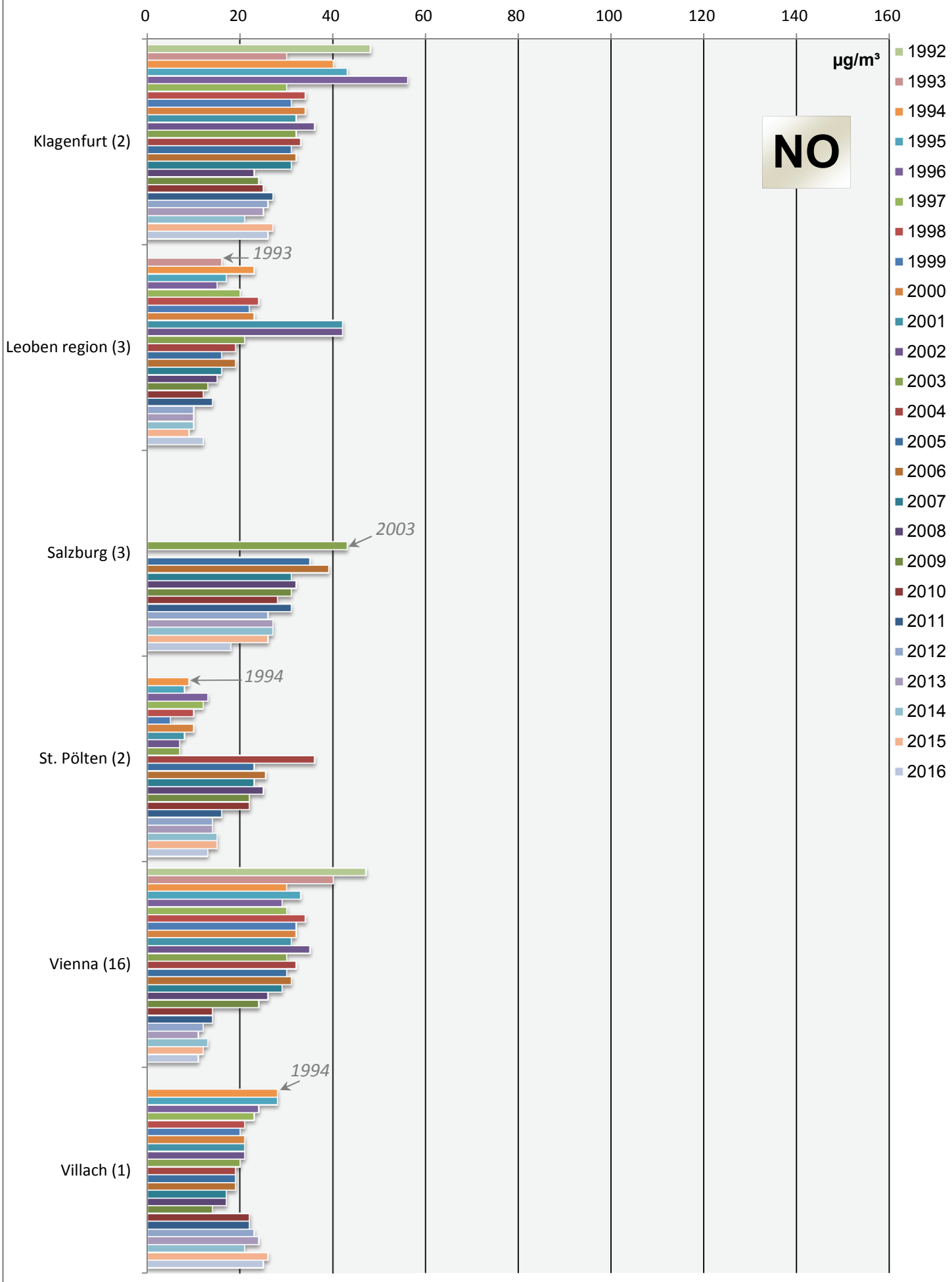
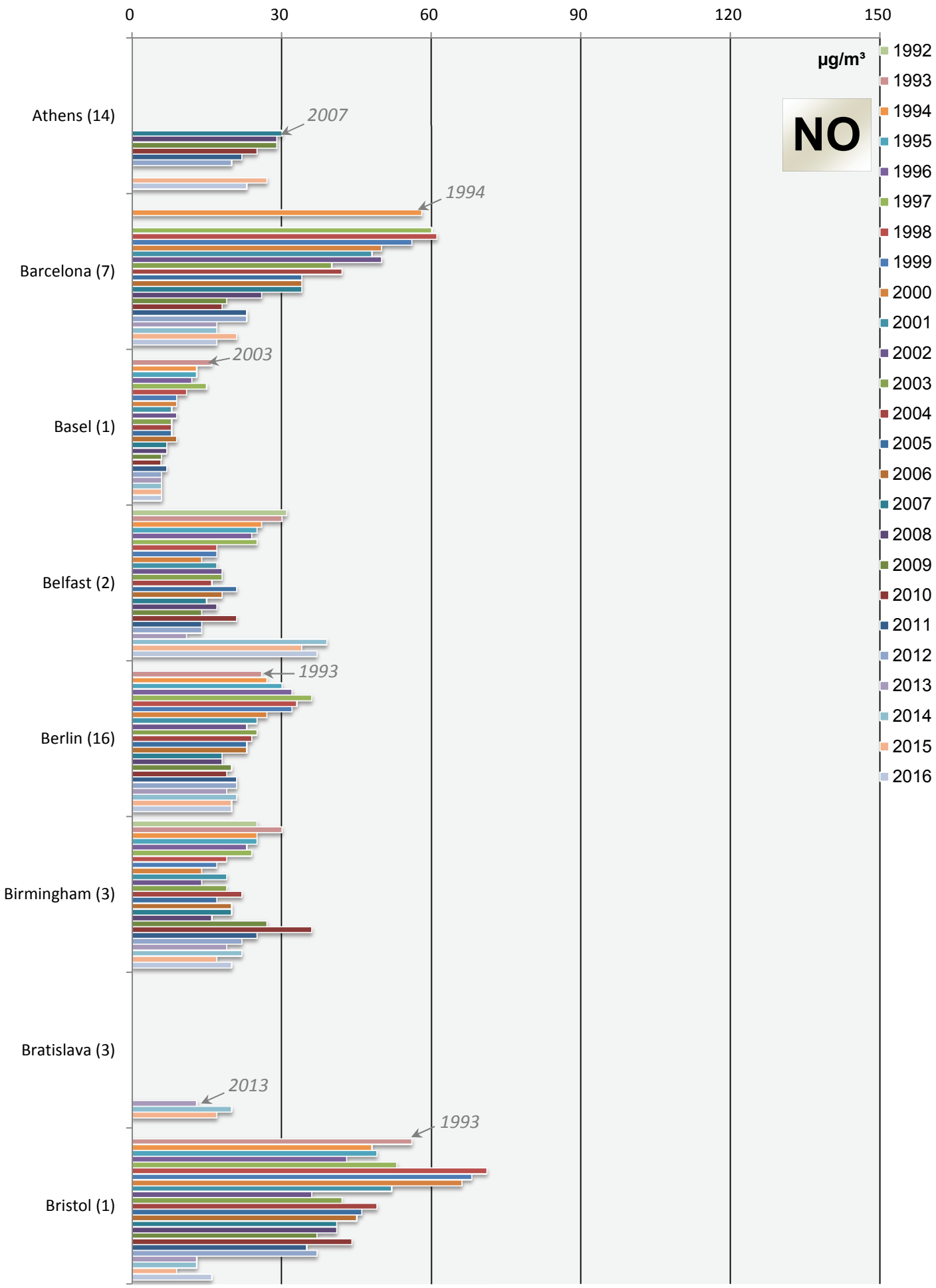
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



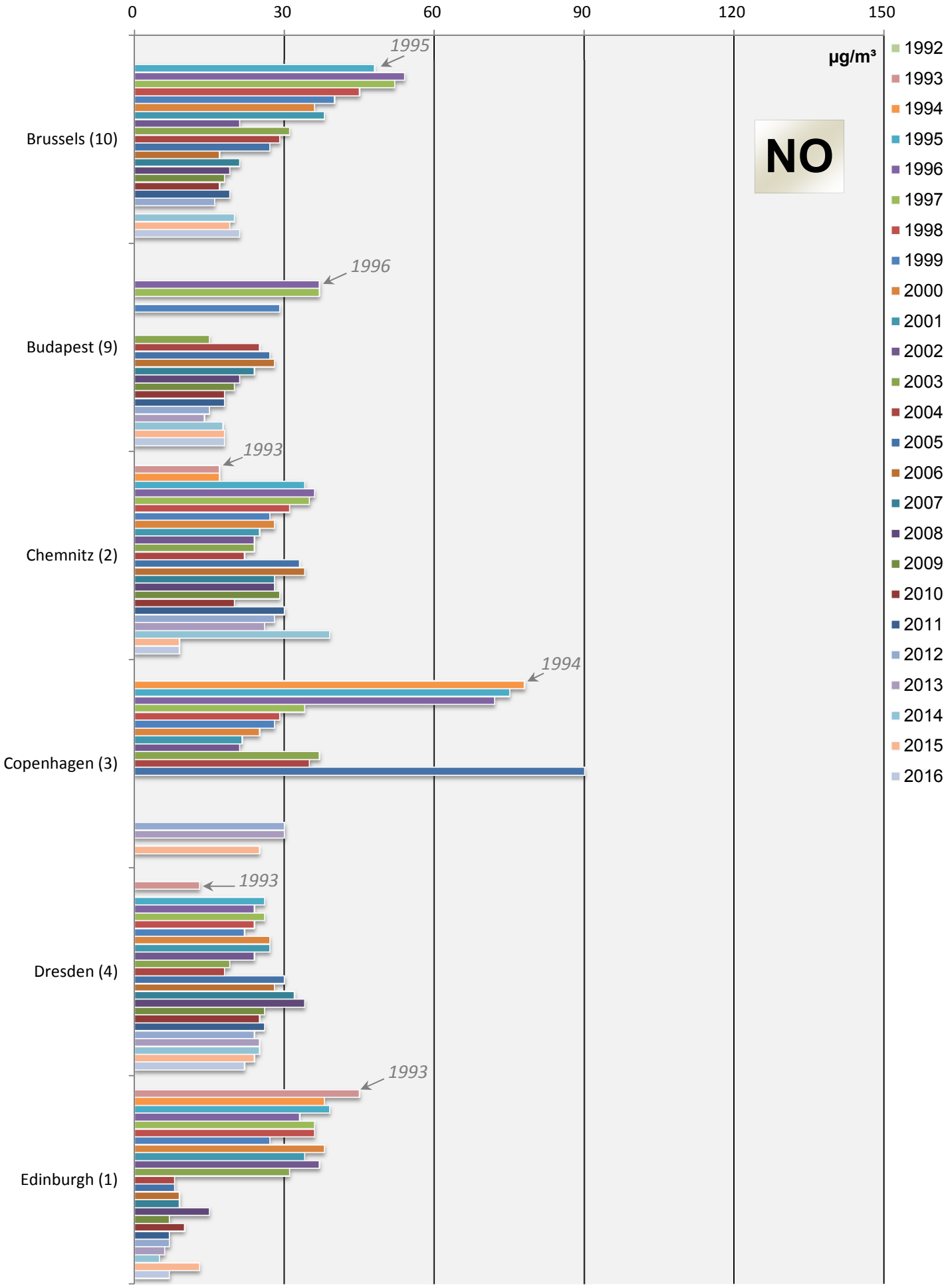
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



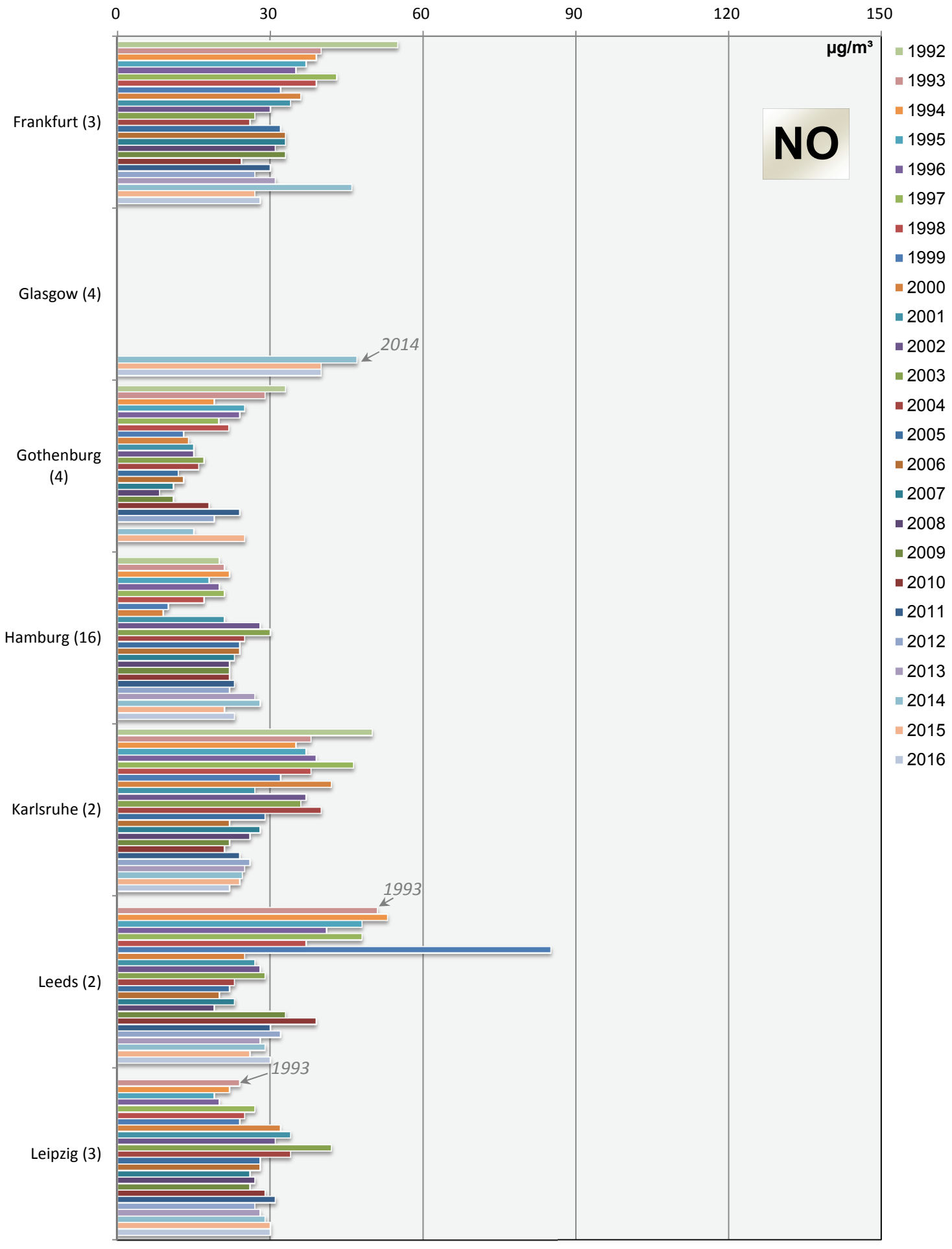
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



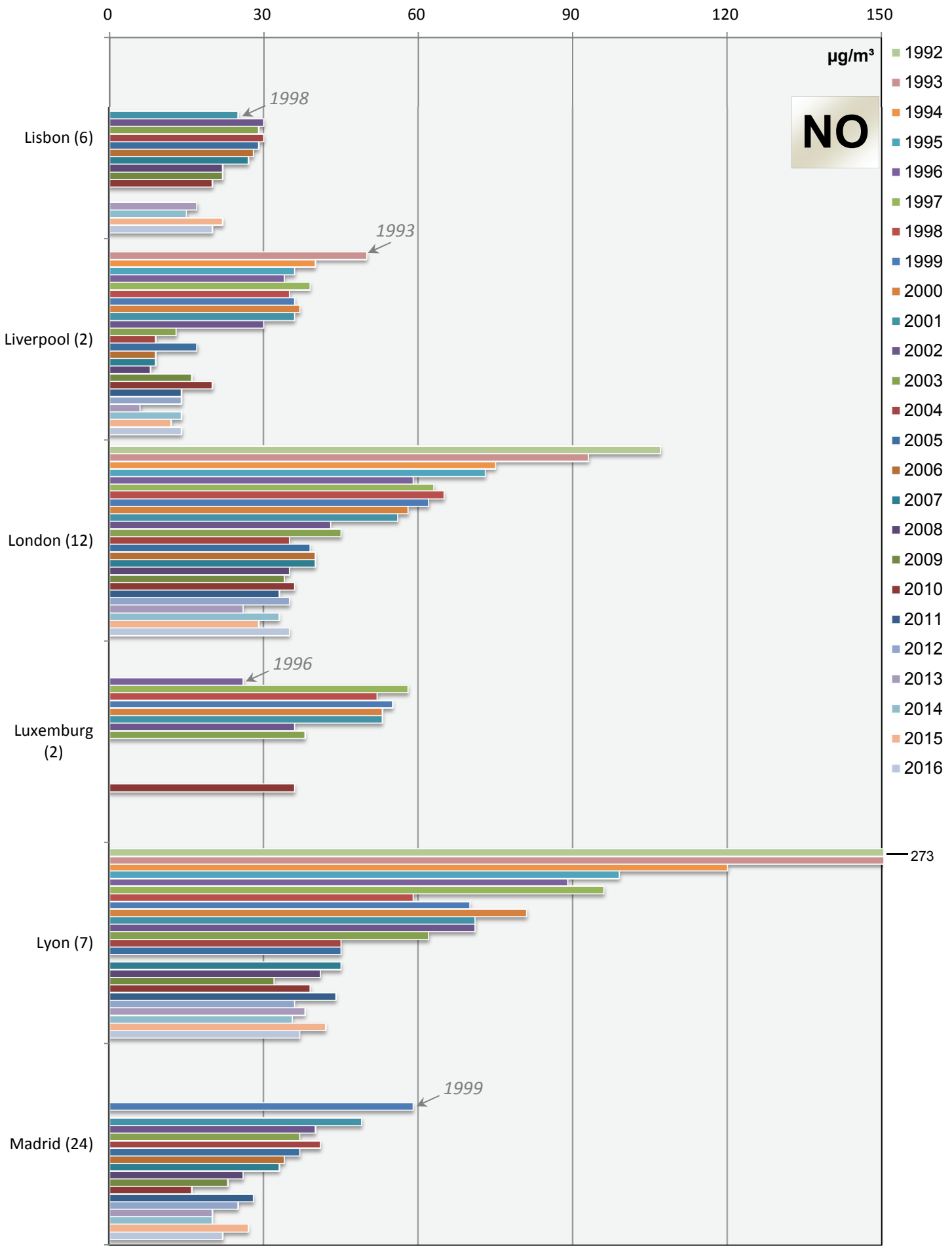
Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



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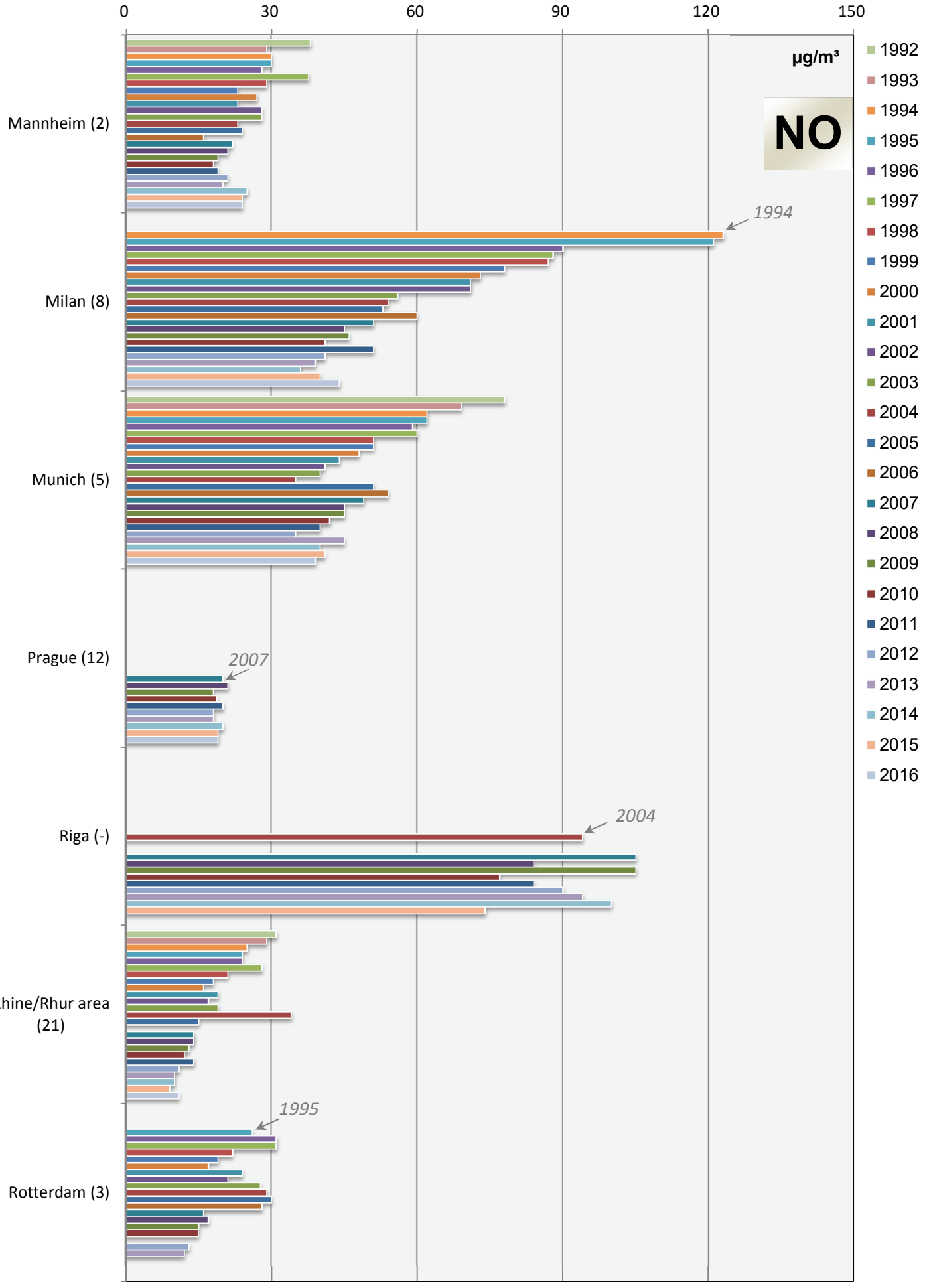

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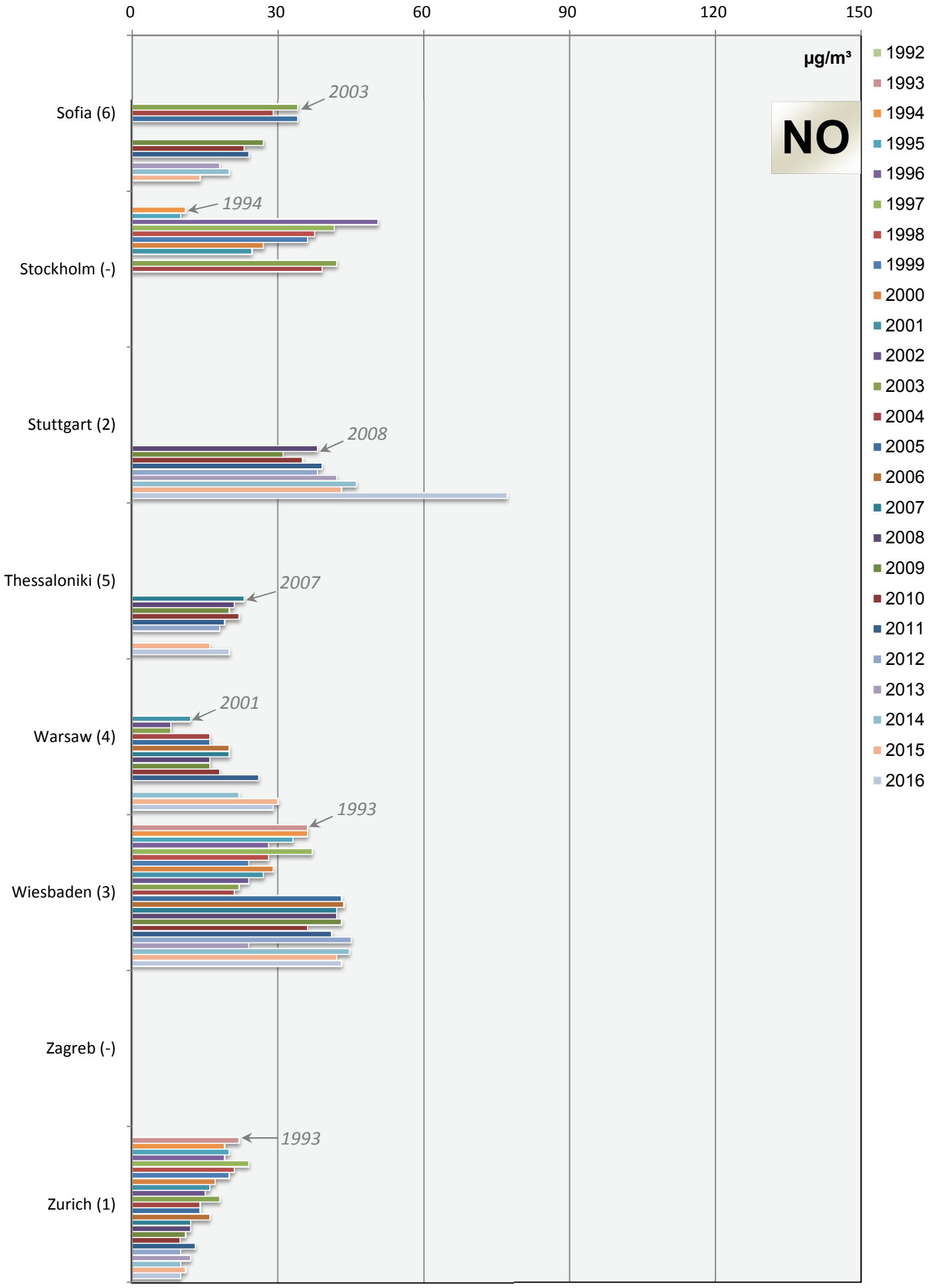

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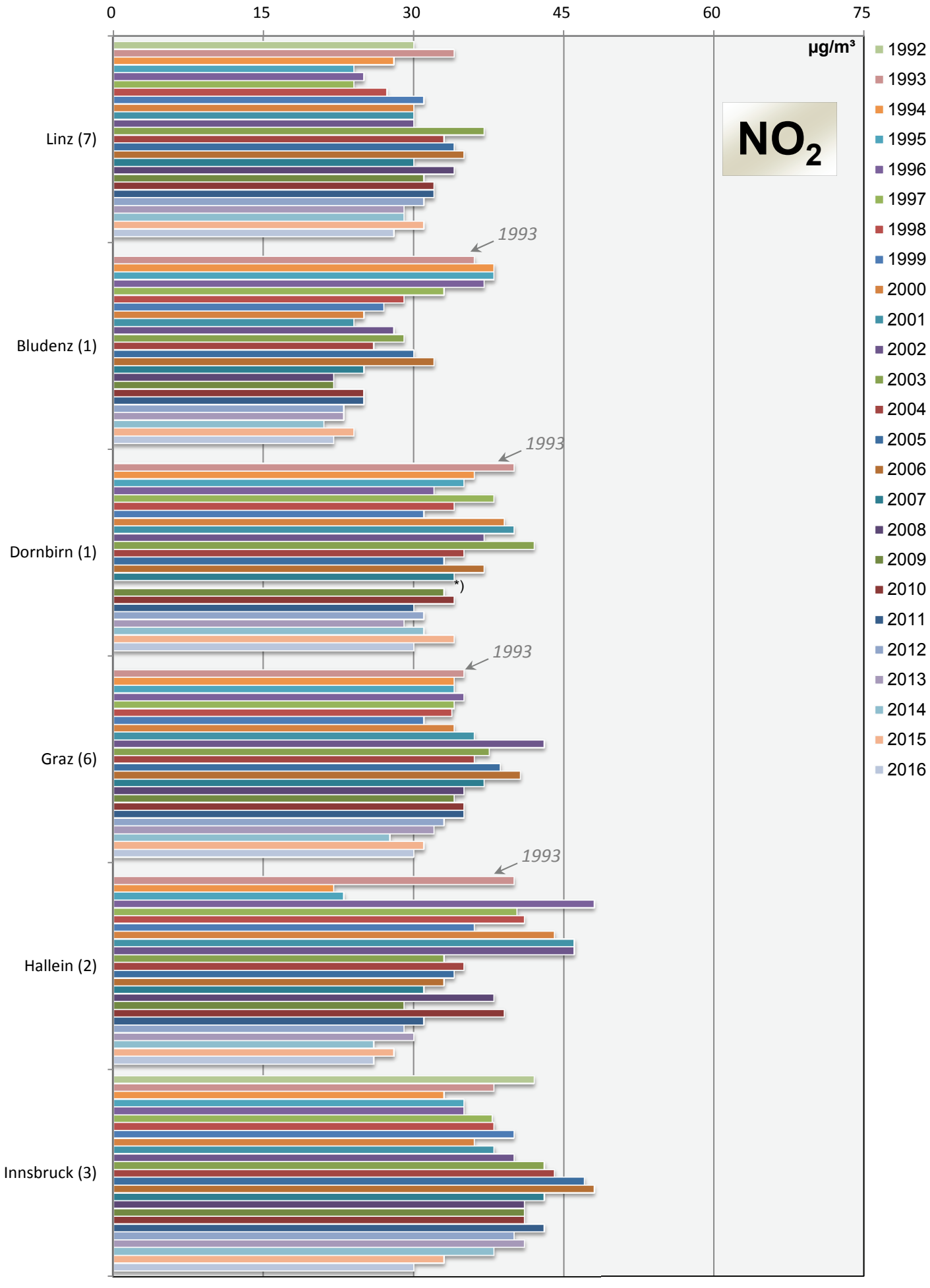

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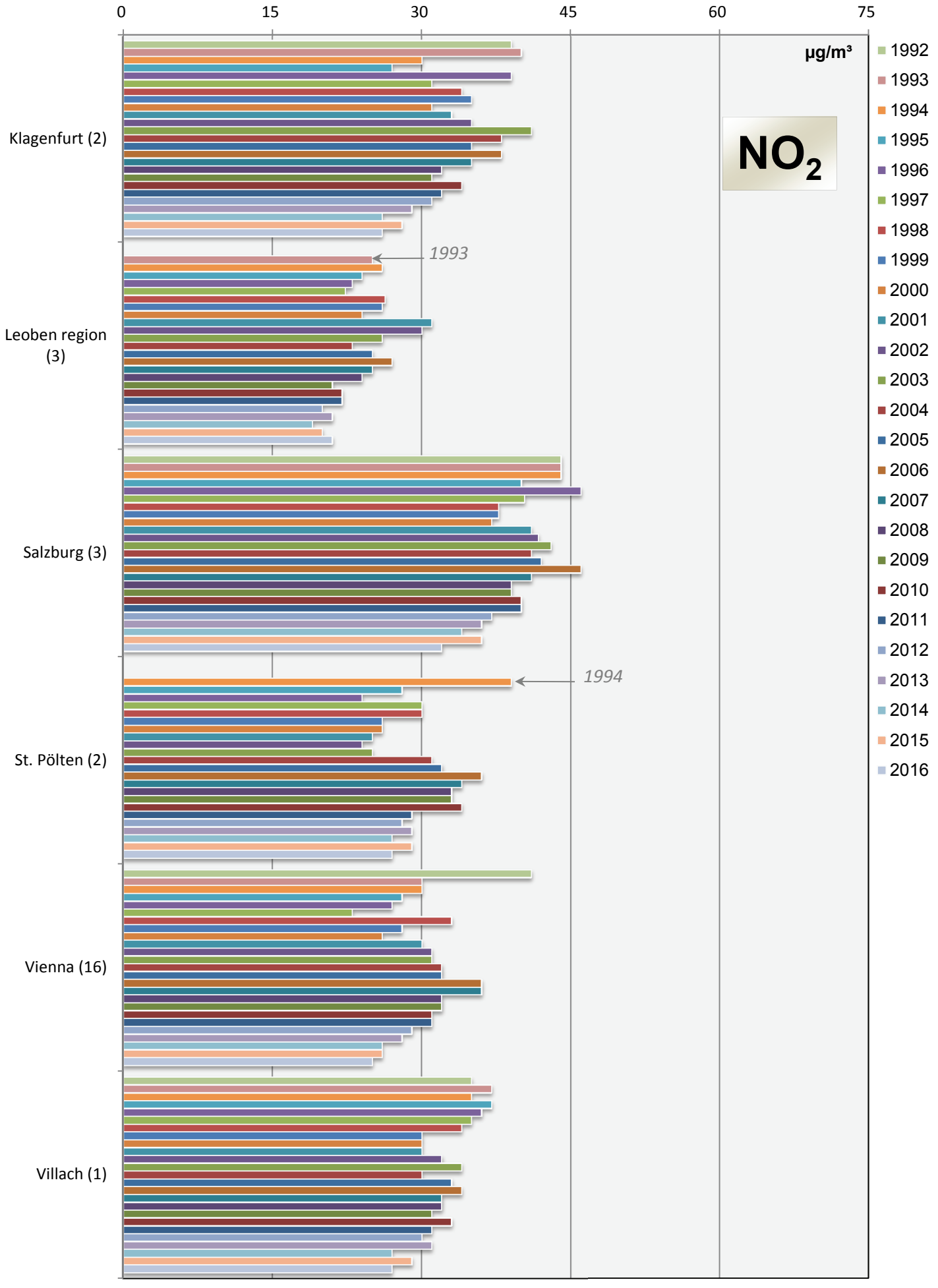
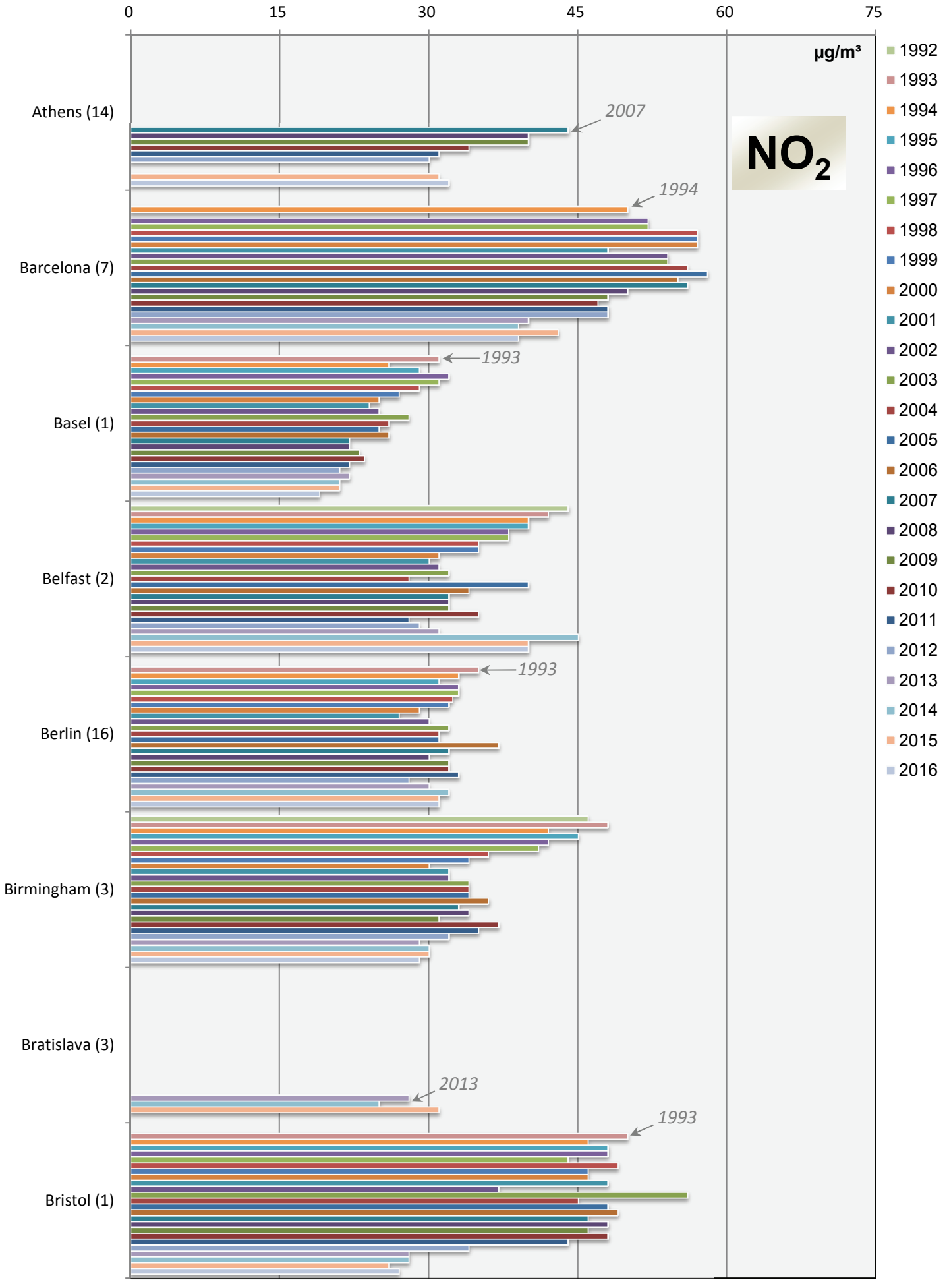


Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



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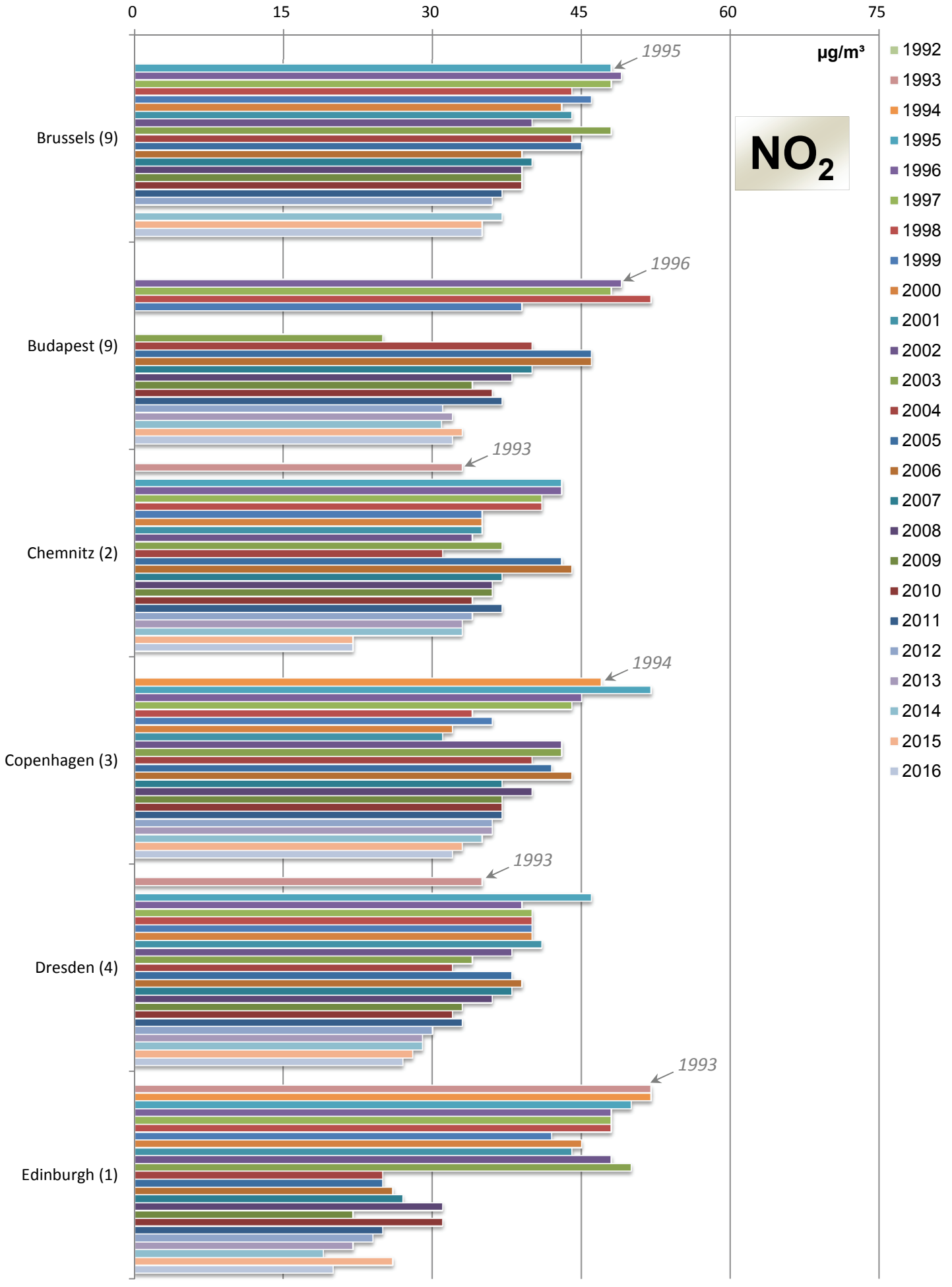
Annual mean values (mean of all monitoring stations)



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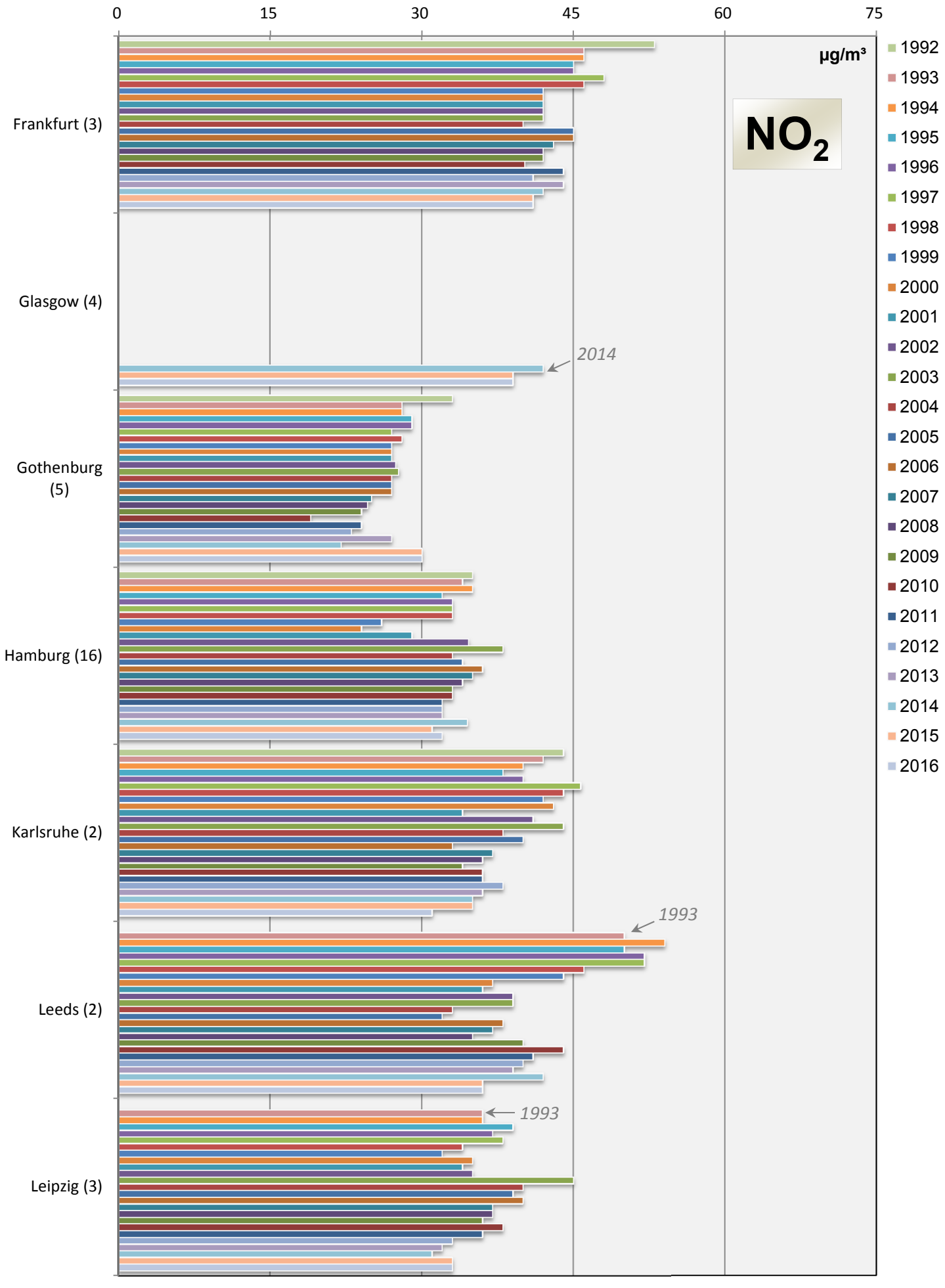

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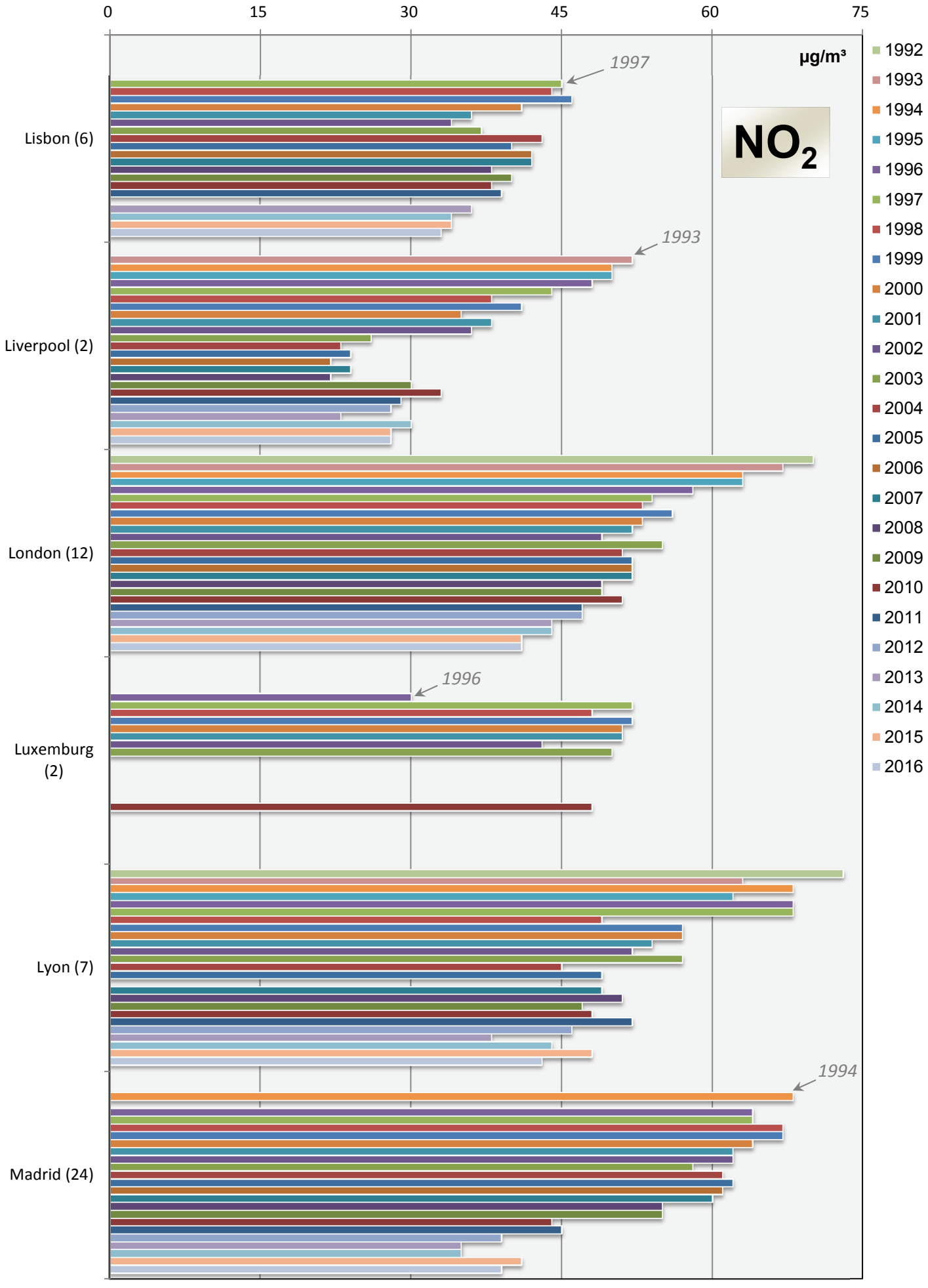

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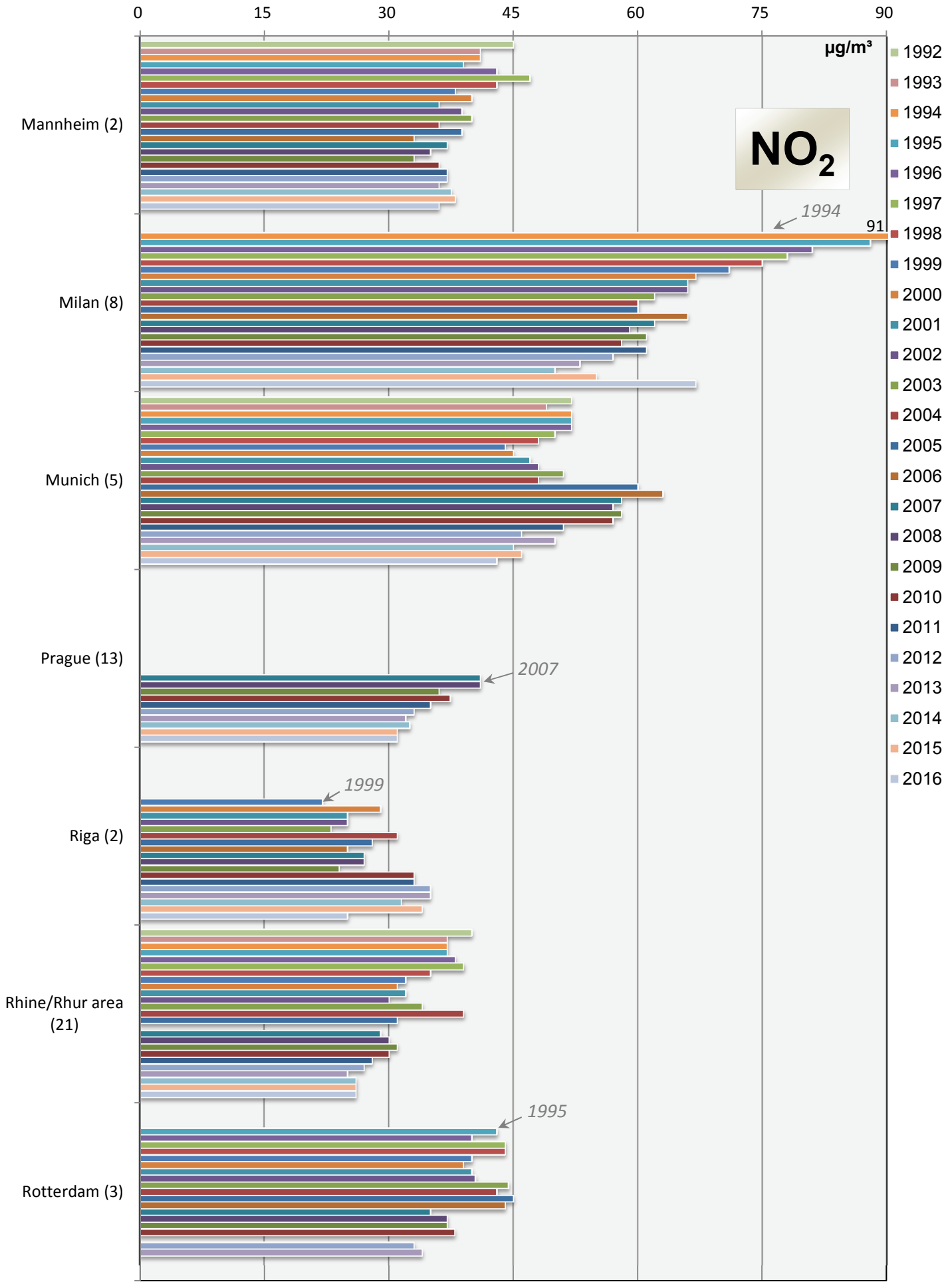

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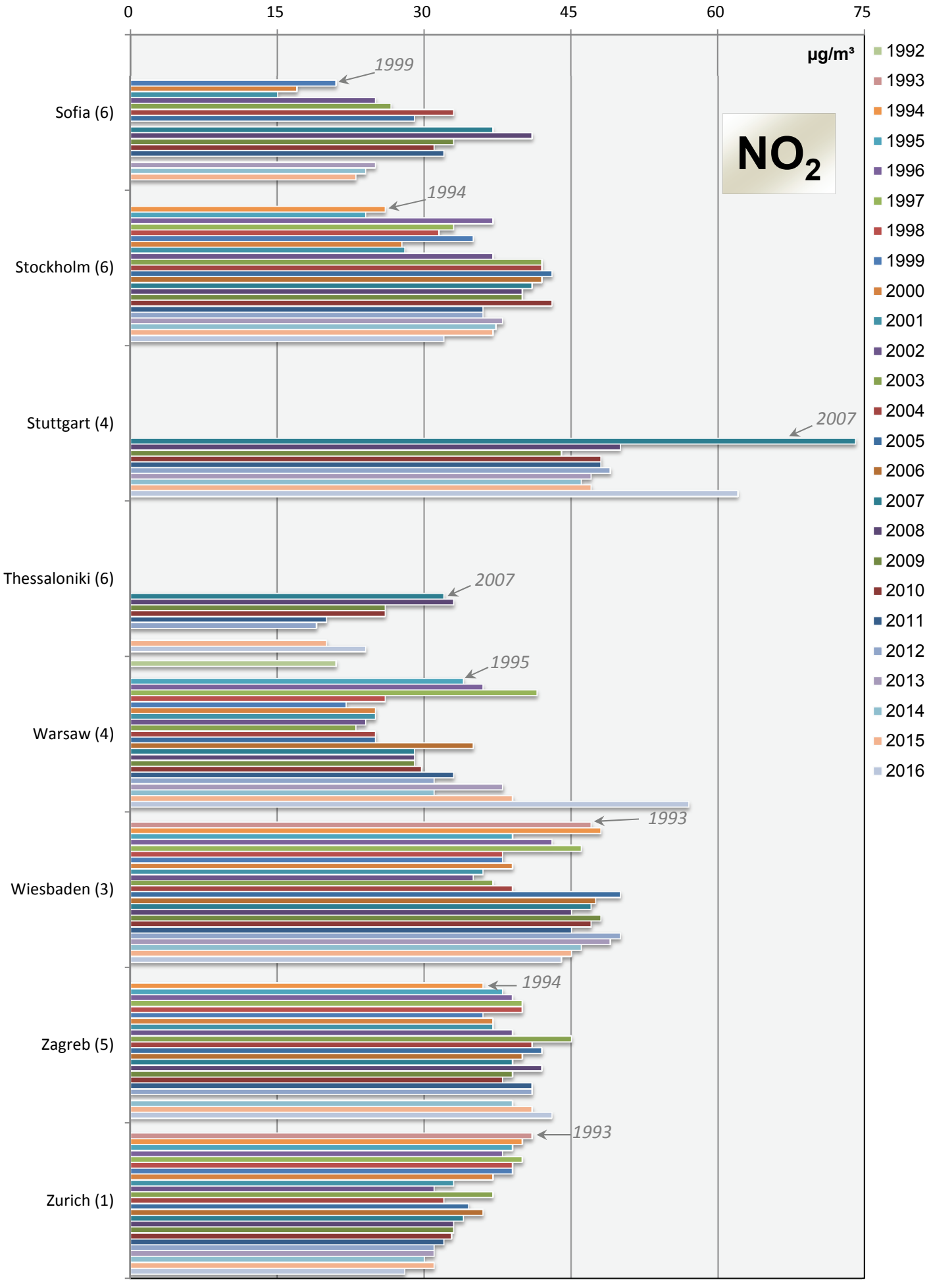

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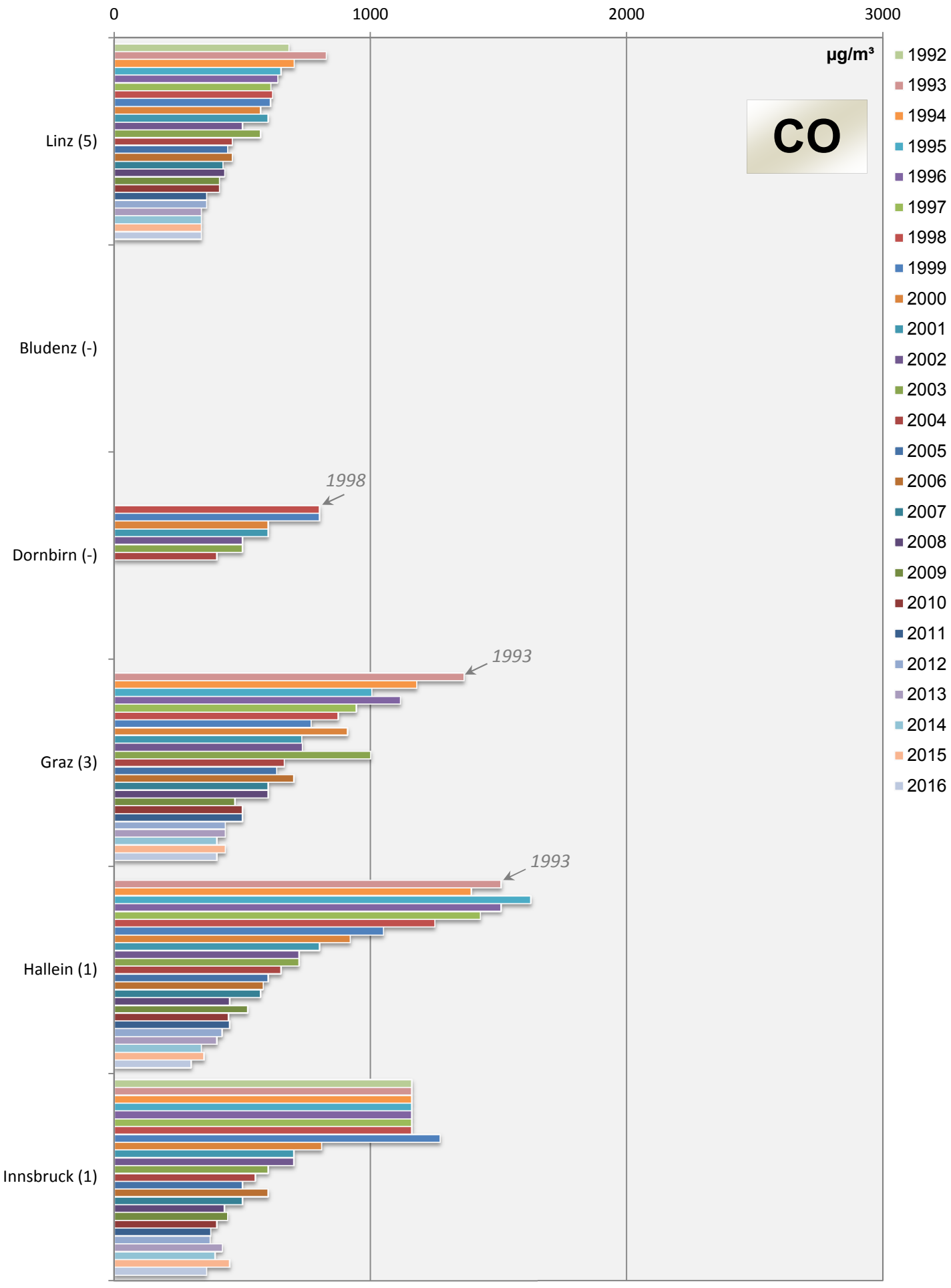

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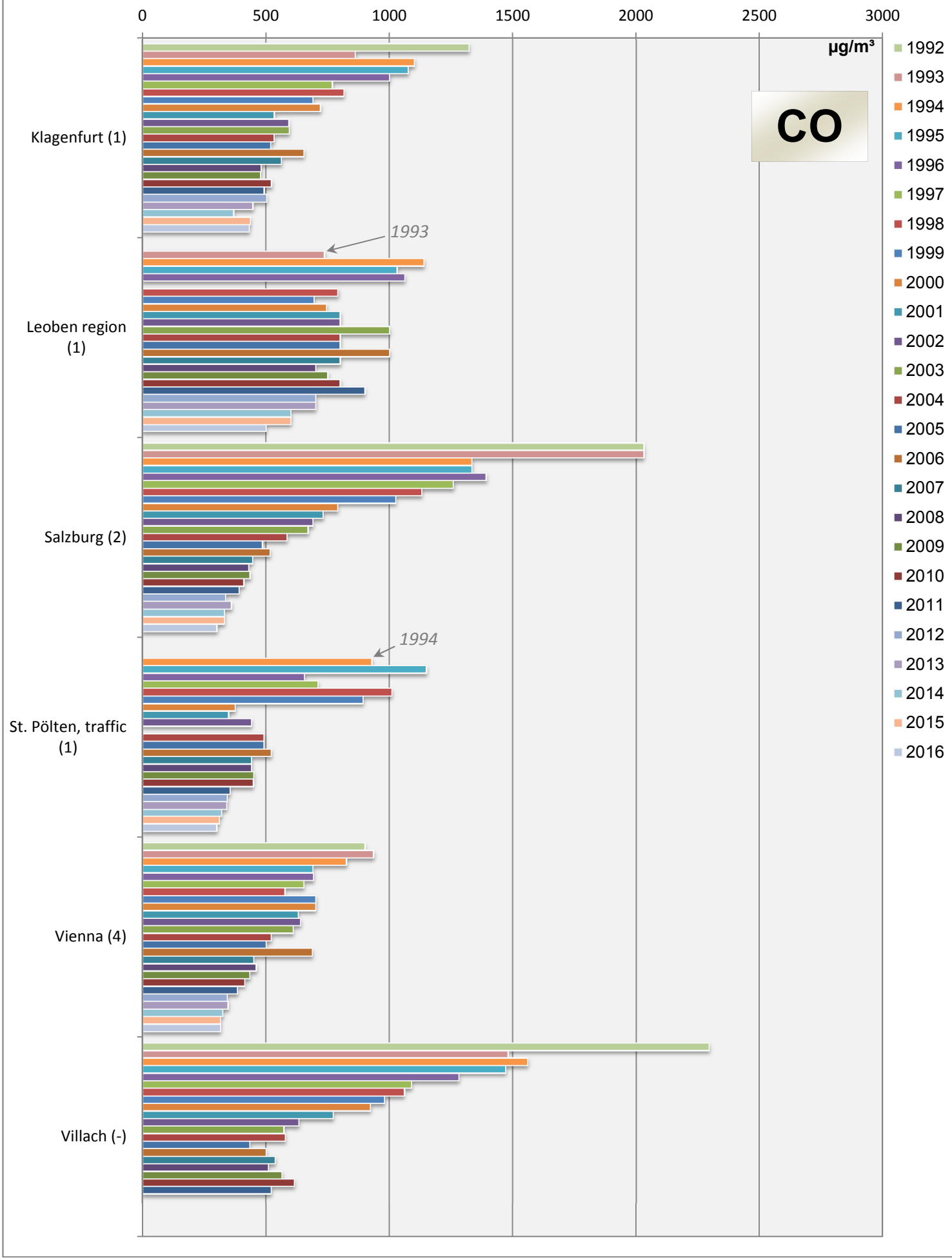

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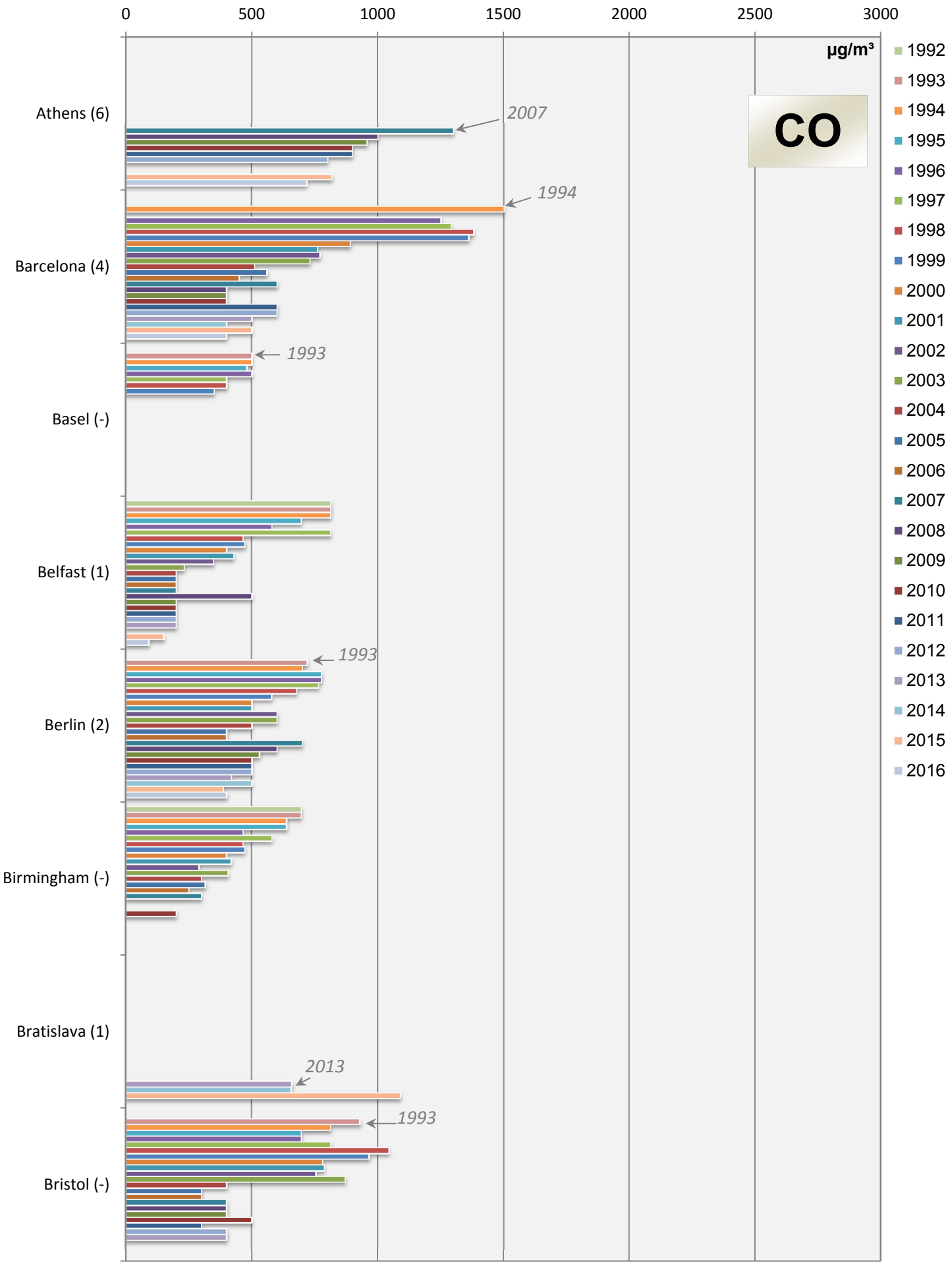

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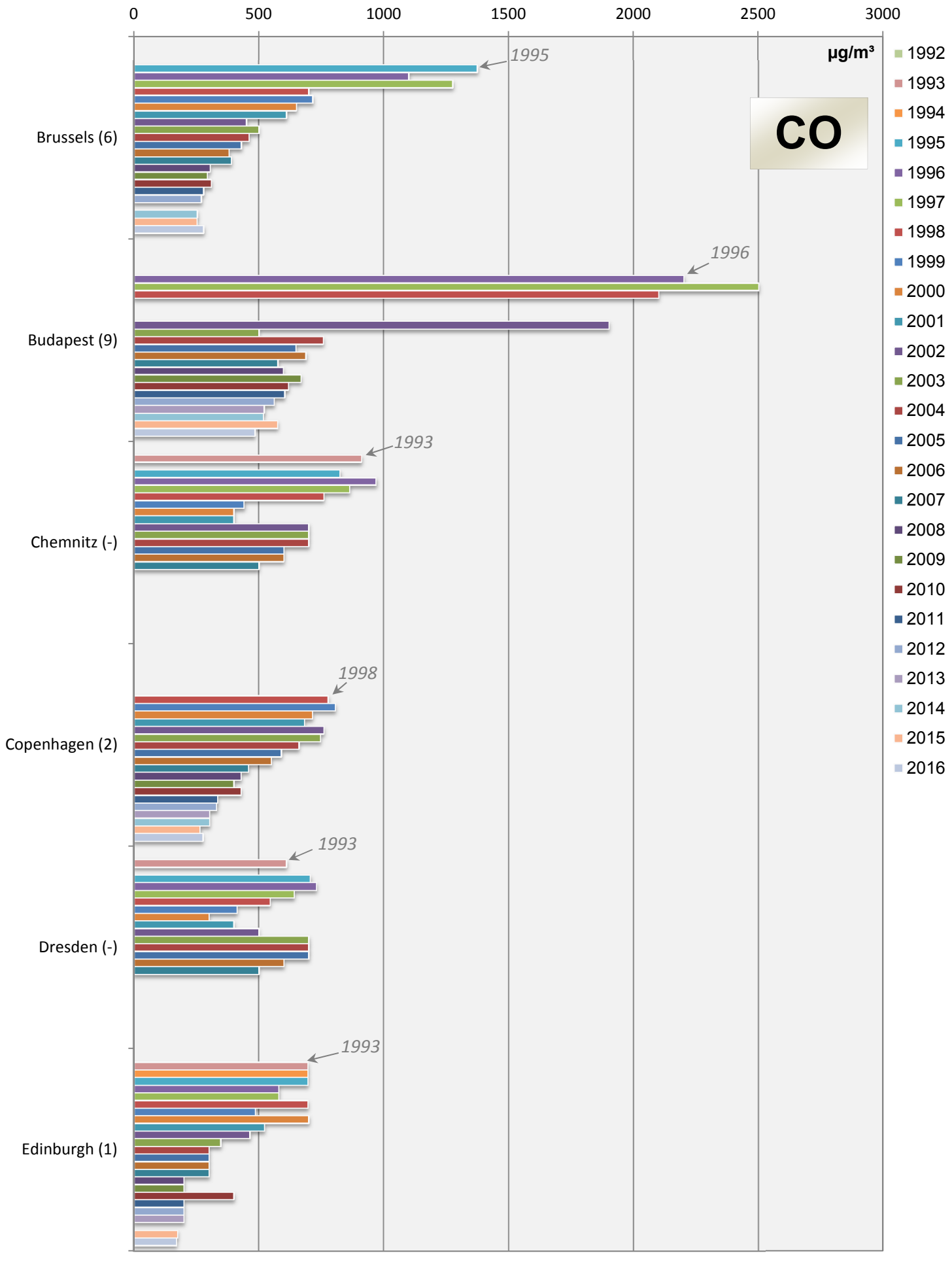

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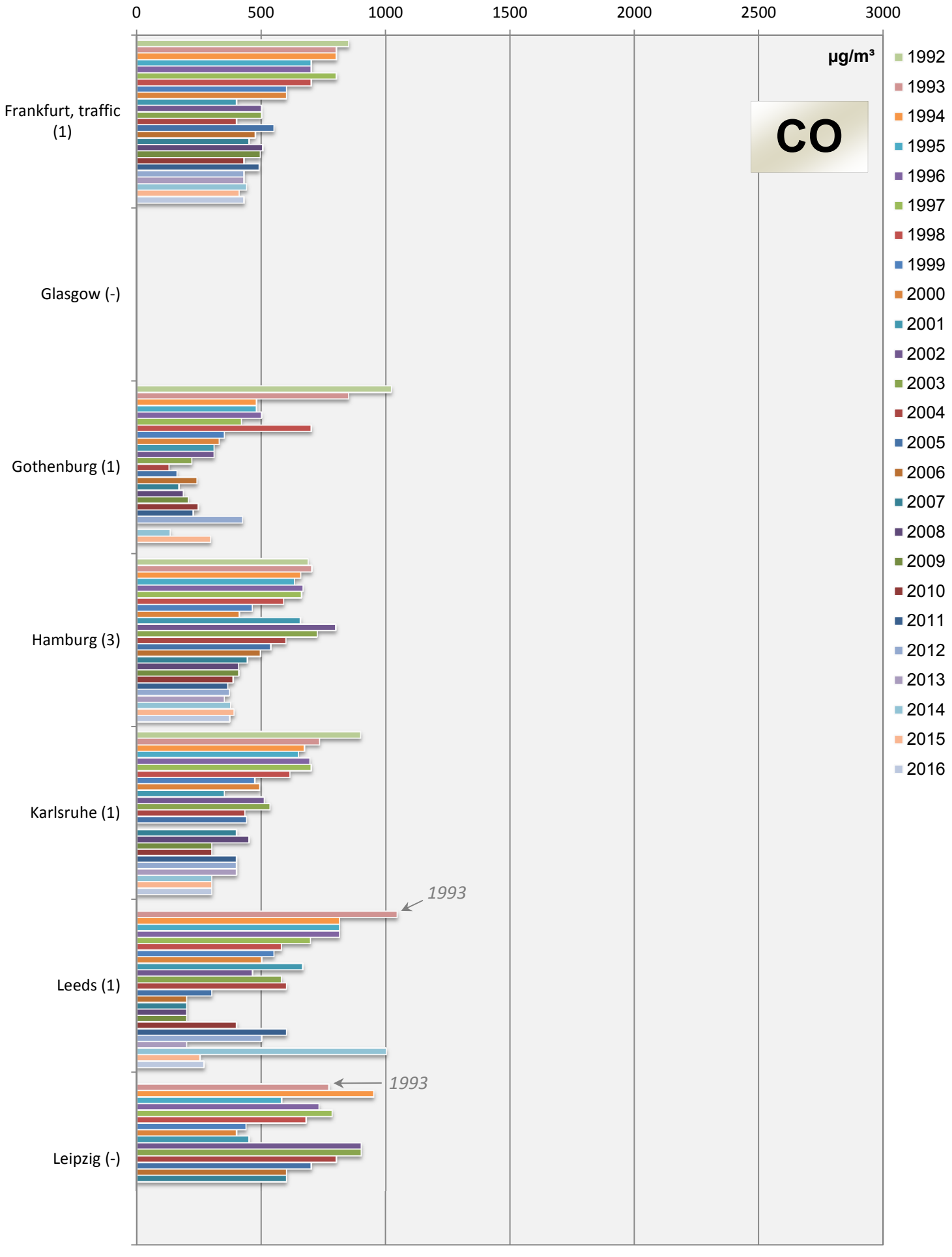

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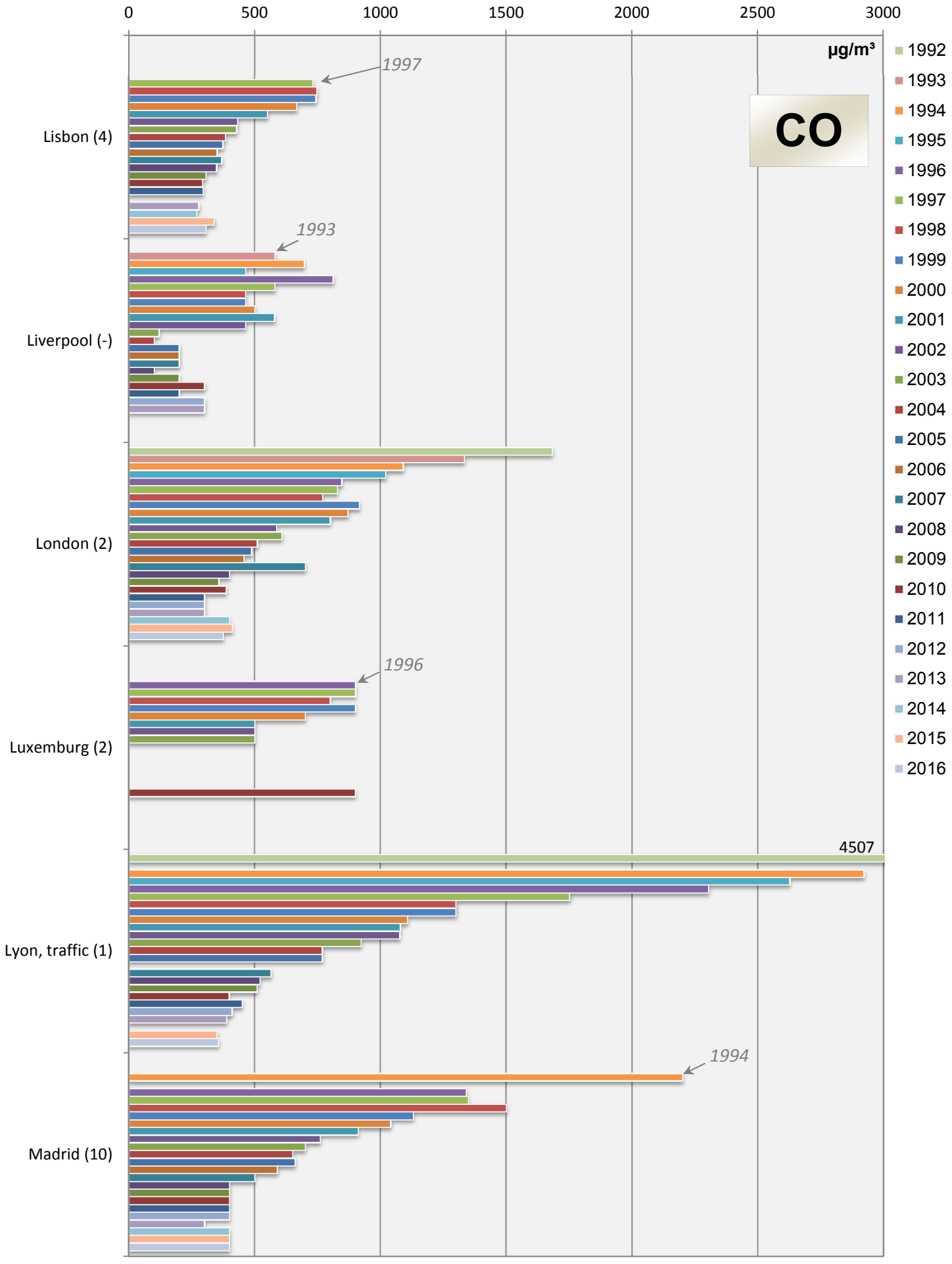

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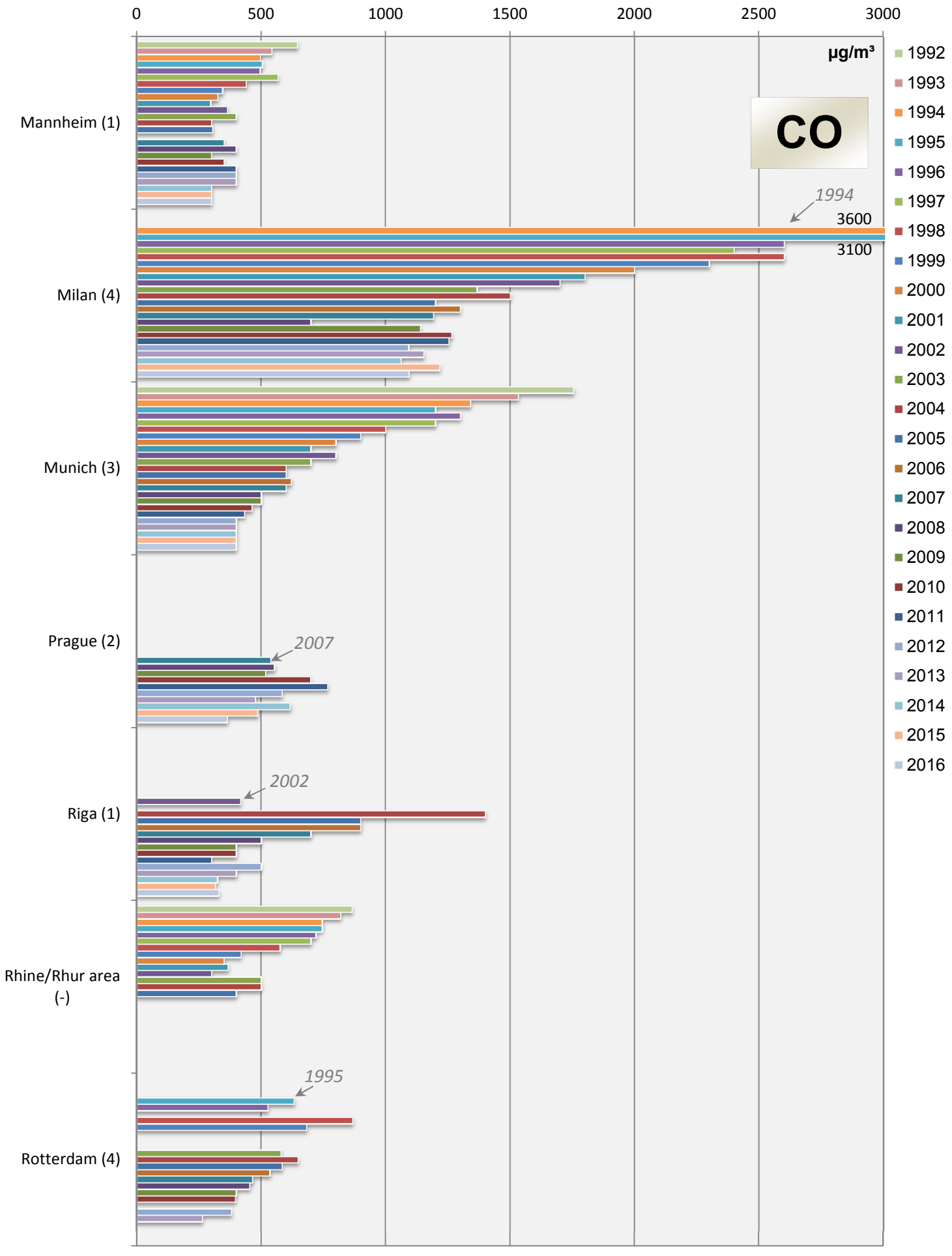

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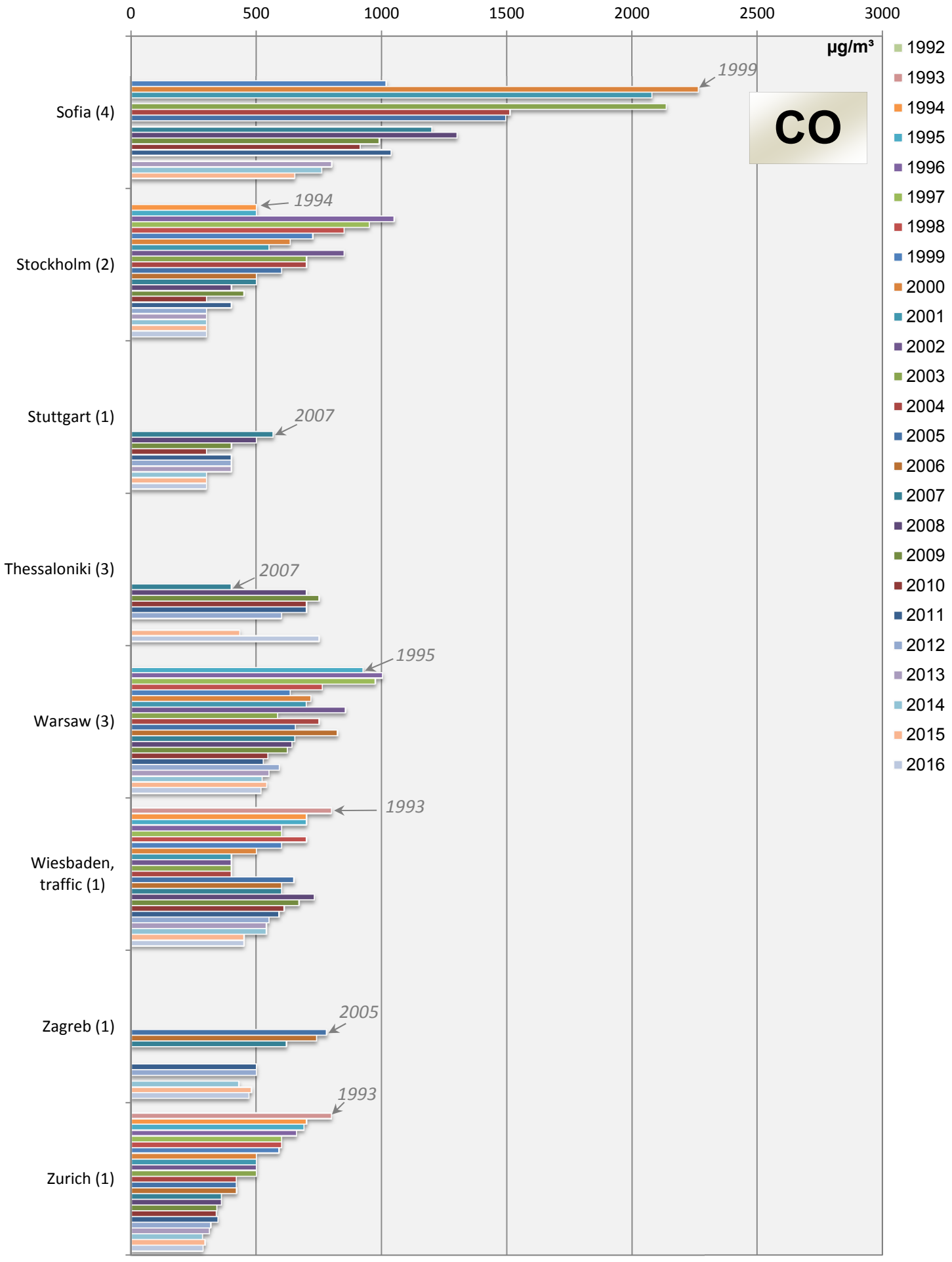
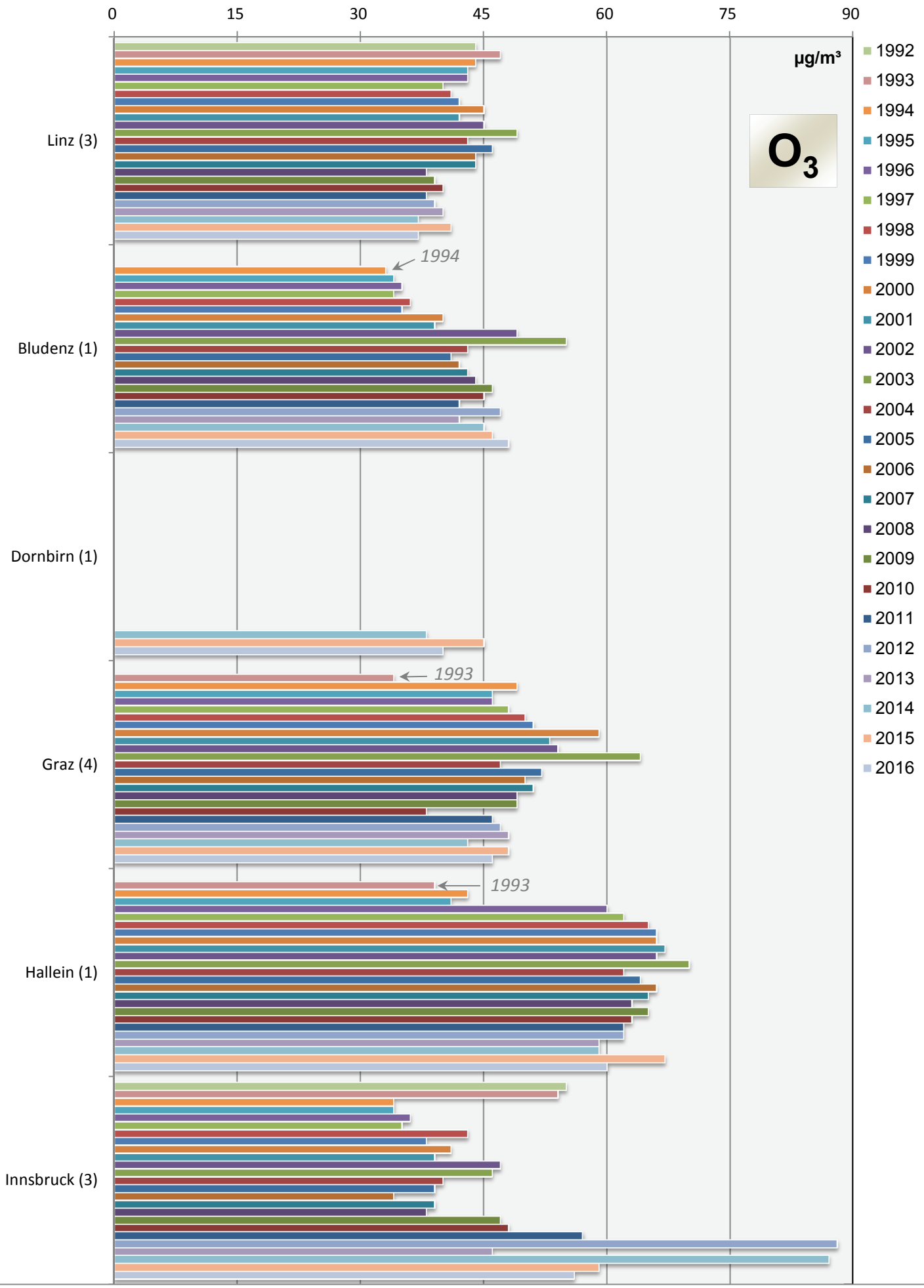


Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



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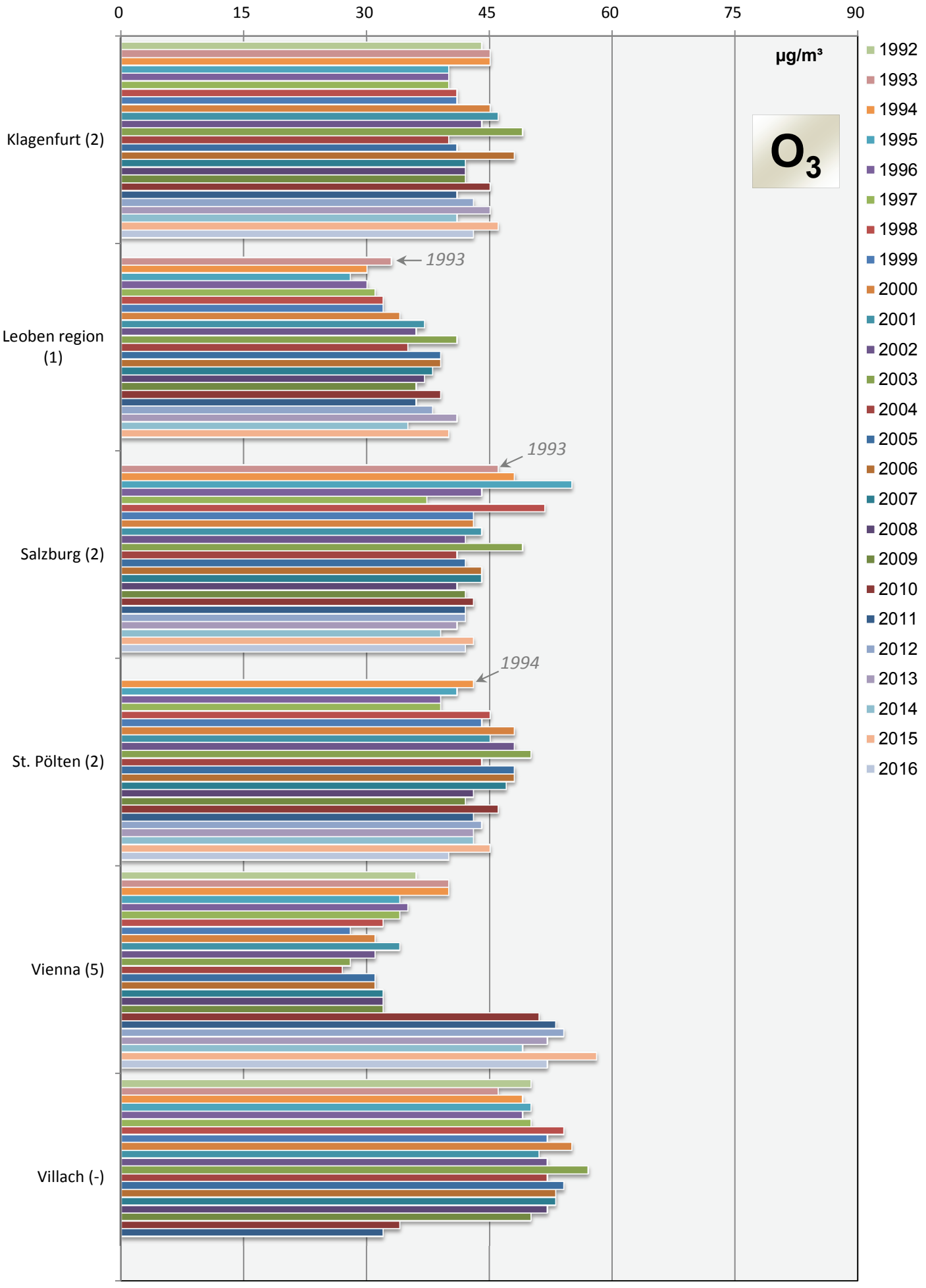

Comparison of The Air Quality 1992 - 2016

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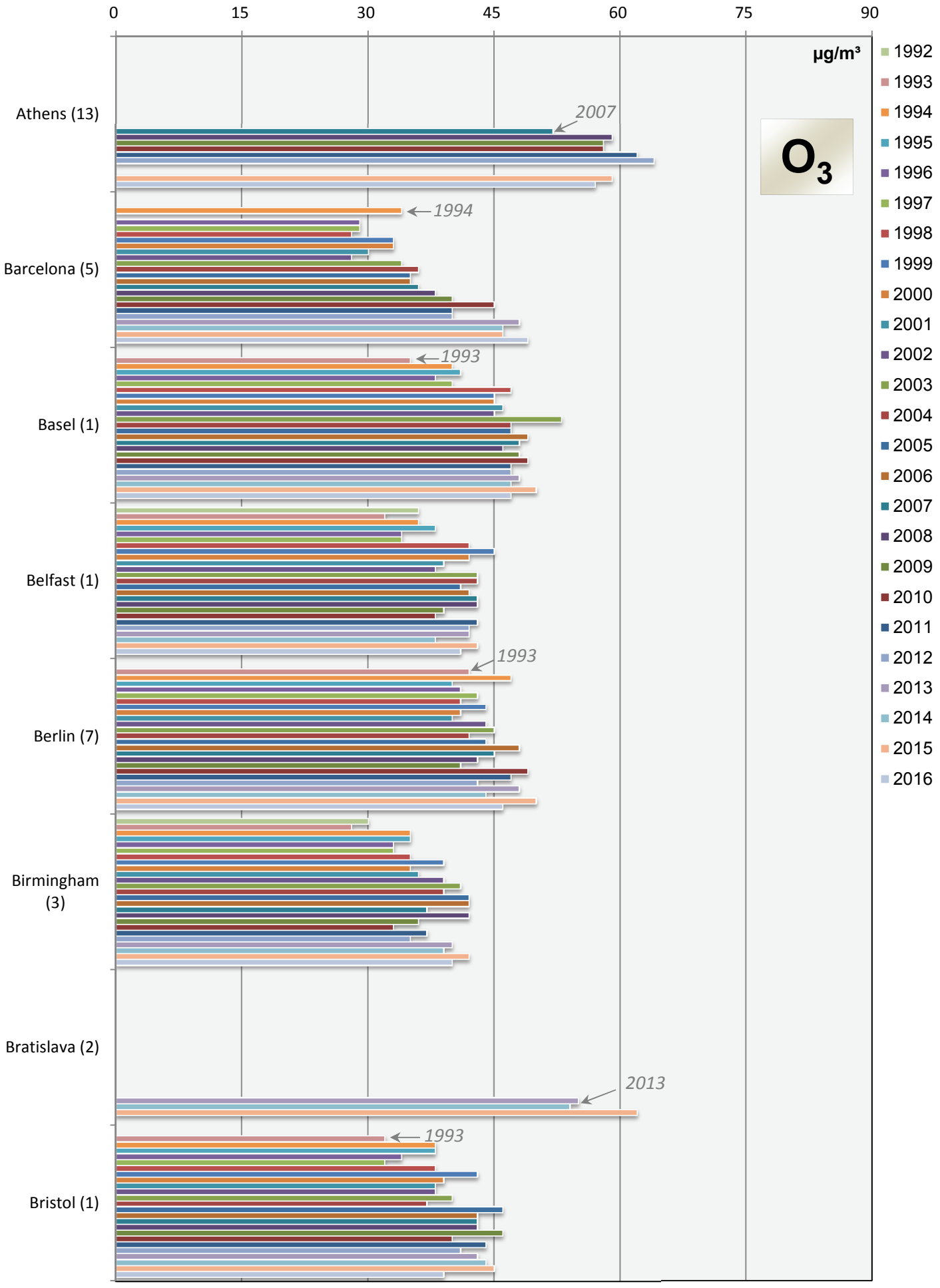
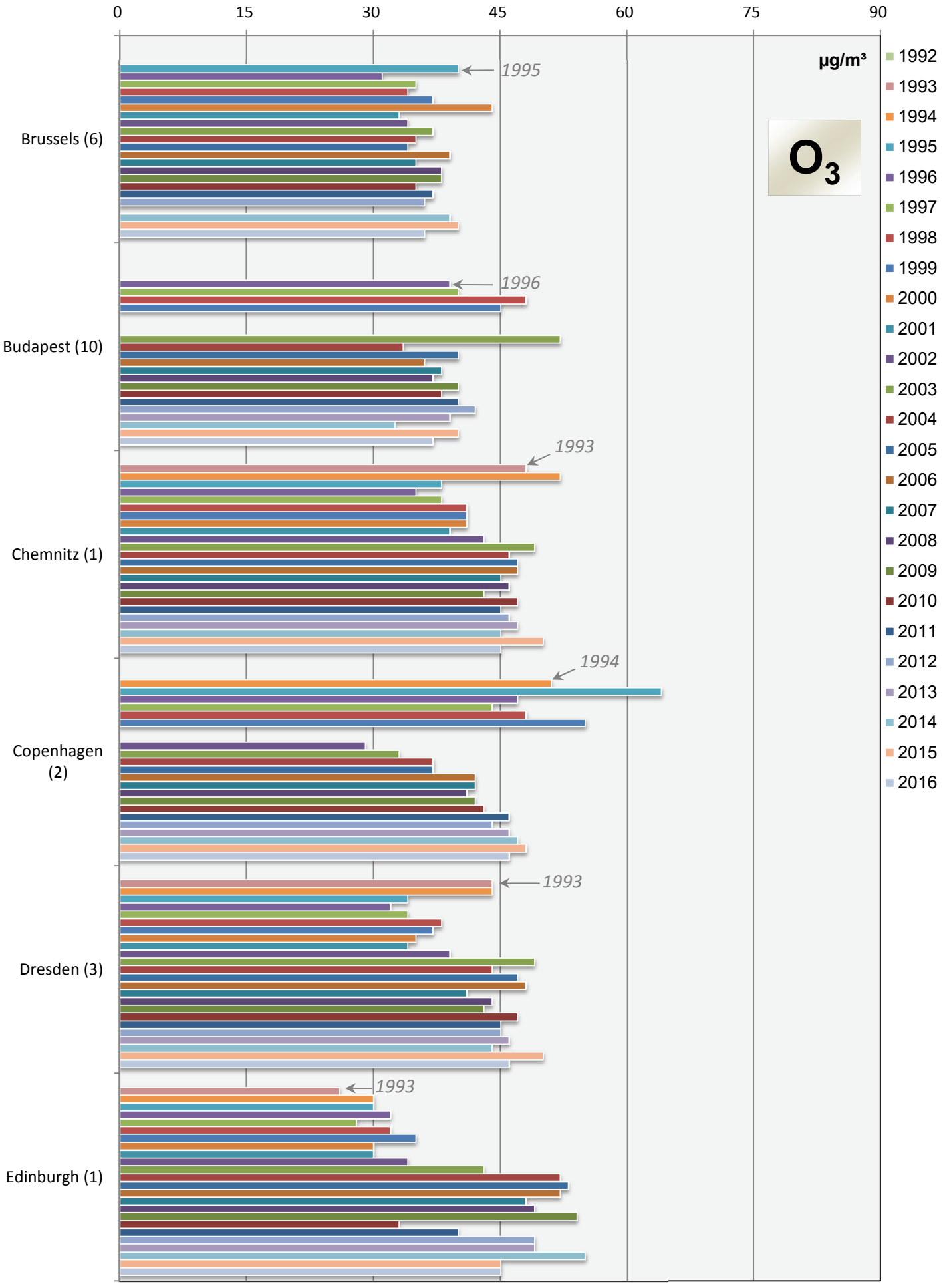


Comparison of The Air Quality 1992 - 2016

Annual mean values (mean of all monitoring stations)



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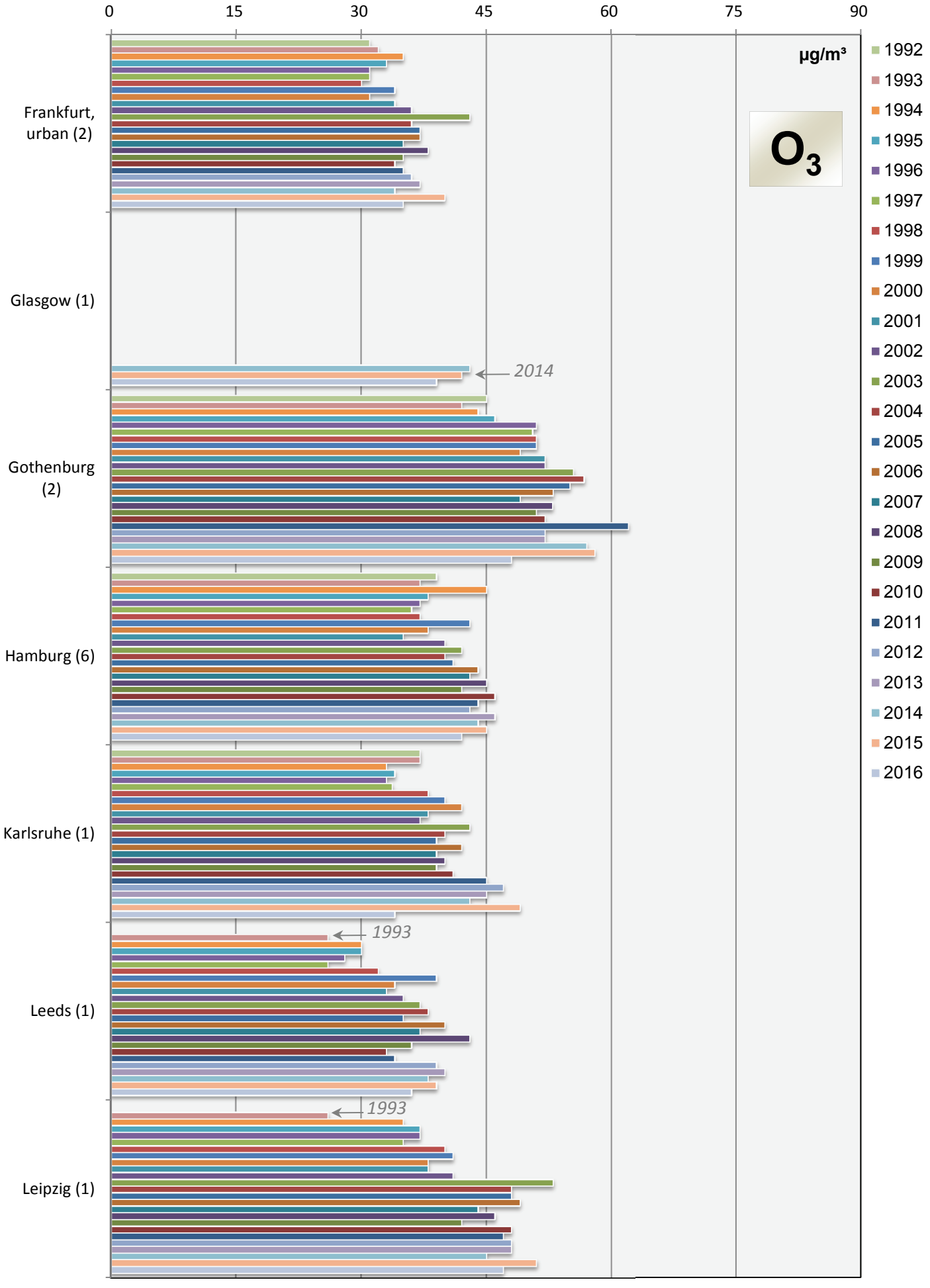
Annual mean values (mean of all monitoring stations)



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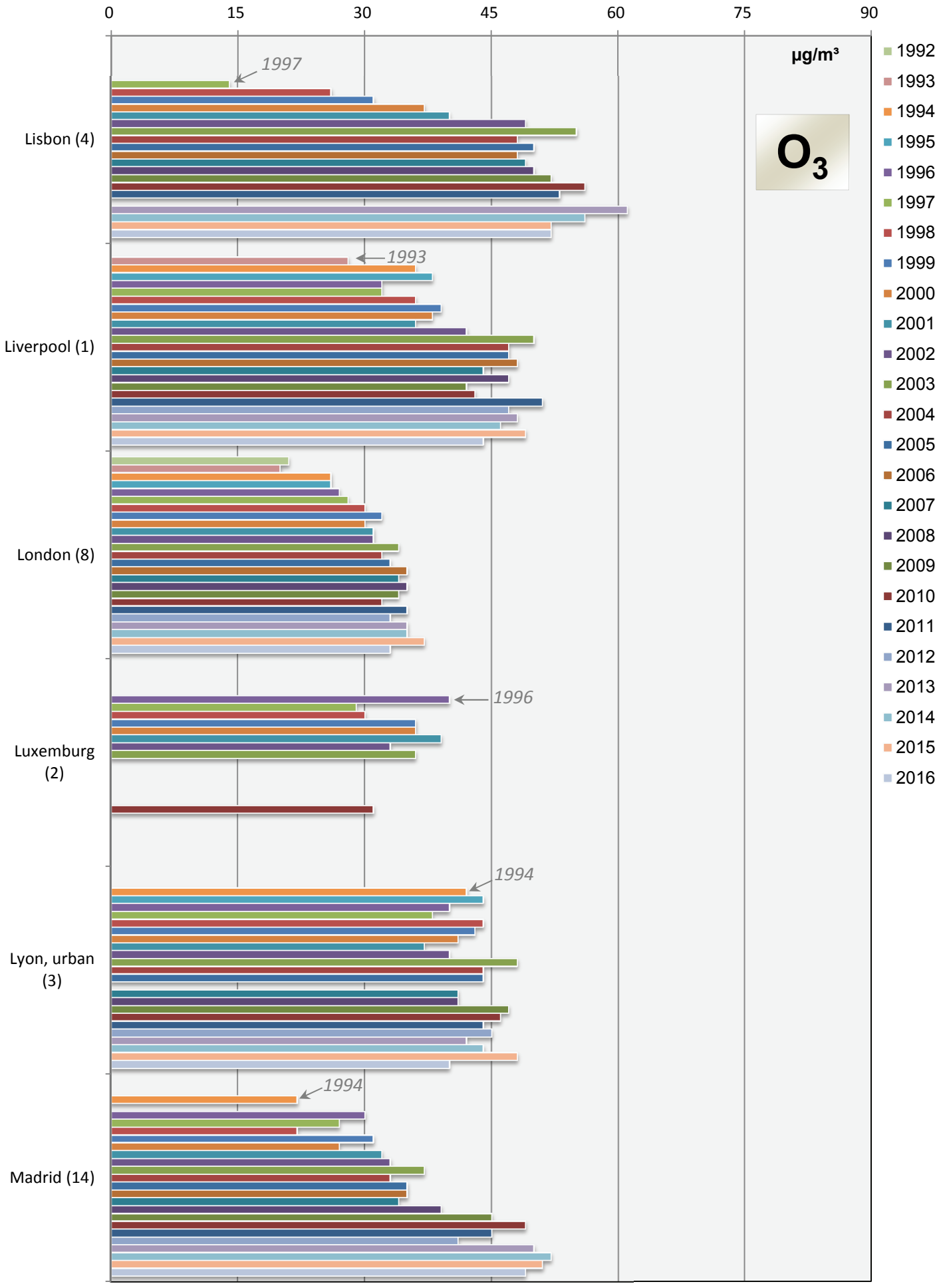

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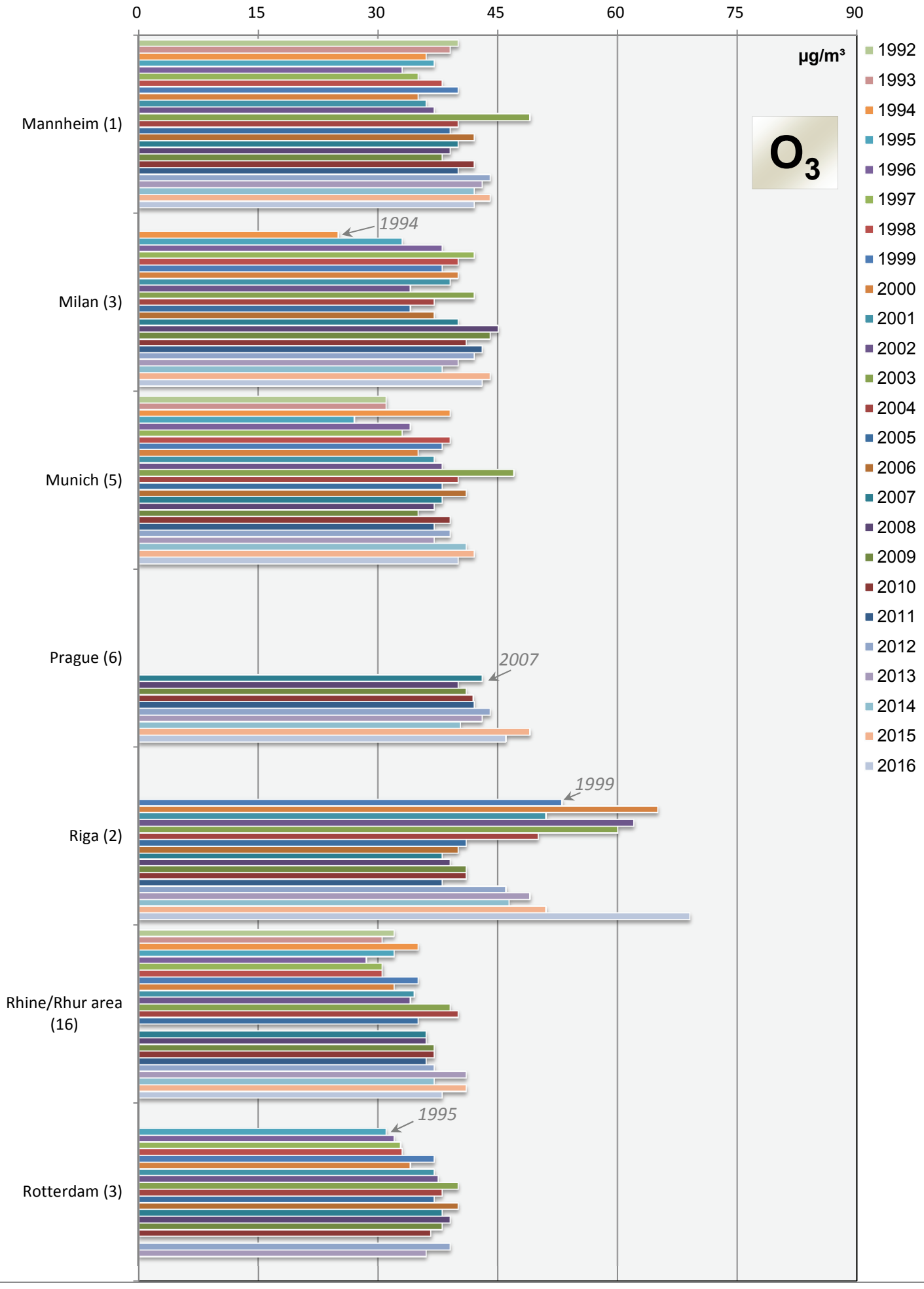

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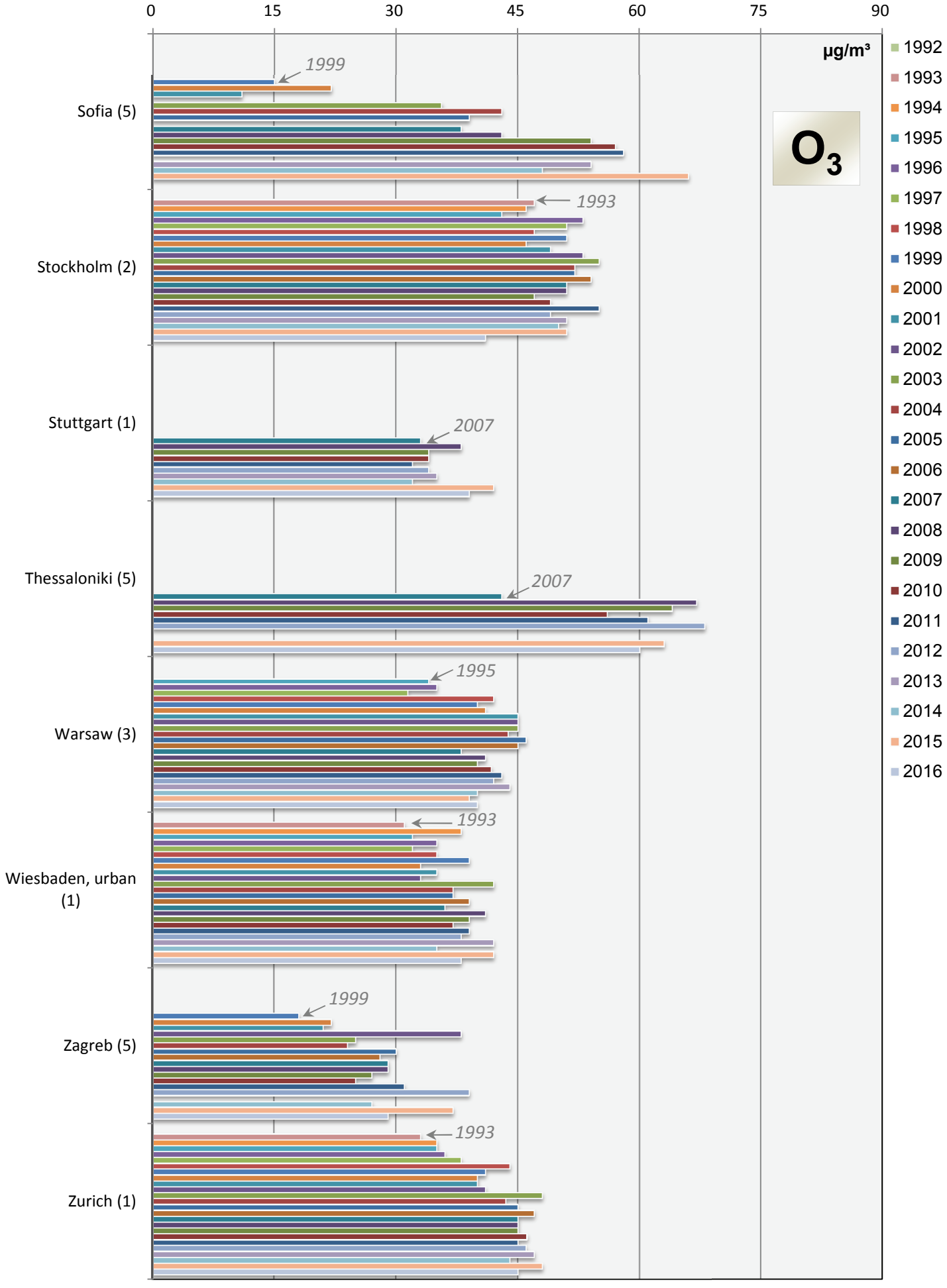
Annual mean values (mean of all monitoring stations)



Jahresvergleich

1992 - 2016

max. Tagesmittelwerte

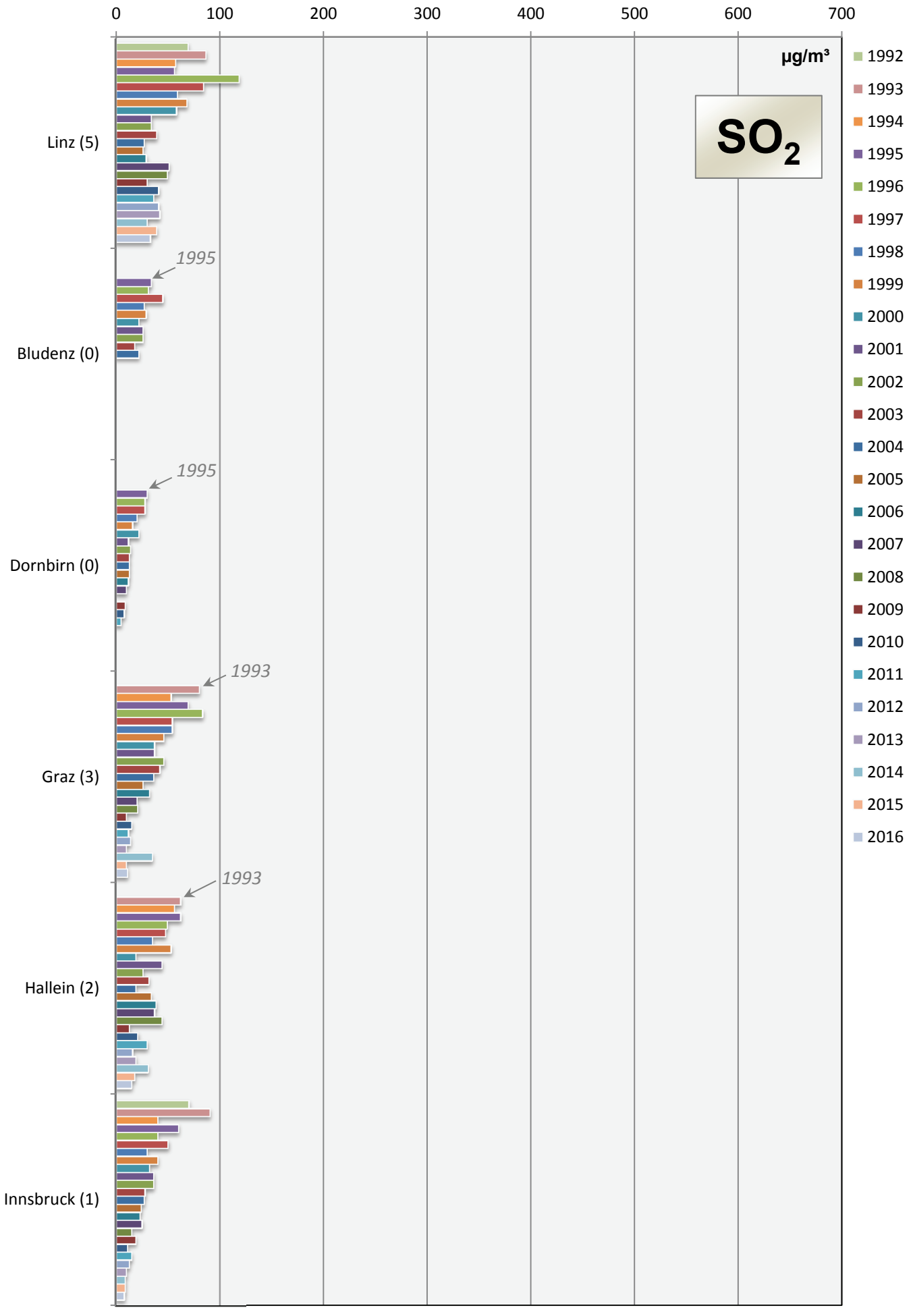
Comparison of The Air Quality Over The Years

1992 - 2016

Max. Daily Mean Values

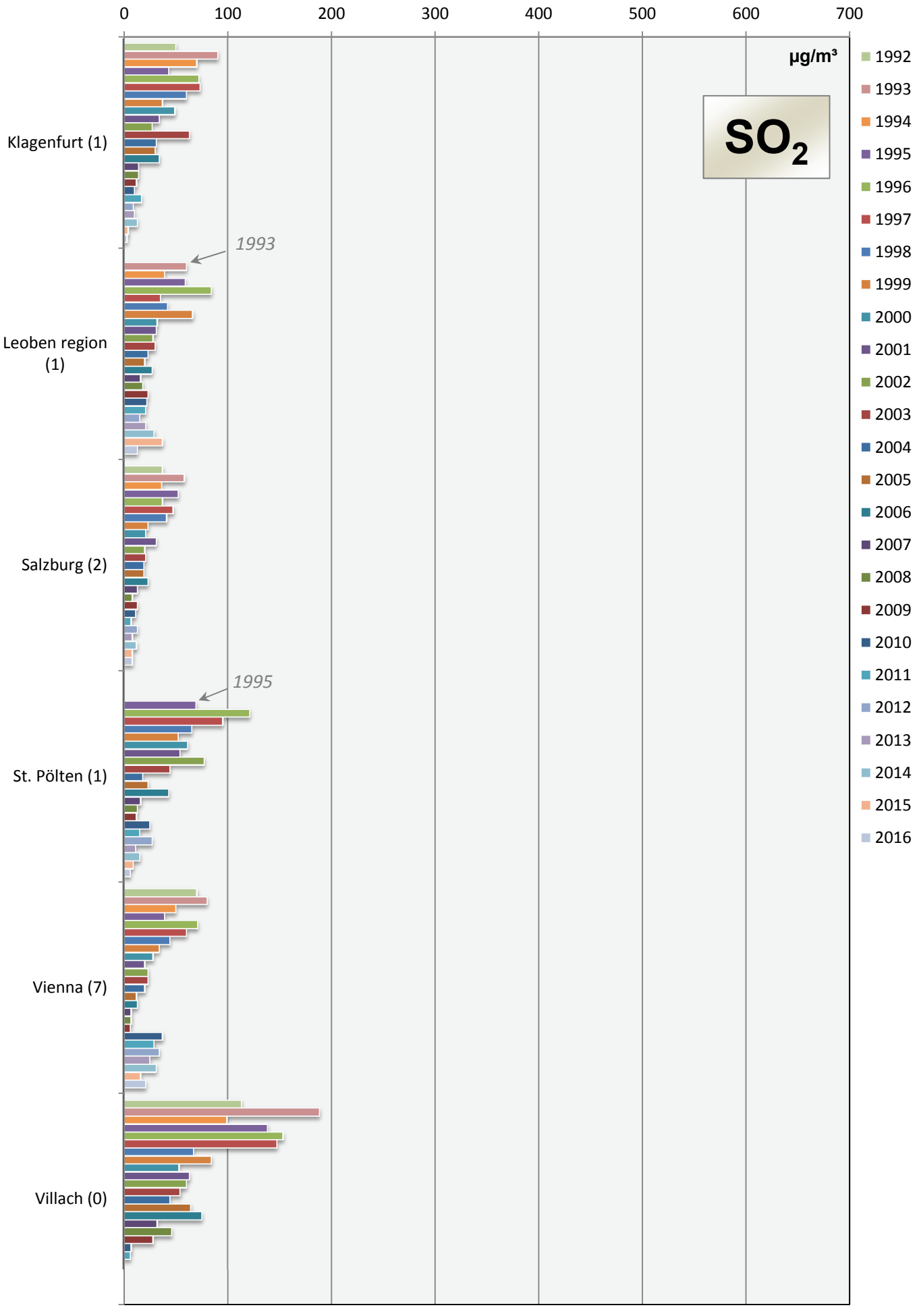
Comparison of The Air Quality 1992 - 2016

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



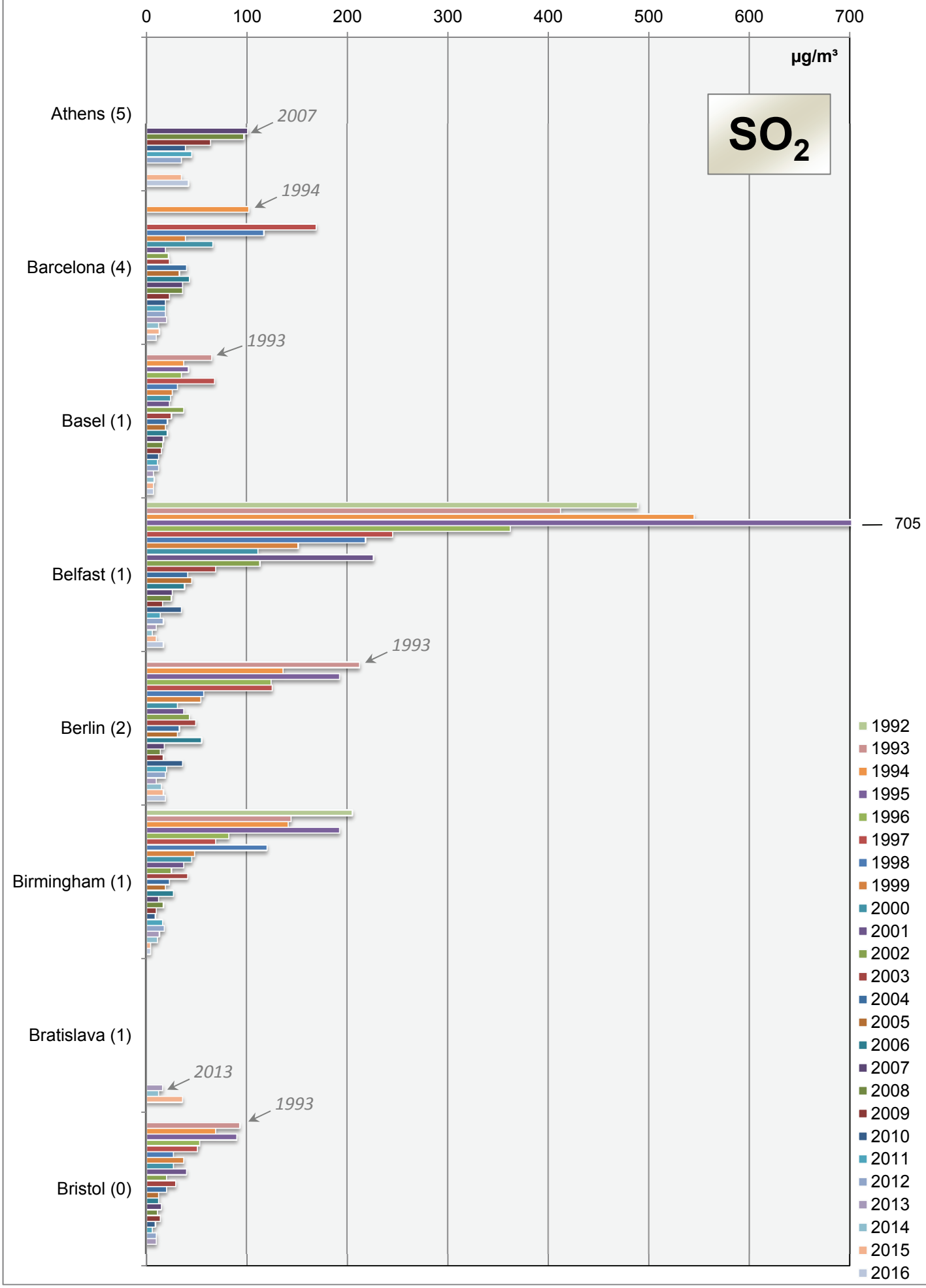
Comparison of The Air Quality 1992 - 2016

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



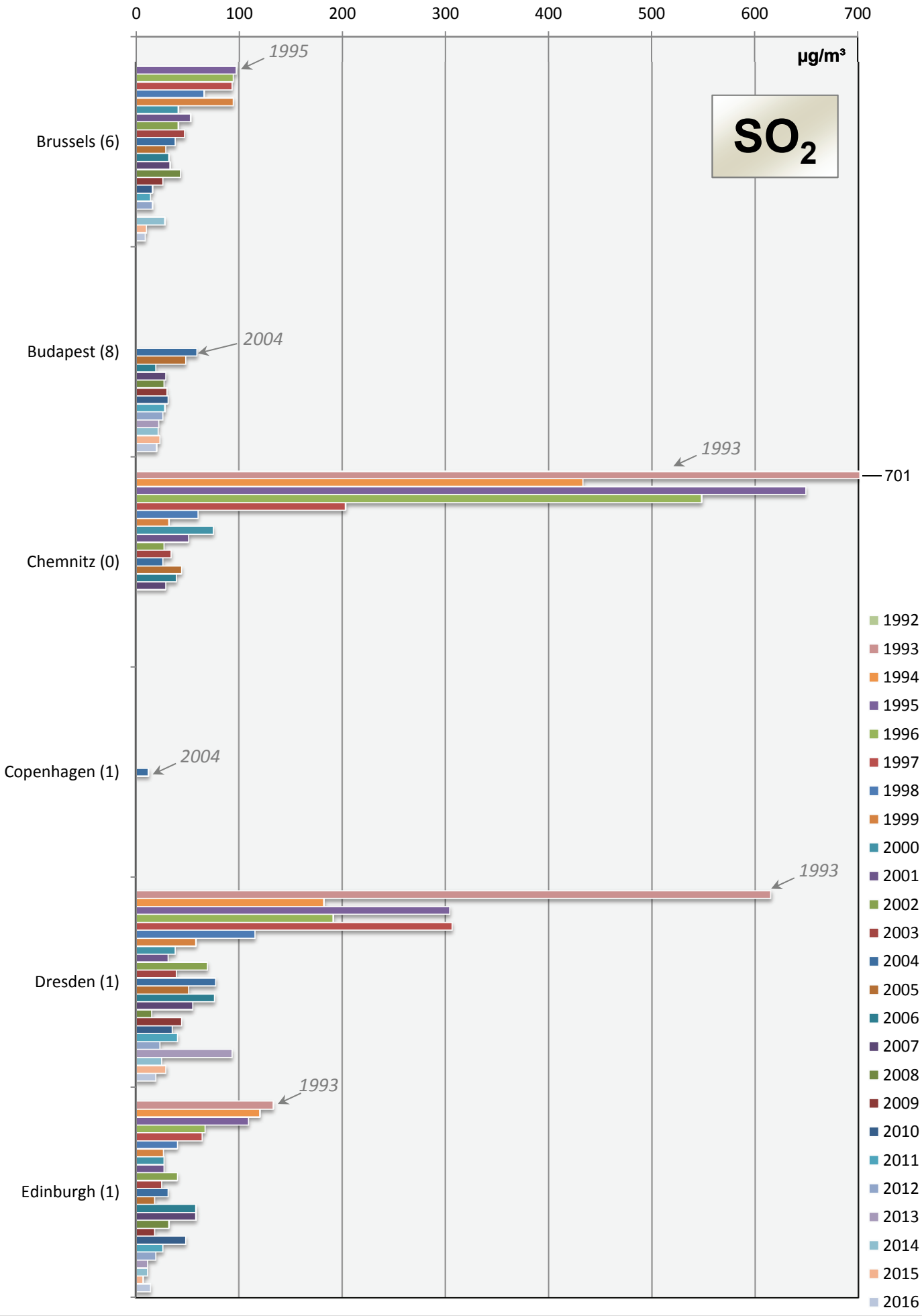
Comparison of The Air Quality 1992 - 2016

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



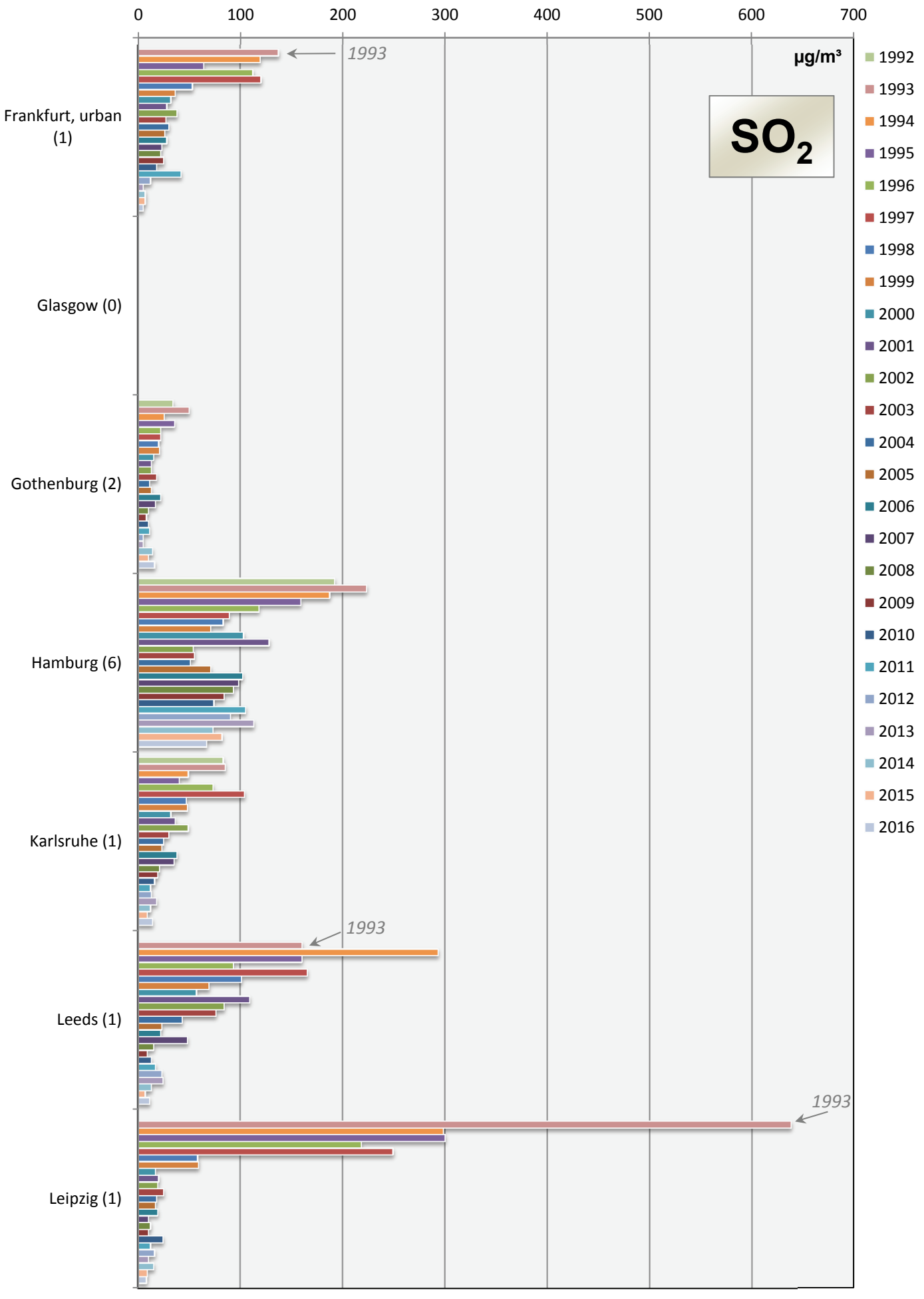
Comparison of The Air Quality 1992 - 2016

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



Comparison of The Air Quality 1992 - 2016

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



Comparison of The Air Quality 1992 - 2016

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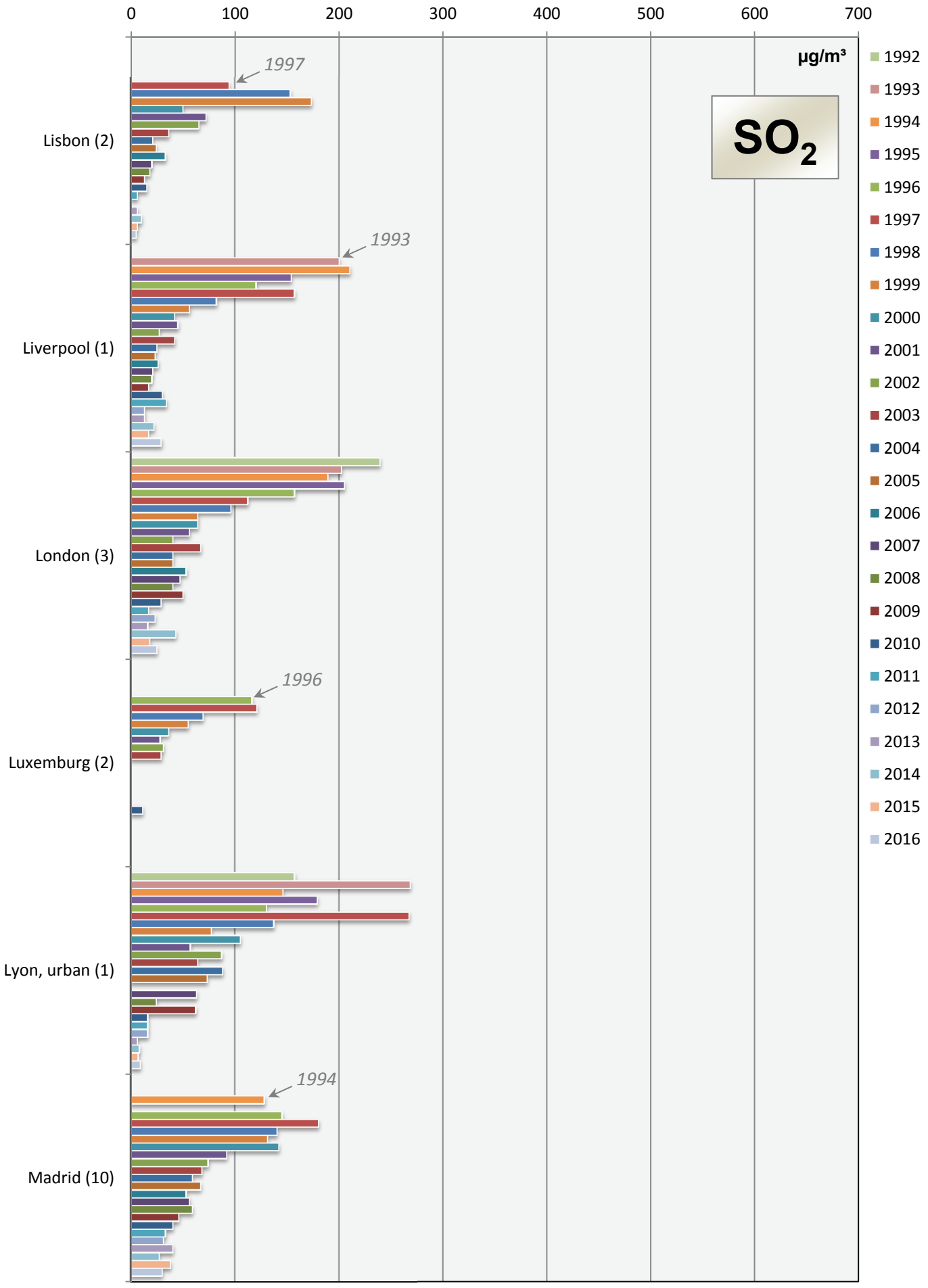

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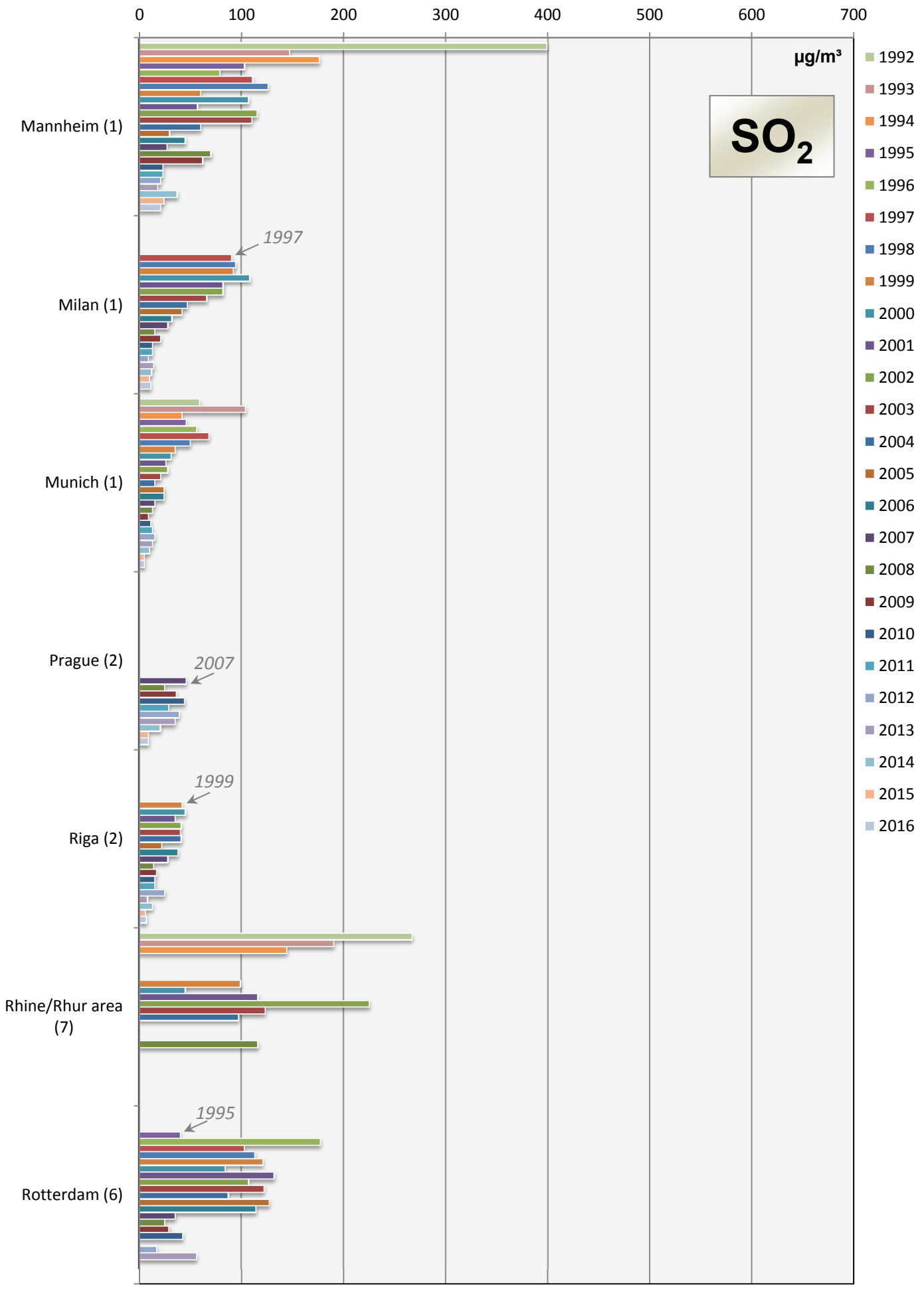
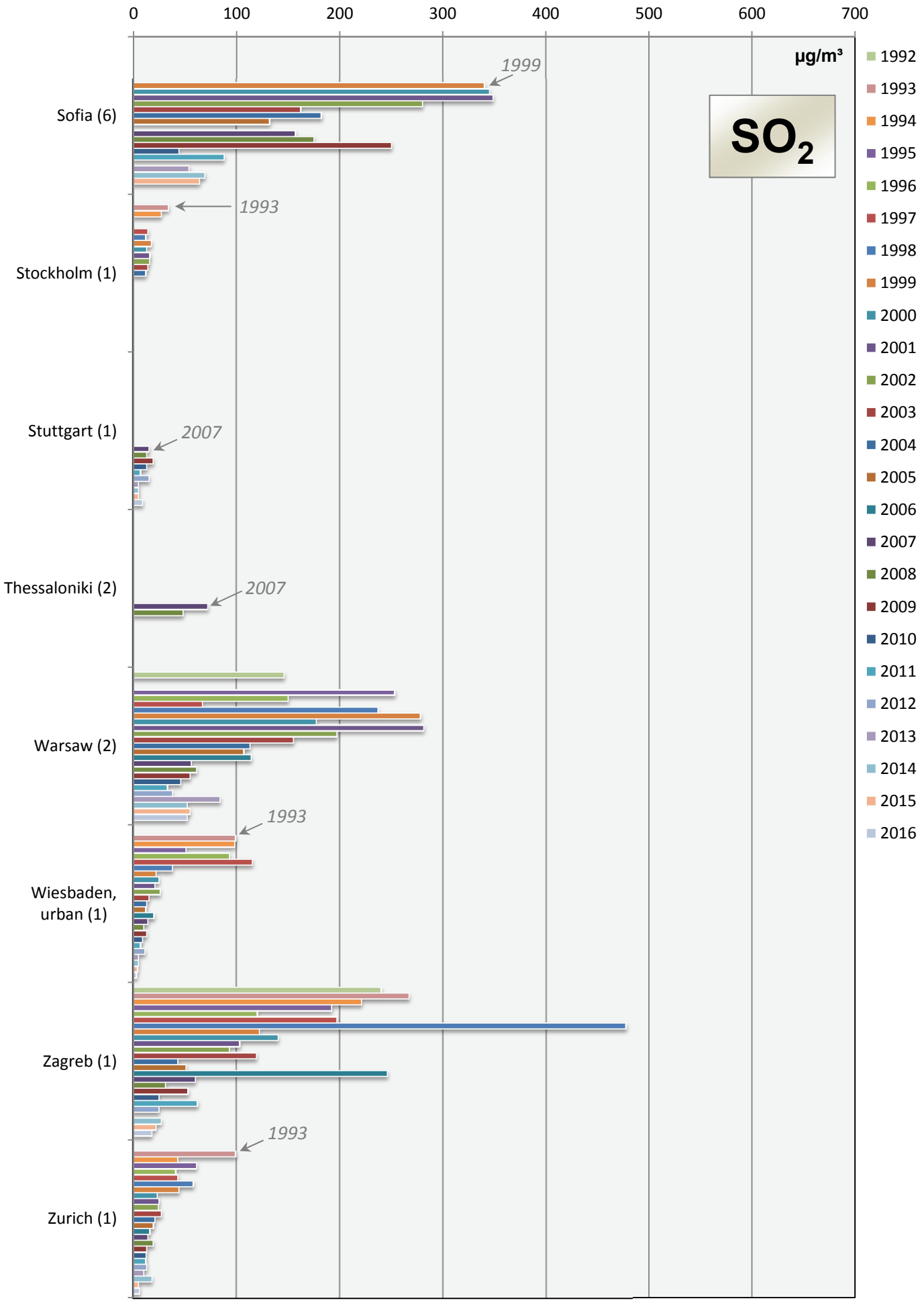
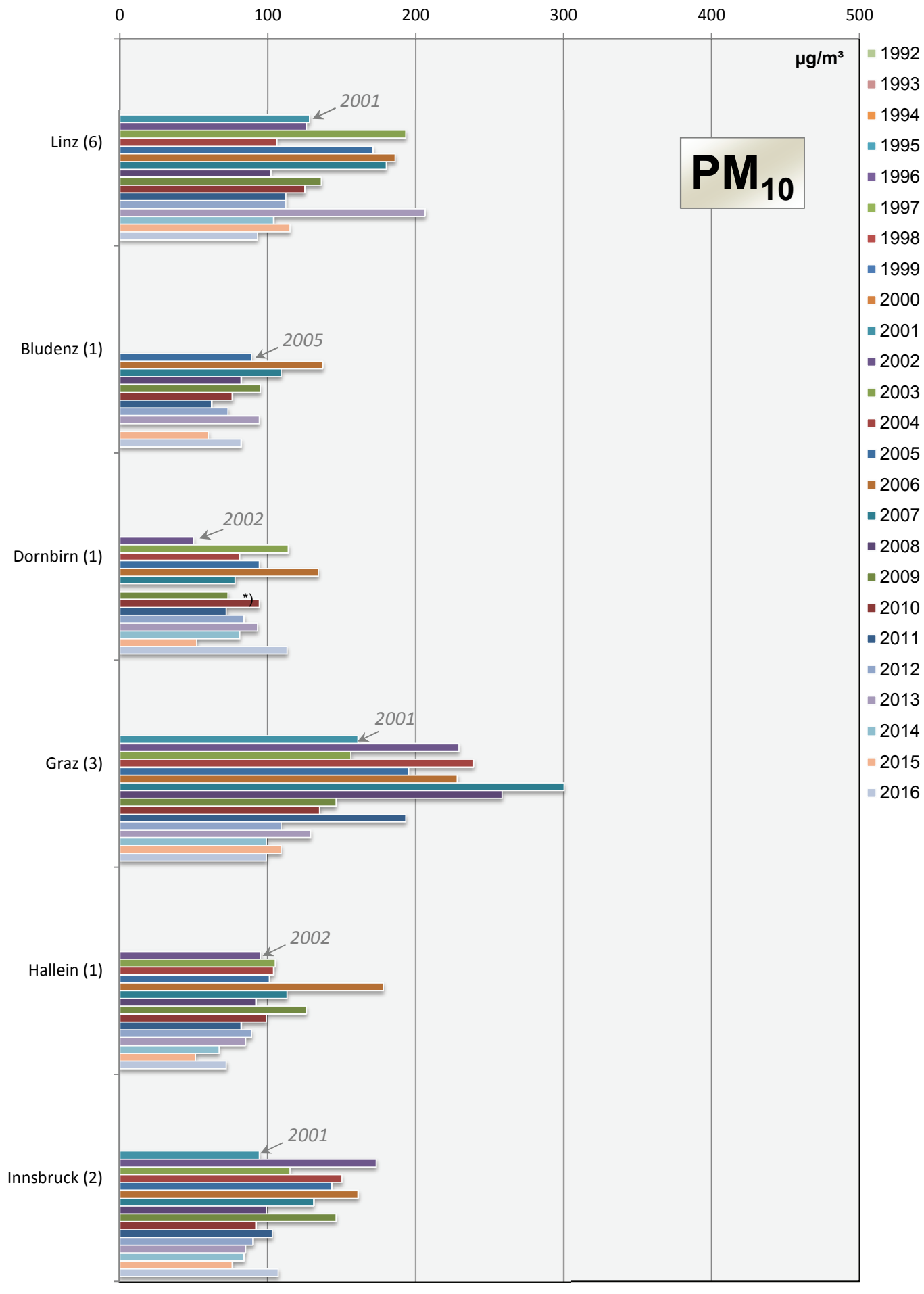


Comparison of The Air Quality 1992 - 2016

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



Comparison of The Air Quality 1992 - 2016
max. daily mean values (peak-stressed monitoring station)



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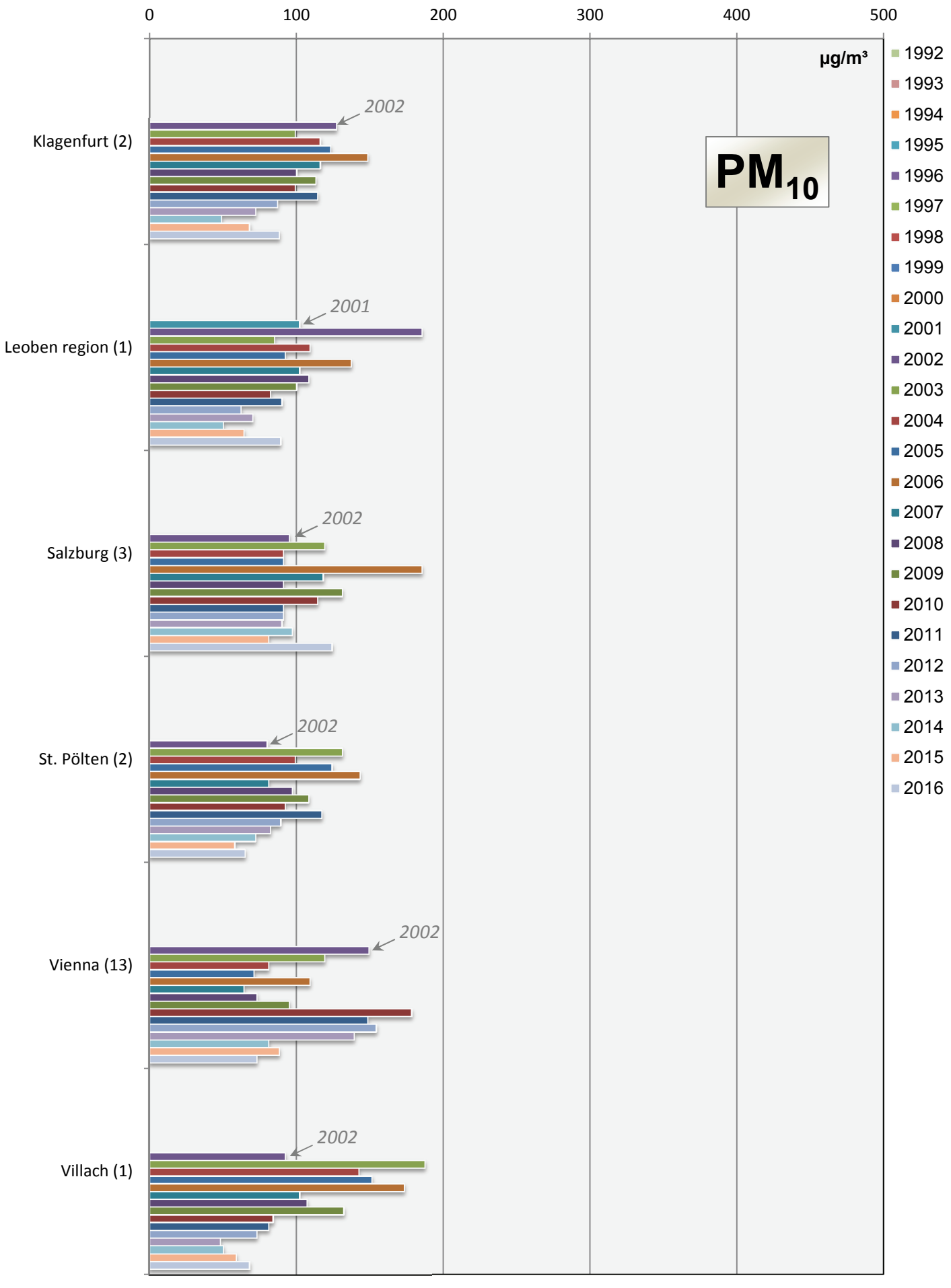
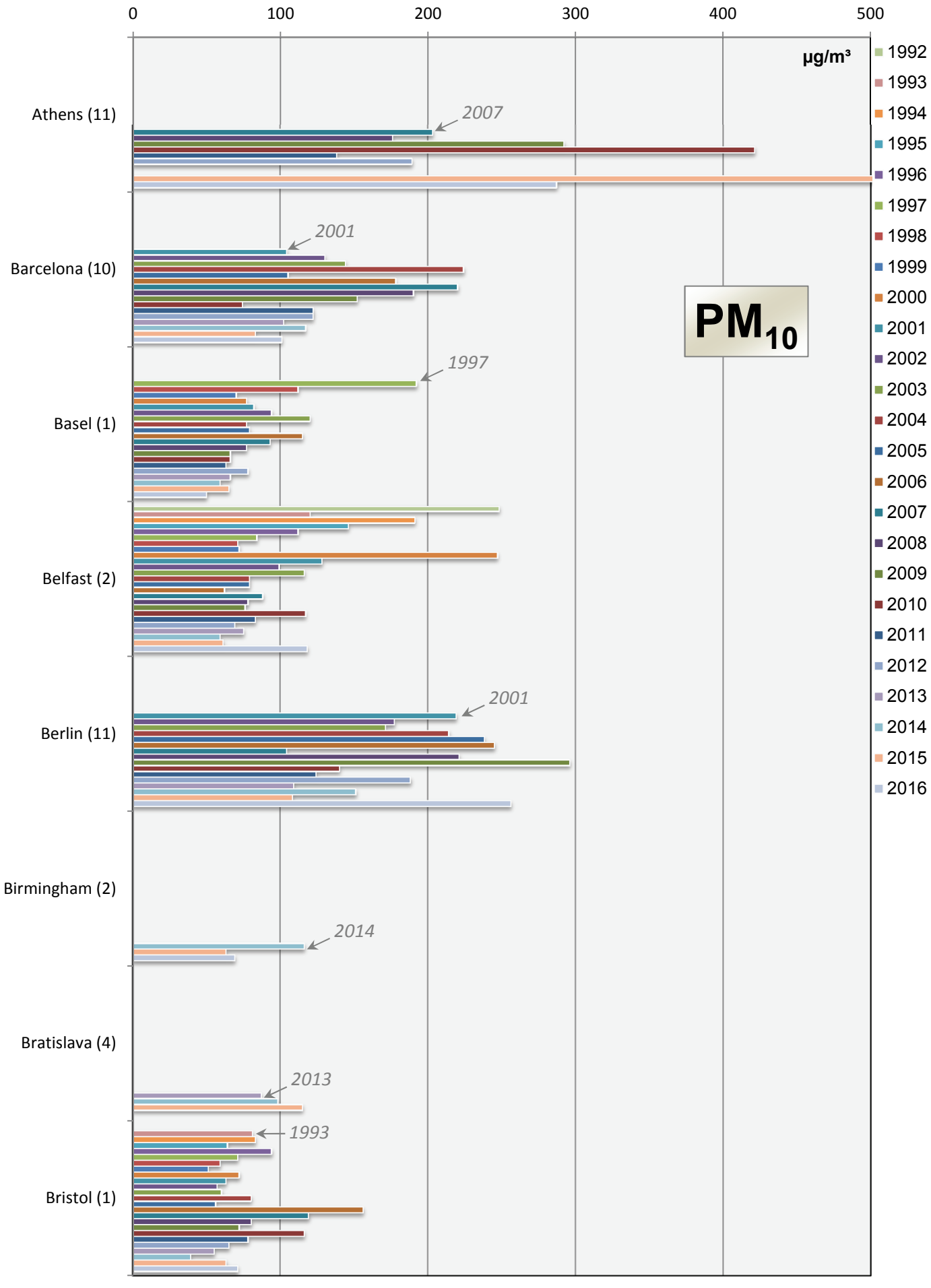
Comparison of The Air Quality 1992 - 2016
max. daily mean values (peak-stressed monitoring station)



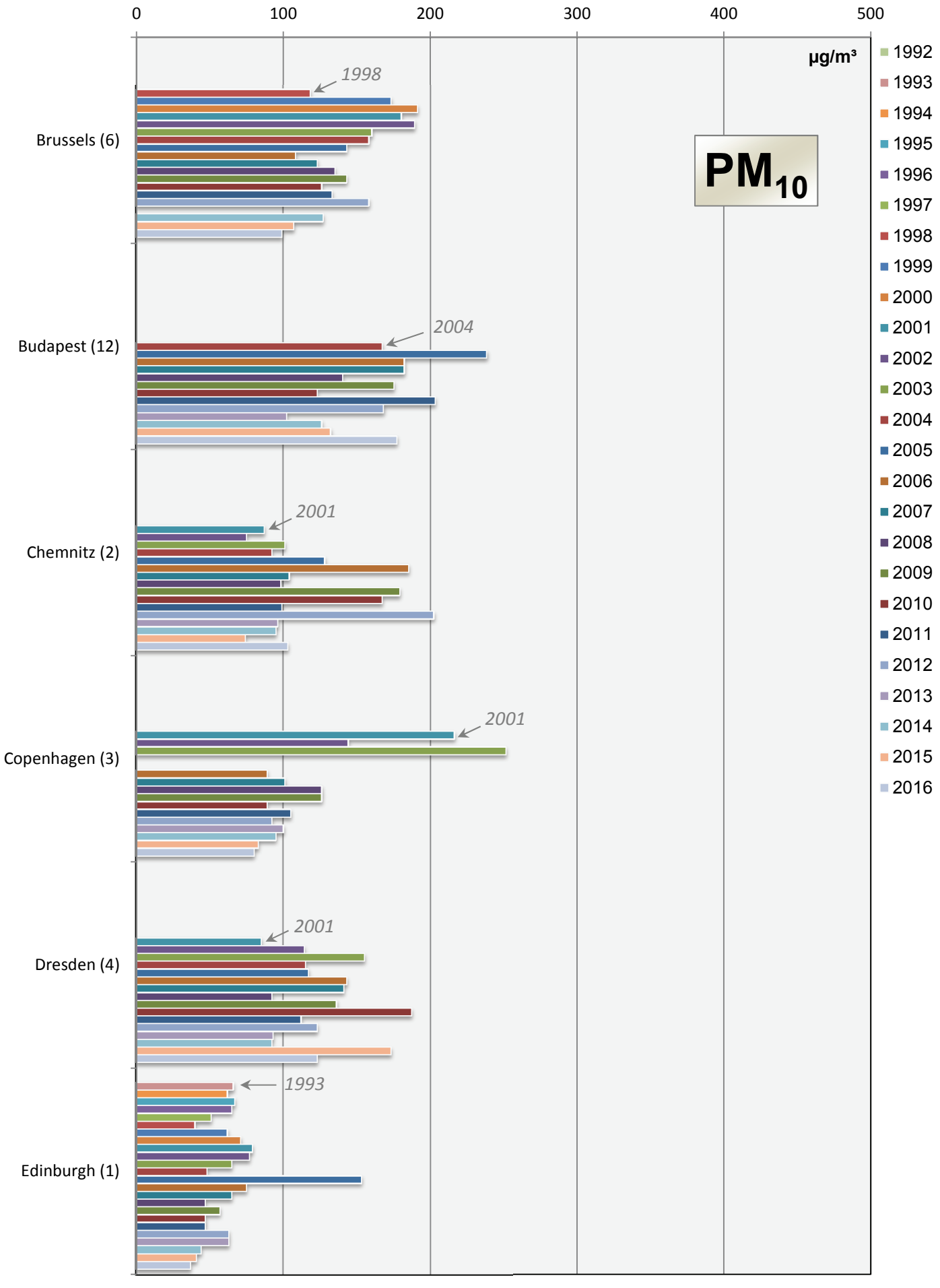
Comparison of The Air Quality 1992 - 2016

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



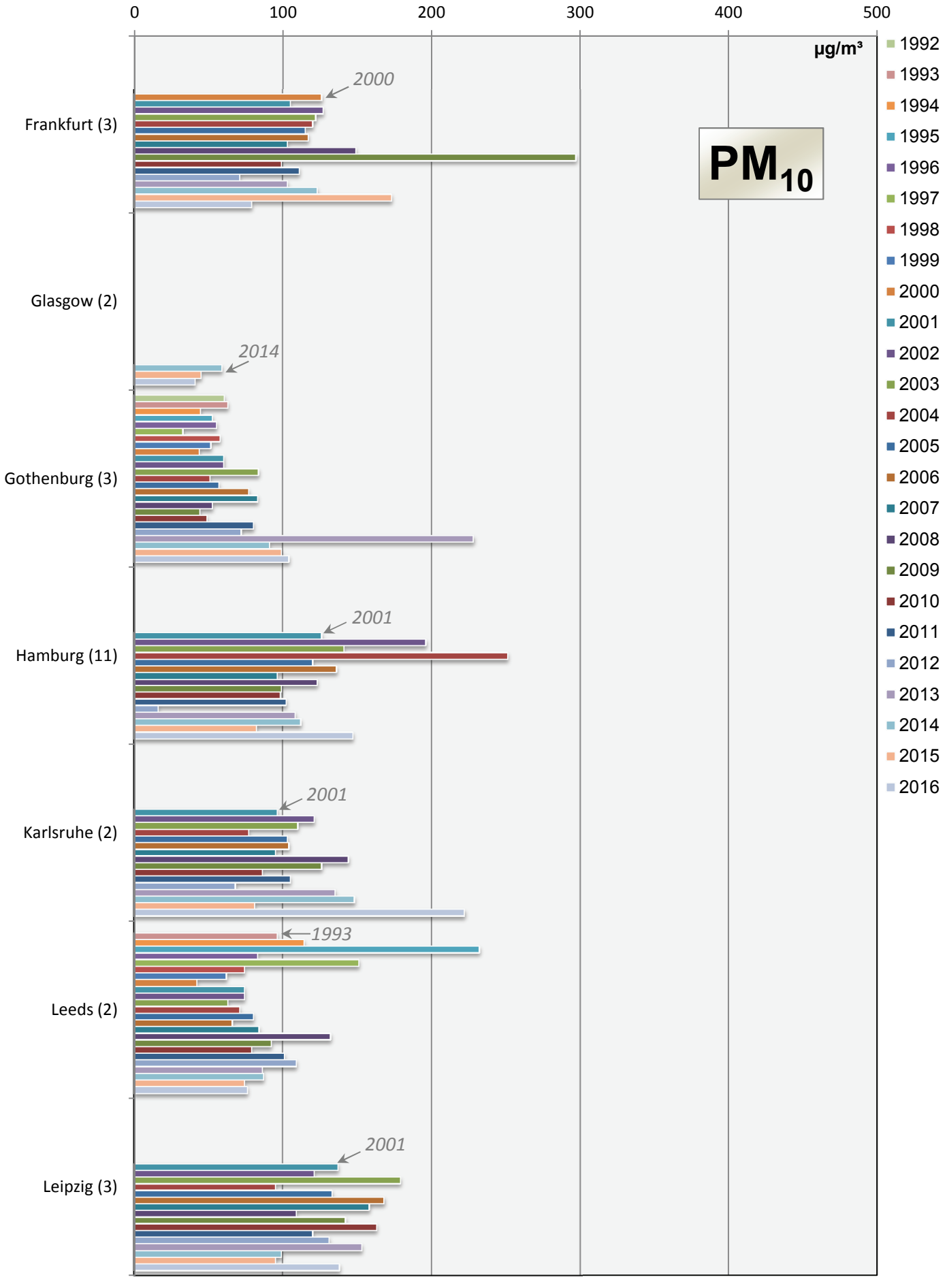
Comparison of The Air Quality 1992 - 2016

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



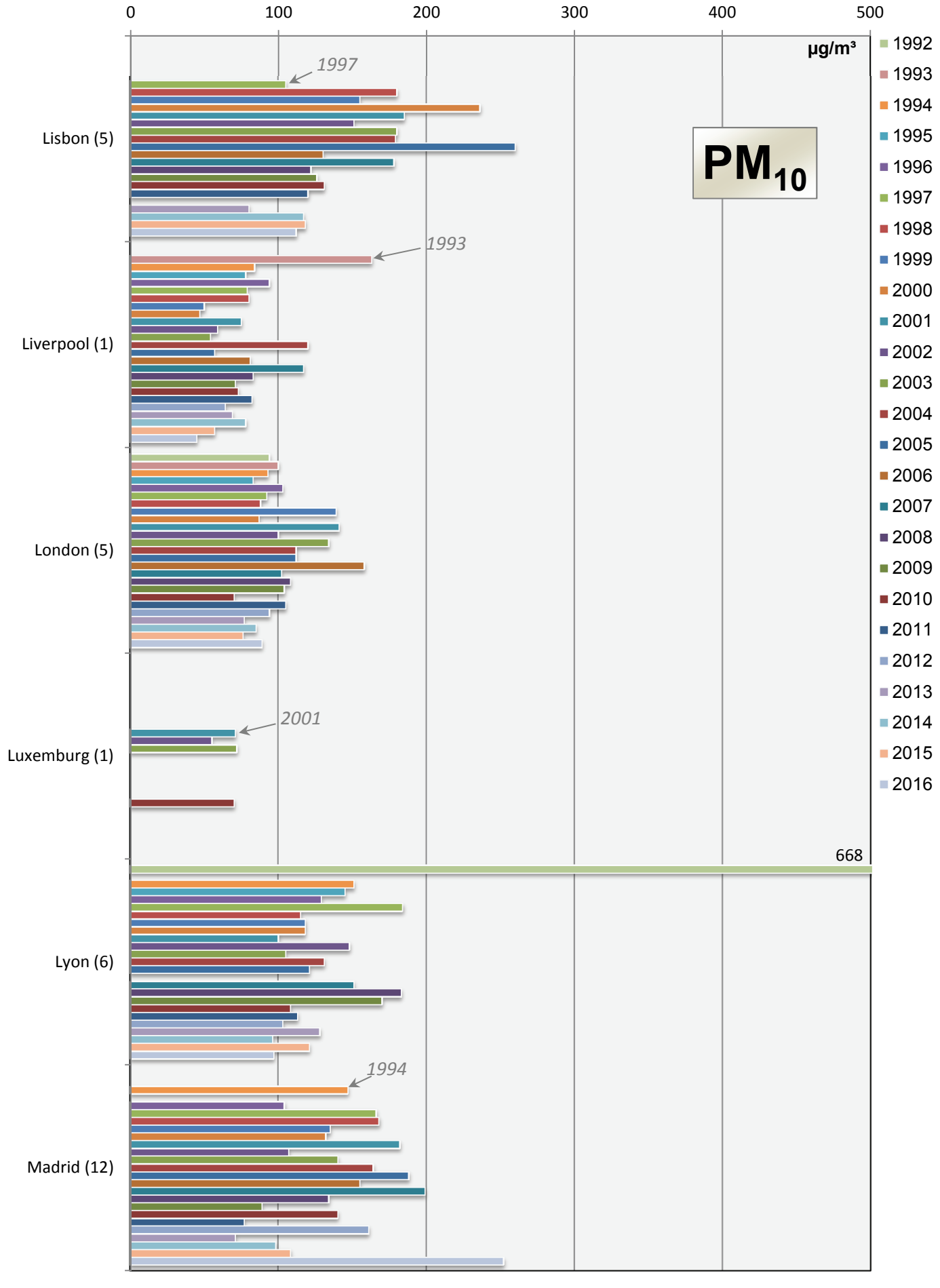
Comparison of The Air Quality 1992 - 2016

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



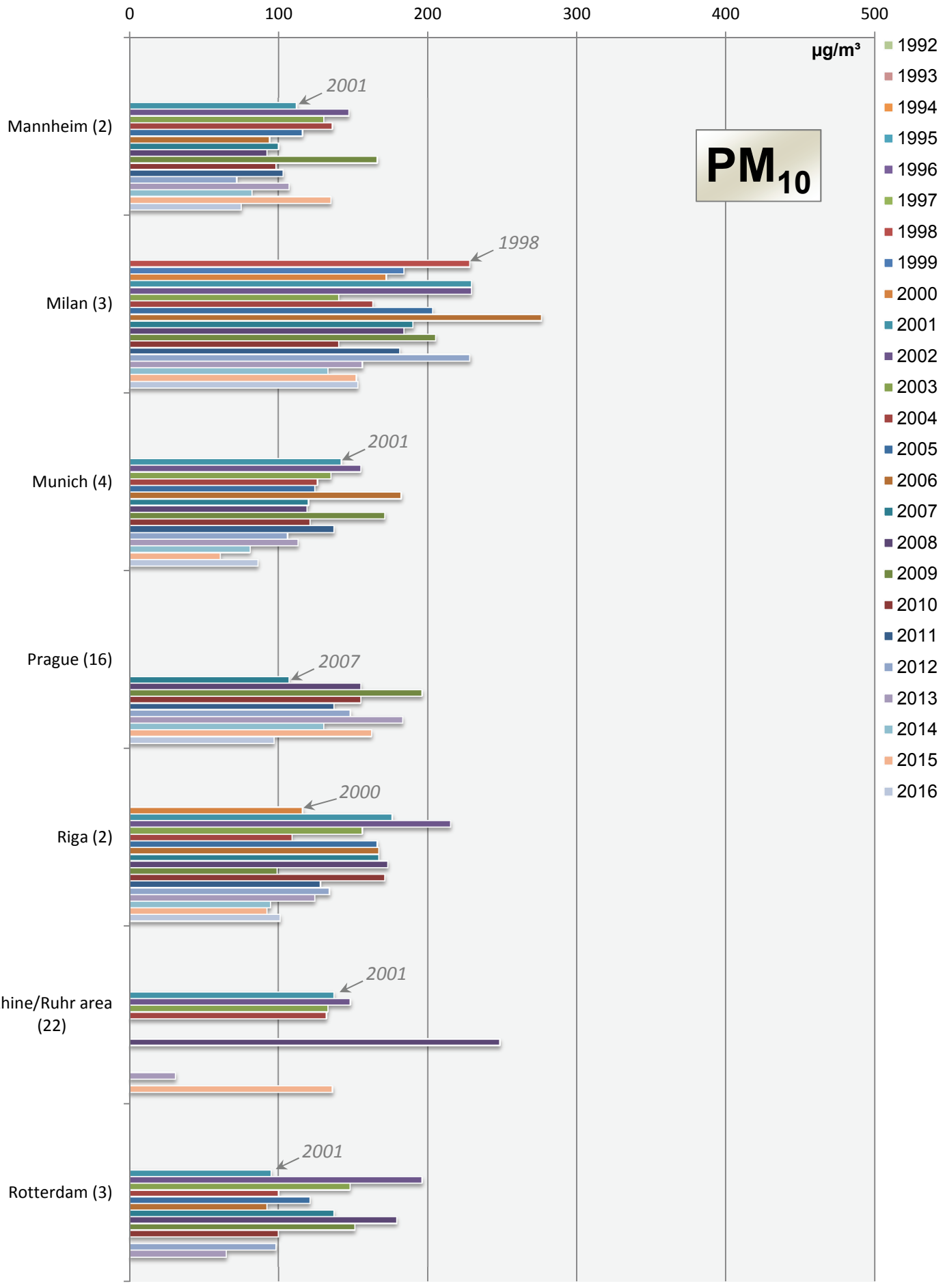
Comparison of The Air Quality 1992 - 2016

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



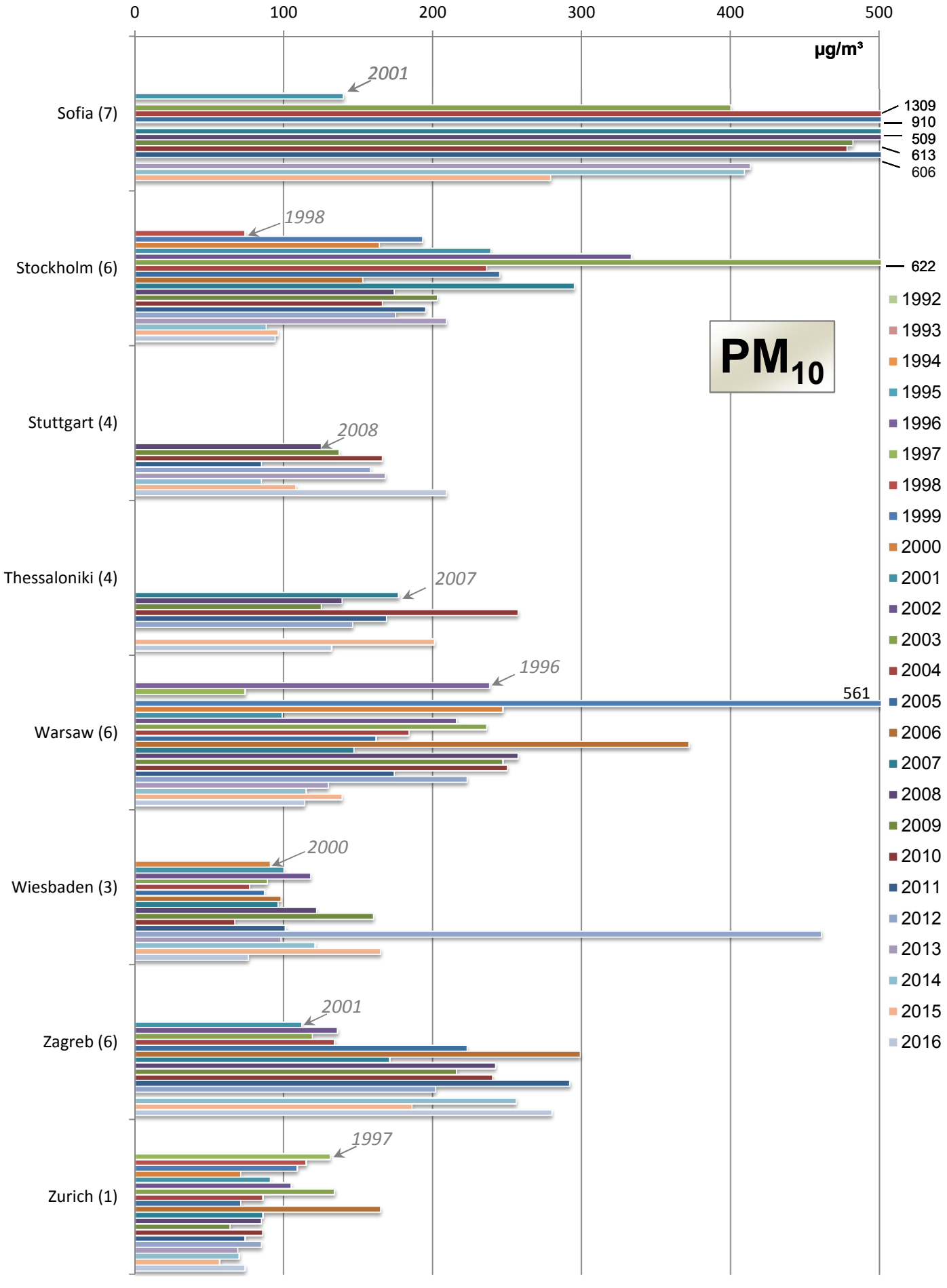
Comparison of The Air Quality 1992 - 2016

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

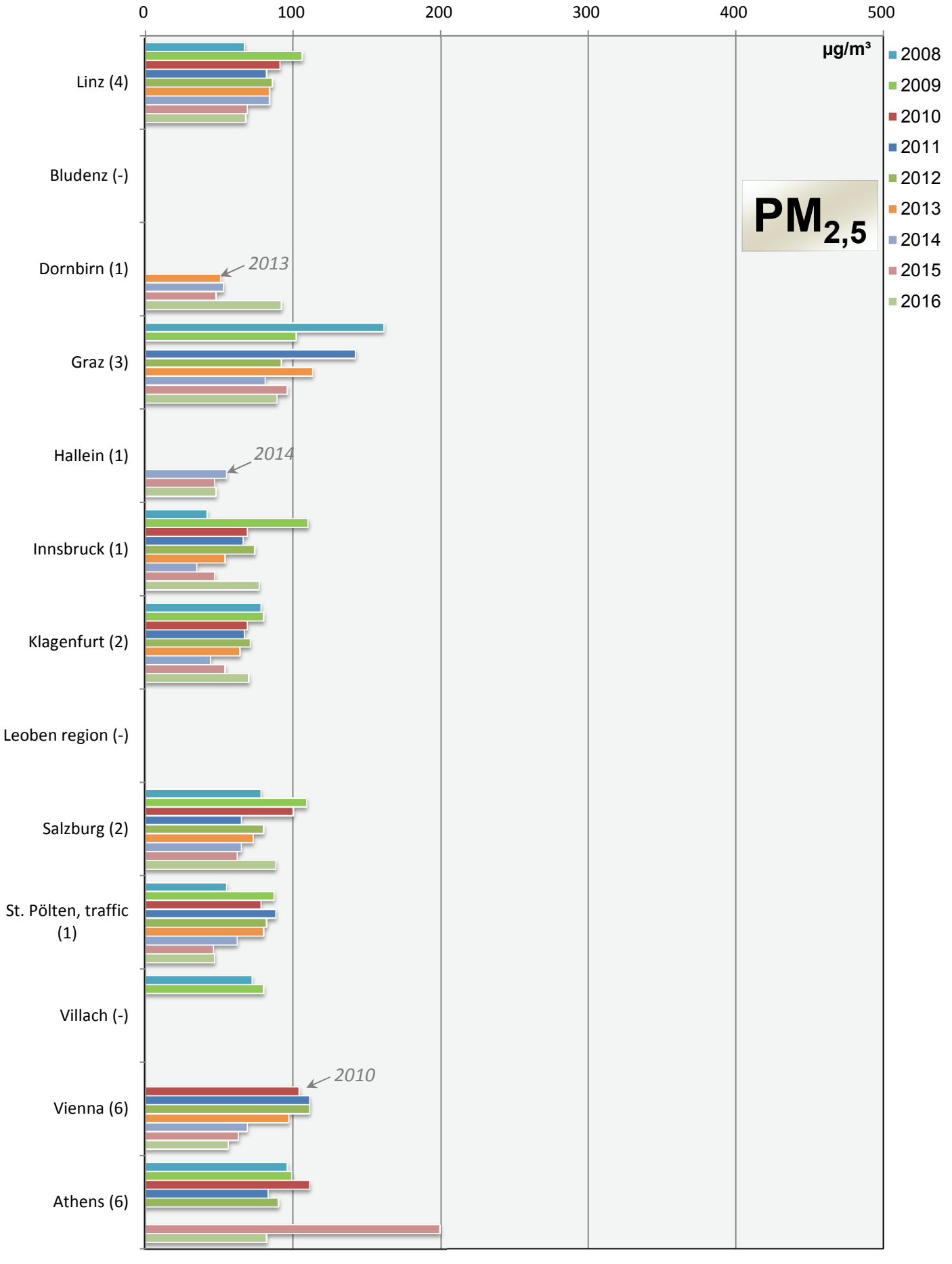


Comparison of The Air Quality 1992 - 2016

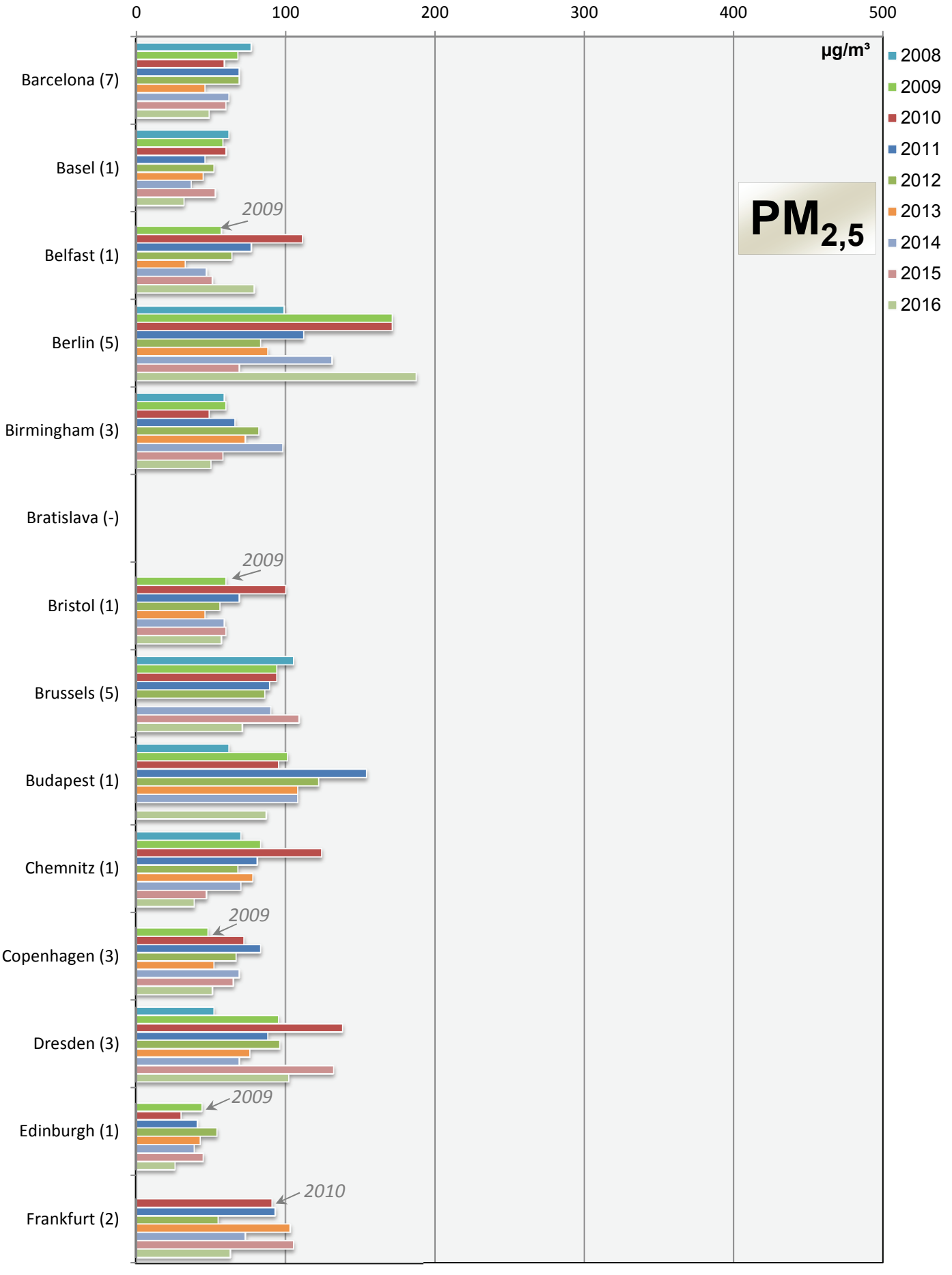
max. daily mean values (peak-stressed monitoring station)



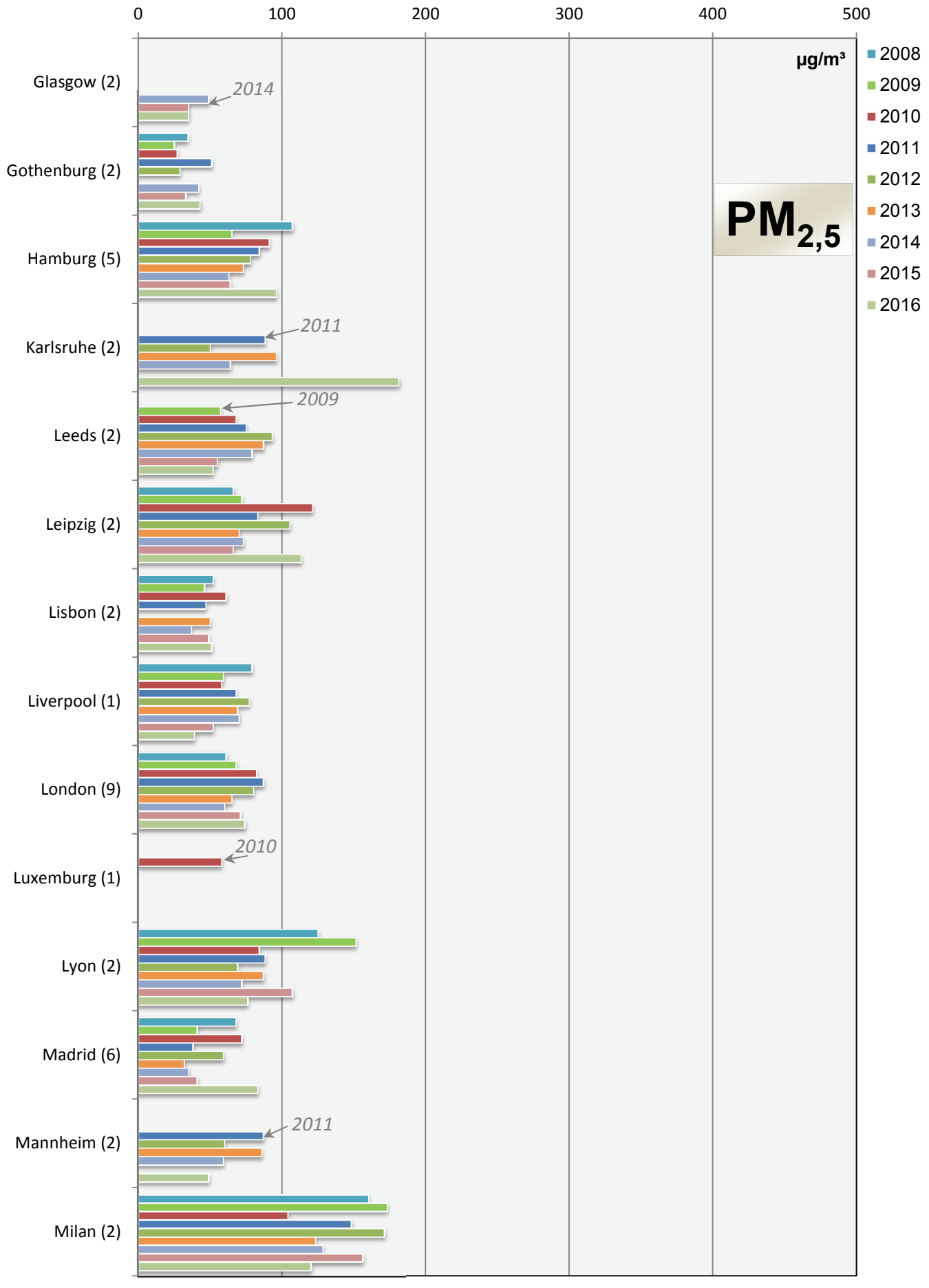
Comparison of The Air Quality 2008 - 2016
max. daily mean values (peak-stressed monitoring station)



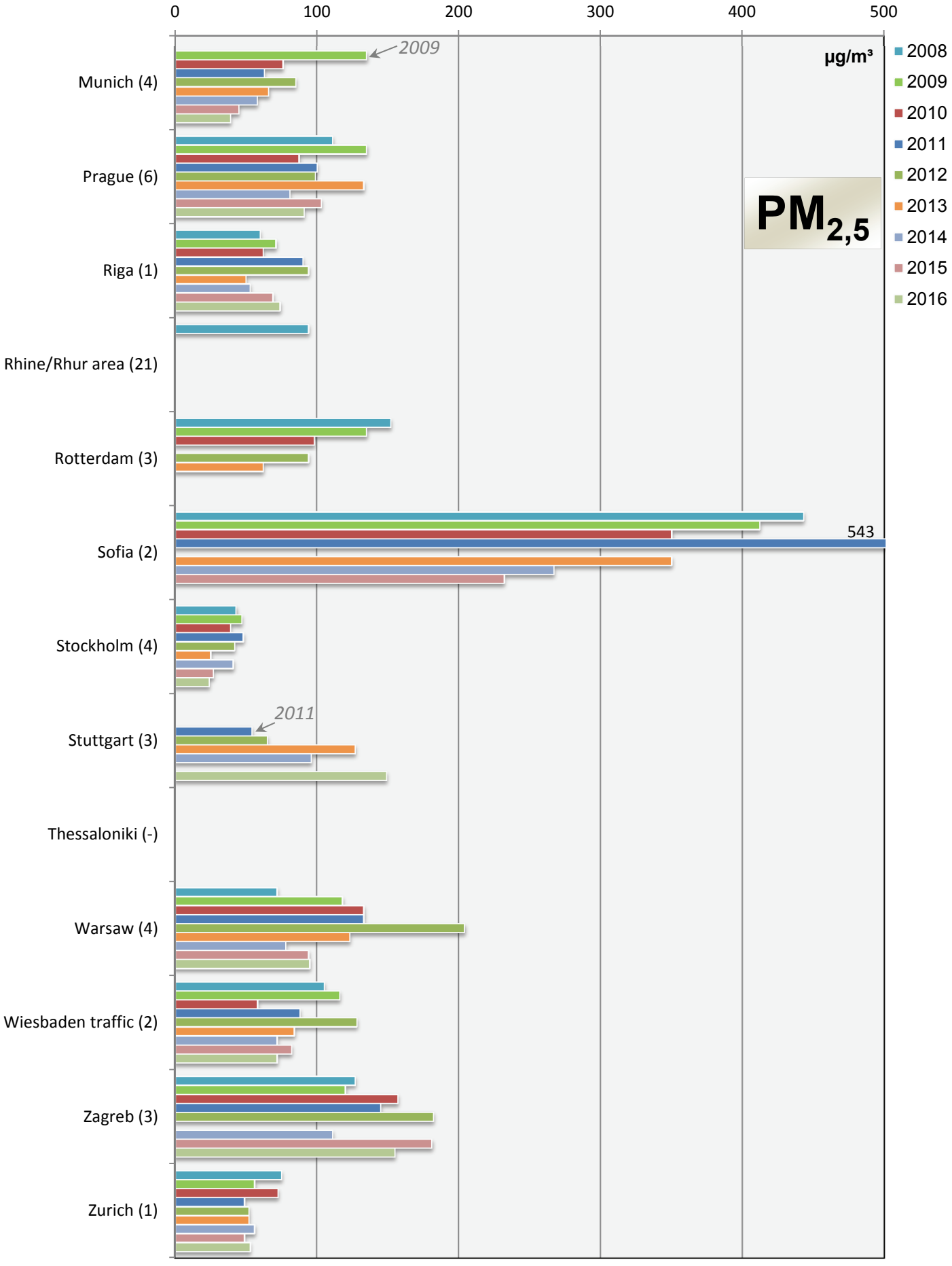
Comparison of The Air Quality 2008 - 2016
max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 2008 - 2016
max. daily mean values (peak-stressed monitoring station)

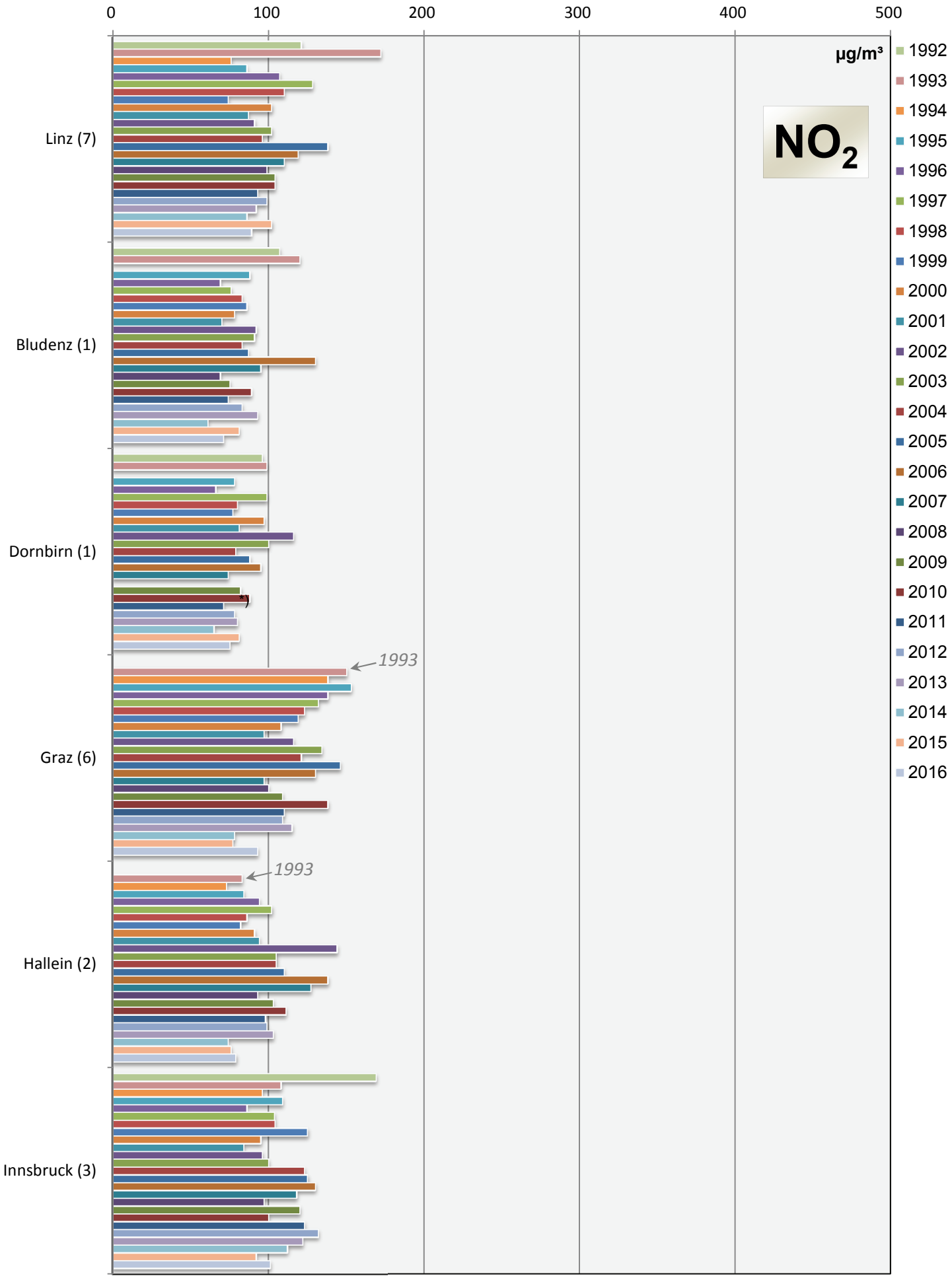


Comparison of The Air Quality 2008 - 2016
max. daily mean values (peak-stressed monitoring station)



Comparison of The Air Quality 1992 - 2016

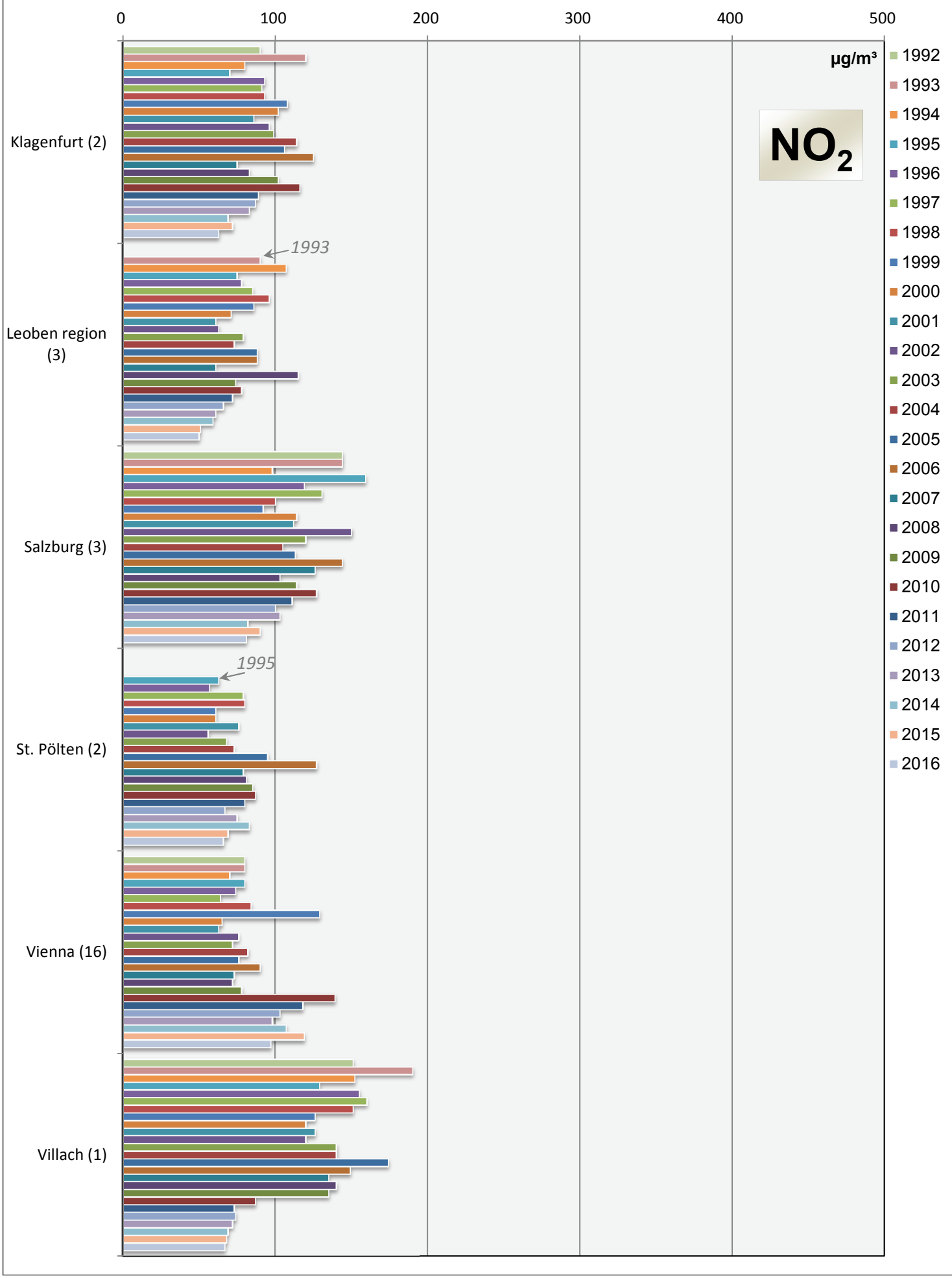
max. daily mean values (peak-stressed monitoring station)



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

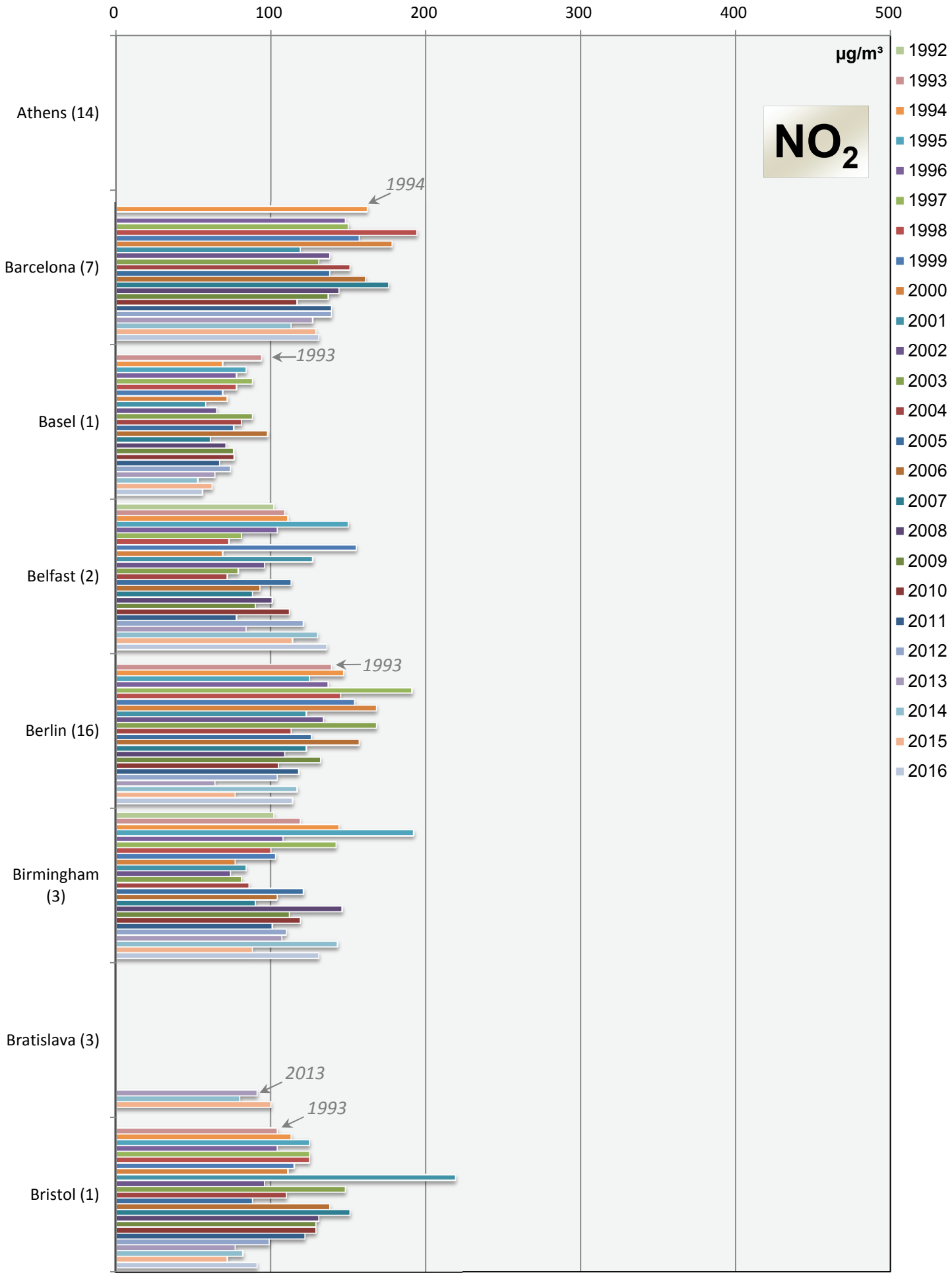
Comparison of The Air Quality 1992 - 2016

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



Comparison of The Air Quality 1992 - 2016

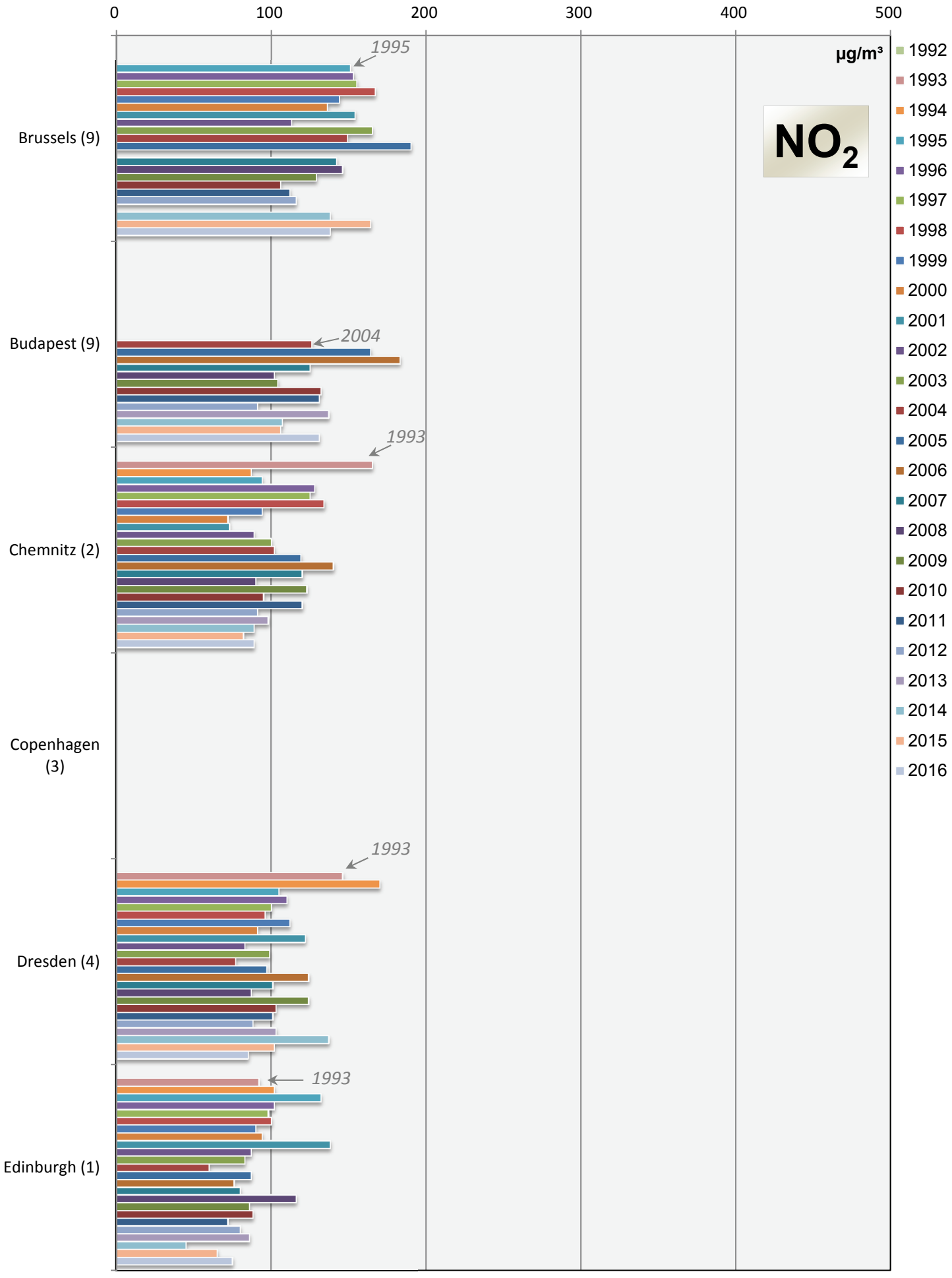
max. daily mean values (peak-stressed monitoring station)



140

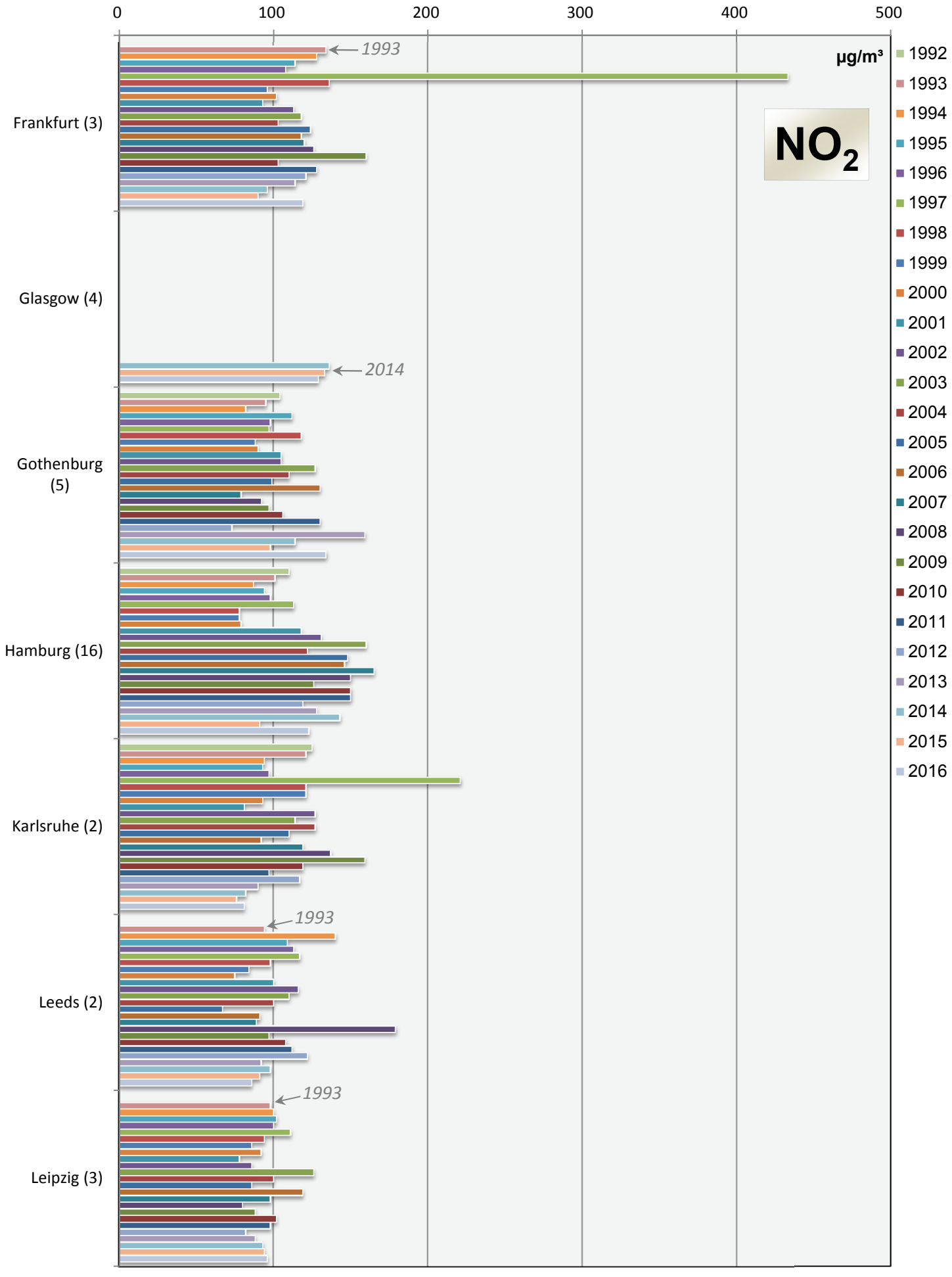
Comparison of The Air Quality 1992 - 2016

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



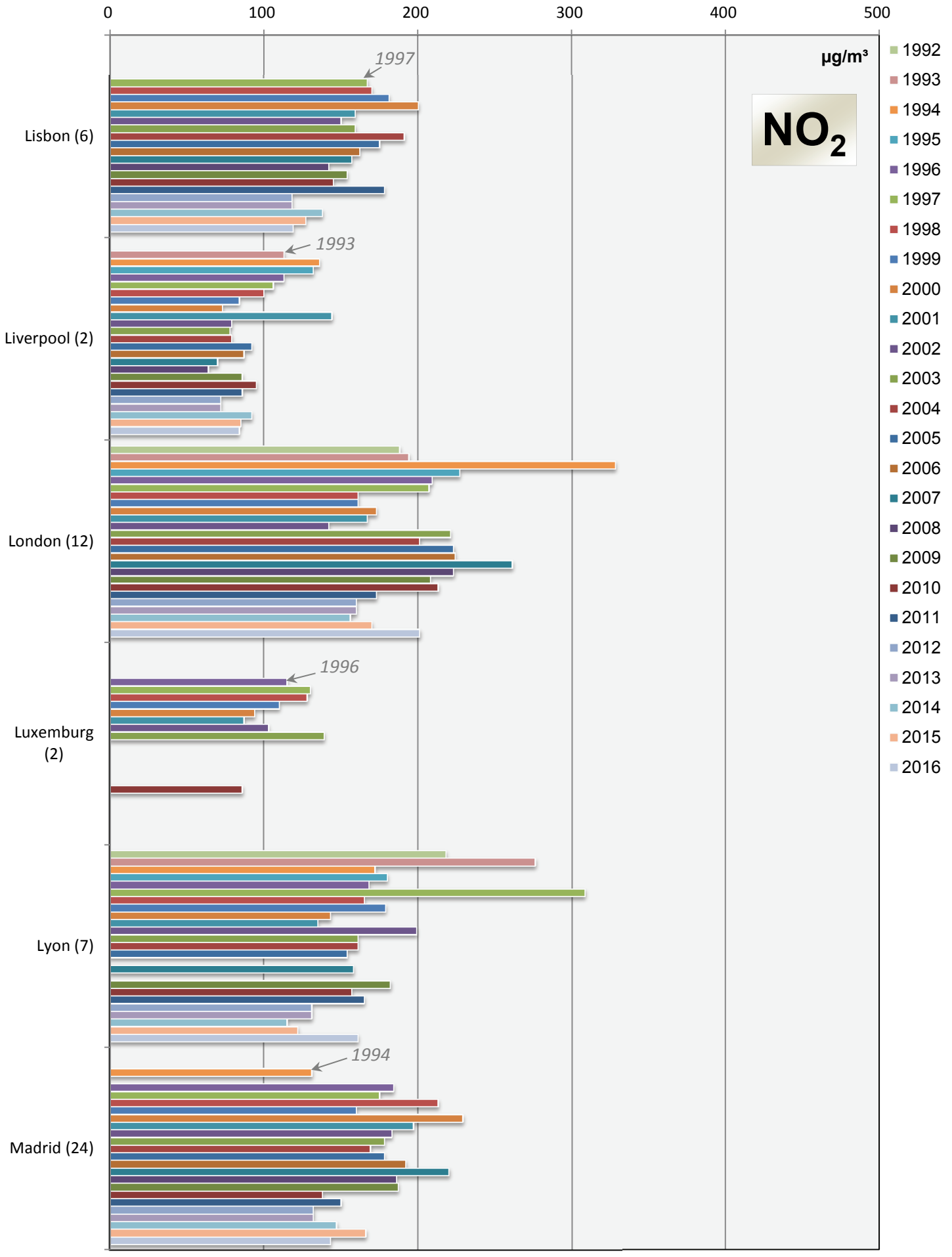
Comparison of The Air Quality 1992 - 2016

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



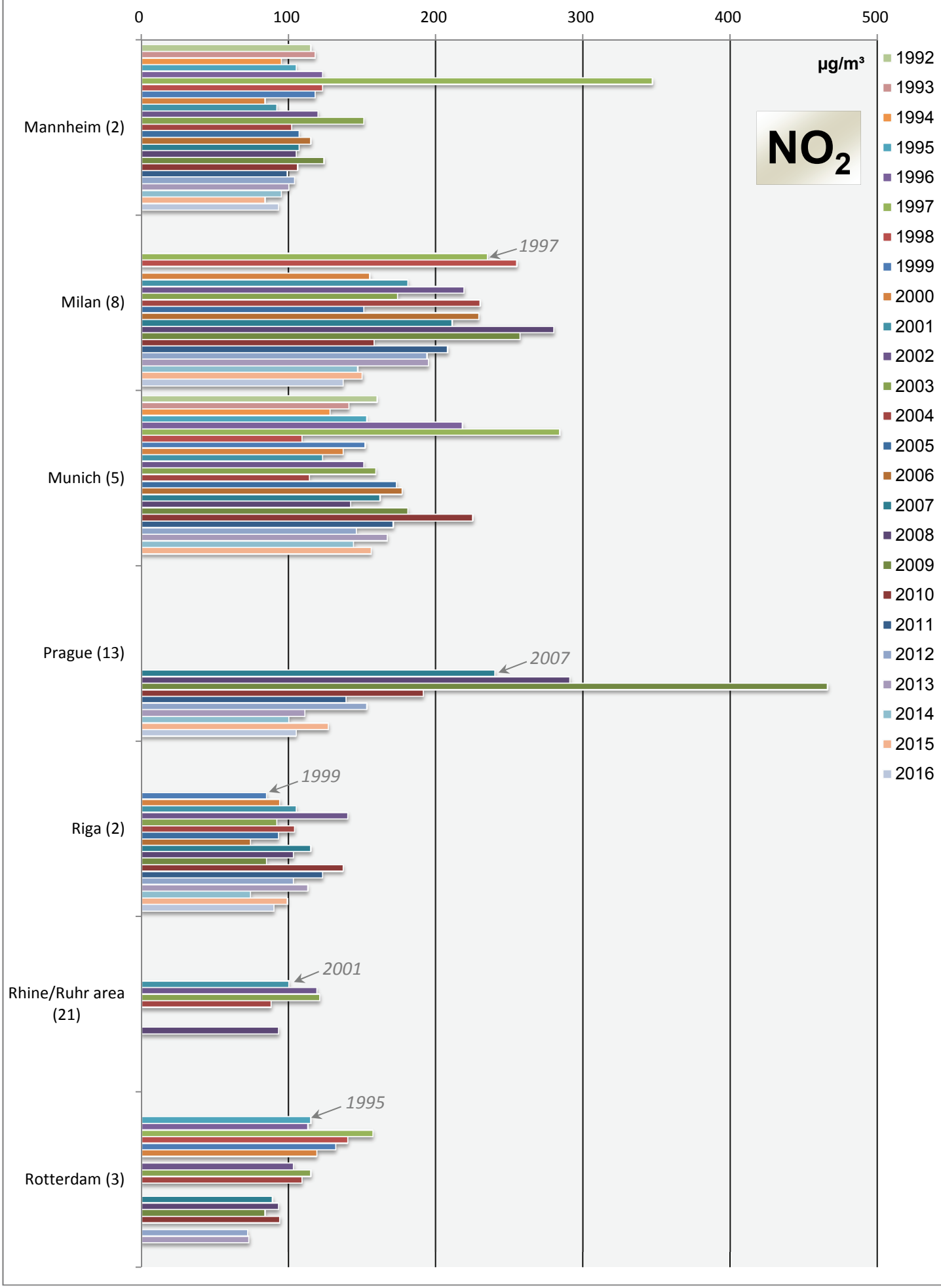
Comparison of The Air Quality 1992 - 2016

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



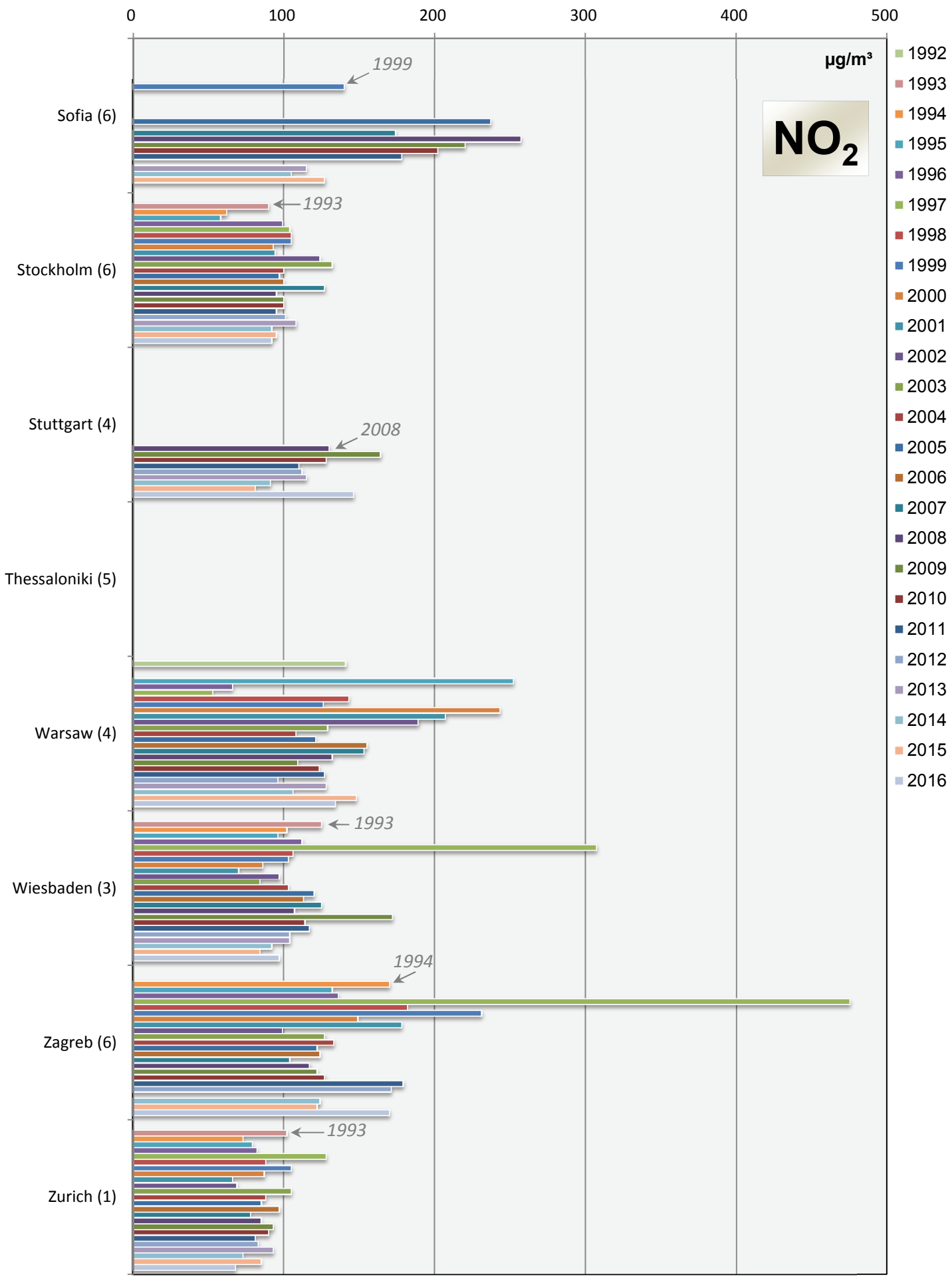
Comparison of The Air Quality 1992 - 2016

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



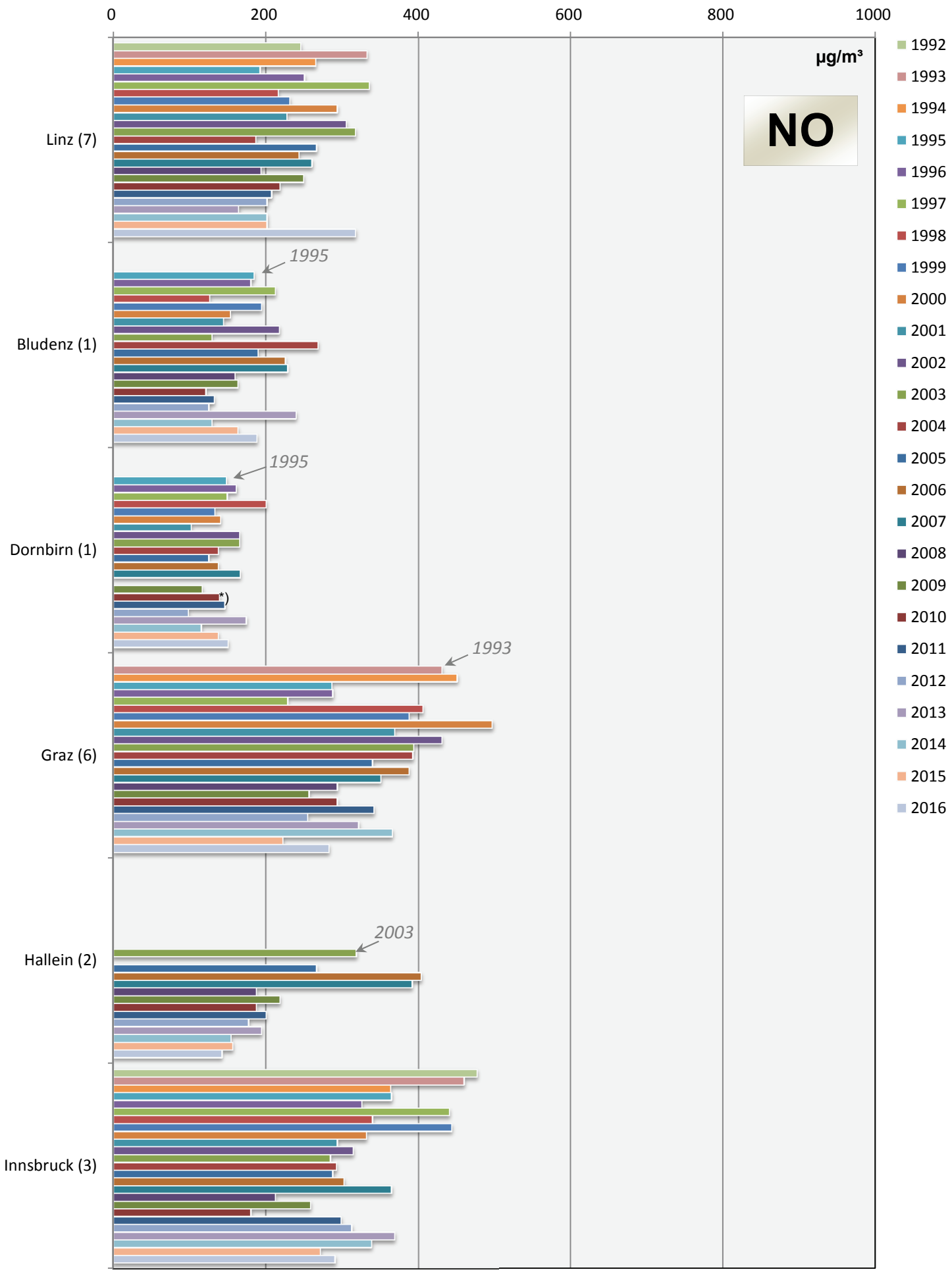
Comparison of The Air Quality 1992 - 2016

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



Comparison of The Air Quality 1992 - 2016

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



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Comparison of The Air Quality 1992 - 2016

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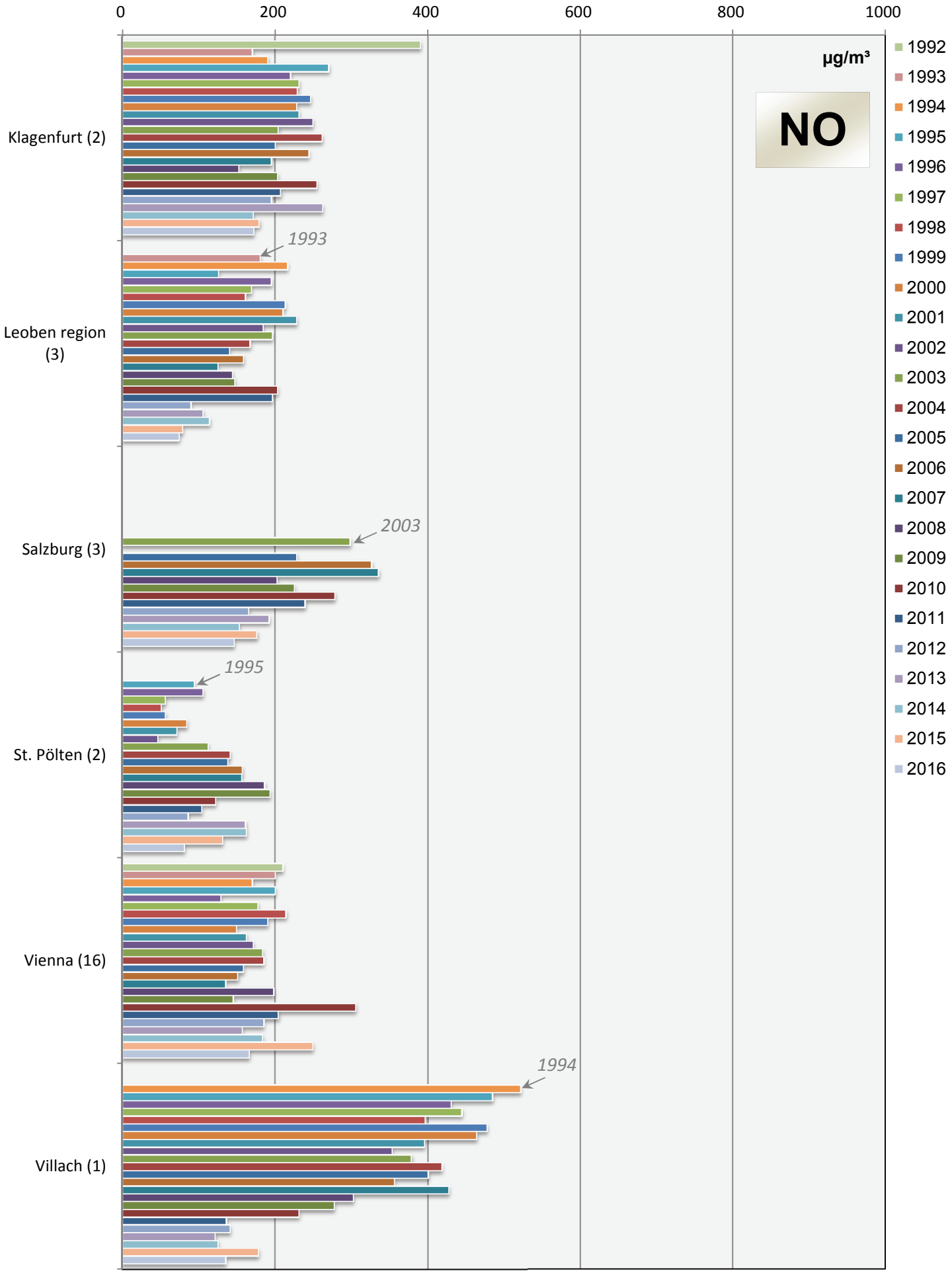

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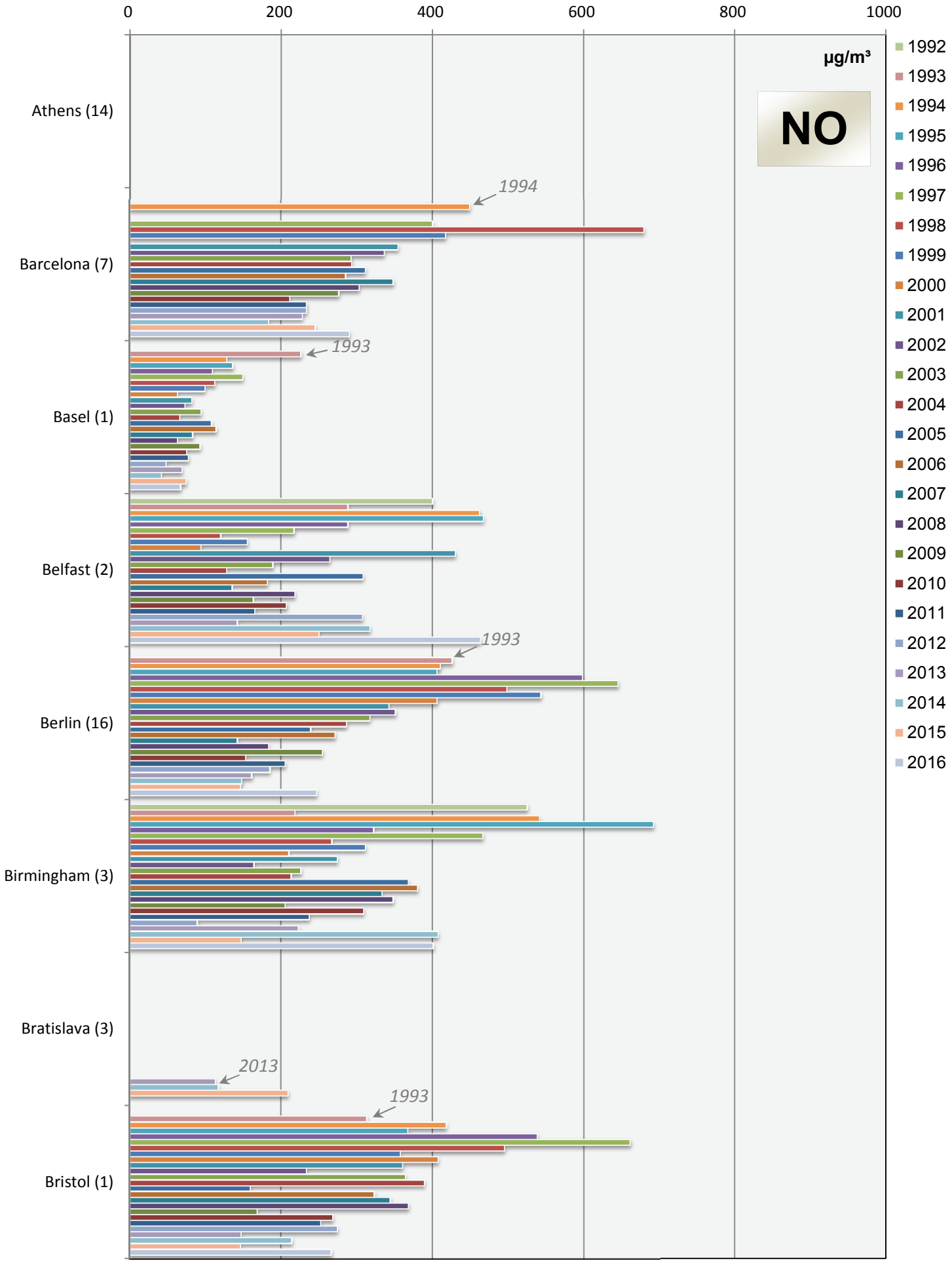
max. daily mean values (peak-stressed monitoring station)



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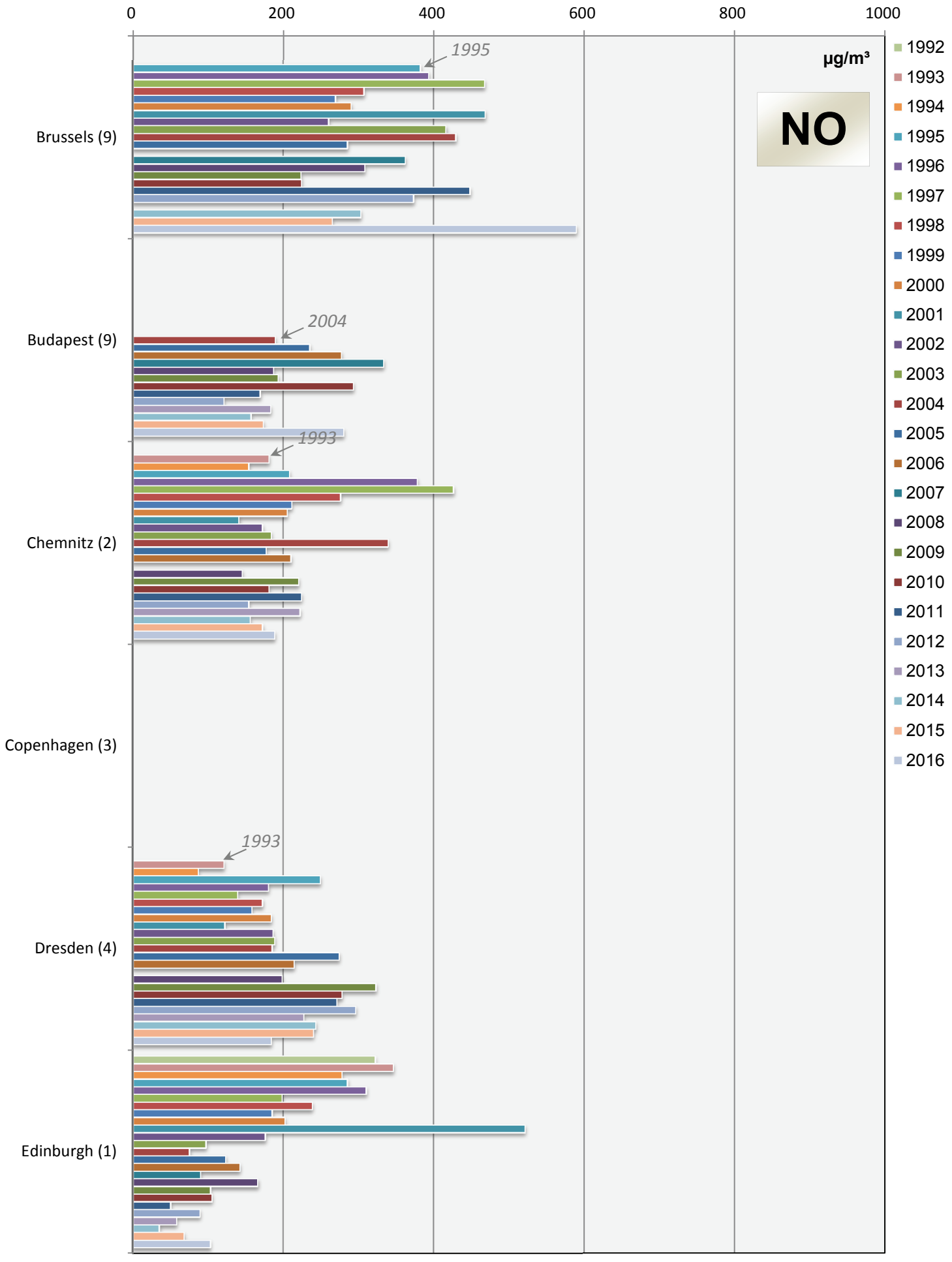
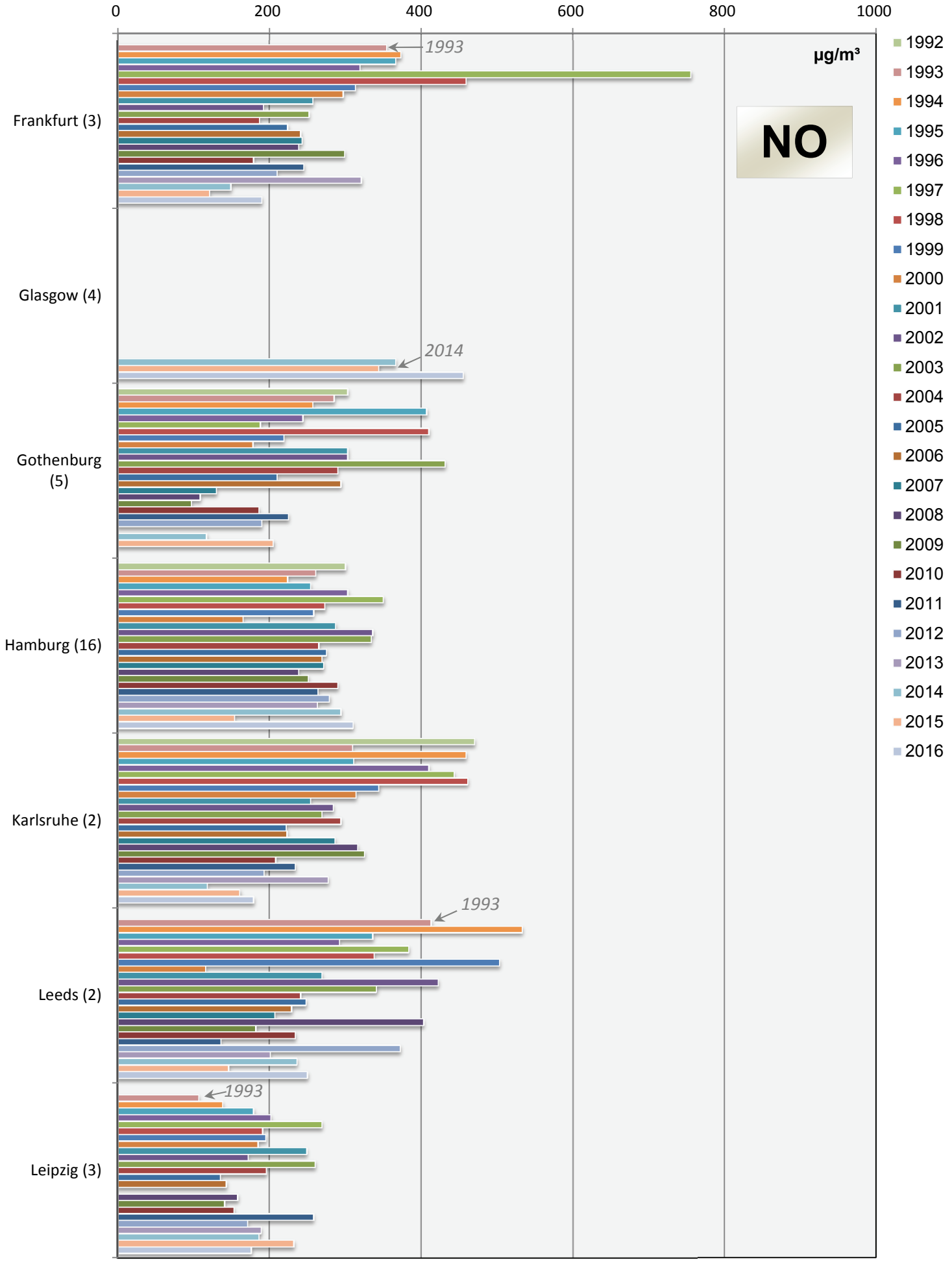


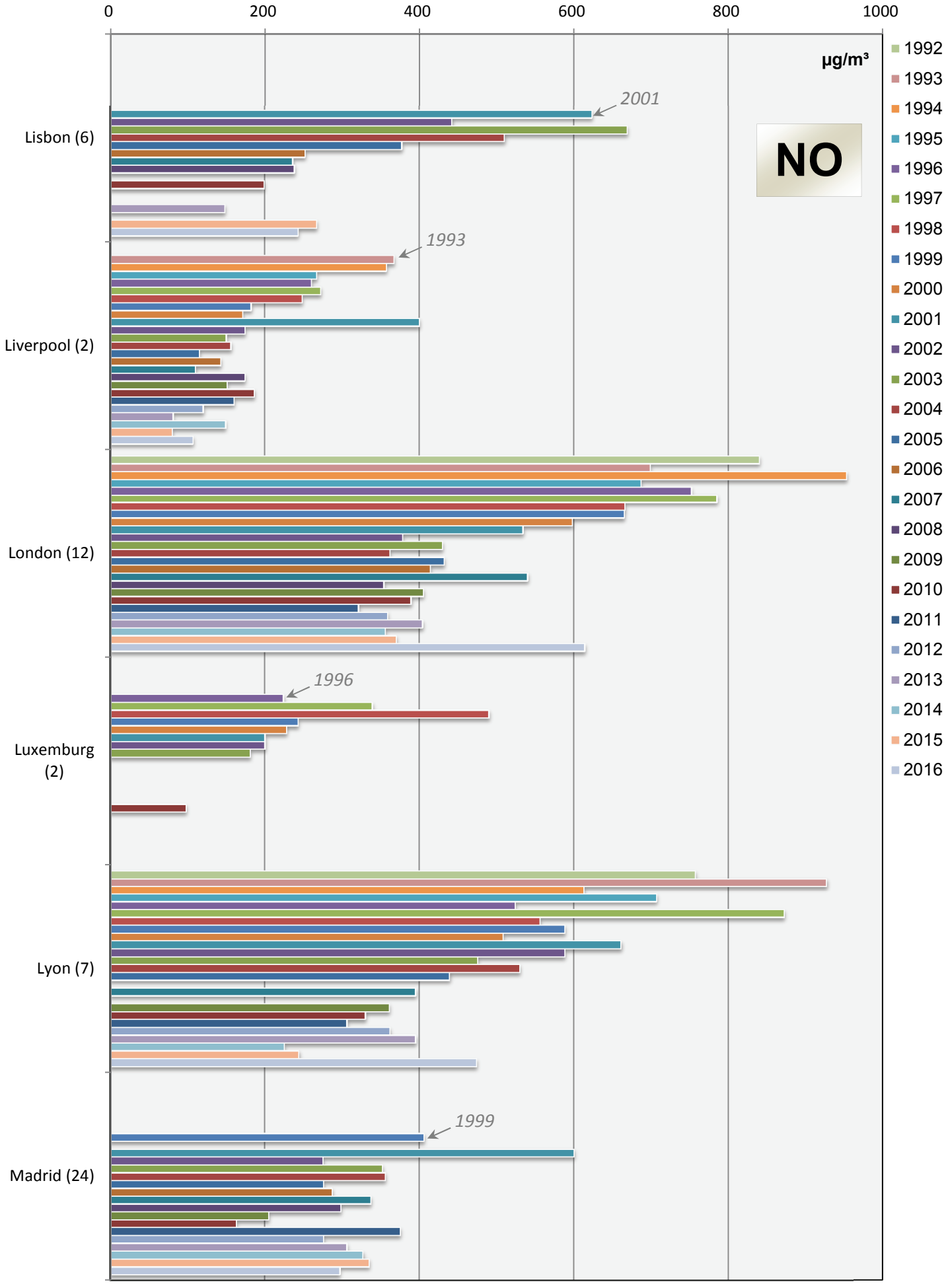
Comparison of The Air Quality 1992 - 2016

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



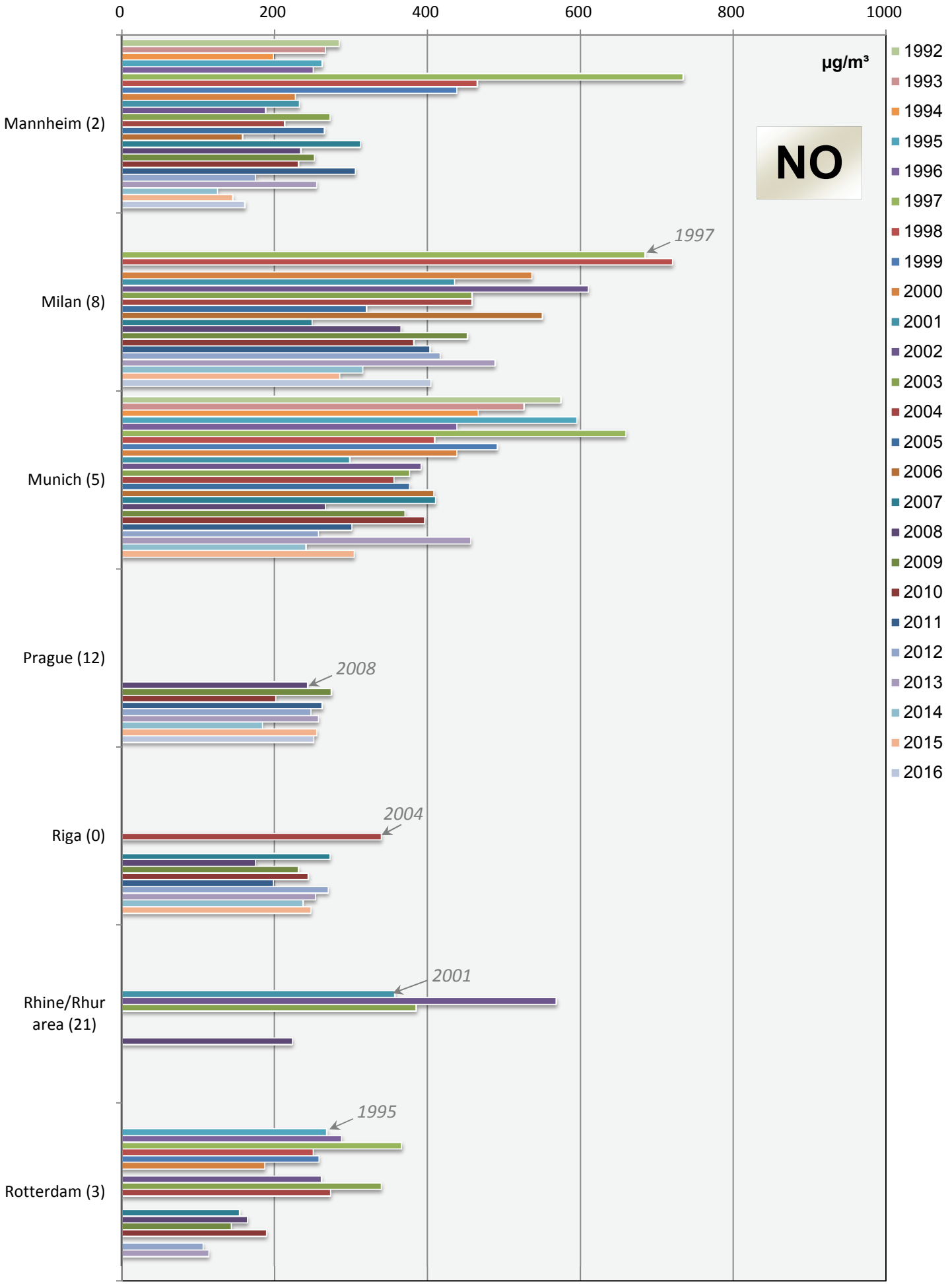
Comparison of The Air Quality 1992 - 2016

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



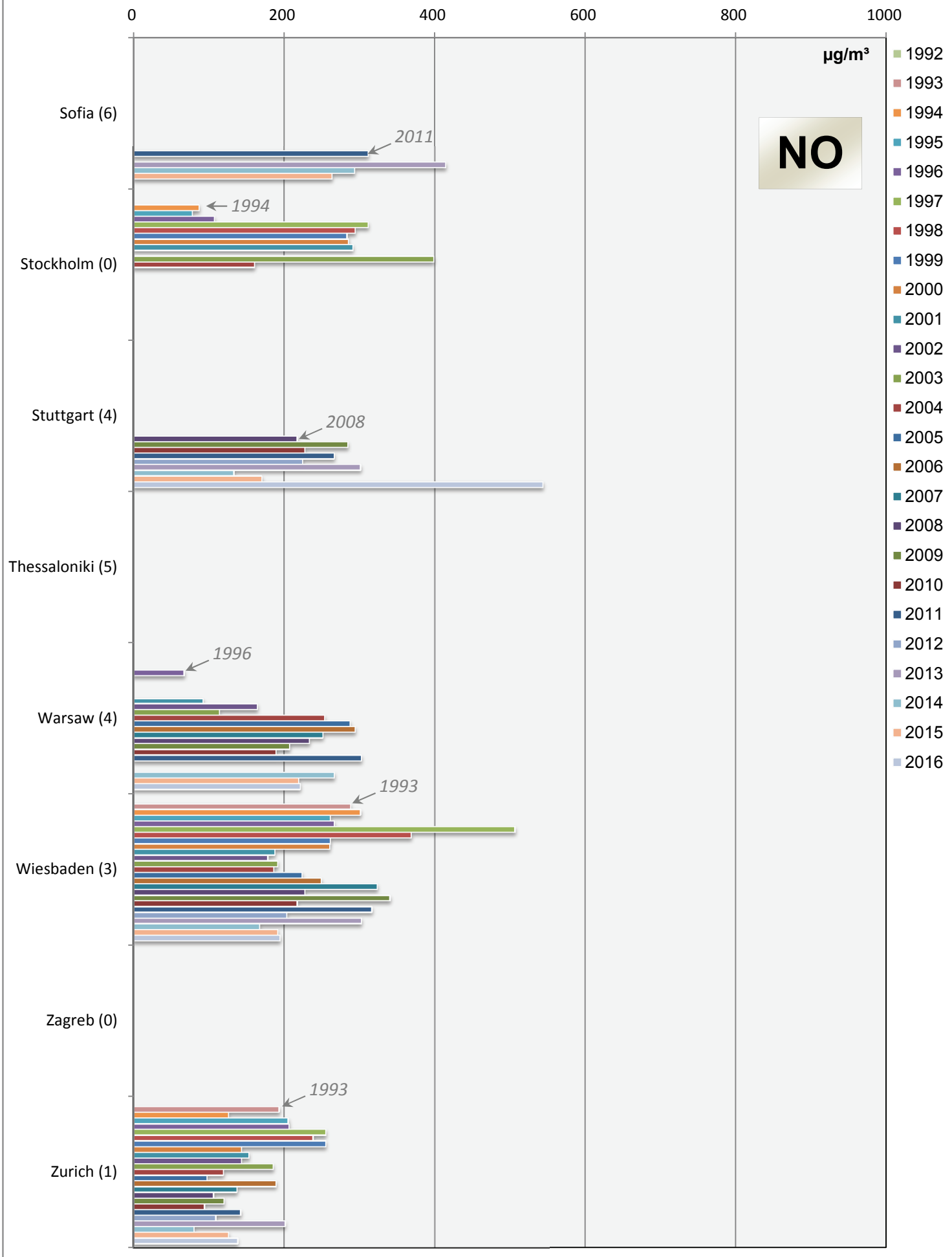
Comparison of The Air Quality 1992 - 2016

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



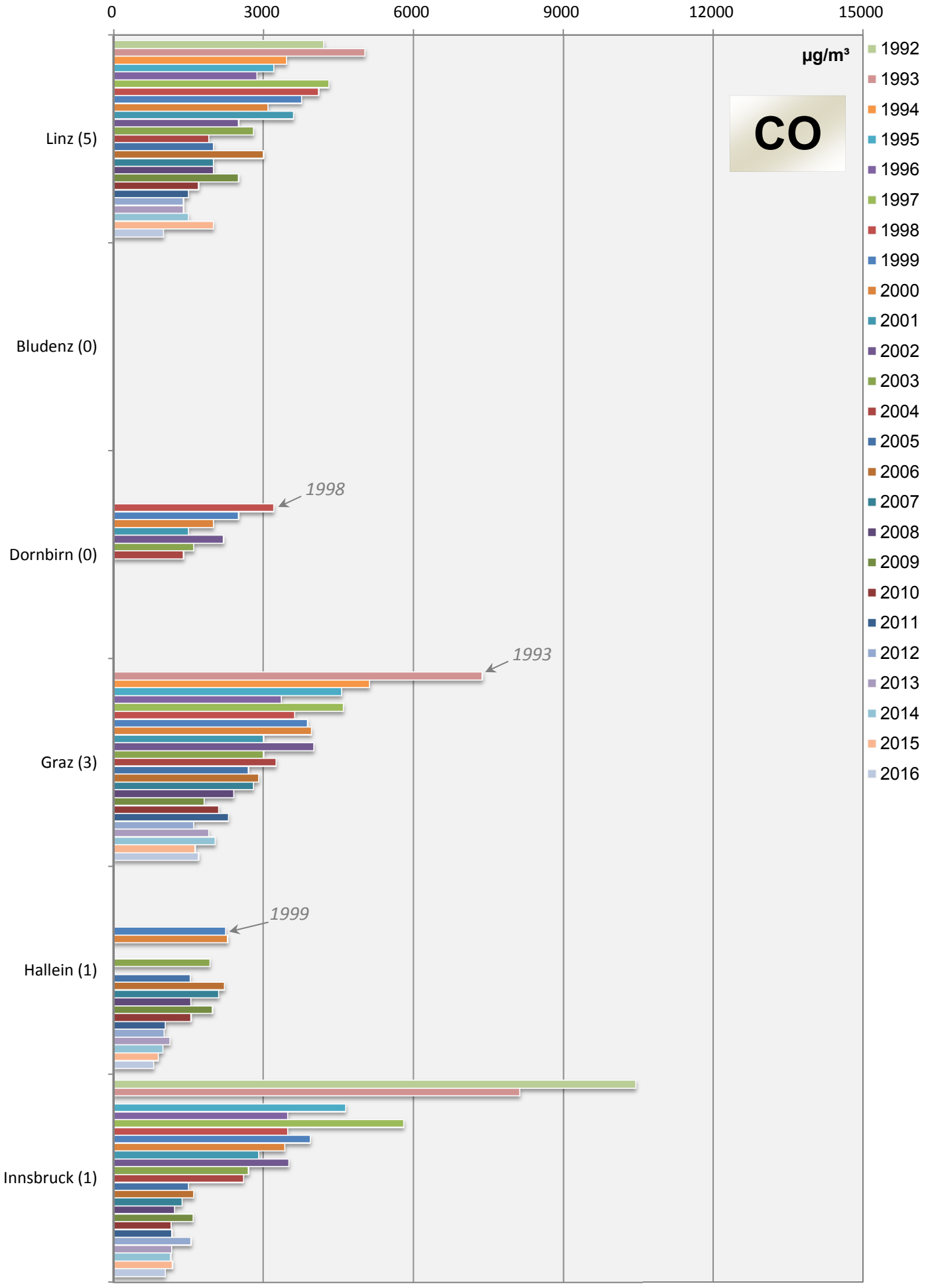
Comparison of The Air Quality 1992 - 2016

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



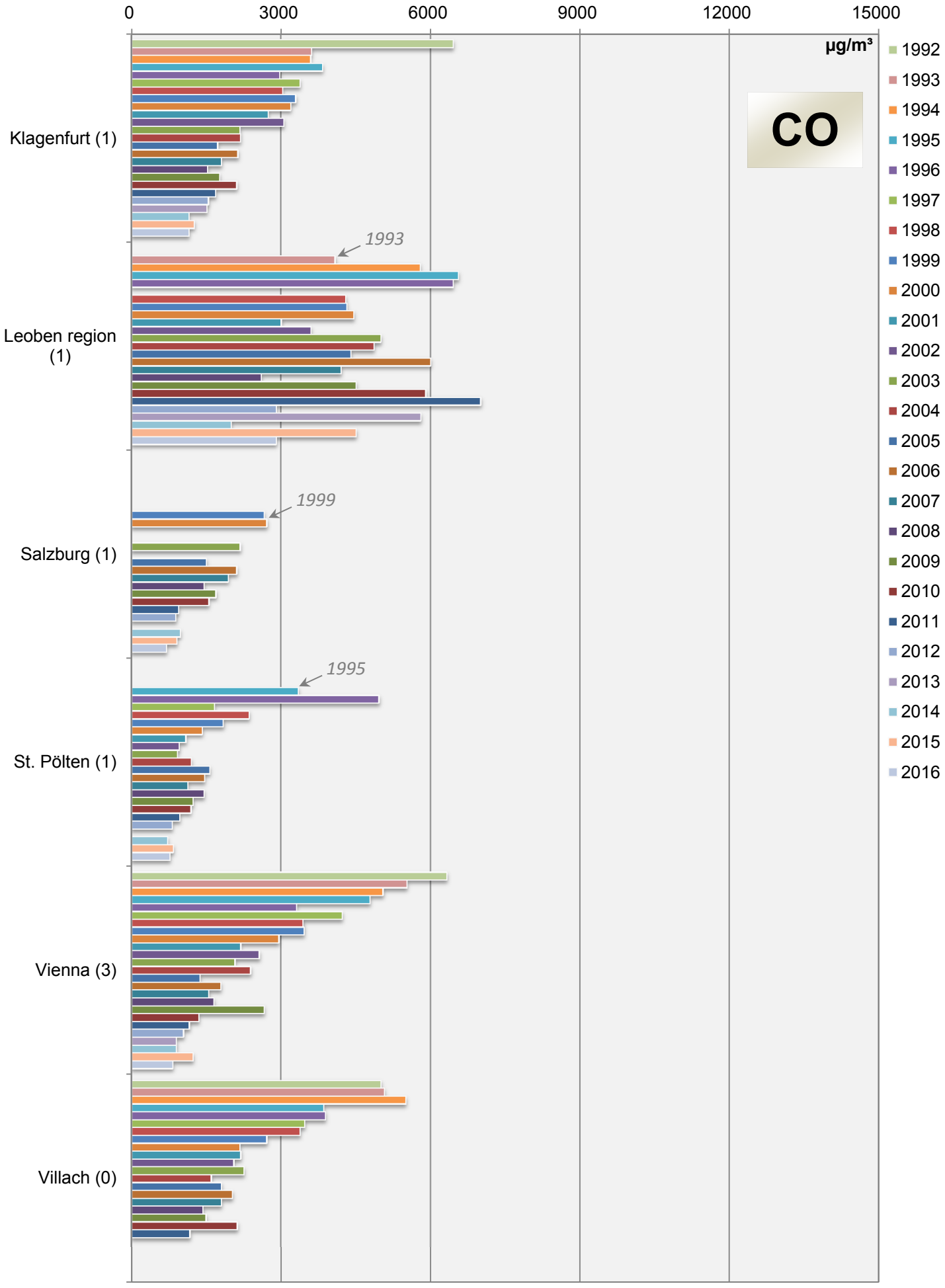
Comparison of The Air Quality 1992 - 2016

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



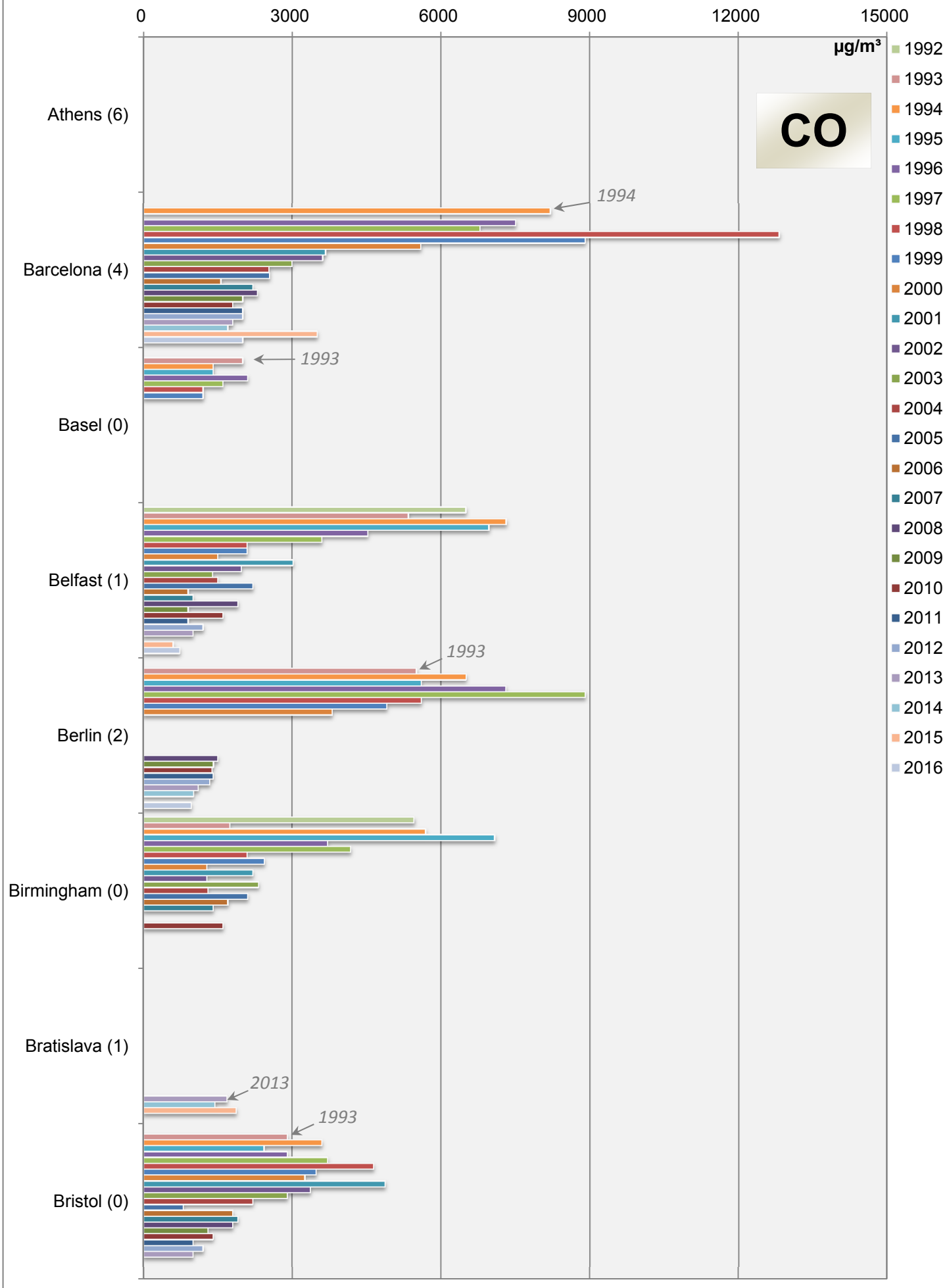
Comparison of The Air Quality 1992 - 2016

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



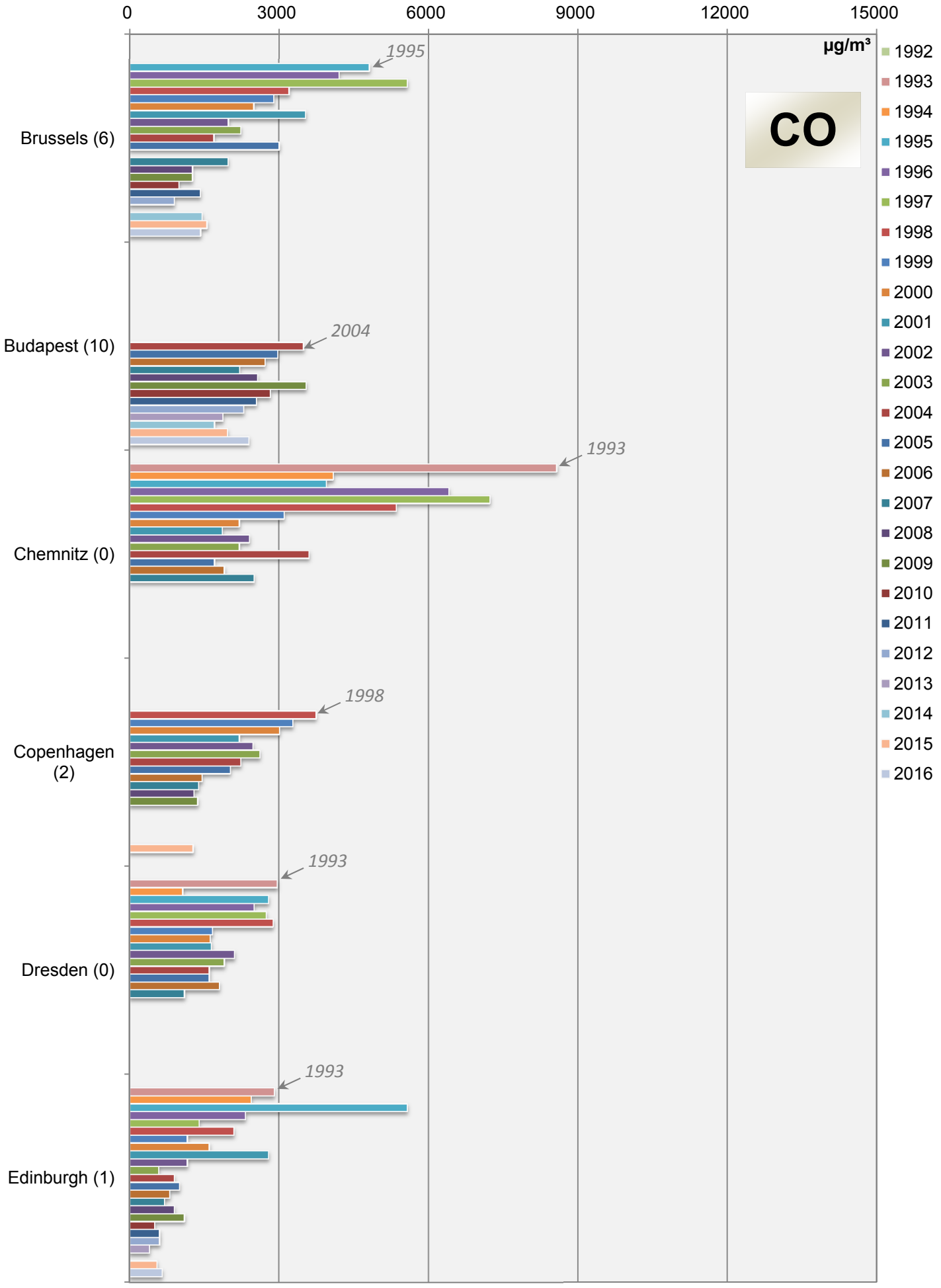
Comparison of The Air Quality 1992 - 2016

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



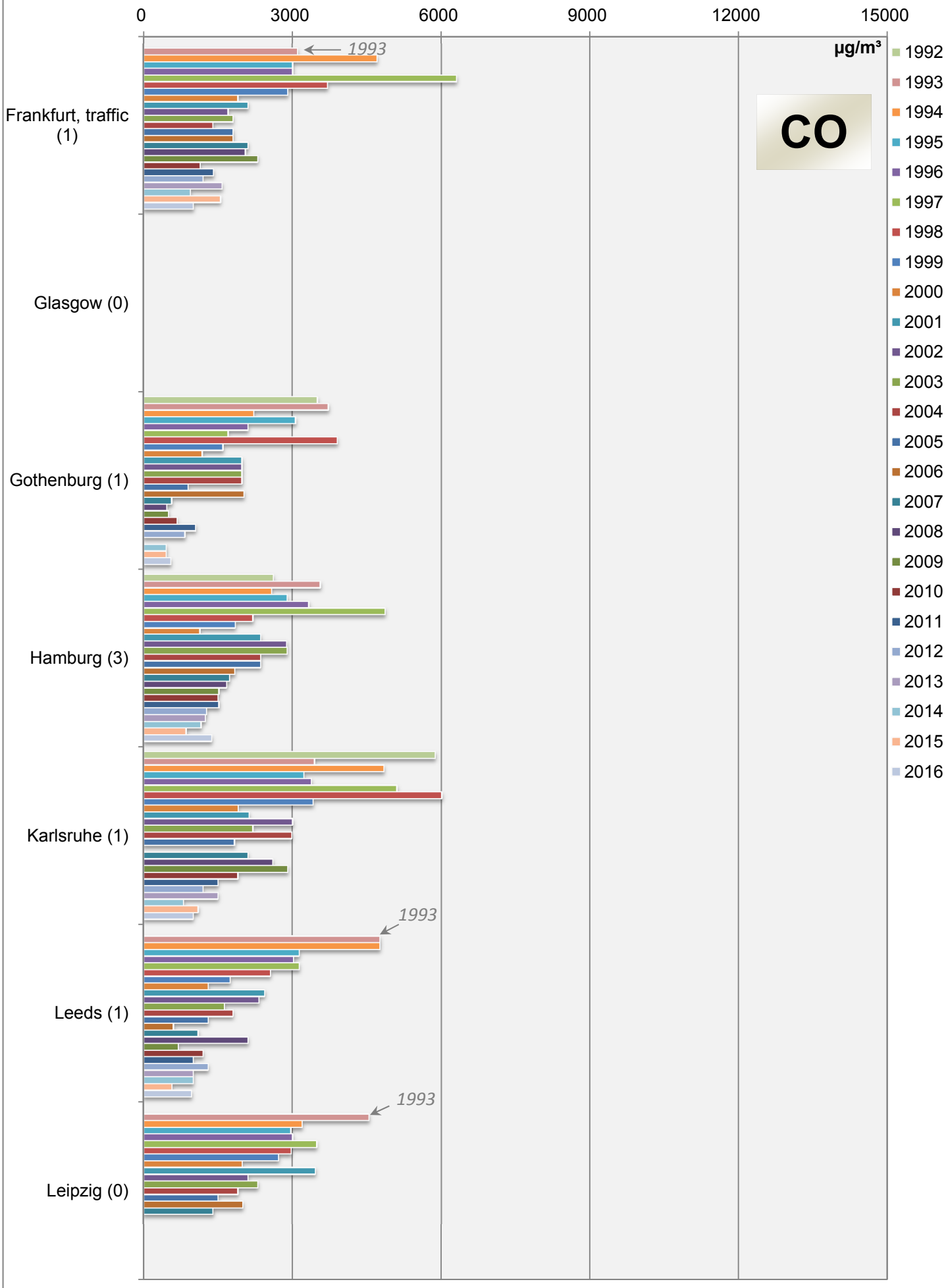
Comparison of The Air Quality 1992 - 2016

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



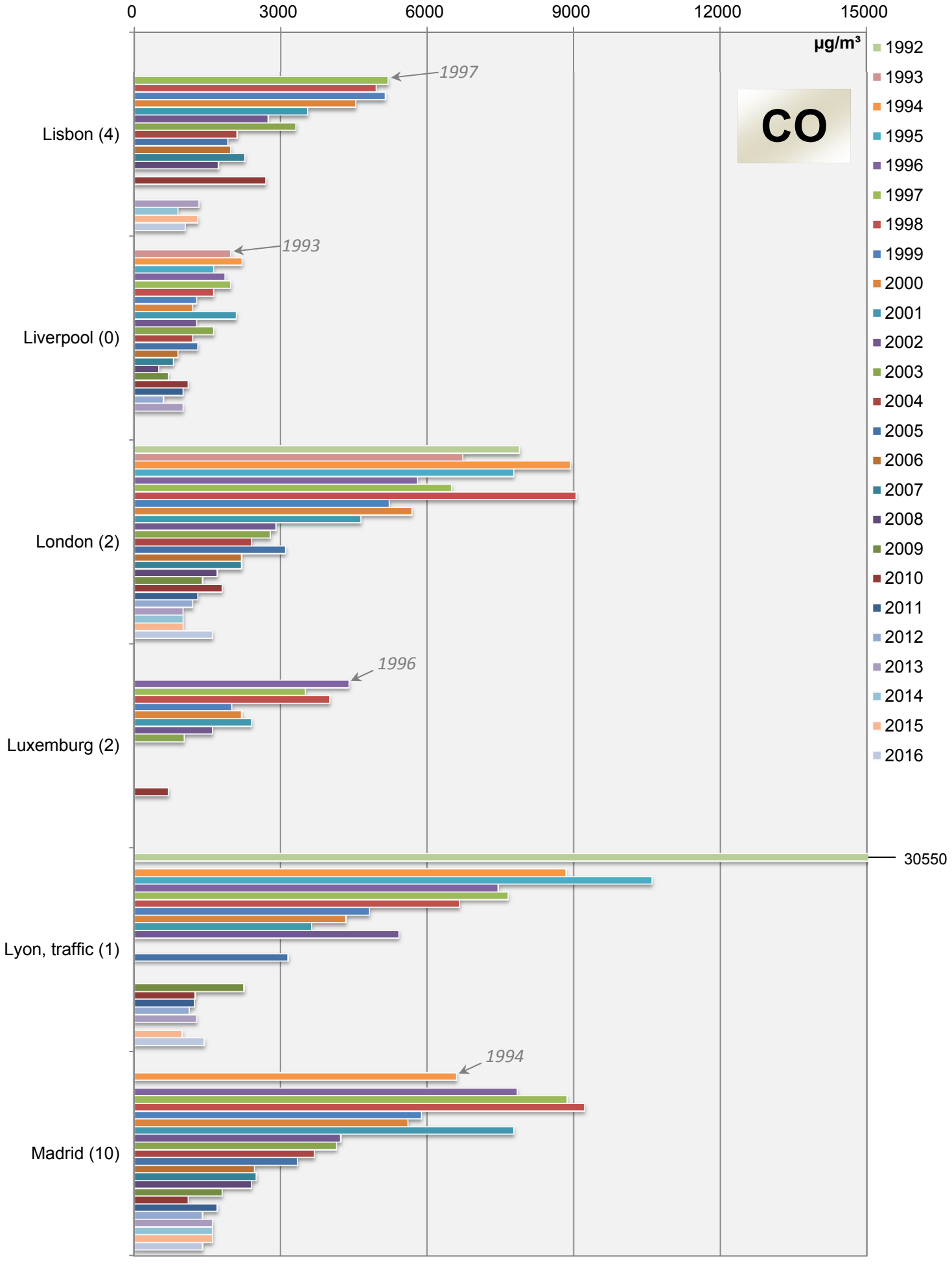
Comparison of The Air Quality 1992 - 2016

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



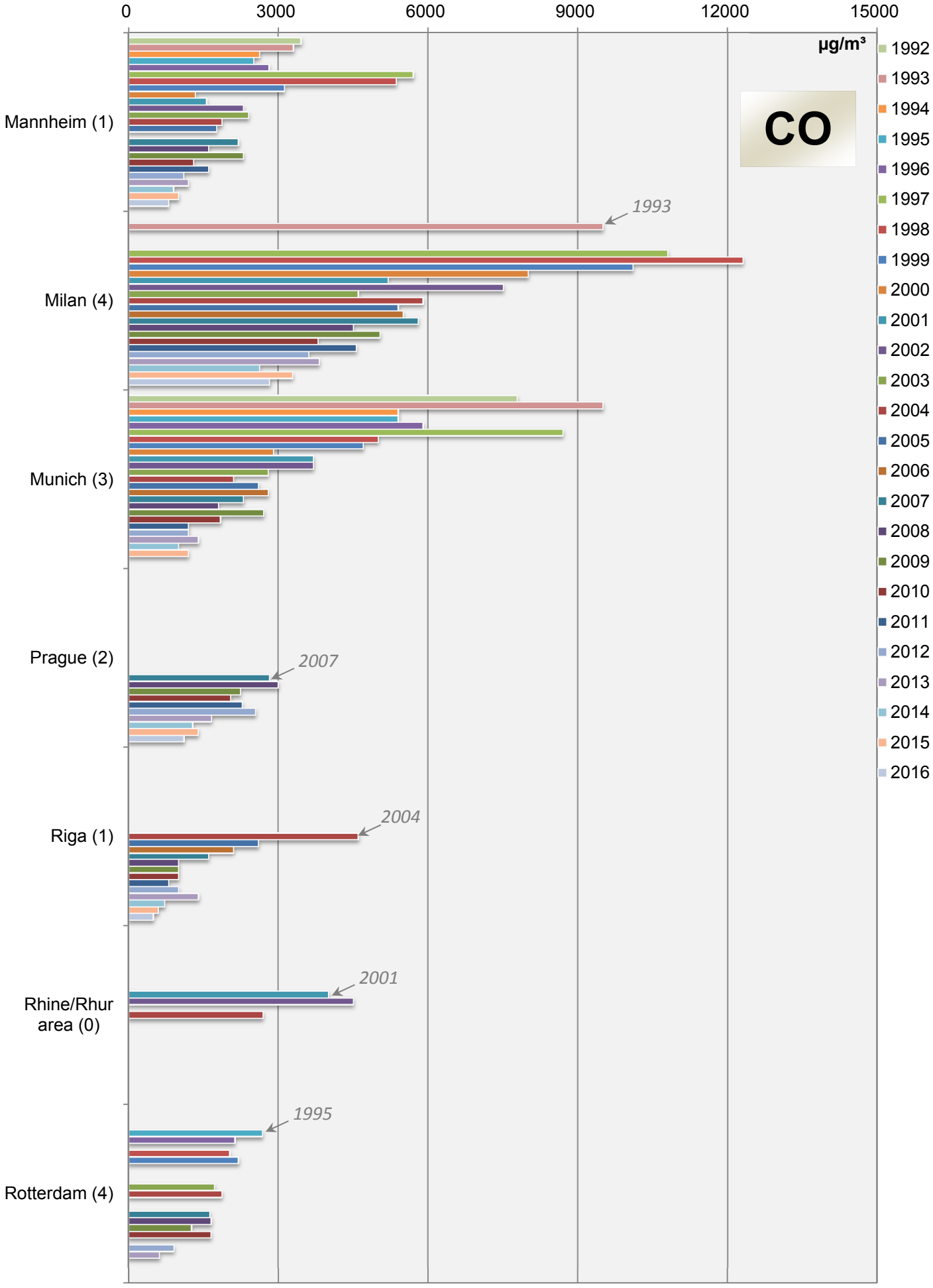
Comparison of The Air Quality 1992 - 2016

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



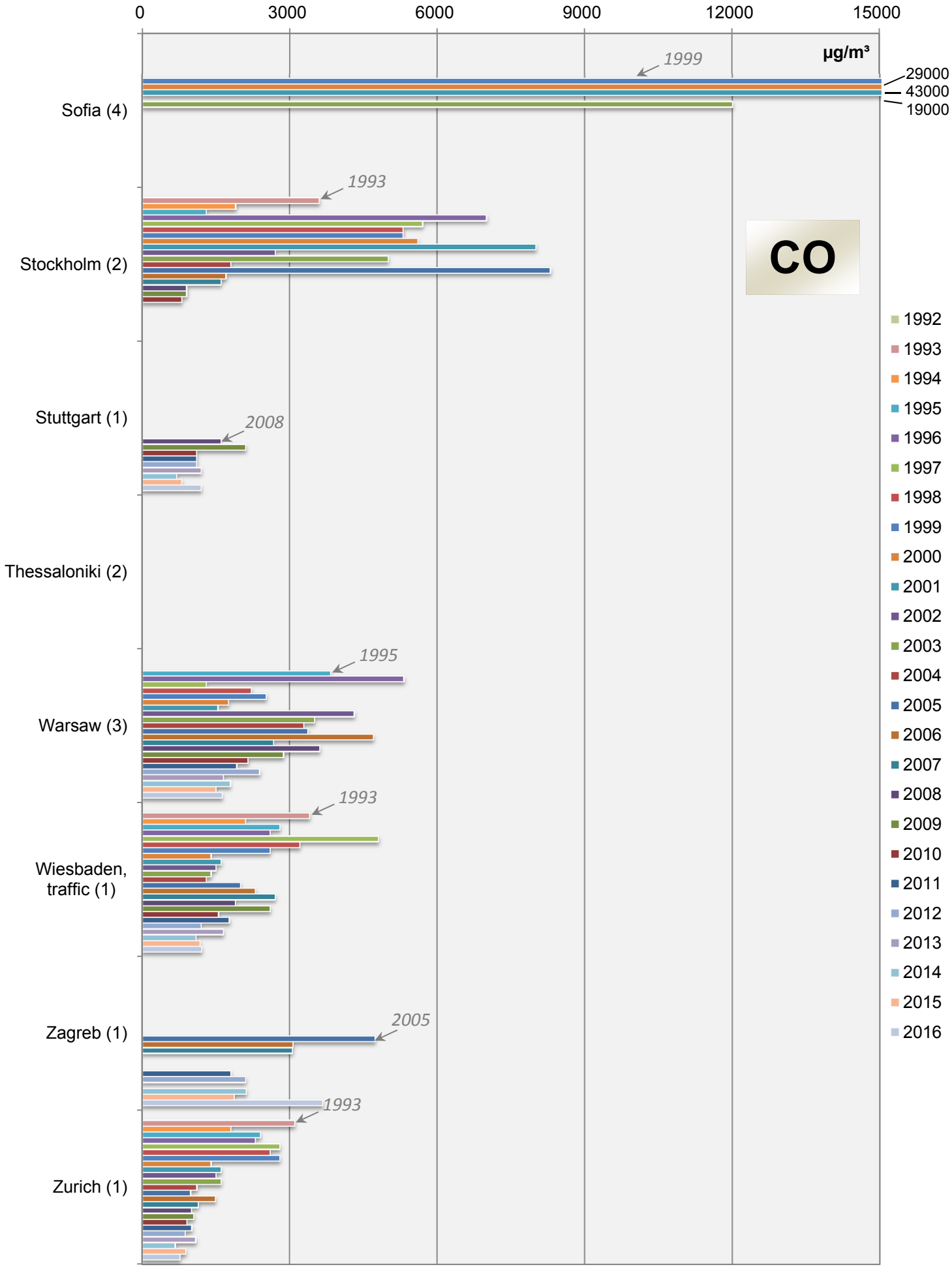
Comparison of The Air Quality 1992 - 2016

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



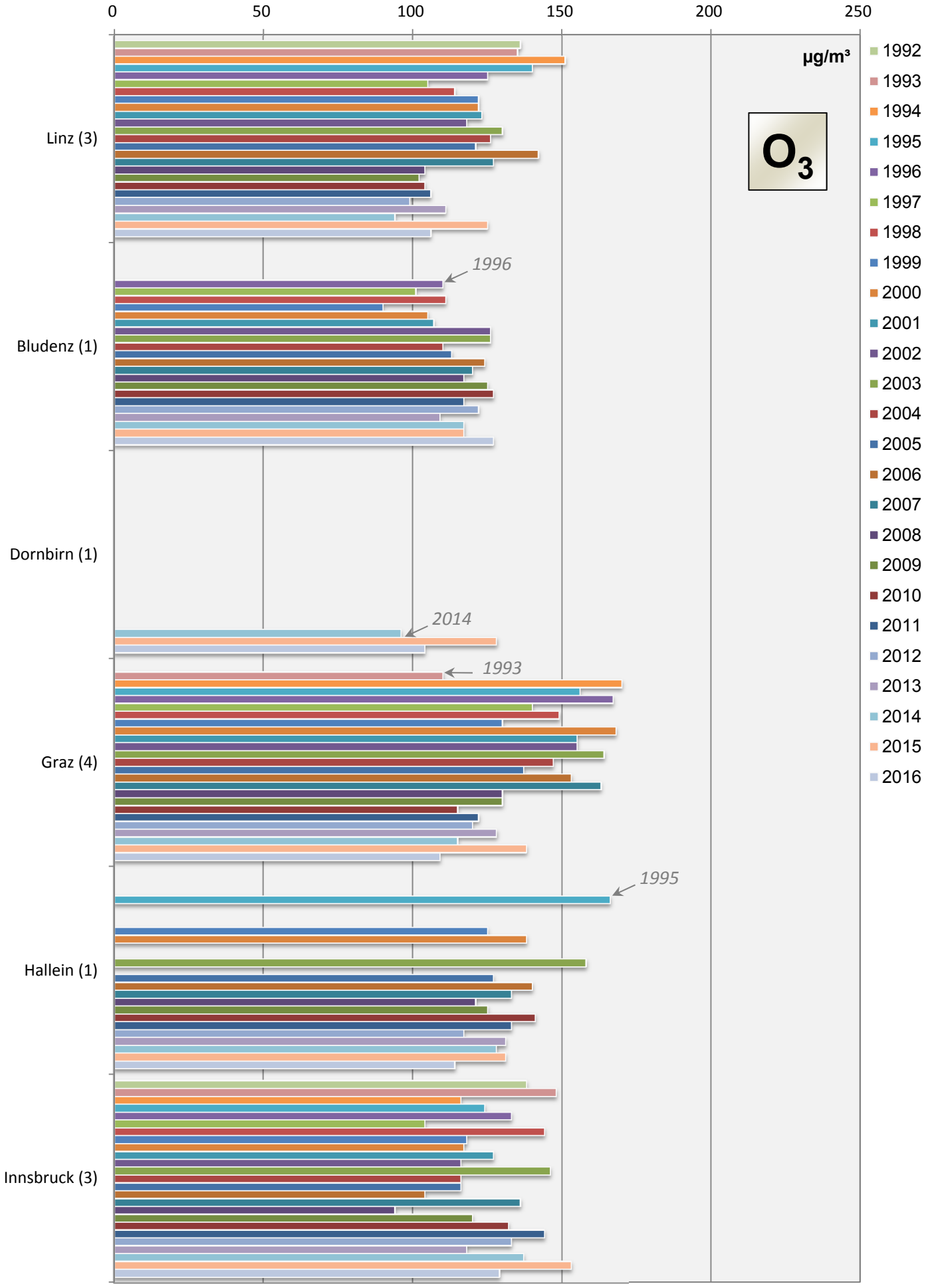
Comparison of The Air Quality 1992 - 2016

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



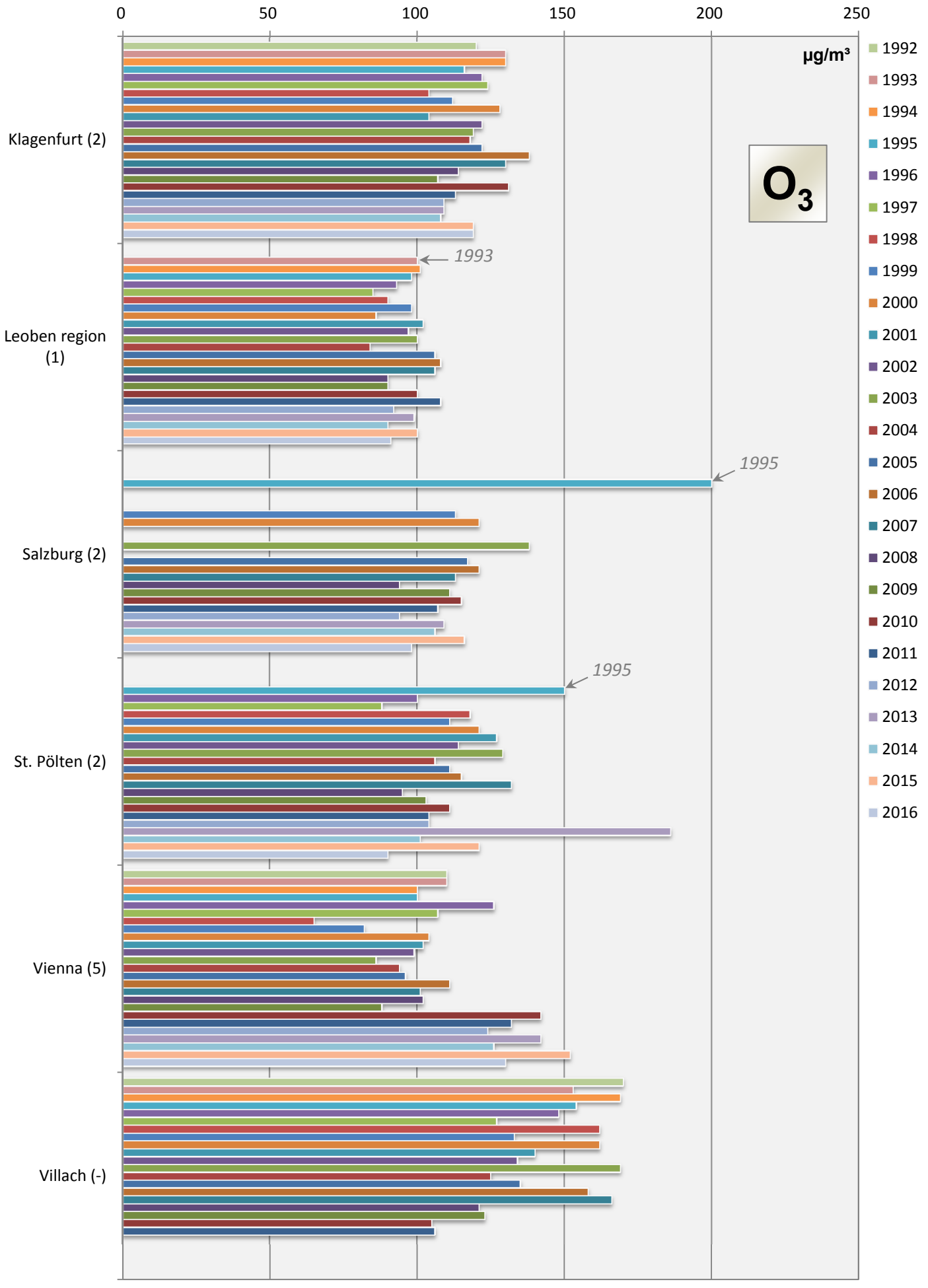
Comparison of The Air Quality 1992 - 2016

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



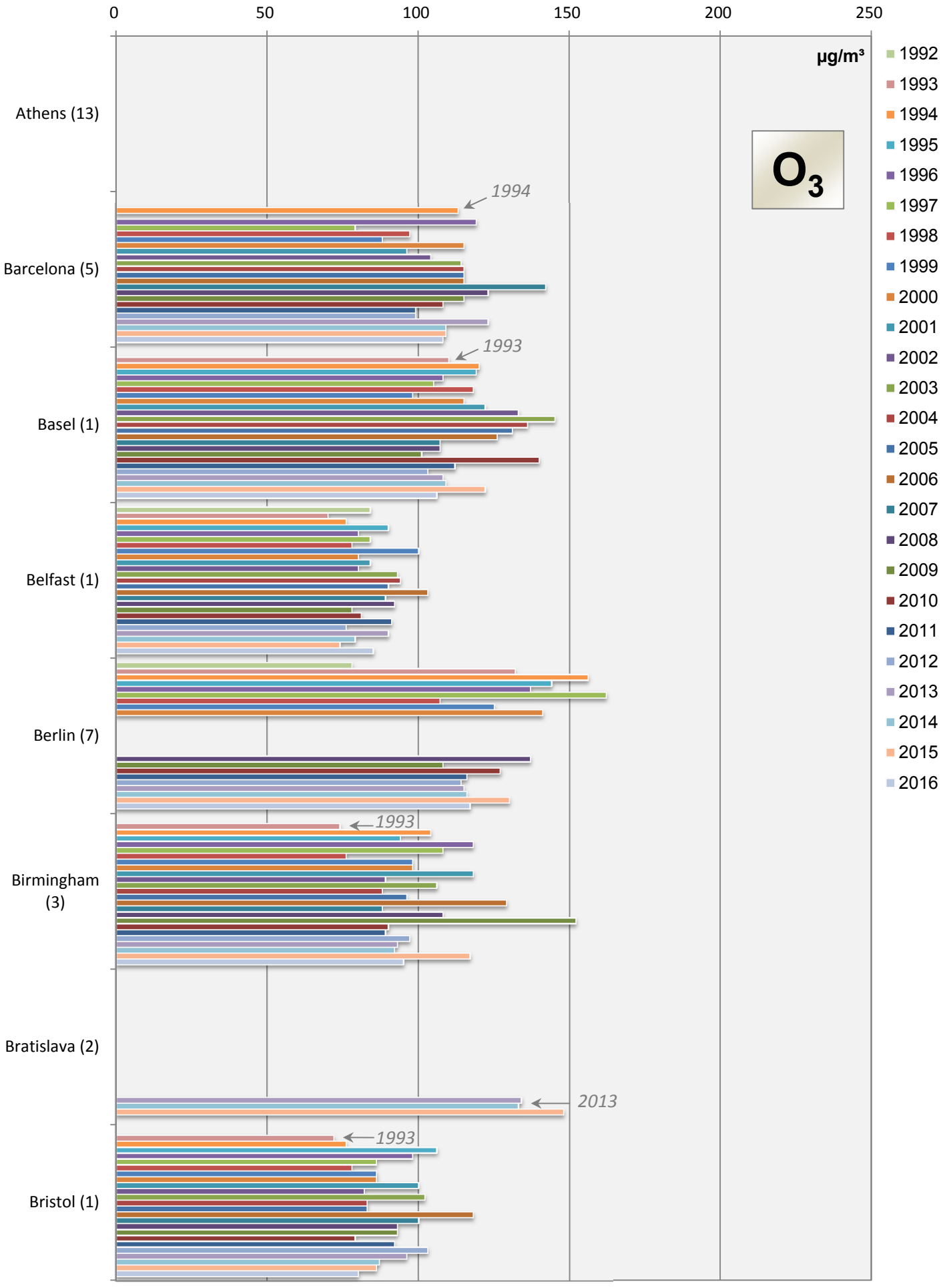
Comparison of The Air Quality 1992 - 2016

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



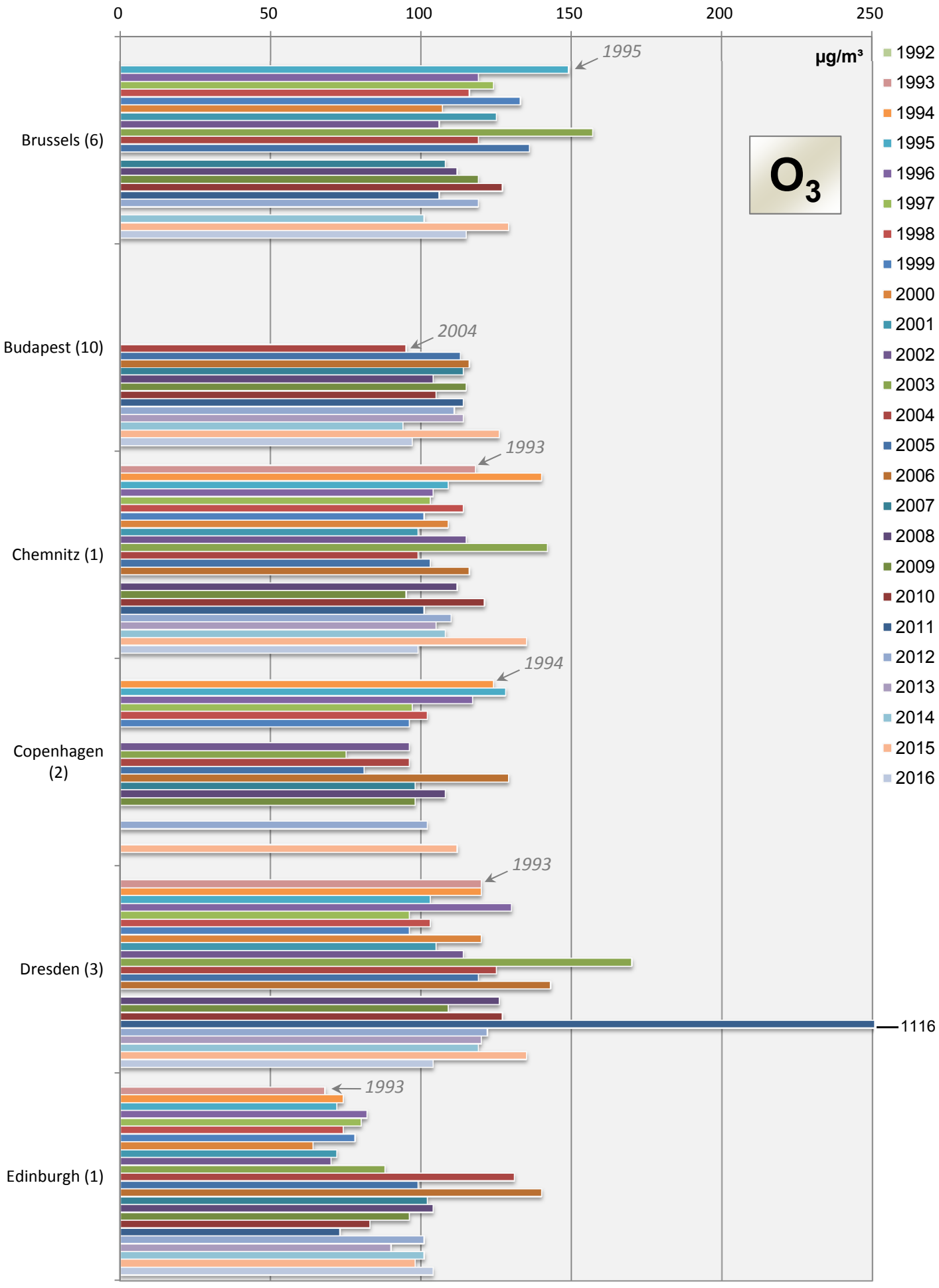
Comparison of The Air Quality 1992 - 2016

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



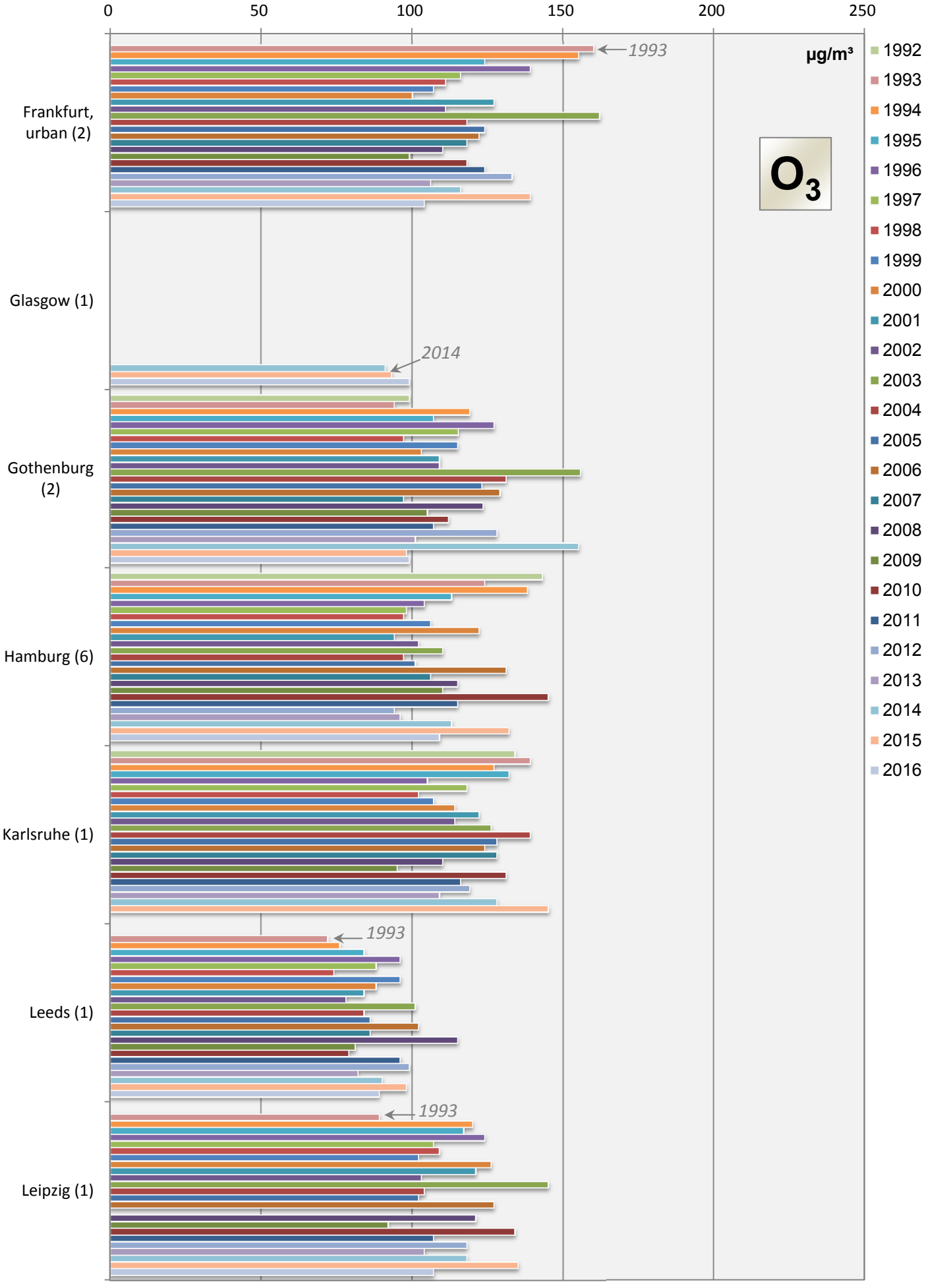
Comparison of The Air Quality 1992 - 2016

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



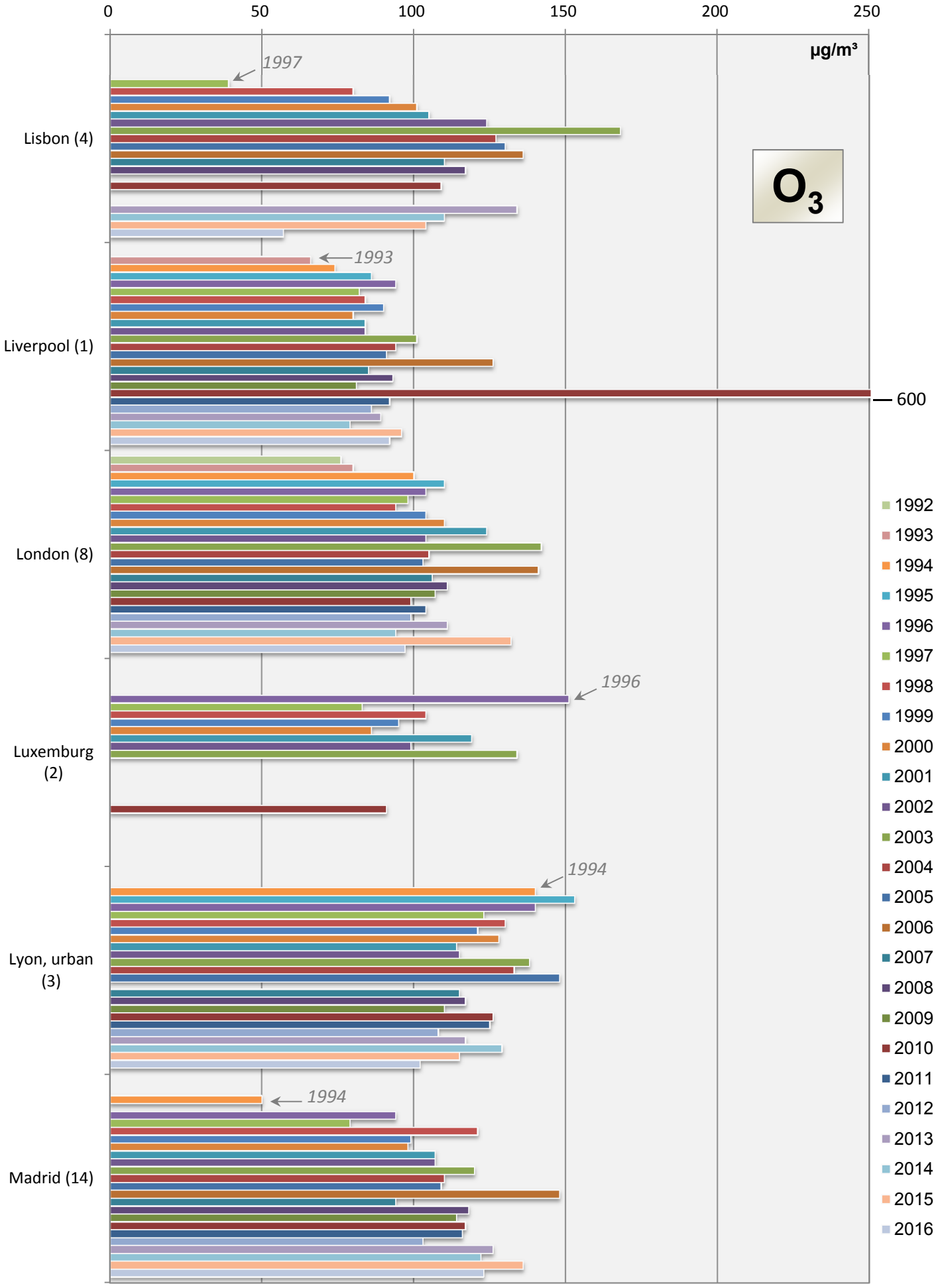
Comparison of The Air Quality 1992 - 2016

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



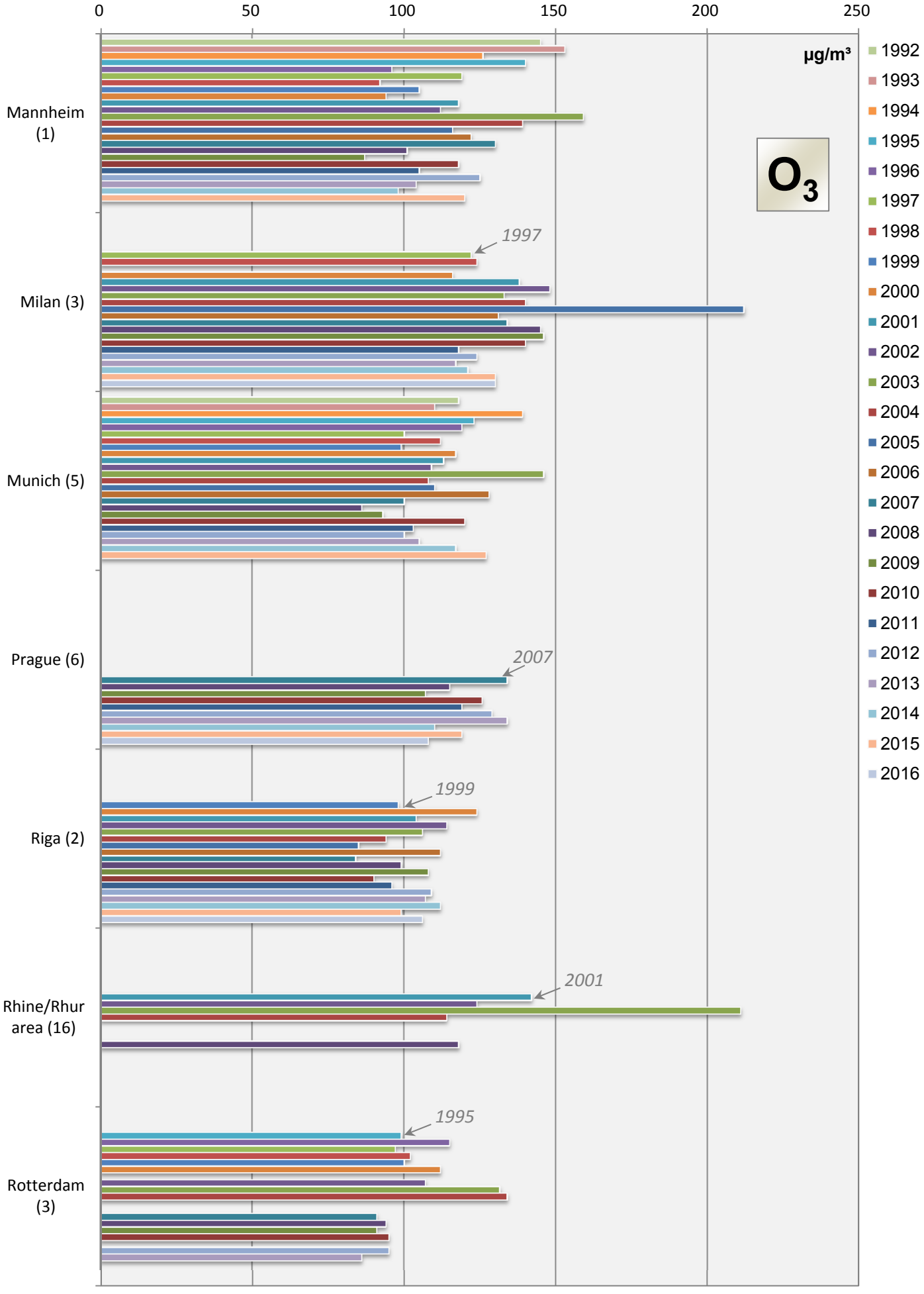
Comparison of The Air Quality 1992 - 2016

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



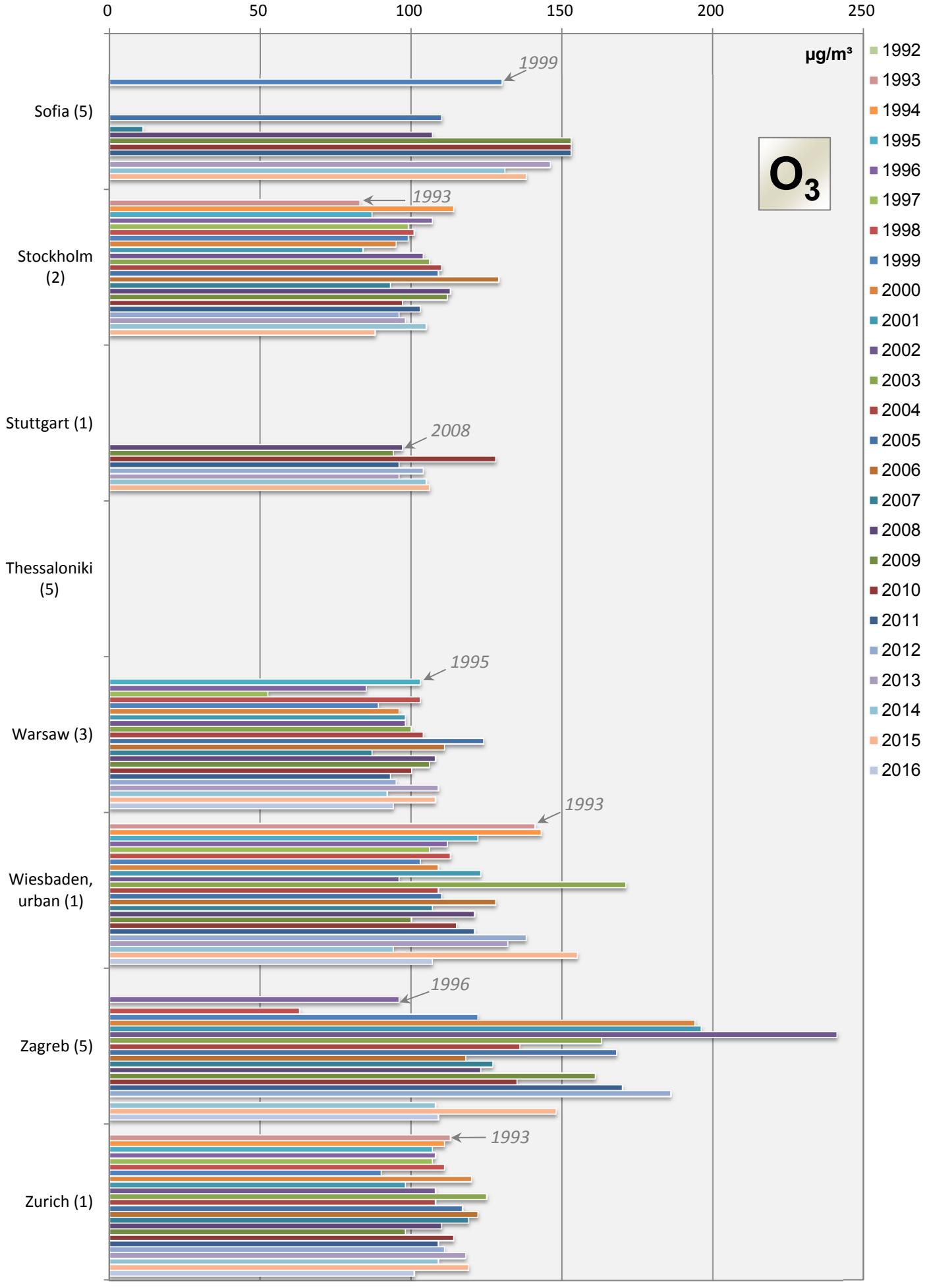
Comparison of The Air Quality 1992 - 2016

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



Comparison of The Air Quality 1992 - 2016

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



Jahresvergleich

1993 - 2016

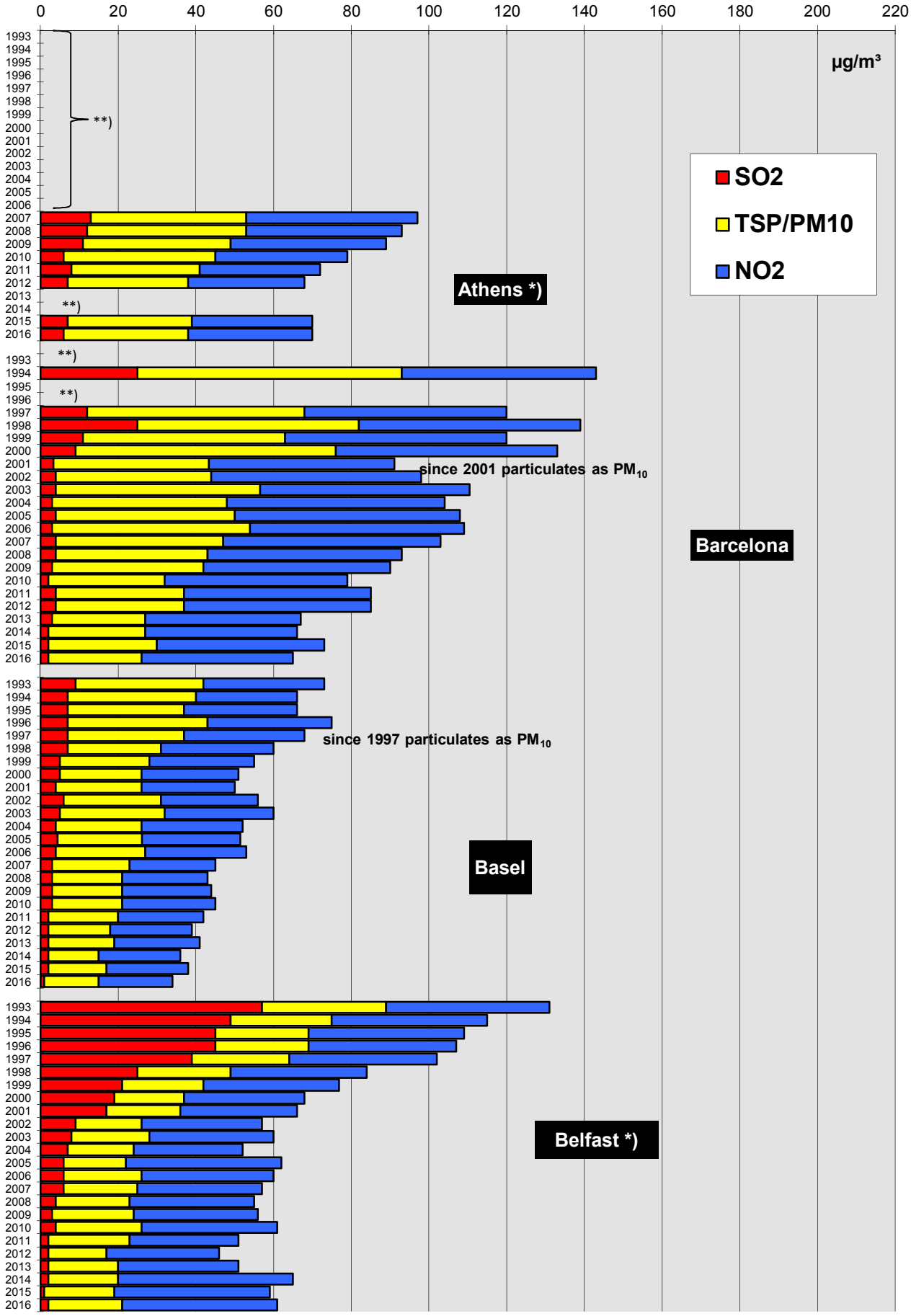
Jahresmittelwerte, Σ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality

1993 - 2016

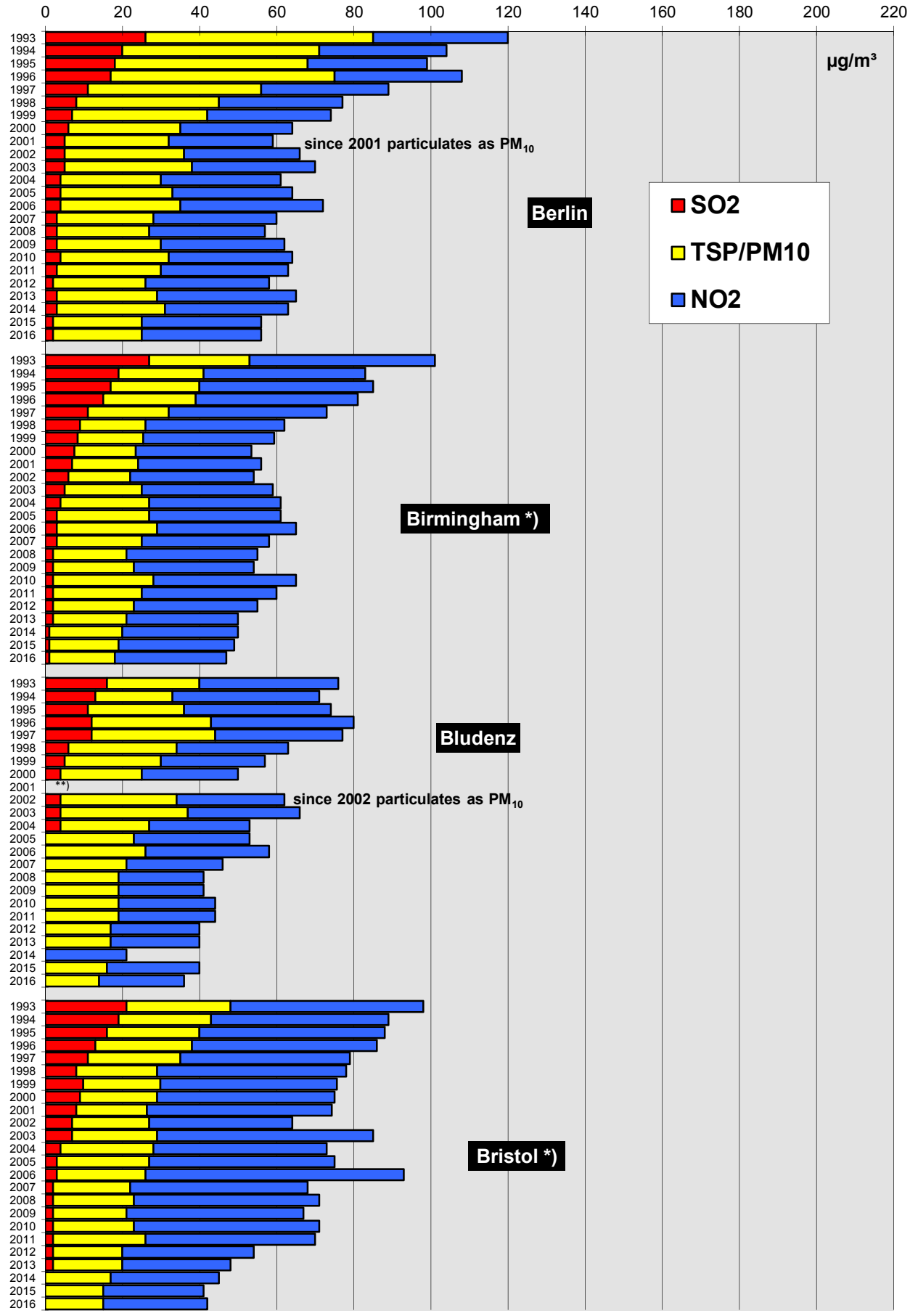
Annual Mean Values, Σ SO_2, TSP/PM10, NO_2

Comparison Of The Air Quality 1993-2016
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 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)

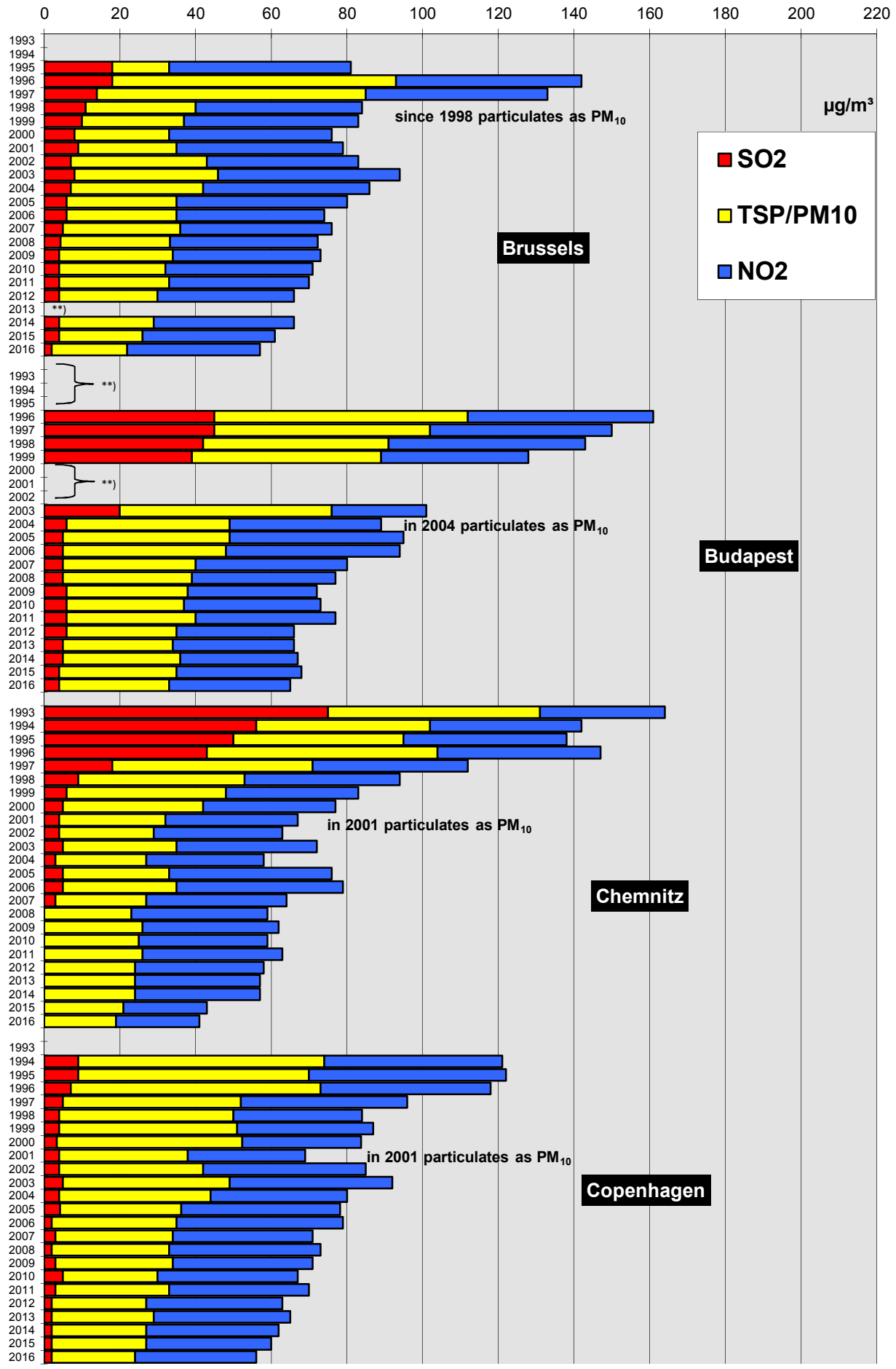


*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2016

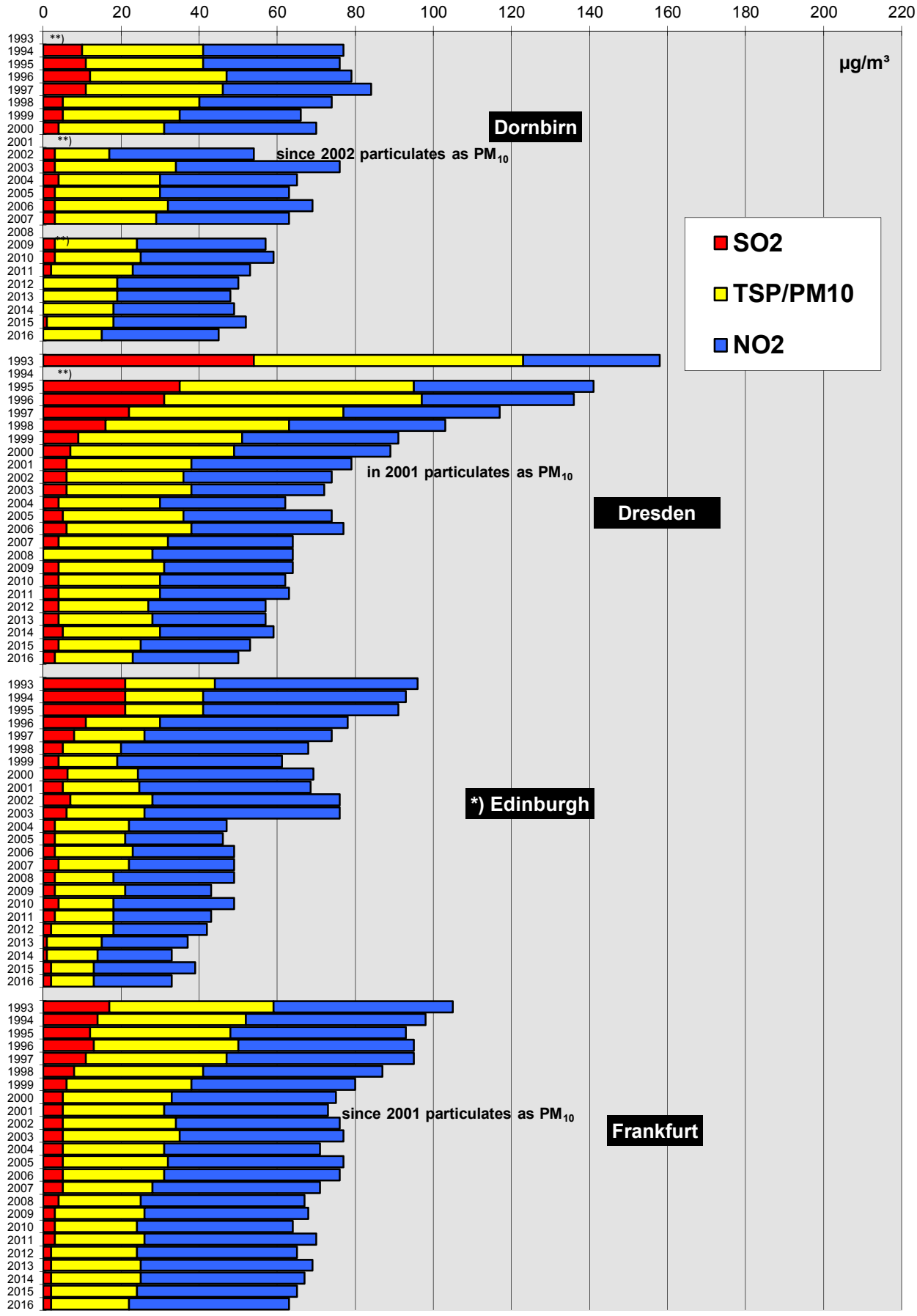
Development of the annual mean values Σ SO_2, TSP/PM_{10}, NO_2

(mean of all monitoring stations)



*) particulates calculated as PM10 **) no data

Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



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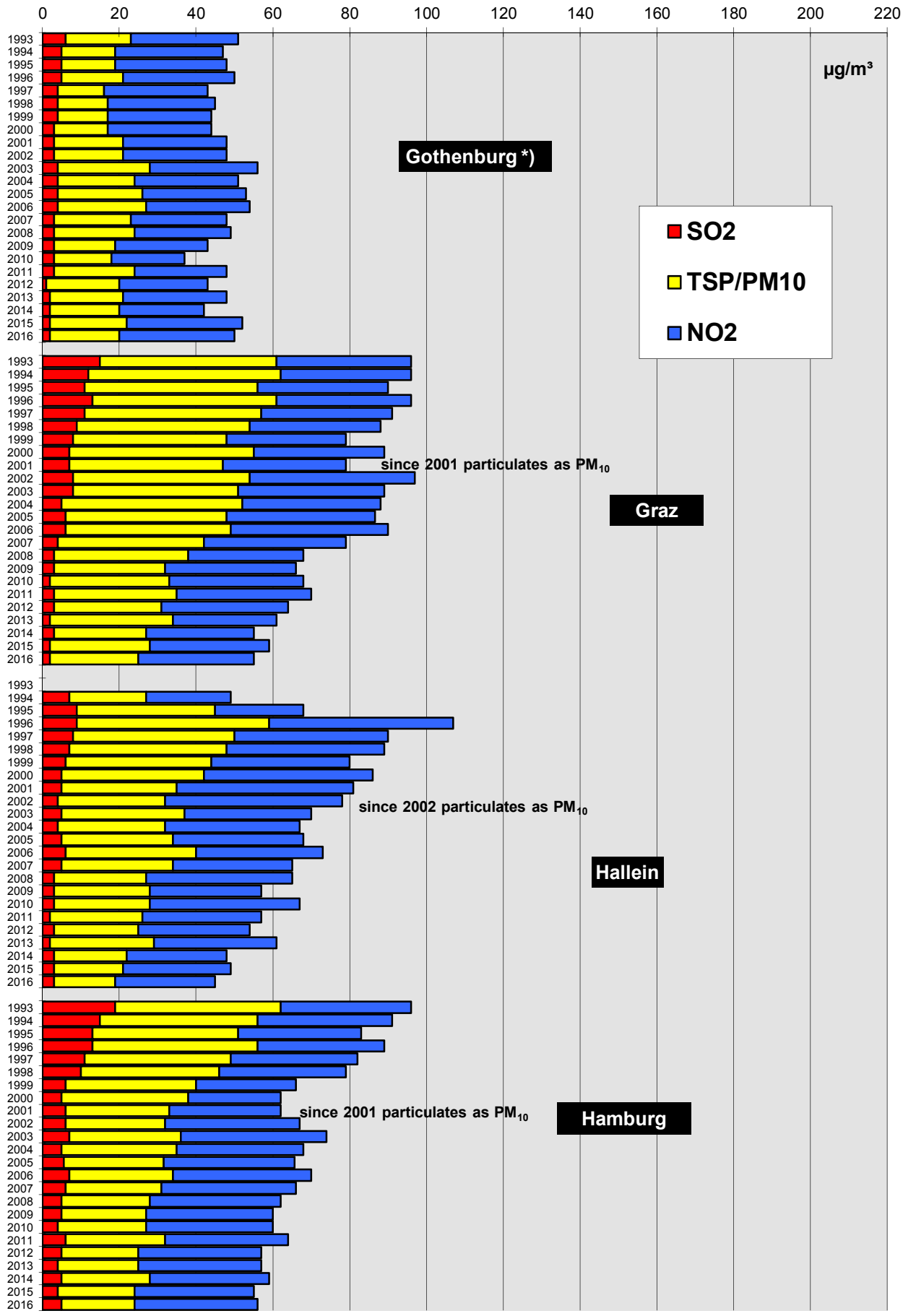
Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



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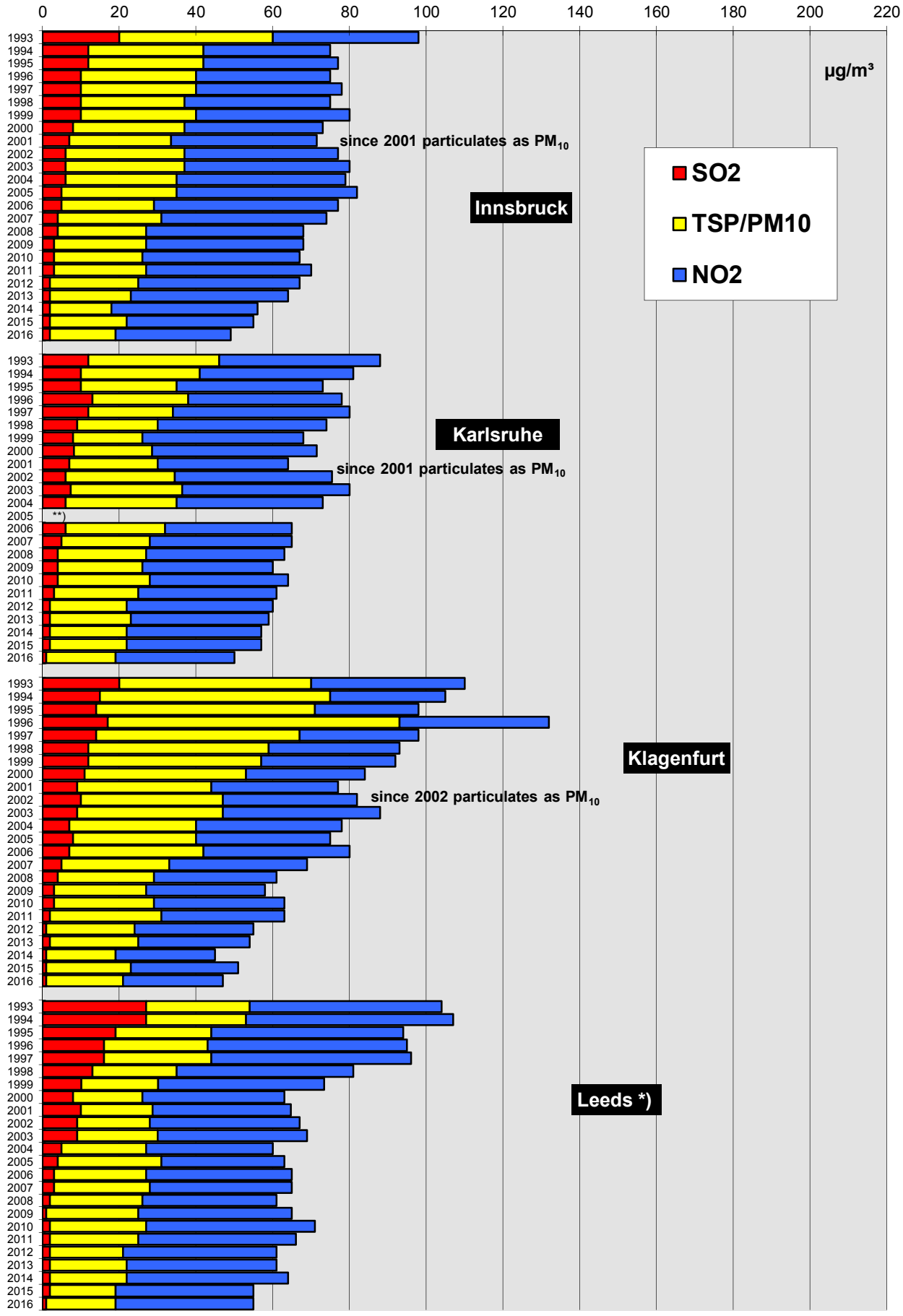
Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



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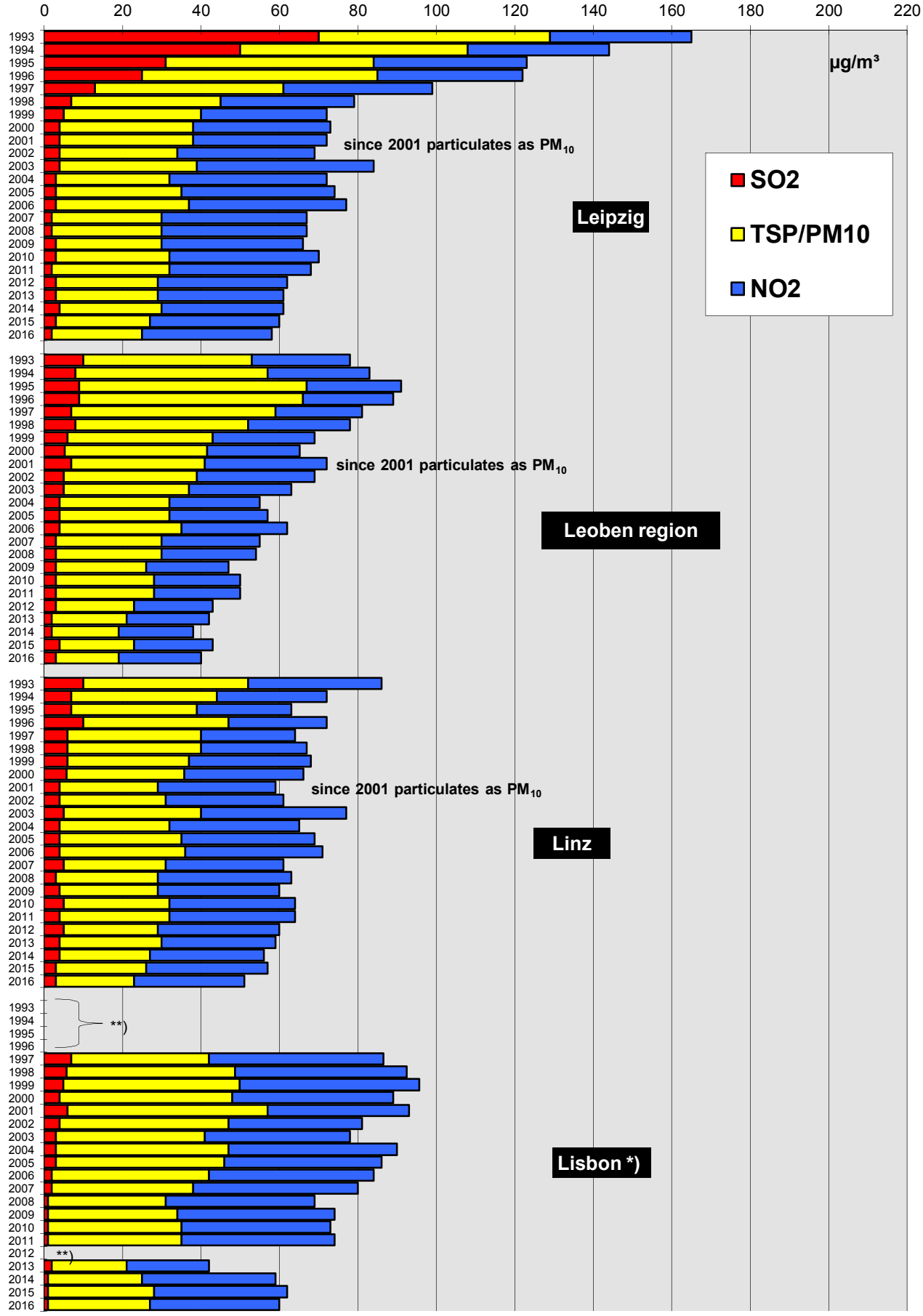
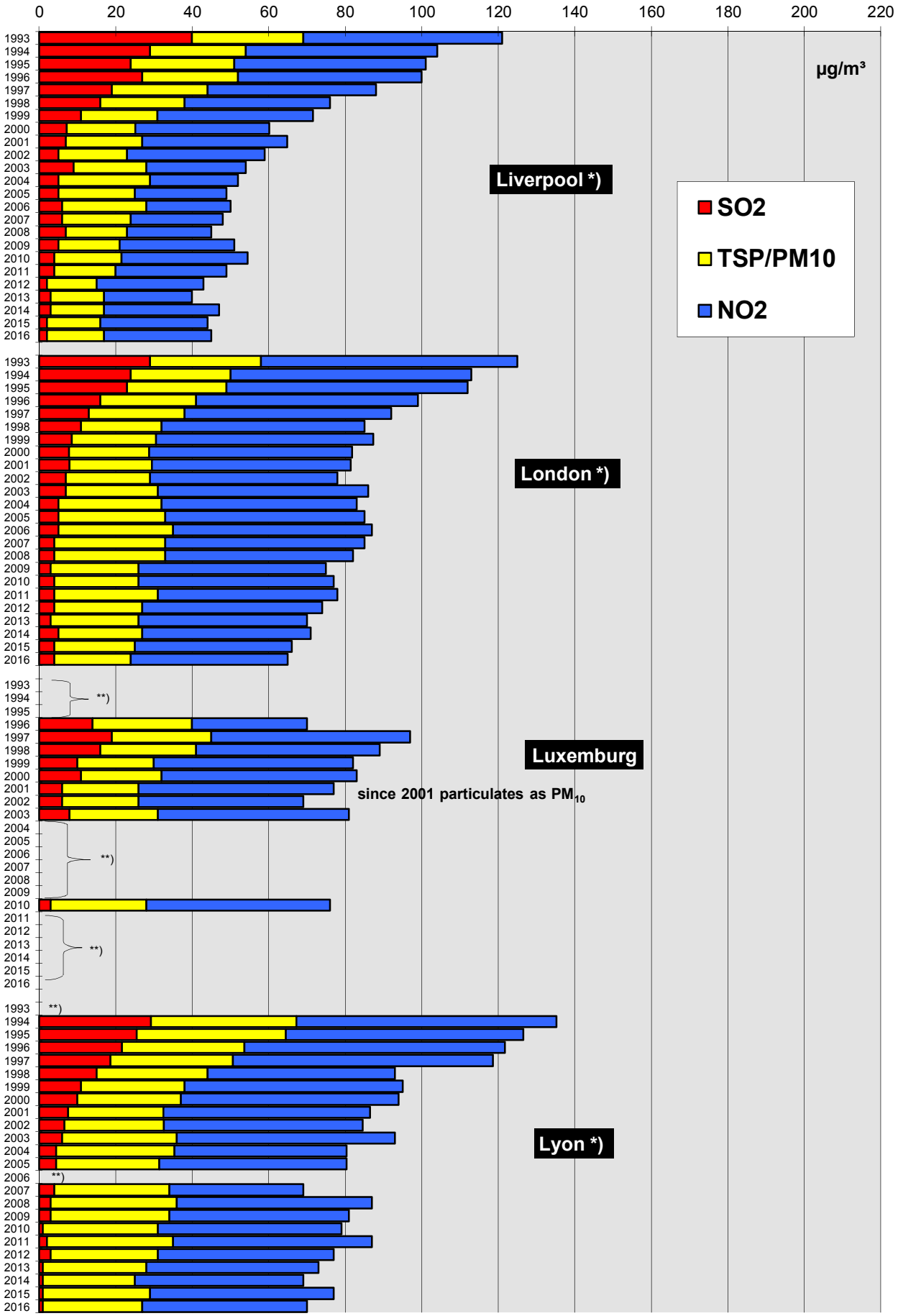
Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



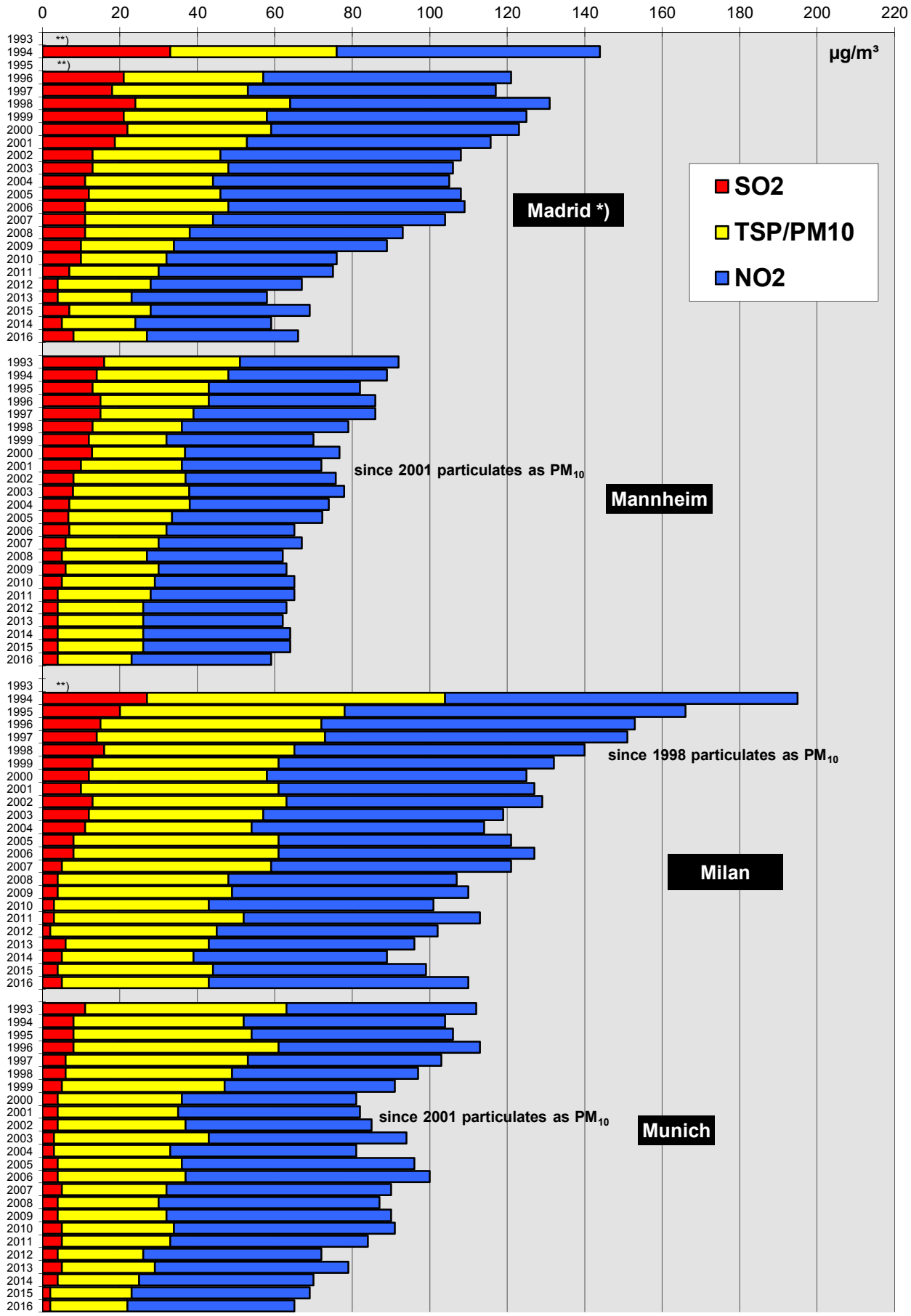
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



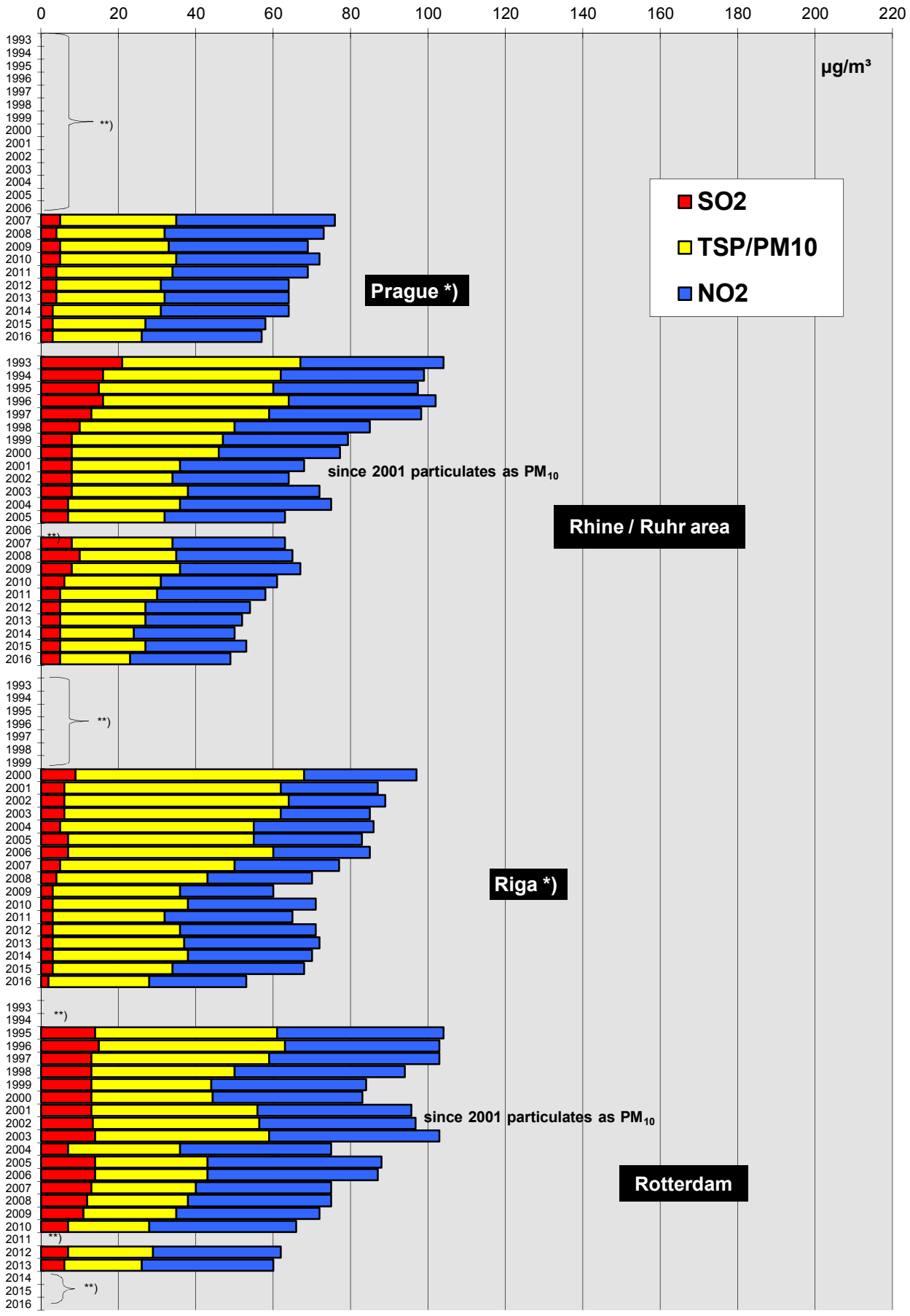
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



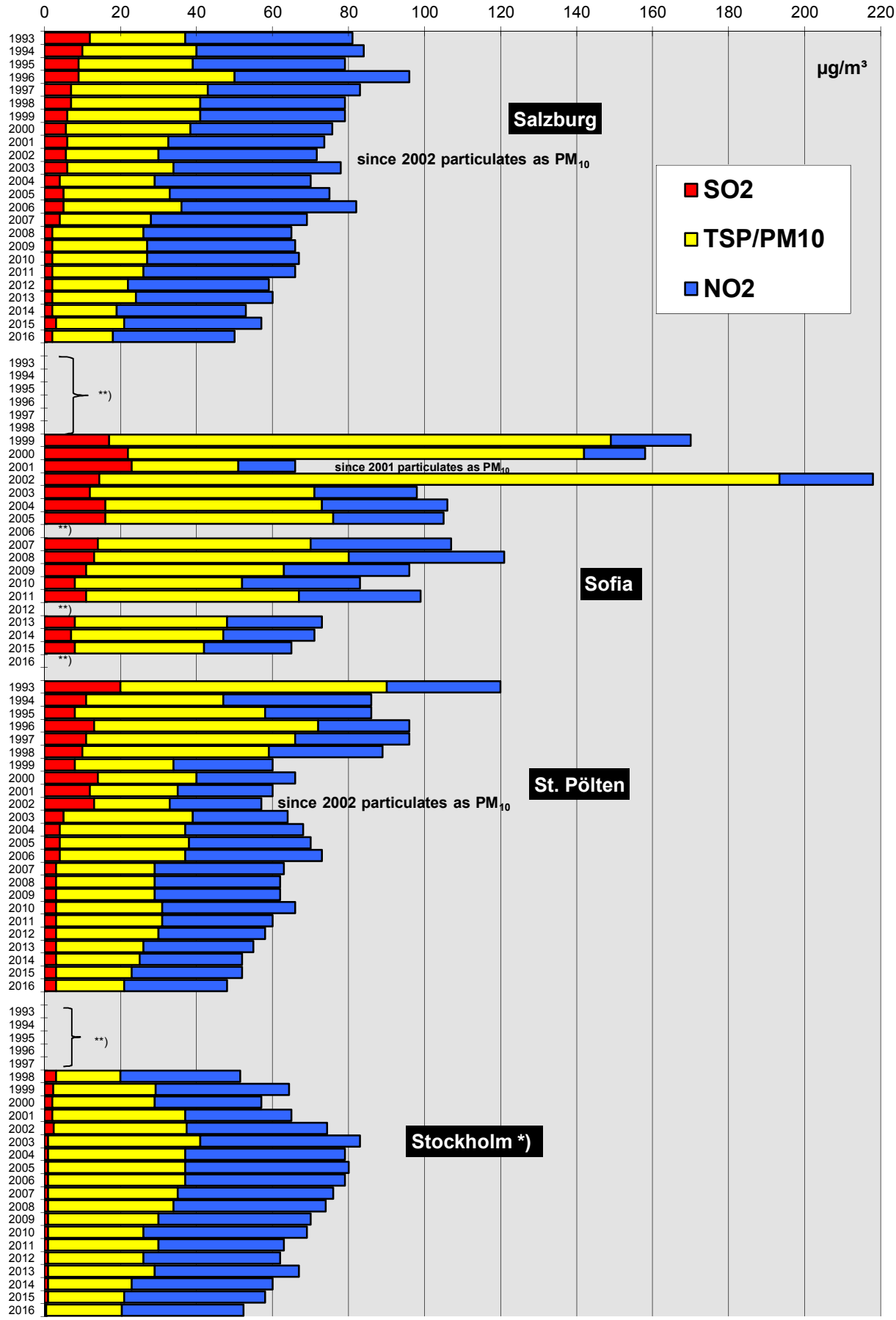
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



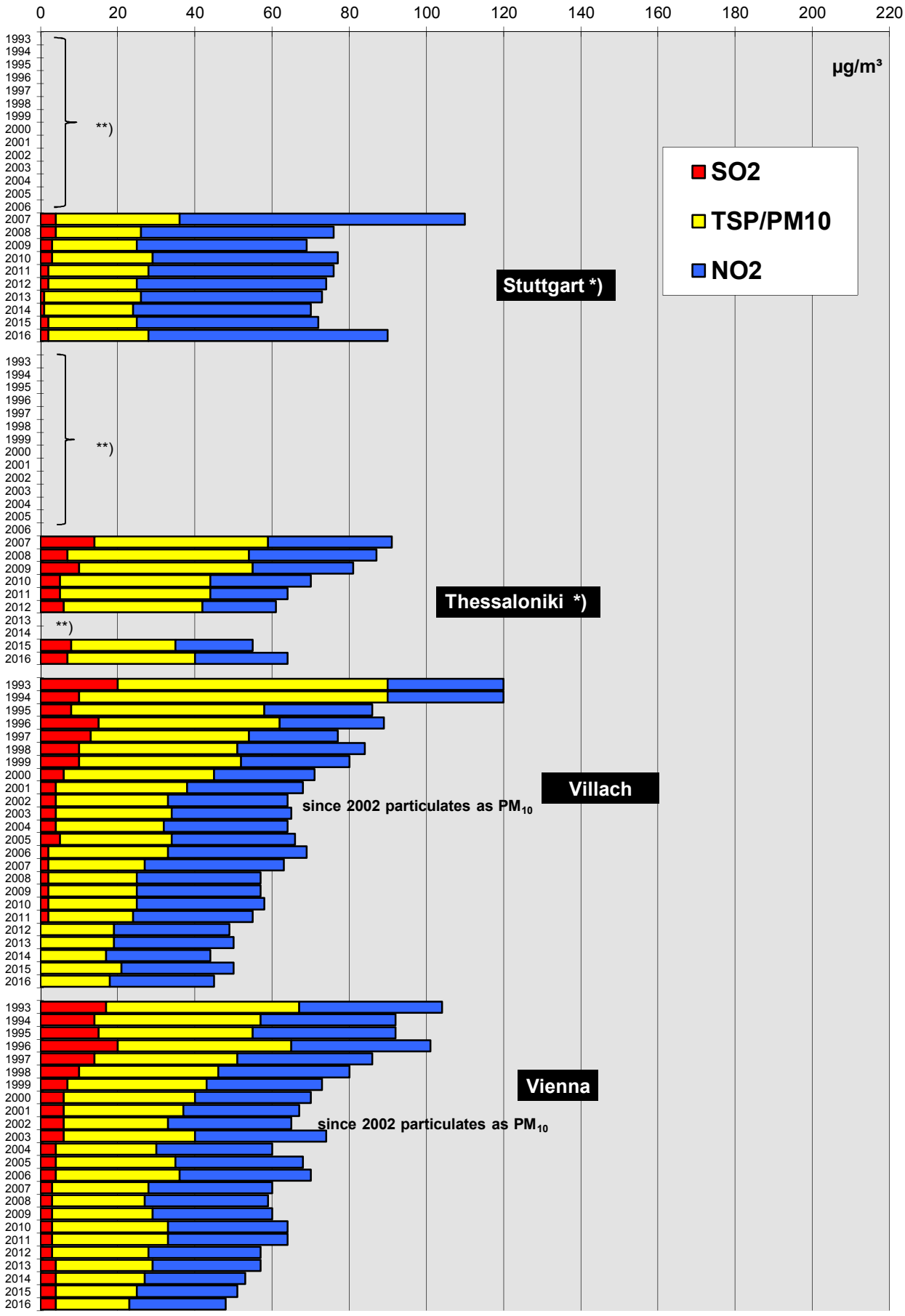
*) particulates calculated as PM_{10} **) no data

Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



*) particulates calculated as PM10 **) no data

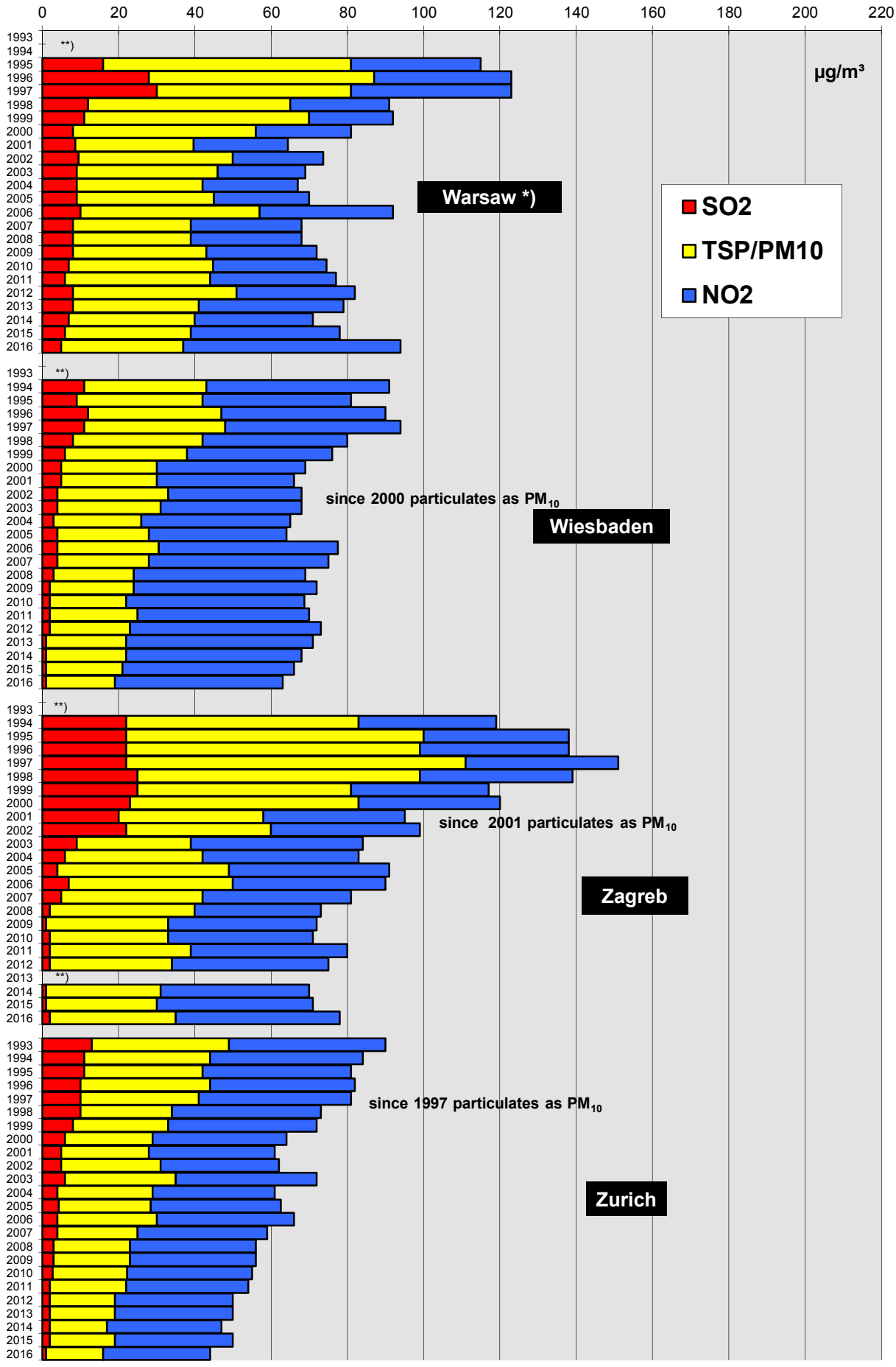
Comparison Of The Air Quality 1993-2016
Development of the annual mean values, Σ SO_2, TSP/PM_{10}, NO_2
(mean of all monitoring stations)



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

Comparison Of The Air Quality 1993-2016

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 2016

der einzelnen

Vergleichsregionen

Immission Reference Values 2016

Of All Compared Regions

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	5	6	15	42		152		38
PM_{10}	11	32	56	287				98
$PM_{2,5}$	6	17	31	82				54
NO	14	23	132			832		300
NO_2	14	32	87			297		132
CO	6	717	1900			9900		4100
O_3	13	57	121			301		141

PM_{10}	Monitoring method(s) used:	β-attenuation
	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 2016 (measured values **including** equivalent factor, if applicable):	72
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	5

Barcelona

immission area: 101 km^2 population: 1 608 746

	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	2	3	10	45	79	-	8
PM_{10} *	10	24	33	101	-	-	-	57
$PM_{2,5}$ *	7	14	21	49	-	-	-	35
NO	7	17	84	290	679	742	-	178
NO_2	7	39	71	131	214	262	-	109
CO	4	400	1000	2000	4800	7000	-	1700
O_3	5	49	77	108	155	165	-	115

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 2016 (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 2016:	4****

Comments:

* Gravimetric method, daily resolution

** Maximum 98 percentile of hourly values, except PM_{10} and $PM_{2.5}$ daily mean values

*** Station: POBLENOU, ES0691A, 08019004) P90.4= 39.5

**** Station: GRÀCIA - SANT GERVASI, ES1480A, 08019044) P99.8=145

Area and population of the municipalities of Barcelona (not metropolitan area)

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

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	1	2	7	18	23	24	6
PM_{10}	1	14	27	50	119	164	167	40
$PM_{2,5}$	1	10	24	32	-	-	-	-
NO	1	6	31	67	113	131	162	55
NO_2	1	19	39	56	72	75	78	56
CO	-	-	-	-	-	-	-	-
O_3	1	47	70	106	167	170	172	125

PM_{10}	Monitoring method(s) used:	FIDAS 200, calibrated with gravimetrical measurements every 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 2016 (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 2016:	0

Belfast

immission area: 115 km^2 population: 339 600

	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	17	-	-	-	5
PM_{10}	2	19	28	118	-	-	-	51
$PM_{2,5}$	1	10	17	79	-	-	-	28
NO	2	37	117	463	-	-	-	194
NO_2	2	40	70	136	-	248	-	90
CO	1	91	141	730	-	-	-	278
O_3	1	41	61	85	-	-	-	76

PM_{10}	Monitoring method(s) used:	TEOM (FDMS)
	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 2016 (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 2016:	10

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

Berlin (outskirt stations)

immission area: 892 km² population: 3 520 000

	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	18	34	241	1031	1144	1186	33
$PM_{2,5}$*	1	14	--	--	--	--	--	--
NO	5	3	10	63	137	196	215	41
NO_2	5	14	24	54	82	97	98	46
CO	-	--	--	--	--	--	--	--
O_3	5	47	84	117	190	202	209	127

PM_{10}	Monitoring method(s) used:	β-absorption and Light Scattering
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.21 and 1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	0

Comments: * $PM_{2,5}$: The data are collected every other day. For this reason there are no data for max. monthly mean value or max. daily mean value.

Berlin (traffic stations)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	4	19	135	329	609	7
PM_{10}	5	27	44	256	1580	2738	3224	44
$PM_{2,5}$*	1	18	34	187	--	--	--	--
NO	6	44	98	247	679	801	957	239
NO_2	6	48	67	114	210	268	297	112
CO	2	400	550	960	1610	1770	2530	930
O_3	0	--	--	--	--	--	--	--

PM_{10}	Monitoring method(s) used:	β-absorption and Light Scattering
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1 and 1.21
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	18
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	3

Comments: * $PM_{2,5}$: mean or max. values from daily values (gravimetric measurement)

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

Berlin (urban stations)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	1	3	10	16	22	26	8
PM_{10}	3	22	34	136	693	1076	133	36
$PM_{2,5}$ *	3	16	28	103	--	--	--	--
NO	5	7	20	100	257	318	550	62
NO_2	5	26	35	64	121	132	135	69
CO	--	--	--	--	--	--	--	--
O_3	2	43	76	110	171	174	179	119

PM_{10}	Monitoring method(s) used:	β-absorption and Light Scattering
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1 and 1.21
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicc.):	6
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Comments: * $PM_{2,5}$: mean and max. values from daily values

Birmingham

immission area: 268 km^2 population: 1 101 000

	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	0.5	1	4			-	2
PM_{10}	2	17	29	69			-	58
$PM_{2,5}$	3	11	18	50			-	41
NO	3	20	62	401			-	120
NO_2	3	29	53	131		223	-	87
CO	-	-	-	-	-	-	-	-
O_3	3	40	66	95	-	-	-	79

PM_{10}	Monitoring method(s) used:	TEOM (FDMS)
	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 2016 (measured values **including** equivalent factor, if applicable):	6
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	5

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

Bludenz

immission area: 30 km^2 population: 14 005

	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	14*	43**	82*	351**	424**	463**	65**
$PM_{2,5}$								
NO	1	16	103	188	350	388	393	157
NO_2	1	22	49	71	104	112	144	70
CO								
O_3	1	48	78	127	153	162	166	124

PM_{10}	Monitoring method(s) used:	Gravimetrically *; Sharp **
	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 2016 (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 2016:	0

Bratislava

immission area: 368 km^2 population: 422 932

	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}			No data for 2016!					
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

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 2016 (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 2016:	

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

Bristol

immission area: 110 km^2 population: 454 200

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	15	28	71	-	-	-	46
$PM_{2,5}$	1	12	24	57	-	-	-	43
NO	1	16	58	266	-	-	-	118
NO_2	1	27	46	91	-	176	-	67
CO	-	-	-	-	-	-	-	-
O_3	1	39	55	80	-	-	-	69

PM_{10}	Monitoring method(s) used:	TEOM (FDMS)
	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 2016 (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 2016:	0

Brussels

immission area: 161 km^2 population: 1 187 890

	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	6	2	6	9	-	35	66	8
PM_{10}	6	20	39	99	-	529	573	68
$PM_{2,5}$	5	15	27	71	-	121	121	50
NO	9	21	92	589	-	1213	1222	230
NO_2	9	35	63	138	-	253	274	113
CO	6	279	647	1423	-	2066	5060	995
O_3	6	36	65	115	-	179	185	108

PM_{10}	Monitoring method(s) used:	TEOM model 1400ab + FDMS 8500 & TEOM 1405DF
	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 2016 (measured values **including** equivalent factor, if applicable):	16
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	3

[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 km² population: 1 759 407

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [2,3,4] [µg/m³] *
SO_2	8	4	9	20	29	56	-	14
PM_{10}	12	29	61	177	244	-**	-	101
$PM_{2,5}$	1	21	44	87	116	138	-	74
NO	9	18	67	280	506	670	-	153
NO_2	9	32	65	131	192	218	-	103
CO	10	481	1019	2394	3609	4029	-	1816
O_3	10	37	71	97	172	179	-	122

PM_{10}	Monitoring method(s) used:	β-absorption
	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 2016 (measured values **including** equivalent factor, if applicable):	46
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	3

Comments:
* Max. 98 percentile per year is calculated from hourly mean values except the PM10. There the max. 98 percentile per year is calculated from 24 hourle mean values.
** due to the characteristics of the measuring equipment.

Chemnitz

immission area: 221 km² population: 248 645

	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	0	-	-	-	-	-	-	-
PM_{10}	2	19	28	103	-	246	-	54
$PM_{2,5}$	1	12	16	39	-	-	-	-
NO	2	9	68	188	188	490	-	199
NO_2	2	22	48	89	89	141	-	98
CO	0	-	-	-	-	-	-	-
O_3	1	45	70	99	99	178	-	116

PM_{10}	Monitoring method(s) used:	gravimetrically (High-Volume-Sampler, micro balance)
	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 2016 (measured values **including** equivalent factor, if applicable):	2
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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

station	PM_{10}-HVS	PM_{10}-TEOM
Chemnitz-Leipziger Straße	1.0	1.0

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

Copenhagen

immission area: 88 km^2 population: 602 481

	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	-	-	-	17	-	7
PM_{10}	3	22	-	80	-	-	-	-
$PM_{2,5}$	3	13	-	51	-	-	-	-
NO	3	-	-	-	-	-	-	-
NO_2	3	32	-	-	-	-	-	107
CO	2	276	-	-	-	1925	-	755
O_3	2	46	-	-	-	172	-	-

PM_{10}	Monitoring method(s) used:	Gravimetically
	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 2016 (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 2016:	0

Dornbirn

immission area: 121 km^2 population: 47 420

	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	15*	31**	113*	407**	737**	786**	50**
$PM_{2,5}$	1	11*	26**	92*	356**	420**	434**	39**
NO	1	25	72	150	308	396	452	132
NO_2	1	30	46	75	98	123	150	76
CO	-	-	-	-	-	-	-	-
O_3	1	40	67	104	154	163	169	117

PM_{10}	Monitoring method(s) used:	Gravimetrically*, Sharp**
	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 2016 (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 2016:	0

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

Dresden

immission area: 328 km² population: 543 825

	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	1	3	6	19	39	63	-	12
PM_{10}	4	20	34	123	196	309	-	57
$PM_{2,5}$	3	13	24	102	-	-	-	-
NO	4	22	84	184	184	506	-	231
NO_2	4	27	54	85	85	175	-	104
CO	-	-	-	-	-	-	-	-
O_3	3	46	78	104	104	159	-	119

PM_{10}	Monitoring method(s) used:	Gravimetrically (High-Volume-Sampler, micro balance)
	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 2016 (measured values **including** equivalent factor, if applicable):	10
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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

station	PM_{10}-HVS	PM_{10}-TEOM
Dresden-Bergstr.	1.0	1.0
Dresden-Nord.	1.0	1.0 + f (temperature, humidity)
Dresden-Winckelmannstr.	1.0	1.0
Dresden-Wahnsdorf	1.0	1.0 + f (temperature, humidity)

Edinburgh (St. Leonhards)

immission area: 262 km² population: 492 680

	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	14	-	-	-	5
PM_{10}	1	11	15	37				29
$PM_{2,5}$	1	6	8	26				18
NO	1	7	17	103				50
NO_2	1	20	37	75		138		57
CO	1	170	270	650				440
O_3	1	45	70	104				77

PM_{10}	Monitoring method(s) used:	TEOM (FDMS)
	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 2016 (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 2016:	0

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

Frankfurt (urban stations) immission area: 248 km² population: 729 624

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	2	3	5	15	22	24	7
PM_{10}	2	19	30	55	169**	215**	282**	53
$PM_{2,5}$	1*	12	19	40	-	-	-	-
NO	2	20	50	160	332	399	461	119
NO_2	2	35	44	68	104	125	137	79
CO	0	-	-	-	-	-	-	-
O_3	2	35	61	104	164	173	174	112

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 2016 (measured values **including** equivalent factor, if applicable):	3
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Comments: * monitoring method: gravitmetrically
** value is form 1.1.2016 (New Year's Eve fire works)

Frankfurt (traffic station) immission area: 248 km² population: 729 624

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	0	-	-	-	-	-	-	-
PM_{10}	1	23	36	79	405*	888*	1231*	57
$PM_{2,5}$	1	15	23	63	326	710	975	40
NO	1	43	74	190	518	585	588	176
NO_2	1	52	69	119	194	230	236	118
CO	1	430	570	1000	2720	2920	3160	990
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 2016 (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 2016:	6

Comments: * value is form 1.1.2016 (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

Glasgow (incl. traffic station)

immission area: 176 km^2 population: 596 000

	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}	2	13	17	41	-	-	-	29
$PM_{2,5}$	2	7	12	35	-	-	-	22
NO	4	40	172	455	-	-	-	270
NO_2	4	39	83	129	-	254	-	109
CO	-	-	-	-	-	-	-	-
O_3	1	39	64	99	-	-	-	73

PM_{10}	Monitoring method(s) used:	TEOM (FDMS)
	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 2016 (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 2016:	6

Gothenburg (traffic stations)

immission area: 1 031 km^2 population: 572 779

	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	-	-	-	-	-	-	-	-
PM_{10}	2	19	37	104	-	248	-	85
$PM_{2,5}$	1	6	8	33	-	42	-	20
NO	3	-	-	-	-	-	-	-
NO_2	3	35	57	134	-	262	-	117
CO	-	-	-	-	-	-	-	-
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	VCM
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	13

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

Gothenburg (urban stations)

immission area: 1 031 km population: 572 779

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile year [µg/m³]
SO_2	2	2	5	16	-	51	-	14
PM_{10}	1	14	19	47	-	156	-	37
$PM_{2,5}$	1	8	11	43	-	57	-	24
NO	2	-	-	-	-	-	-	-
NO_2	2	22	34	98	-	231	-	81
CO*	1	-	281	549	-	1112	-	526**
O_3	2	48	77	99	-	140	-	101

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	VCM
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	2

Comments:
* 98% percentile of 8h-means
** data availability under 75 %

Graz (urban stations)

immission area: 128 km² population: 283 869

	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	5	11	27	63	115	9
PM_{10}*	2	21	52	95	-	-	-	72**
$PM_{2,5}$*	2	16	41	77	-	-	-	56**
NO	5	22	92	268	470	575	616	222
NO_2	5	27	50	84	135	149	161	80
CO	2	400	1000	1700	2900	3600	5100	1500
O_3	4	46	81	109	140	144	144	114

PM_{10}	Monitoring method(s) used:	continuously / 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 2016 (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 2016:	0

Comments:
* PM_{10} and $PM_{2,5}$: gravimetric monitoring method
** Max. 98-Percentile per year is calculated from daily mean values.
*** Max 3h-mean value = static 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

Graz (traffically influenced Don Bosco)

immission area: 128 km² population: 283 869

	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	7	29	58	64	7
PM_{10}*	1	27	55	99	-	-	-	74**
$PM_{2,5}$*	1	20	43	89	-	-	-	57**
NO	1	52	125	282	670	800	910	277
NO_2	1	42	57	93	149	164	185	95
CO	1	400	900	1500	2300	2600	2600	1500
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	continuously, 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 2016 (measured values **including** equivalent factor, if applicable):	39
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	-

Comments:
* PM_{10} and $PM_{2.5}$: gravimetric monitoring method
** Max. 98-Percentile per year is calculated from daily mean values.
*** Max 3h-mean value = static average
**** Max 1h-mean value = static average

Hallein

immission area: 27 km² population: 21 043

	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	5	15	73	127	233	8
PM_{10}	1	16	23	72	-	-	-	53
$PM_{2,5}$	1	12	18	48	-	-	-	28
NO	2	21	76	142	313	348	387	161
NO_2	2	26	53	79	112	125	136	84
CO	1	300	500	800	1900	3000	3600	900
O_3	1	60	80	114	159	160	160	118

PM_{10}	Monitoring method(s) used:	Gravimetrically and β-absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0,895
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	3
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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

Hamburg (area monitoring stations)

immission area: 755 km² population: 1 860 000

	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	10	67	152	240	337	39
PM_{10}	8	18	30	147	-	-	-	54
$PM_{2,5}$	3	13	23	93	-	-	-	44
NO	12	10	38	177	527	730	764	121
NO_2	12	24	42	71	111	139	141	77
CO	1	180	270	860	1200	1340	1370	540
O_3	6	42	71	109	178	182	185	113

PM_{10}	Monitoring method(s) used:	TEOM (7 stations), light scattering and β-absorption (1 station)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	7 TEOM:1; light scattering + β-absorption: 1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	3
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Hamburg (traffic stations)

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile peryear [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	3	21	34	123	-	-	-	64
$PM_{2,5}$	2	15	25	96	-	-	-	46
NO	4	60	116	310	504	623	693	345
NO_2	4	54	76	123	209	227	239	147
CO	2	470	570	1370	1920	2820	5000	1200
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	Light scattering and β-absorption, TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	TEOM:1 light scattering + β-absorption: 1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	11

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

Innsbruck

immission area: 105 km^2 population: 132 236

	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	6	8	12	14	23	7
PM_{10}	2	17	47	107	-	-	-	63
$PM_{2,5}$	1	11	24	77	-	-	-	30
NO	3	25	160	290	514	604	636	274
NO_2	3	30	73	101	162	182	195	103
CO	1	360	767	1031	1397	1531	1753	995
O_3	3	56	106	129	144	145	146	124

PM_{10}	Monitoring method(s) used:	gravimetrically (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 2016 (measured values **including** equivalent factor, if applicable):	20
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Karlsruhe (urban station)

immission area: 173 km^2 population: 304 319

	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	14	-	37	-	-
PM_{10}	1	16	-	126	-	-	-	-
$PM_{2,5}$	1	11	-	91	-	-	-	-
NO	1	9	35	94	-	298	-	-
NO_2	1	23	37	58	-	-	-	-
CO	-	-	-	-	-	-	-	-
O_3	1	34	65	-	-	179	-	-

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 2016 (measured values **including** equivalent factor, if applicable):	1
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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

Karlsruhe (traffic station) immission area: 173 km² population: 304 619

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	-	-	-	-	-	-	-	-
PM_{10}	1	19	-	222	-	-	-	-
$PM_{2,5}$	1	13	-	181	-	-	-	-
NO	1	35	73	179	-	456	-	-
NO_2	1	39	46	81	-	-	-	-
CO	1	300	500	1000	-	-	-	-
O_3	-	-	-	-	-	-	-	-

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 2016 (measured values **including** equivalent factor, if applicable):	1
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Klagenfurt immission area: 120 km² population: 99 790

	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	3	6	6	7	3
PM_{10}	2	20	48	88	-	-	-	-
$PM_{2,5}$	2	13	33	70	-	-	-	-
NO	2	26	98	172	448	499	514	204
NO_2	2	26	48	63	127	139	139	81
CO	1	432	812	1150	1880	2150	2193	1240
O_3	2	43	85	119	143	152	152	123

PM_{10}	Monitoring method(s) used:	continuously (Sharp 5030)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.106y – 1.566 already applied to data
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	17 (27)*
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	-

Comment: * In Parentheses: Including the contribution of salt strewing (under this directive „IG-L-Winterstreuverordnung“)

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

Leeds

immission area: 552 km² population: 751 500

	Number of monitoring stations	Annual mean value [1] [µg/m³]	max. monthly mean value [2] [µg/m³]	max. daily mean value [2] [µg/m³]	max. 3h mean value [2] [µg/m³]	max. 1h mean value [2] [µg/m³]	max. ½ h mean value [2] [µg/m³]	Max. 98-Percentile per year [µg/m³]
SO_2	1	1	2	11	-	-	-	3
PM_{10}	2	18	26	76	-	-	-	45
$PM_{2,5}$	2	10	16	58	-	-	-	36
NO	2	30	69	250	-	-	-	123
NO_2	2	36	50	86	-	147	-	77
CO	1	270	410	970	-	-	-	600
O_3	1	36	58	89	-	-	-	73

PM_{10}	Monitoring method(s) used:	TEOM FDMS
	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 2016 (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 2016:	0

Leipzig

immission area: 298 km² population: 560.472

	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	8	23	28	-	7
PM_{10}*	3	23	38	138	400	1000	-	71
$PM_{2,5}$	2	13	25	113	-	-	-	-
NO	3	30	75	176	395	429	-	173
NO_2	3	33	55	96	165	183	-	93
CO**	-	-	-	-	-	-	-	-
O_3	1	47	71	107	172	182	-	118

PM_{10}	Monitoring method(s) used:	gravimetrically (High-Volume-Sampler, micro balance)
	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 2016 (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 2016:	0

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

station	PM_{10}-HVS	PM_{10}-TEOM
Leipzig-Lützner Str.	1.0	1. 0 + f (temperature, humidity)
Leipzig-Mitte	1.0	1.0+ f (temperature, humidity)
Leipzig-West	1.5	1.0+ f (temperature, humidity)

** No measurements of CO since 2008.

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

Leoben (Leoben, Donawitz, Göß)

immission area: 108 km² population: 24 915

	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	36	58	73	16
PM_{10}	1	16	23	89	-	-	-	36
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	3	12	34	74	179	218	229	81
NO_2	3	21	36	50	74	86	87	61
CO	1	500	900	2900	7100	9300	15800	2500
O_3	1	-	62	91	129	130	132	-

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 2016 (measured values **including** equivalent factor, if applicable):	1
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Comments: * Max 3h-mean value = static average,
** Max 1h-mean value = static average

Linz

immission area: 96 km² population: 203 957

	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	9	33	48	63	66	34
PM_{10}	6	20	36	93	172	186	313	88
$PM_{2,5}$	6	14	27	68	-	110	119	52
NO	7	19	82	317	728	760	791	187
NO_2	7	28	55	89	189	228	298	112
CO	5	340	560	1000	3300	4200	8100	1484
O_3	3	37	67	106	153	156	163	117

PM_{10}	Monitoring method(s) used:	gravimetrically and continuously
	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 2016 (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 2016:	5

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

Lisbon

immission area: 85 km^2 population: 547 733*

	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	2	5	-	20	-	5
PM_{10}	4	26	42	112	-	166	-	87
$PM_{2,5}$	2	12	20	51	-	83	-	38
NO	6	20	111	243	-	871	-	228
NO_2	6	33	68	119	-	243	-	141
CO	4	306	639	1049	-	2996	-	1219
O_3	4	52	74	57	-	224	-	109

PM_{10}:	Monitoring method(s) used:	TEOM (FDMS): 1 station; Beta-absorption: 3 stations
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	TEOM (FDMS): 1 β-absorption: 1
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	20
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	14

Comments: * in 2011

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	2	3	29	-	-	-	7
PM_{10}	1	15	21	45	-	-	-	36
$PM_{2,5}$	1	10	14	39	-	-	-	30
NO	2	14	28	107	-	-	-	69
NO_2	2	28	42	84	-	138	-	67
CO	-	-	-	-	-	-	-	-
O_3	1	44	66	92	-	-	-	77

PM_{10}	Monitoring method(s) used:	TEOM (FDMS)
	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 2016 (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 2016:	0

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

London

immission area: 1.572 km^2 population: 8 788 000

	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	3	4	10	25	-	-	-	14
PM_{10}	5	20	39	89	-	-	-	58
$PM_{2,5}$	9	12	26	74	-	-	-	47
NO	12	35	209	614	-	-	-	312
NO_2	12	41	103	201	-	385	-	142
CO	2	375	680	1600	-	-	-	1000
O_3	8	33	64	97	-	-	-	77

PM_{10}	Monitoring method(s) used:	GRAV EQ, TEOM (FDMS)
	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 2016 (measured values **including** equivalent factor, if applicable):	14
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	64

Lyon (urban site)

immission area: 47,9 km^2 population: 500 715

	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	-	9	-	31	-	7
PM_{10}	2	23	-	93	-	175	-	76
$PM_{2,5}$	1	15	-	70	-	105	-	52
NO	3	15	-	319	-	543	-	165
NO_2	3	29	-	102	-	160	-	81
CO	-	-	-	-	-	-	-	-
O_3	3	40	-	102	-	153	-	107

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 2016 (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 2016:	0

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

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	-	-	-	-	-	-	-	-
PM_{10}	4	27	-	97	-	197	-	84
$PM_{2,5}$	1	18	-	76	-	104	-	60
NO	4	53	-	474	-	899	-	354
NO_2	4	54	-	161	-	302	-	158
CO	1	356	-	1435	-	2393	-	1025
O_3	-	-	-	-	-	-	-	-

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 2016 (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 2016:	18

Madrid

immission area: 604 km^2 population: 3 165 883

	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	10	8	18	30	53	80	-	28
PM_{10}	12	19	34	252	374	419	-	79
$PM_{2,5}$	6	10	18	83	177	215	-	35
NO	24	22	130	297	848	957	-	305
NO_2	24	39	78	143	278	324	-	156
CO	10	400	700	1400	3700	4500	-	1400
O_3	14	49	93	123	192	196	-	142

PM_{10}	Monitoring method(s) used:	Oscillating microbalance
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.29 summer); 0.85 (winter); 1.07 (autumn-spring)
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	19**
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	46***

Comments:

* Maximum 98 percentile of hourly values

** Station: URBANIZACION EMBAJADA, ES1942A, 28079055) / P90.4=39

*** Station: FERNANDEZ LADREDA-OPORTO, ES1943A, 28079056) / P99.8=234

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 has 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

Mannheim (urban station)

immission area: 145 km^2 population: 316 265

	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	5	21	-	-	-	-
PM_{10}	1	16	-	48	-	-	-	-
$PM_{2,5}$	1	11	-	39	-	-	-	-
NO	1	10	36	92	-	196	-	-
NO_2	1	26	40	61	-	-	-	-
CO	-	-	-	-	-	-	-	-
O_3	1	42	69	-	-	206	-	-

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 2016 (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 2016:	0

Mannheim (traffic station)

immission area: 145 km^2 population: 316 265

	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	22	-	75	-	-	-	-
$PM_{2,5}$	1	14	-	49	-	-	-	-
NO	1	37	80	161	-	430	-	-
NO_2	1	46	58	93	-	-	-	-
CO	1	300	500	800	-	-	-	-
O_3	-	-	-	-	-	-	-	-

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 2016 (measured values **including** equivalent factor, if applicable):	1
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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

Milan

immission area: 182 km^2 population: 1 351 562

	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	-	11	-	25	-	9
PM_{10}	3	38	-	153	-	-	-	103
$PM_{2,5}$	2	28	-	120	-	-	-	85
NO	8	44	-	404	-	610	-	256
NO_2	8	67	-	137	-	229	-	141
CO	4	1094	-	2824	-	5010	-	2730
O_3	3	43	-	130	-	207	-	142

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 2016 (measured values **including** equivalent factor, if applicable):	73
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	7

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

Munich

immission area: 310 km^2 population: 1 530 000

	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	-	5	-	15	-	-
PM_{10}	4	20	-	86*	-	-	-	-
$PM_{2,5}$	4	12	-	39*	-	-	-	-
NO	5	39	-	-	-	780	-	-
NO_2	5	43	-	-	-	249	-	-
CO	3	400	-	-	-	2700	-	-
O_3	5*	40	-	-	-	164	-	-

PM_{10}	Monitoring method(s) used:	β-absorption / β-absorption+ nephelometer
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.25 / 1.00
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	13

Comments: * PM10 / PM2,5: Values from Jan. 1st 2016 are not considered because of fireworks during the New Year's Eve.
** PM_{10}-exeedances of limit values: 1 day due to winter services on the streets; § 25 of the 39. BImSchV regulates the deduction of PM_{10}-exeedances of limit values caused by winter services like road salt and grit
*** O_3: number of monitoring station: 3 monitoring stations are stations to regulation 39. BImSchV;
2 monitoring stations are only for quality assurance

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

Prague

immission area: 496 km^2 population: 1 270 000

	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	2	3	4	9	-	23	-	6
PM_{10}	16	23	37	97	-	228	-	68
$PM_{2,5}$	6	17	30	91	-	123	-	54
NO	12	19	79	251	-	557	-	134
NO_2	13	31	67	105	-	205	-	91.3
CO	2	364	624	1110	-	1492	-	874
O_3	6	46	83	108	-	173	-	101

PM_{10}	Monitoring method(s) used:	1 x gravimetrically, 14 x radiometrically, 1 x optoelectronically
	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 2016 (measured values **including** equivalent factor, if appliccable):	27
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	2

Riga (urban station)

immission area: 307 km^2 population: 641 007

	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	3	7	18	25	28	5
PM_{10}	1	19	37	80	-	-	-	51
$PM_{2,5}$	1	15	28	74	-	-	-	43
NO	-	-	-	-	-	-	-	-
NO_2	2	25	45	90	153	193	195	84
CO	-	-	-	-	-	-	-	-
O_3	2	69	88	106	134	131	142	109

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 2016 (measured values **including** equivalent factor, if appliccable):	0
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Comments: * SO_2 - 98% - value of 1- hour's means; PM_{10} - 98% - value of daily means; CO - 98% - value of 1- hour's means; NO_2 - 98% - value of 1- hour's means; O_3 - 98% - value of 1- 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

Riga (traffic station)

immission area: 307 km^2 population: 639 630

	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	33	50	101	-	-	-	66
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	-	-	-	-	-	-	-	-
NO_2	-	-	-	-	-	-	-	-
CO	1	330	360	495	570	690	1000	486
O_3								

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 2016 (measured values **including** equivalent factor, if applicable):	24
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	-

Comments: * PM_{10} - 98% - value of 1- daily means (traffic station)
CO - 98% - value of 1- hour's means

Rhine/Ruhr area

immission area: 5 770 km^2 population: 9 963 000

	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	7	5	-	-	-	422	-	31
PM_{10}	22	18	-	-	-	-	-	-
$PM_{2,5}$	12	13	-	-	-	-	-	-
NO	21	11	-	-	-	754	-	97
NO_2	21	26	-	-	-	168	-	65
CO	-	-	-	-	-	-	-	-
O_3	16	38	-	-	-	231	-	117

PM_{10}	Monitoring method(s) used:	Beta-absorption; Oscillating micro balance; 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 2016 (measured values **including** equivalent factor, if applicable):	10
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Comment: Traffic stations are not included in the calculation.

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

Rotterdam

immission area: 803 km^2 population: 631 155

	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 2016!

PM_{10}	Monitoring method(s) used:	TEOM SES and BAM
	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 2016 (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 2016:	

Salzburg

immission area: 66 km^2 population: 153 766

	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	11	20	37	5
PM_{10}	3	16	28	124	-	-	-	60
$PM_{2,5}$	1	10	18	88	-	-	-	30
NO	3	18	72	146	285	309	328	145
NO_2	3	32	59	81	132	153	157	96
CO	1	300	400	700	1000	1000	1100	600
O_3	2	42	66	98	150	150	152	112

PM_{10}	Monitoring method(s) used:	β-absorption, gravimetric
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0.895
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	0

Comment:
A traffic accident destroyed the measurement station “Rudolfsplatz” on 26th of Februar. That causes a restricted measurement (none measurement of CO and gravimetric measurement of particle matters) from 26. till 12.7.2016.

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

Sofia

immission area: 1 344 km^2 population: 1 256 667

	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}			No data for 2016!					
$PM_{2,5}$								
NO								
NO_2								
CO								
O_3								

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:	
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (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 2016:	

St. Pölten, urban station

immission area: 108 km^2 population: 54 557

	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	6	11	13	13	5
PM_{10}	1	17	26	54	122	129	138	45
$PM_{2,5}$	1	13	21	47	51	55	58	34
NO	1	6	11	39	144	210	239	36
NO_2	1	21	30	54	75	86	94	54
CO	-	-	-	-	-	-	-	-
O_3	1	43	67	90	139	140	144	113

PM_{10}	Monitoring method(s) used:	Grimm
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0.794
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	3
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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

St. Pölten, traffically influenced

	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	18	27	65	102	114	115	49
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	20	33	81	269	390	472	101
NO_2	1	32	39	66	100	123	134	72
CO	1	300	450	770	1420	2000	1580	650
O_3	1	37	59	82	129	131	134	101

PM_{10}	Monitoring method(s) used:	TEOM - FDMS
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0.901
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	6
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Stockholm

immission area (inner city): 48 km^2
area (Stockholm): 220 km^2 population (Stockholm): 923 516

	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	0.4	1.2	-	-	-	-	-
PM_{10}**	6	20	-	94	-	325	-	-
$PM_{2,5}$**	4	6	-	24	-	62	-	-
NO	-	-	-	-	-	-	-	-
NO_2**	6	32	-	92	-	106	-	-
CO**	2	300	-	-	-	2100	-	-
O_3***	2	41	-	-	-	124	-	-

PM_{10}	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	VCM correction
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	22
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Comments: All stations are situated in the inner city 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

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

Stuttgart (urban station)

immission area: 207 km^2 population: 611 802

	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	9	-	-	-	-
PM_{10}	1	17	-	175	-	-	-	-
$PM_{2,5}$	1	11	-	149	-	-	-	-
NO	1	18	71	188	-	331	-	-
NO_2	1	31	46	79	-	-	-	-
CO	-	-	-	-	-	-	-	-
O_3	1	39	62	-	-	185	-	-

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 2016 (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 2016:	0

Stuttgart (traffic station)

immission area: 207 km^2 population: 611 802

	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	29	-	209	-	-	-	-
$PM_{2,5}$	2	16	-	132	-	-	-	-
NO	3	97	253	543	-	970	-	-
NO_2	3	72	99	146	-	-	-	-
CO	1	300	600	1200	-	-	-	-
O_3	-	-	-	-	-	-	-	-

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 2016 (measured values **including** equivalent factor, if applicable):	63
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	35

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

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	2	7	-	-	-	147	-	28
PM_{10}	4	33	-	132	-	-	-	90
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	5	20	-	-	-	787	-	272
NO_2	5	24	-	-	-	182	-	106
CO	2	750	-	-	-	11500	-	4400
O_3	5	60	-	-	-	160	-	124

PM_{10}	Monitoring method(s) used:	β-attenuation
	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 2016 (measured values **including** equivalent factor, if applicable):	61
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Vienna

immission area: 415 km^2 population: 1 840 226

	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	8	21	26	28	28	11
PM_{10}*	13	19	32	73	133	143	150	59
$PM_{2,5}$**	6	14	24	56	61	63	64	45
NO	16	11	71	166	336	373	386	214
NO_2	16	25	52	97	145	155	158	116
CO	3	314	519	826	1158	1205	1228	805
O_3	5	52	90	130	150	151	152	130

PM_{10}	Monitoring method(s) used:	7 Stations gravimetric and continuous, 6 Stations only continuous (including equivalent factor)
	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 2016 (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 2016:	0

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

Comments for Vienna:

* PM_{10} equivalent factor 2016 for the continuous measurement method:

PM_{10} monitoring station	period	measurement system	calibration
Taborstraße	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
AKH	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Belgradplatz	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Laaer Berg	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Kaiser-Ebersdorf	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
A23-Wehlistraße	from 1.1.	Grimm EDM-180	yäquivalent = 0,894*yroh + 1,0
Gaudenzdorf	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Kendlerstraße	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Schafberg	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Gerichtsgasse	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Lobau	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Stadlau	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh
Liesing-Gewerbegebiet	from 1.1.	Grimm EDM-180	yäquivalent = 0,827*yroh

Bold printed monitoruing stations: additionally gravimetrical method used

** $PM_{2,5}$ - equivalent faktor 2016 for the continous measurement method:

$PM_{2,5}$ monitoring station	period	measurement system	calibration
Taborstraße	from 1.1.	Grimm EDM-180	yäquivalent = 0,801*yroh - 0,1
AKH	from 1.1.	Grimm EDM-180	yäquivalent = 0,801*yroh - 0,1
A23-Wehlistraße	from 1.1.	Grimm EDM-180	yäquivalent = 0,801*yroh - 0,1
Kendlerstraße	from 1.1.	Grimm EDM-180	yäquivalent = 0,801*yroh - 0,1
Lobau	from 1.1.	Grimm EDM-180	yäquivalent = 0,801*yroh - 0,1
Stadlau	from 1.1.	Grimm EDM-180	yäquivalent = 0,801*yroh - 0,1

Bold printed monitoring stations: additionally gravimetrical method used

99.9-Percentile values (HMW, MW1 and MW3) of PM_{10} and $PM_{2,5}$ are from continuous measurements (including station factor). This applies also for stations 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.

** station“Gaudenzdorf“

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

Villach

immission area: 135 km^2 population: 61 662

	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	18	35	68	-	-	-	-
$PM_{2,5}$	-	-	-	-	-	-	-	-
NO	1	25	75	135	297	336	362	146
NO_2	1	27	47	67	115	142	145	69
CO	-	-	-	-	-	-	-	-
O_3	-	-	-	-	-	-	-	-

PM_{10}	Monitoring method(s) used:	continuously (Sharp 5030)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,106y – 1,566 already applied to data
	Number of limit violations of the daily mean standard of 50 µg/m³ at the highest stressed station in 2016 (measured values **including** equivalent factor, if applicable):	3
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

Warsaw

immission area: 517 km^2 population: 1.753.977

	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	5	9	52	103	137	-	52
PM_{10}	6	32	59	114	303	553	-	160
$PM_{2,5}$	4	23	51	95	170	243	-	68
NO	4	29	86	221	497	596	-	291
NO_2	4	57	73	134	203	213	-	134
CO	3	518	724	1629	2980	5801	-	1629
O_3	3	40	74	94	157	157	-	86

[1]

PM_{10}	Monitoring method(s) used:	automatic: TEOM+FDMS, optical particle counter+conversion to mass concentration; manual: gravimetric method
	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 2016 (measured values **including** equivalent factor, if applicable):	85
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	3

Comments: * TEOM+FDMS PM_{10} and $PM_{2,5}$ - urban background: 1.25*x-0.798
optical particle counter-road station: PM_{10} and $PM_{2,5}$: 1.044*x+1.196
optical particle counter- urban background: PM_{10}: 0.877*x+2.587, PM2,5: 0.701*x+2.568

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

Wiesbaden (urban stations)

immission area: 204 km² population: 289 544

	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	1	3	9	19	37	3
PM_{10}	1	16	25	56	180	352	462**	43
$PM_{2,5}$	1*	11	16	37	-	-	-	-
NO	1	15	37	128	225	288	324	107
NO_2	1	28	37	56	84	98	115	69
CO	0	-	-	-	-	-	-	-
O_3	1	38	61	107	189	210	211	119

[1]

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 2005 (measured values **including** equivalent factor, if applicable):	1
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2005:	0

Comments: * monitoring method: gravimetrically
** value from Jan. 1 2016 (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	-	-	-	-	-	-	-	-
PM_{10}	2	19	28	76	286*	563*	689*	48
$PM_{2,5}$	1	12	19	72	345	796	1181	38
NO	2	57	95	194	485	568	684	226
NO_2	2	52	61	97	152	194	243	110
CO	1	450	640	1210	2230	2790	3410	1200
O_3	-	-	-	-	-	-	-	-

[1]

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 2005 (measured values **including** equivalent factor, if applicable):	2
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2005:	0

Comments: * value from Jan. 1 2016 (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

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	1	2	-	18	-	50	-	8
PM_{10}	6	33	5	280	-	-	-	157
$PM_{2,5}$	3	24	139	155	-	-	-	114
NO	-	-	72	-	-	-	-	-
NO_2	6	43	70	170	-	187	-	97
CO	1	470	1040	3670	-	5130	-	1620
O_3	5	29	65	109	-	189	-	81

PM_{10}	Monitoring method(s) used:	HRN EN 12341:2014 (EN 12341: 2014)
	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 2016 (measured values **including** equivalent factor, if applicable):	75
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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	1	2	6	22	48	76	5
PM_{10}	1	15	29	74	243	255	300	44
$PM_{2,5}$	1	11	22	53	-	-	-	-
NO	1	10	47	138	210	234	258	91
NO_2	1	28	48	68	93	117	119	71
CO	1	287	496	770	1096	1578	1939	664
O_3	1	45	70	101	154	168	168	121

PM_{10}:	Monitoring method(s) used:	FIDAS 200, calibrated with gravimetrical measurements every 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 2016 (measured values **including** equivalent factor, if applicable):	2
NO_2	Number of limit violations of the 1h mean standard of 200 µg/m³ at the highest stressed station in 2016:	0

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