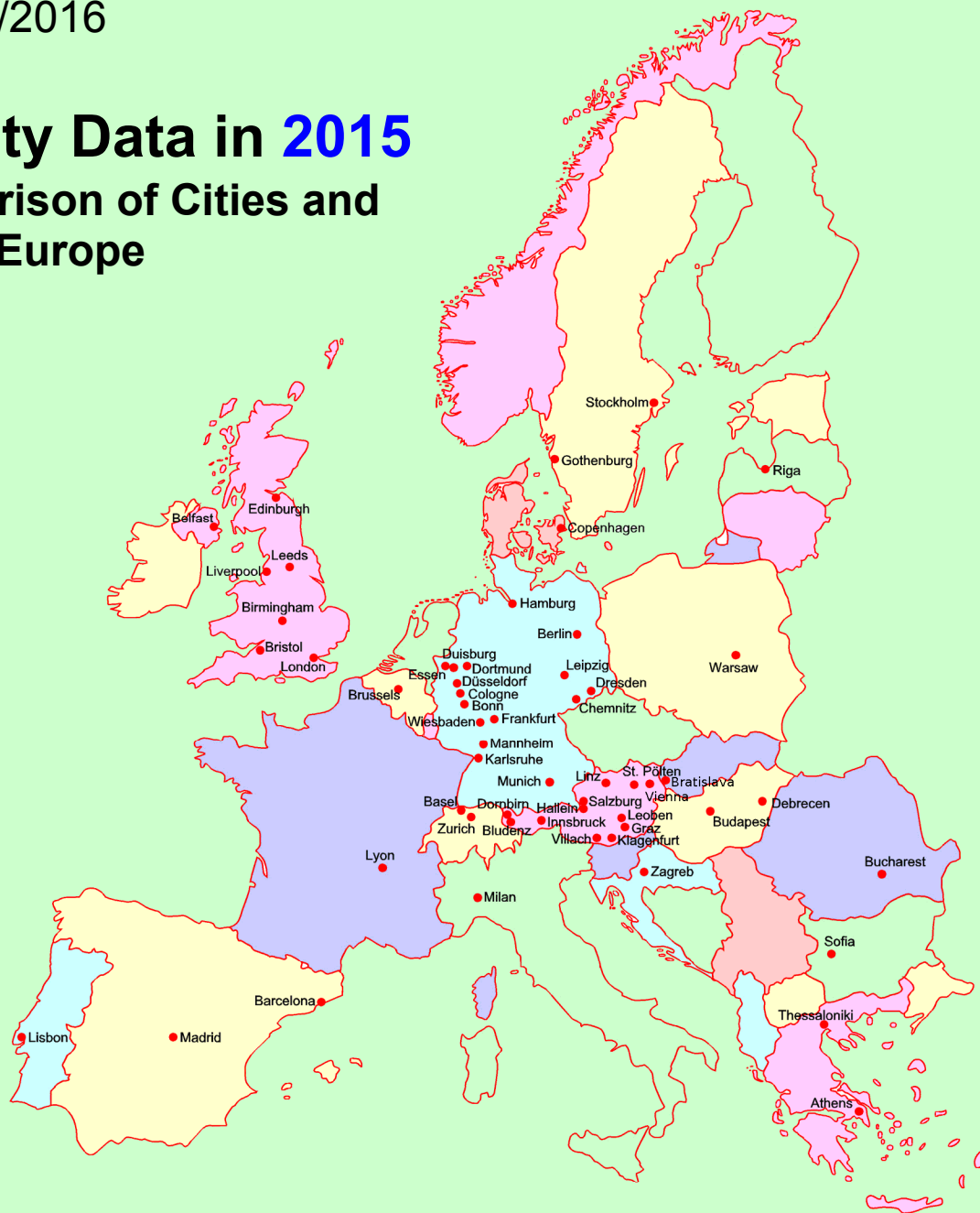


Report Nr. 1/2016

# Air Quality Data in 2015

## The Comparison of Cities and Regions in Europe



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## Luftgütedaten 2015 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<sub>10</sub> und PM<sub>2,5</sub>) 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.

## Air Quality Data in 2015 The Comparison of Cities and Regions in Europe

### 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<sub>10</sub> and PM<sub>2,5</sub>) 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 2015 wurden Städte bzw. Regionen aus Österreich, Deutschland, Großbritannien, Frankreich, Belgien, Schweden, Italien, Schweiz, Spanien, Polen, Dänemark, Bulgarien, Tschechien, Ungarn, Lettland, Portugal, Slowakei und Kroatien mit einbezogen. Die Städte Luxemburg und Rotterdam lieferten für das Jahr 2015 keine Daten.

Die Stadt Bukarest liefert seit 15 Jahren keine Daten mehr. Sollten diese noch eintreffen, werden sie in künftigen Städtevergleichen in Form von Zeitreihen mit berücksichtigt.

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.

Die Größe des Immissionsgebietes und die Bevölkerungszahl wurden ebenfalls seit 2008 in den Luftgütevergleich aufgenommen, um die Messstellendichte miteinander zu vergleichen.

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 2015 comprised cities and regions of Austria, Germany, cities from Great Britain, France, Belgium, Sweden, Italy, Switzerland, Spain, Poland, Denmark, Bulgaria, Czech Republic, Hungary, Latvia, Portugal, Slovakia and Croatia. We did not receive data from the city of Luxemburg and Rotterdam in 2015.

The city of Bucharest has not been delivering any data for 15 years. In case a delivery will follow, it will be taken into account for future reports in terms of time series.

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.

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-Perzentil/Jahr (höchstbelastete Station einer Stadt/Region)
- Anzahl der Überschreitungen des PM<sub>10</sub>-Tagesgrenzwertes an der höchstbelasteten Messstation
- Anzahl der Überschreitungen des NO<sub>2</sub>-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-Perzentil verfügbar, sondern es werden andere Perzentilgrößen (z. B. 95-Perzentil) 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<sub>10</sub> daily mean standard at the highest stressed monitoring station
- Number of violations of the NO<sub>2</sub> 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<sub>2</sub>, CO, NO, NO<sub>2</sub>, O<sub>3</sub>, Feinstaub (PM<sub>10</sub> und PM<sub>2,5</sub>)

Anmerkung:

Schwebestaub (TSP) wurde nicht mehr ausgewertet, da die Messungen in den einzelnen Messgebieten mittlerweile durch PM<sub>10</sub>-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 2015 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<sub>2</sub>, CO, NO, NO<sub>2</sub>, O<sub>3</sub>, fine particulates (PM<sub>10</sub> and PM<sub>2,5</sub>)

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<sub>10</sub>.

### **Comparison over a period of years**

A good impression of the development of air pollutant stress can be received by the graphical evaluations. Therefore the immission stress for the area of each participating city and region from 1993 through 2015 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.

<p>5. Es zeigt sich, dass in den Städten und Regionen die Schwebstaub-(TSP)-Messungen abgeschaltet wurden. Diese Messungen wurden von Feinstaub (PM<sub>10</sub>-Messungen) abgelöst. TSP-Messungen werden daher seit einigen Jahren nicht mehr in die Auswertungen mit einbezogen.</p> <p>6. Entwicklung der Langzeitbelastung - Jahresmittelwerte SO<sub>2</sub>, Schwebstaub (TSP) (nur bis 2004!), NO, NO<sub>2</sub>, CO, und O<sub>3</sub> gegenüber 1993; PM<sub>10</sub>: gegenüber 2001; PM<sub>2,5</sub>: gegenüber 2008:</p> <p>SO<sub>2</sub>: Alle Regionen <i>geringer</i> belastet</p> <p>Staub: TSP-Messung in nahezu allen Regionen eingestellt. Wenn vorhanden, ist die Tendenz zu <i>geringeren</i> Belastungen (Vergleich nur bis 2004).</p> <p>PM<sub>10</sub>: uneinheitlich, tendenziell <i>gleich bleibend</i> oder <i>geringer belastet</i></p> <p>PM<sub>2,5</sub>: uneinheitlich, tendenziell gleich bleibend</p> <p>NO: uneinheitlich, tendenziell <i>geringer</i> belastet</p> <p>NO<sub>2</sub>: uneinheitlich, tendenziell <i>geringer</i> belastet oder <i>gleich bleibend</i></p> <p>CO: alle Regionen <i>geringer</i> belastet</p> <p>O<sub>3</sub>: Belastung tendenziell <i>gleich bleibend</i> oder <i>leicht erhöht</i></p>	<p>5. It can be shown that cities and regions do not monitor TSP anymore. These measurements were replaced by monitoring the pollutant PM<sub>10</sub> which is the reason TSP measurements have not been included in the present report any more for a couple of years.</p> <p>6. Long term development of the air pollution stress - annual mean values of SO<sub>2</sub>, TSP (only until 2004!), NO, NO<sub>2</sub>, CO, O<sub>3</sub> in comparison with 1993; for PM<sub>10</sub>: comparison with 2001; for PM<sub>2,5</sub>: comparison with 2008:</p> <p>SO<sub>2</sub>: All regions <i>less</i> stressed</p> <p>TSP: Nearly no TSP-measurements any more. If there is still monitoring, regions are <i>less</i> stressed in tendency (Comparison only up to 2004).</p> <p>PM<sub>10</sub>: non-uniform, trend is constant or <i>lower</i> stressed</p> <p>PM<sub>2,5</sub>: non-uniform, trend constant</p> <p>NO: non-uniform, trend of lower stress</p> <p>NO<sub>2</sub>: non-uniform, trend is <i>lower</i> stressed or constant</p> <p>CO: all regions trend of <i>lower</i> stress</p> <p>O<sub>3</sub>: trend is constant or <i>slightly higher</i> stressed</p>
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## Quellen für die Immissionsdaten      Sources for the immission data

Austria <b>Bludenz, Dornbirn</b>	Umweltinstitut des Landes Vorarlberg Montfortstrasse 4 A-6901 Bregenz Austria e-mail: <a href="mailto:umweltinstitut@vorarlberg.at">umweltinstitut@vorarlberg.at</a> Homepage: <a href="http://www.vorarlberg.at/umweltinstitut">http://www.vorarlberg.at/umweltinstitut</a>
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Austria <b>Vienna</b>	Magistrat der Stadt Wien, Wiener Umweltschutzabteilung, MA 22 Bereich Luftmessnetz Dresdner Strasse 45 A-1200 Wien Austria e-mail: <a href="mailto:roman.augustyn@wien.gv.at">roman.augustyn@wien.gv.at</a> Homepage: <a href="https://www.wien.gv.at/ma22-lgb/luftgi.htm">https://www.wien.gv.at/ma22-lgb/luftgi.htm</a>
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**Anzahl der Messstellen****Number of monitoring stations**

Country	Monitored Area	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2,5</sub>	NO	NO <sub>2</sub>	CO	O <sub>3</sub>
Austria	Bludenz	0	1	0	1	1	0	1
	Dornbirn	1	1	1	1	1	0	1
	Graz	4	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	4	7	7	5	3
	Salzburg	2	3	2	3	3	2	2
	St. Pölten	1	2	1	2	2	1	2
	Vienna	6	13	6	16	16	4	4
	Villach	0	1	0	1	1	0	0
Belgium	Brussels	7	6	5	10	10	6	7
Bulgaria	Sofia	6	7	2	6	6	4	5
Croatia	Zagreb	6	6	3	0	5	1	5
Czech Republic	Prague	3	18	6	13	16	2	6
Denmark	Copenhagen	1	3	3	3	3	2	2
France	Lyon	1	5	2	6	6	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	-	3
	Frankfurt	1	3	2	3	3	1	2
	Hamburg	5	11	4	17	17	3	6
	Karlsruhe	1	2	2	2	2	1	1
	Leipzig	1	3	2	3	3	-	1
	Mannheim	1	2	2	2	2	1	1
	Munich	1	4	4	5	5	3	4
	Rhine/Ruhr Area	7	8	6	21	21	-	16
	Stuttgart	1	2	2	2	2	1	1
Wiesbaden	1	3	2	3	3	1	1	
Greece	Athens	6	11	6	14	14	6	13
	Thessaloniki	3	4	-	6	6	3	6
Hungary	Budapest	8	12	-	9	9	9	10
Italy	Milan	1	3	2	8	8	4	3
Latvia	Riga	0	2	0	1	1	1	1
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	5	3	4	4	3	3
Portugal	Lisbon	2	5	2	6	6	4	4
Slovakia	Bratislava	1	4	-	3	3	1	2

Country	Monitored Area	SO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2,5</sub>	NO	NO <sub>2</sub>	CO	O <sub>3</sub>
Spain	Barcelona	4	10	7	7	7	4	5
	Madrid	10	12	6	24	24	10	14
Switzerland	Basel	1	1	1	1	1	-	1
	Zurich	1	1	1	1	1	1	1
Sweden	Gothenburg	2	5	3	4	6	1	2
	Stockholm	1	4	3	0	4	2	1
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	-	1
	London	3	5	7	12	12	2	8

- no monitoring station  
n.d. no data

## **Immissionsgebiete und Bevölkerung Immission area and population**

Country	Monitored Area	Immission area [km <sup>2</sup> ]	Population
Austria	Bludenz	30	14.005
	Dornbirn	121	47.420
	Graz	128	280.200
	Hallein	27	20.769
	Innsbruck	105	130.894
	Klagenfurt	120	99.110
	Region Leoben	108	25.341
	Linz	96	201.595
	Salzburg	66	150.887
	St. Pölten	108	53.619
	Vienna	415	1.797.337
	Villach	135	61.221
Belgium	Brussels	161	1.180.531
Bulgaria	Sofia	1 311	1.256.667
Croatia	Zagreb	641	790.017
Czech Republic	Prague	496	1.270.000
Denmark	Copenhagen	86	591.481
France	Lyon	48	500.715
Germany	Berlin	892	3.520.031
	Chemnitz	221	243.521
	Dresden	328	536.308
	Frankfurt	248	724.486
	Hamburg	755	1.787.408
	Karlsruhe	173	300.051
	Leipzig	298	544.473
	Mannheim	145	299.844
	Munich	310	1.530.000
	Rhine/Ruhr Area	5 770	9.963.000
	Stuttgart	207	612.441
Wiesbaden	204	284.620	
Greece	Athens	1 948	3.551.370
	Thessaloniki	129	794.330
Hungary	Budapest	525	1.757.618
Italy	Milan	182	1.345.851
Latvia	Riga	307	641.007
Luxemburg	Luxemburg	51	115.227
The Netherlands	Rotterdam	803	631.155
Poland	Warsaw	517	1.744.351
Portugal	Lisbon	85	545.245

Country	Monitored Area	Immission area [km <sup>2</sup> ]	Population
Slovakia	Bratislava	368	422.932
Spain	Barcelona	101	1.604.555
	Madrid	604	3.237.937
Switzerland	Basel	557	501.285
	Zurich	1 086	1.185.214
Sweden	Gothenburg	1 031	543.005
	Stockholm (inner city)	48	923.516
U.K.	Belfast	115	336.830
	Birmingham	268	1.101.400
	Bristol	110	442.500
	Edinburgh	262	492.700
	Glasgow	176	599.855
	Leeds	552	766.400
	Liverpool	112	473.100
	London	1 572	8.538.700

## Übersicht über die Entwicklung der Schadstoffbelastungen 1993 - 2015 <sup>1)</sup>

Beurteilungsbasis: Jahresmittelwerte über alle Stationen einer Region

### **Overview over the development of the stress of air pollutants from 1993 through 2015 <sup>1)</sup>**

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

Austrian Towns, Cities and Regions

	SO <sub>2</sub>			NO			NO <sub>2</sub>			CO			O <sub>3</sub>		
	Stress in 1993 <sup>2)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>2)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>2)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>2)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>2)</sup>	Trend last 5 years	Stress in 2015
Linz		==			==			↘			==			==	
Bludenz		n.d.	n.d.	1994	==			↘		-	n.d.	n.d.	1994	==	
Dornbirn		n.d.		1994	↗			↗		1998	n.d.	n.d.	2015	n.d.	
Graz		==		1994	↘			↘			↘			==	
Hallein		==		2003	==			↘			↘			==	
Innsbruck		==			↘			↓			↗			==	
Klagenfurt		==			↘			↓			↘			↗	
Region Leoben		==			↘			==			↘			↗	
Salzburg		==		2003	↘			↘			↘			==	
St. Pölten	1994	==		1994	==		1994	==		1994	↘		1994	==	
Vienna		==		1994	==			↘			↘			↗	
Villach		n.d.	n.d.		↗			↘			n.d.	n.d.		n.d.	n.d.

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

<sup>2)</sup> Or year, when data were primarily available




## European Cities and Regions

	SO <sub>2</sub>			NO			NO <sub>2</sub>			CO			O <sub>3</sub>		
	Stress in 1993 <sup>3)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>3)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>3)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>3)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>3)</sup>	Trend last 5 years	Stress in 2015
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	↑		2013	↑			↑			↑			↗	
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	↓		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		==			==			↑			↘			==	
Hamburg		↘			==			==			==			==	
Karlsruhe		==			==			==			↘			==	
Leeds		==			↓			↘			==			==	
Leipzig		==			==			↘			n.d.	n.d.		==	
Lisbon	1997	==		2001	↑		1997	↘			==		1997	==	
Liverpool		==			↘			==			n.d.	n.d.		==	
London		==			↘			↘			↗			==	

<sup>3)</sup> ... or year when data were primarily available

	SO <sub>2</sub>			NO			NO <sub>2</sub>			CO			O <sub>3</sub>		
	Stress in 1993 <sup>4)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>4)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>4)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>4)</sup>	Trend last 5 years	Stress in 2015	Stress in 1993 <sup>4)</sup>	Trend last 5 years	Stress in 2015
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	↘		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	↘		2003	↓		1999	↓		1999	↓		1999	==	
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 <sub>2</sub> < 15, TSP < 30, NO < 30, NO <sub>2</sub> < 30, CO < 1000, O <sub>3</sub> < 30 µg/m <sup>3</sup> )
	Medium stressed	(SO <sub>2</sub> < 30, TSP < 60, NO < 60, NO <sub>2</sub> < 60, CO < 2000, O <sub>3</sub> < 60 µg/m <sup>3</sup> )
	Highly stressed	(SO <sub>2</sub> > 30, TSP > 60, NO > 60, NO <sub>2</sub> > 60, CO > 2000, O <sub>3</sub> > 60 µg/m <sup>3</sup> )

n.d. no data




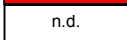
↘	Slight stress decrease	==	Constant stress	↗	Slight stress increase	↑	Strong stress increase
↓	Strong stress decrease						

<sup>4</sup> ... or year when data were primarily available

	PM <sub>10</sub>		
	Stress in 2002 <sup>5)</sup>	Stress in 2015	Trend 2011-2015
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		==
Bristol			↘
Brussels			↘
Budapest	2004		==
Chemnitz			↘
Copenhagen			↘
Dresden			==
Edinburgh			↘
Frankfurt			==

	PM <sub>10</sub>		
	Stress in 2002 <sup>5)</sup>	Stress in 2015	Trend 2011-2015
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			↘
Stockholm			↘
Stuttgart	2007		==
Thessaloniki	2007		↘
Warsaw			==
Wiesbaden			==
Zagreb			↘
Zurich			==

Legend:

	Slightly stressed	(PM <sub>10</sub> < 20 µg/m <sup>3</sup> )
	Medium stressed	(PM <sub>10</sub> < 40 µg/m <sup>3</sup> )
	Highly stressed	(PM <sub>10</sub> ≥ 40 µg/m <sup>3</sup> )
	No data	




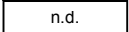
<sup>5)</sup> If values of 2002 are not available, data of the year mentioned are compared.



	PM <sub>2,5</sub>		
	Stress in 2008 <sup>6)</sup>	Stress in 2015	Trend 2010-2015
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	n.d.	↘
Chemnitz			↘
Copenhagen			==
Dresden			==
Edinburgh	2009		↘
Frankfurt	2010		↘

	PM <sub>2,5</sub>		
	Stress in 2008 <sup>5)</sup>	Stress in 2015	Trend 2010-2015
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.	↘
Sofia			↘
Stockholm			↘
Stuttgart	2011		==
Thessaloniki	n.d.	n.d.	n.d.
Warsaw			==
Wiesbaden			↘
Zagreb			==
Zurich			↘

Legend:

	Slightly stressed	(PM <sub>2,5</sub> < 10 µg/m <sup>3</sup> )
	Medium stressed	(PM <sub>2,5</sub> < 20 µg/m <sup>3</sup> )
	Highly stressed	(PM <sub>2,5</sub> ≥ 20 µg/m <sup>3</sup> )
	No data	

<sup>6)</sup> If values of 2002 are not available, data of the year mentioned are compared.

### Anzahl der Tage mit Überschreitungen des PM<sub>10</sub>-Tagesmittelwertes von 50 µg/m<sup>3</sup> in den Jahren 2001 bis 2015 <sup>7)</sup>

Beurteilungsbasis: Anzahl der Überschreitungen an der höchstbelasteten Station eines Messgebietes (einschließlich verkehrsbelasteter Stationen) <sup>8)</sup>

### **Number of days with exceedances of the PM<sub>10</sub> daily mean of 50 µg/m<sup>3</sup> 2001 through 2015 <sup>9)</sup>**

*based on the number of exceedances at the peak stressed monitoring station of a region (including traffic stressed stations) <sup>10)</sup>*

	PM <sub>10</sub> number of days >50 µg/m <sup>3</sup>														
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Linz	62	66	80	46	68	71	41	47	30	45	45	25	33	27	23
Bludenz	-	-	-	-	13	45	16	13	12	17	14	11	12	2	1
Dornbirn	-	-	38	21	22	40	18	20	14	21	13	10	11	3	2
Graz	159	131	131	117	127	113	76	73	57	69	78	49	44	27	39
Hallein	-	28	49	26	27	50	20	13	20	29	19	18	27	6	1
Innsbruck	-	50	61	52	55	83	46	28	26	29	46	23	25	8	18
Klagenfurt	36	58	74	80	82	79	42	33	34	43	46	27	21	0	17
Region Leoben	26	7	42	29	36	49	36	25	19	20	31	3	4	0	1
Salzburg	-	34	62	34	39	56	25	34	37	41	31	17	24	10	6
St. Pölten	-	-	58	79	87	57	23	20	23	38	39	22	21	13	6
Vienna	-	57	95	54	92	108	48	39	40	87	62	35	35	27	14
Villach	-	24	35	25	29	45	10	9	17	7	18	2	0	0	5

- No Data

<sup>7)</sup> Bei den Werten wurden bereits die Korrekturfaktoren berücksichtigt. Diese sind aus den Tabellen im Anhang zu ersehen.

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

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

<sup>10)</sup> 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 <sub>10</sub> number of days >50 µg/m <sup>3</sup>														
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Athens	-	-	-	-	-	-	178	163	122	99	101	40	-	-	89
Barcelona	-	86	-	47	74	100	97	72	94	23	43	42	7	19	22
Basel	11	22	23	16	15	24	12	6	10	11	8	4	5	2	4
Belfast	16	7	33	8	5	7	5	7	3	10	10	7	5	5	4
Berlin	60	91	117	62	74	71	30	24	39	46	54	31	55	48	36
Birmingham	2	1	5	4	5	9	18	10	7	8	18	17	9	8	6
Bratislava	-	-	-	-	-	-	-	-	-	-	-	-	60	41	40
Bristol	7	1	9	12	4	6	15	15	7	4	12	8	2	4	3
Brussels	52	153	163	127	67	56	56	66	66	45	87	55	-	33	19
Budapest	-	-	-	178	160	162	117	96	71	84	86	60	64	60	105
Chemnitz	41	20	35	12	59	65	27	19	32	34	39	28	32	36	11
Copenhagen	-	59	91	-	-	68	60	59	59	18	46	29	14	26	22
Dresden	53	36	53	27	78	49	27	35	42	40	46	22	34	36	21
Edinburgh	3	8	2	0	3	2	6	0	3	0	0	2	3	0	0
Frankfurt	42	44	51	19	48	24	33	22	36	26	42	19	21	17	18
Glasgow	-	-	-	-	-	-	-	-	-	-	-	-	-	3	0
Gothenburg	1	10	12	2	7	13	3	4	0	0	21	11	17	12	15
Hamburg	33	43	62	20	45	31	26	18	15	26	46	12	11	26	18
Karlsruhe	6	33	33	25	22	34	16	10	20	23	18	8	13	12	7
Leeds	3	3	9	4	15	10	11	8	16	11	26	18	4	15	13
Leipzig	109	63	92	49	82	74	40	40	51	49	69	39	41	43	26
London	28	29	61	107	121	157	124	157	47	22	57	23	28	14	10
Lisbon	230	222	183	147	180	145	154	82	92	90	113	-	38	31	66

- No Data

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

- No Data

### Anzahl der Überschreitungen des 1h-Grenzwertes für NO<sub>2</sub> von 200 µg/m<sup>3</sup> in den Jahren 2004 bis 2015

Beurteilungsbasis: Anzahl der Überschreitungen an der höchstbelasteten Station eines Messgebietes

*Number exceedances of the NO<sub>2</sub> 1h mean value of 200 µg/m<sup>3</sup> in 2004 through 2015 based on the number of exceedances at the peak stressed monitoring station of a region*

	NO <sub>2</sub>											
	number of 1 h mean values >200 µg/m <sup>3</sup>											
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Linz	0	1	4	4	1	5	3	6	7	15	1	4
Bludenz	0	0	0	0	0	0	0	0	0	0	0	0
Dornbirn	-	0	0	0	0	0	0	0	0	0	0	0
Graz	0	0	4	0	0	0	1	0	0	0	0	0
Hallein	0	0	1	3	0	0	0	0	0	0	0	0
Innsbruck	0	0	4	0	0	1	0	0	3	0	0	0
Klagenfurt	-	1	1	1	0	0	1	1	1	0	0	0
Region Leoben	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
St. Pölten	0	0	0	0	1	0	0	0	0	0	-	1
Vienna	8	24	26	11	17	4	7	5	0	0	0	3
Villach	0	0	0	0	0	0	0	0	0	0	0	0
Athens	-	-	-	192	56	35	8	1	0	-	-	1
Barcelona	13	-	18	22	13	9	0	12	5	3	1	2
Basel	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
Berlin	-	-	-	6	0	8	6	3	5	8	3	1
Birmingham	0	2	0	0	3	0	7	4	0	1	5	1
Bratislava	-	-	-	-	-	-	-	-	-	2	0	0
Bristol	0	22	13	8	5	11	3	0	0	0	0	0
Brussels	24	90	2	2	6	1	1	3	2	-	3	9
Budapest	1	25	19	9	1	0	1	3	4	5	1	2
Chemnitz	1	0	0	1	0	2	0	2	0	0	0	0
Copenhagen	-	-	-	-	-	-	-	-	0	-	-	-
Dresden	0	0	0	0	0	0	0	0	0	0	9	5
Edinburgh	0	0	0	0	6	0	0	0	0	0	0	-
Frankfurt	0	10	3	6	2	16	5	8	5	0	2	12
Glasgow	-	-	-	-	-	-	-	-	-	-	14	4

- No Data

NO <sub>2</sub>												
number of 1 h mean values >200 µg/m <sup>3</sup>												
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Gothenburg	2	0	7	1	1	0	3	8	1	17	2	2
Hamburg	0	0	26	19	30	29	24	10	2	5	11	7
Karlsruhe	5	0	0	0	3	3	4	2	8	0	2	1
Leeds	0	0	0	0	8	0	1	0	0	0	0	0
Leipzig	1	39	0	0	0	0	0	0	0	1	0	1
Liverpool	0	458	0	0	0	0	0	0	0	0	0	0
Lisbon	52	-	80	39	20	69	21	37	-	15	20	20
London	542	139	686	458	822	486	539	229	143	60	60	58
Luxemburg	-	267	-	-	-	-	0	-	-	-	-	-
Lyon	35	0	-	139	66	28	181	150	66	33	32	34
Madrid	83	-	208	267	119	150	76	103	52	37	45	95
Mannheim	0	69	0	0	0	0	1	1	0	0	0	3
Milan	47	1	123	-	241	101	25	132	99	35	31	57
Munich	11	0	103	69	56	95	192	50	27	50	24	30
Prague	-	0	-	1	106	98	56	51	4	6	5	16
Riga	0	0	0	0	0	0	0	0	0	0	0	2
Rhine/Ruhr Area	0	24	-	0	0	0	1	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
Stuttgart	-	-	-	5	9	22	6	6	3	4	0	0
Thessaloniki	-	3	-	3	1	0	0	0	0	-	-	0
Warsaw	0	0	5	17	0	0	1	5	1	8	1	6
Wiesbaden	0	0	2	3	1	7	1	3	2	1	0	2
Zagreb	0	0	0	0	0	0	0	0	0	-	2	1
Zurich	0	0	0	0	0	0	0	0	0	0	0	0

- No Data

**Luftgütevergleich**

**2015**

**Jahresmittelwerte (Gebietsmittel)**

**Comparison of The Air Quality**

**2015**

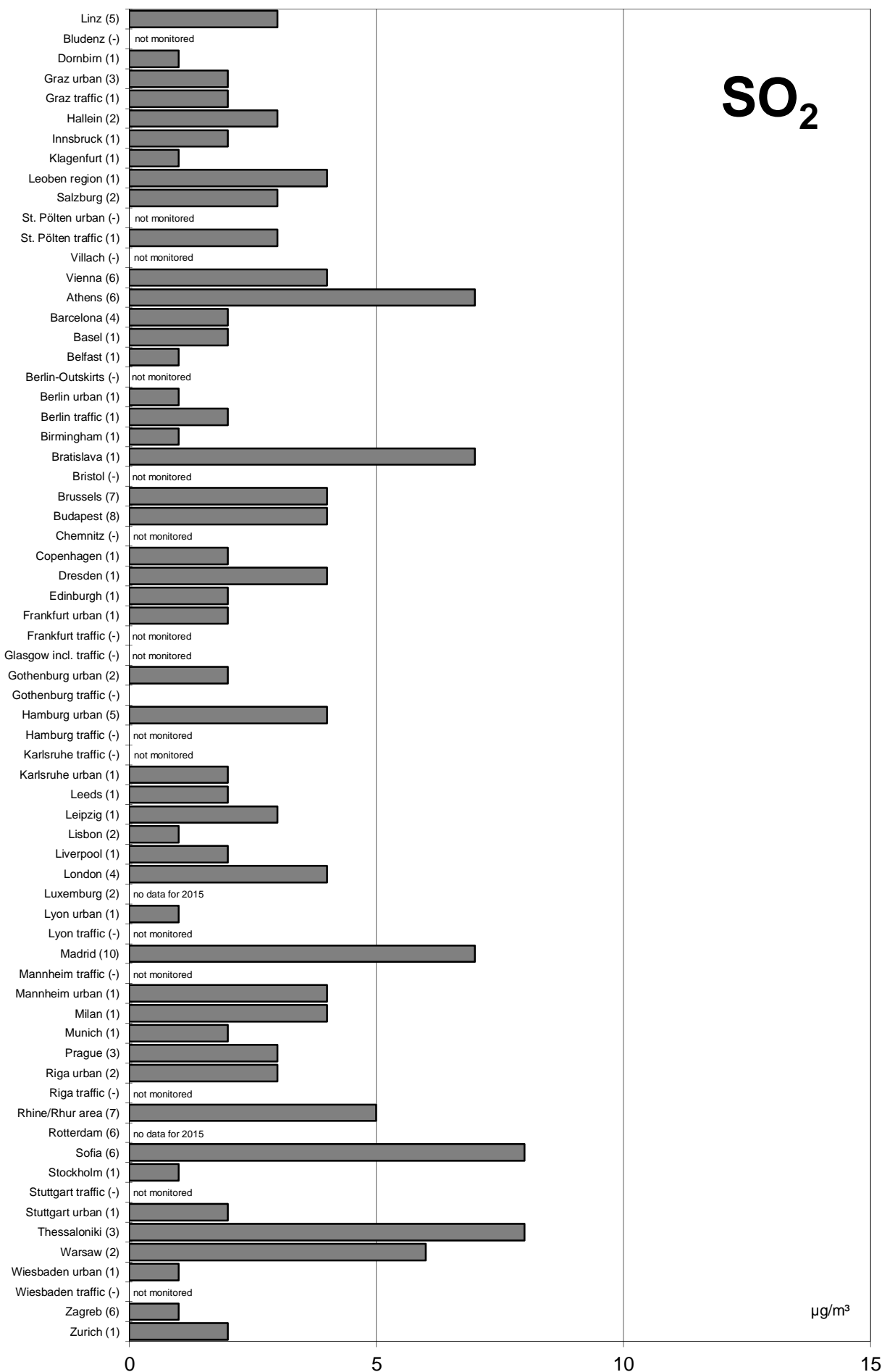
**Annual Mean Values**





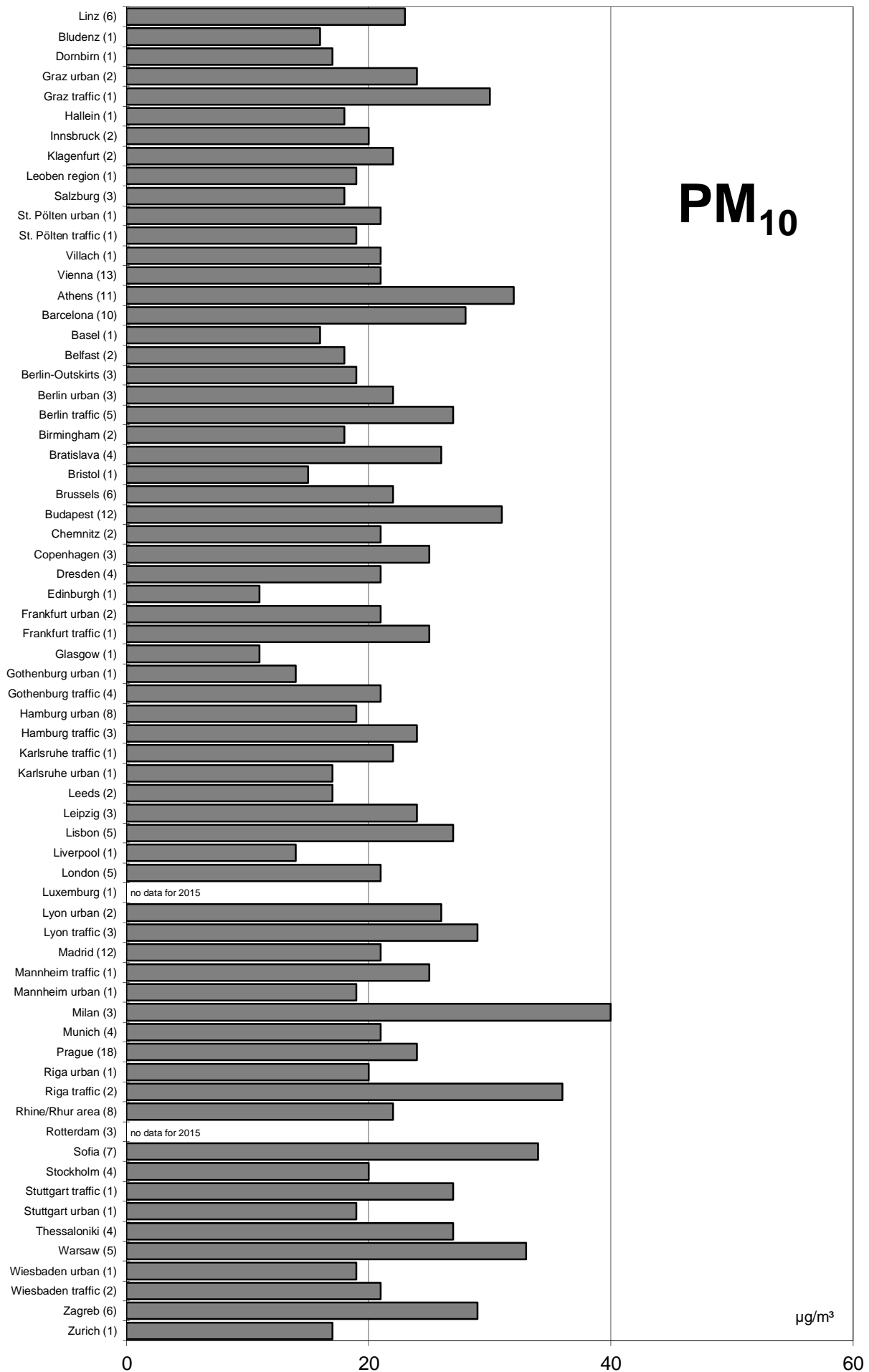
# Comparison of The Air Quality in 2015

annual mean values (mean of all monitoring stations of the city/region)  
(in parentheses: number of monitoring stations)



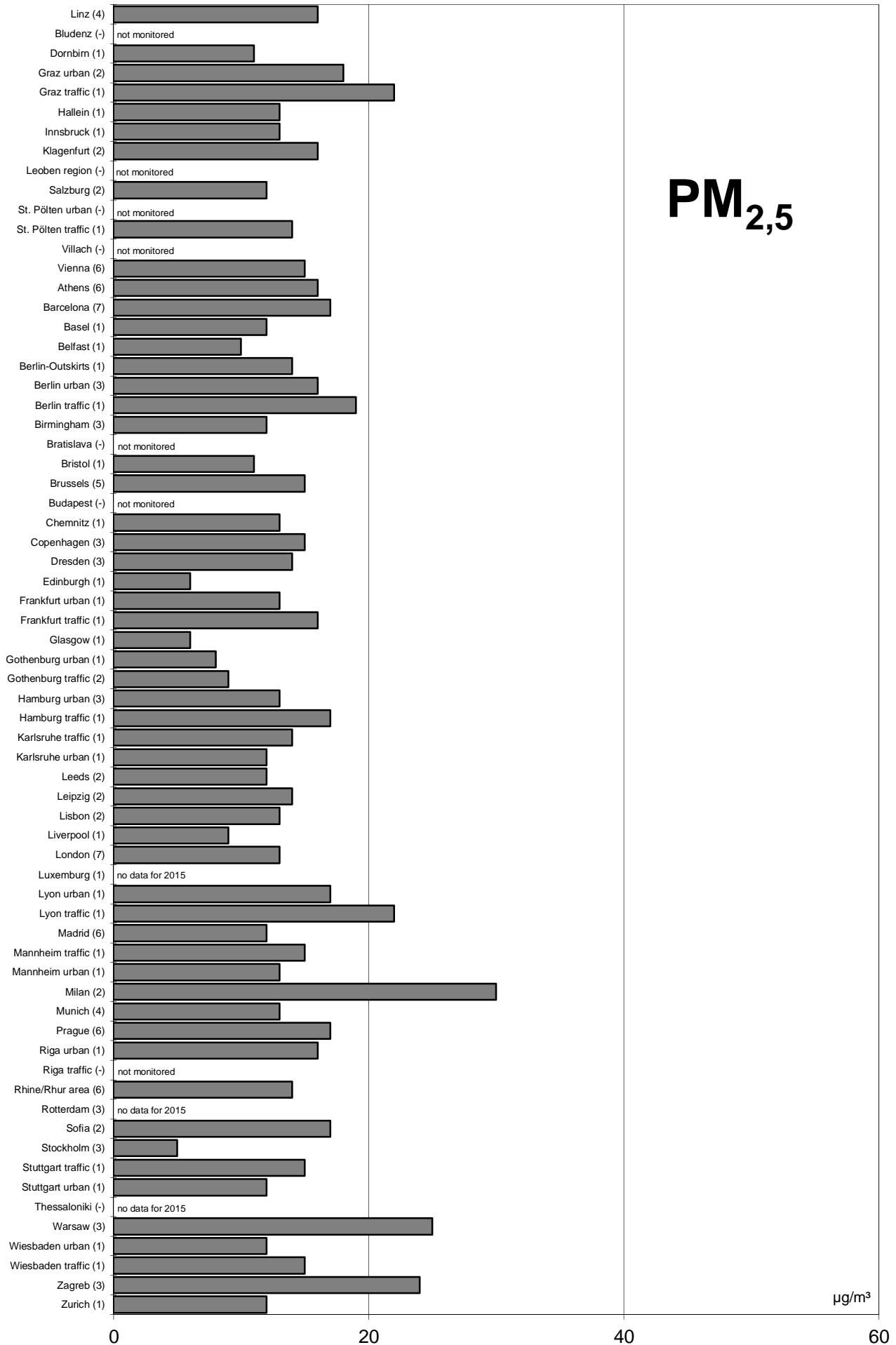
# Comparison of The Air Quality in 2015

annual mean values (mean of all monitoring stations of the city/region)  
(in parentheses: number of monitoring stations)



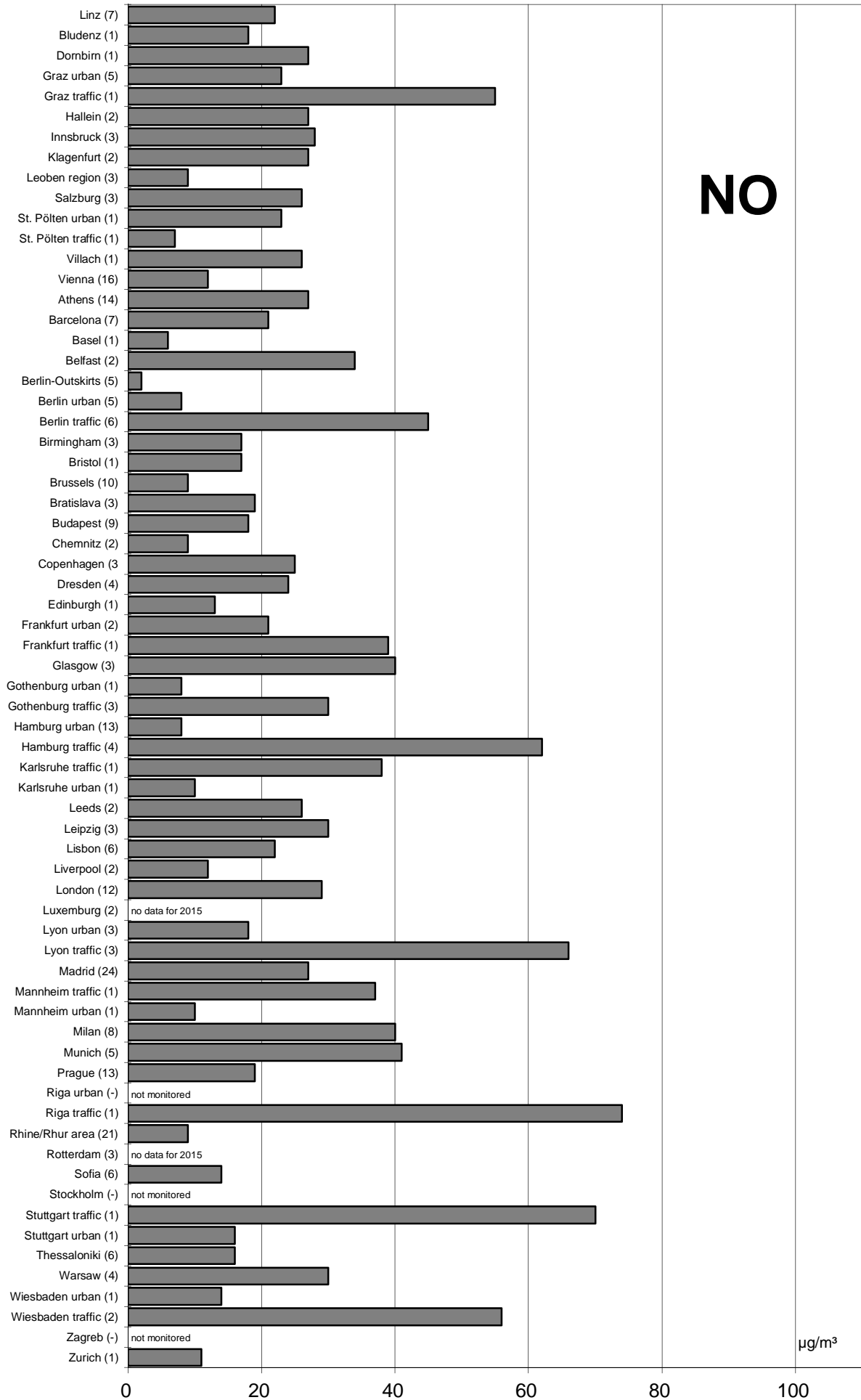
# Comparison of The Air Quality in 2015

annual mean values (mean of all monitoring stations of the city/region)  
(in parentheses: number of monitoring stations)



## Comparison of The Air Quality in 2015

annual mean values (mean of all monitoring stations of the city/region)  
(in parentheses: number of monitoring stations)

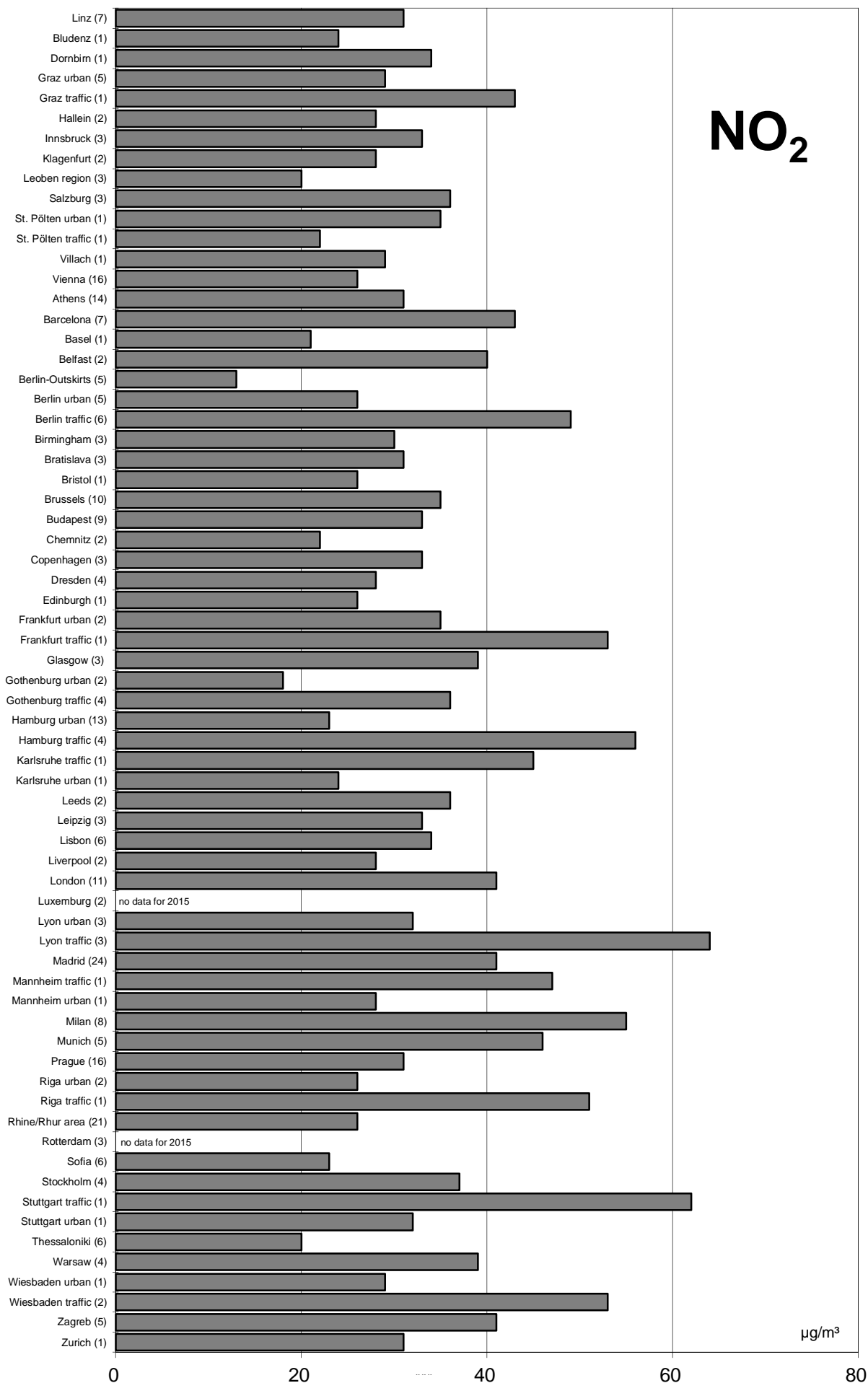


NO

µg/m³

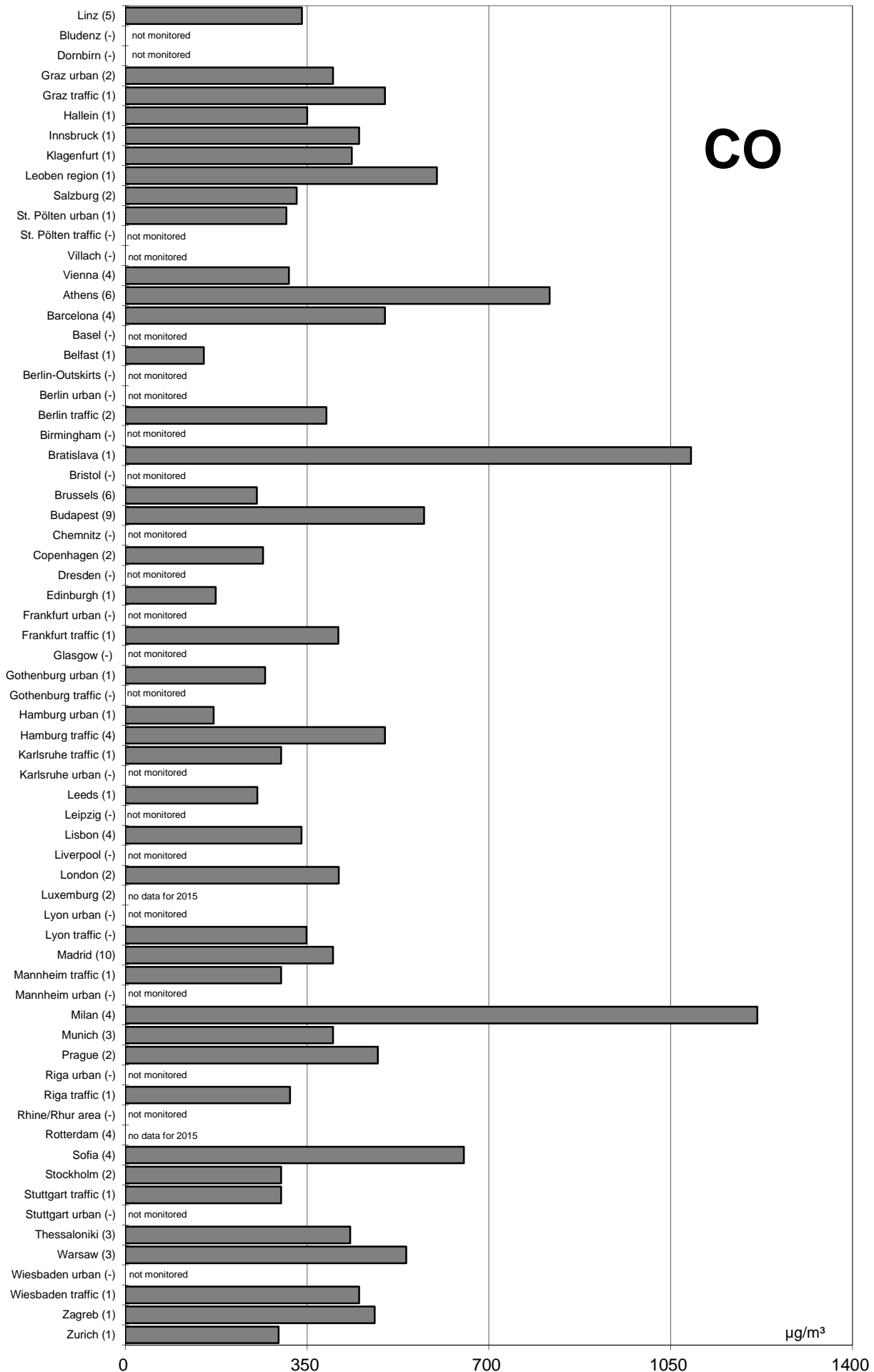
# Comparison of The Air Quality in 2015

annual mean values (mean of all monitoring stations of the city/region)  
(in parentheses: number of monitoring stations)



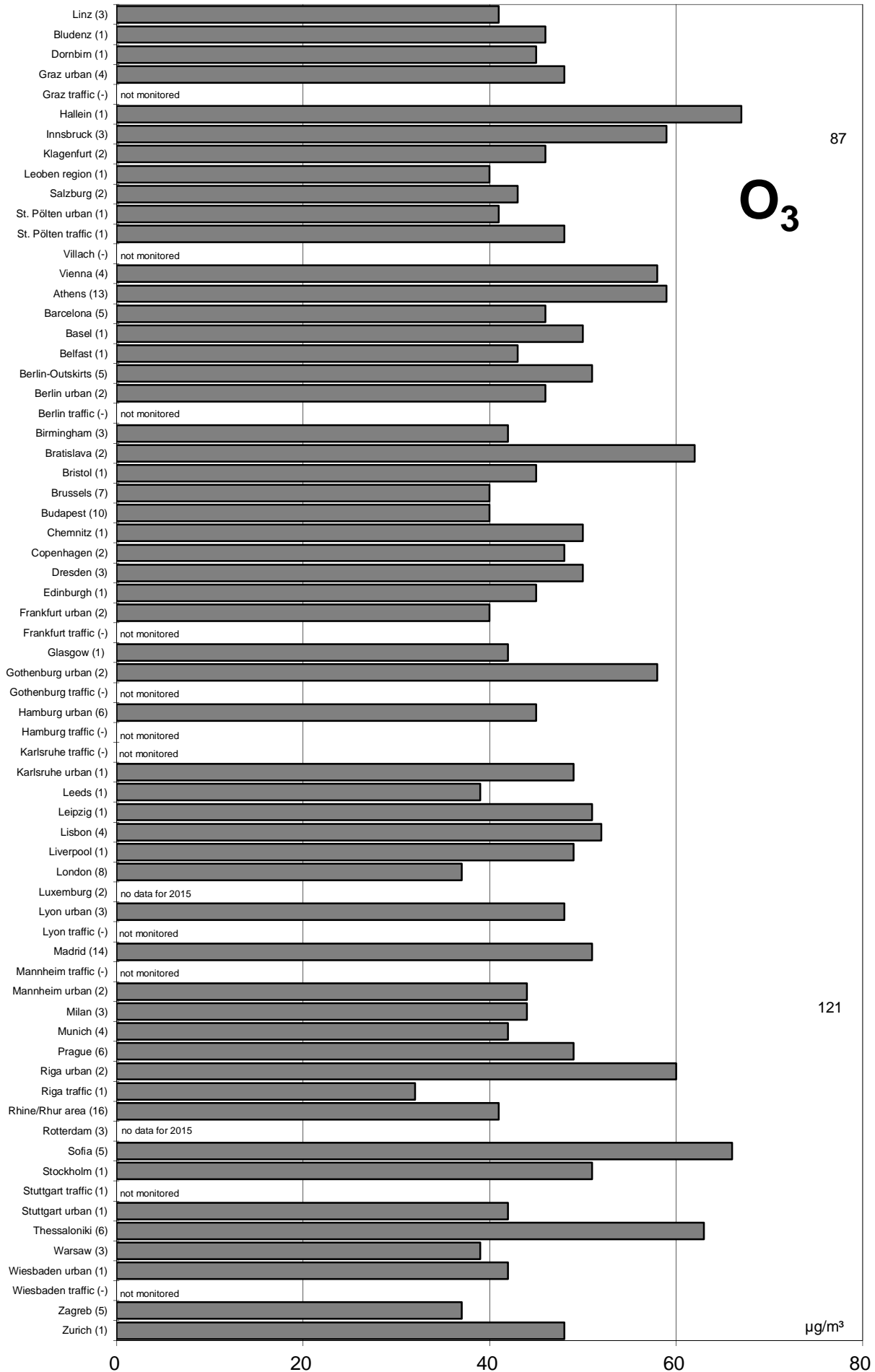
# Comparison of The Air Quality in 2015

annual mean values (mean of all monitoring stations of the city/region)  
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

**annual mean values (mean of all monitoring stations of the city/region)**  
(in parentheses: number of monitoring stations)







**Luftgütevergleich**  
**2015**  
**max. Tagesmittelwerte**

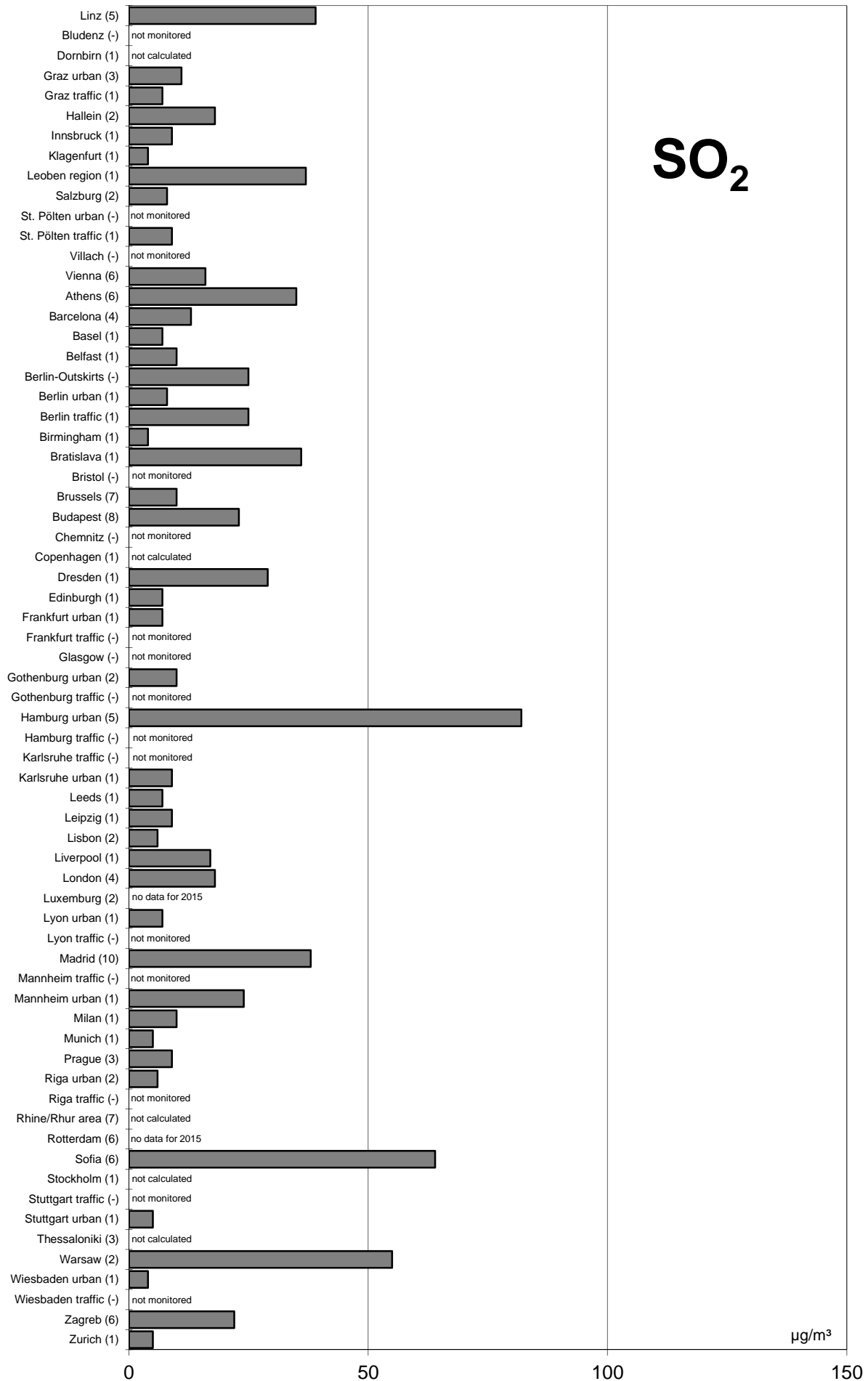
**Comparison of The Air Quality**  
**2015**  
**Max. Daily Mean Values**



# Comparison of The Air Quality in 2015

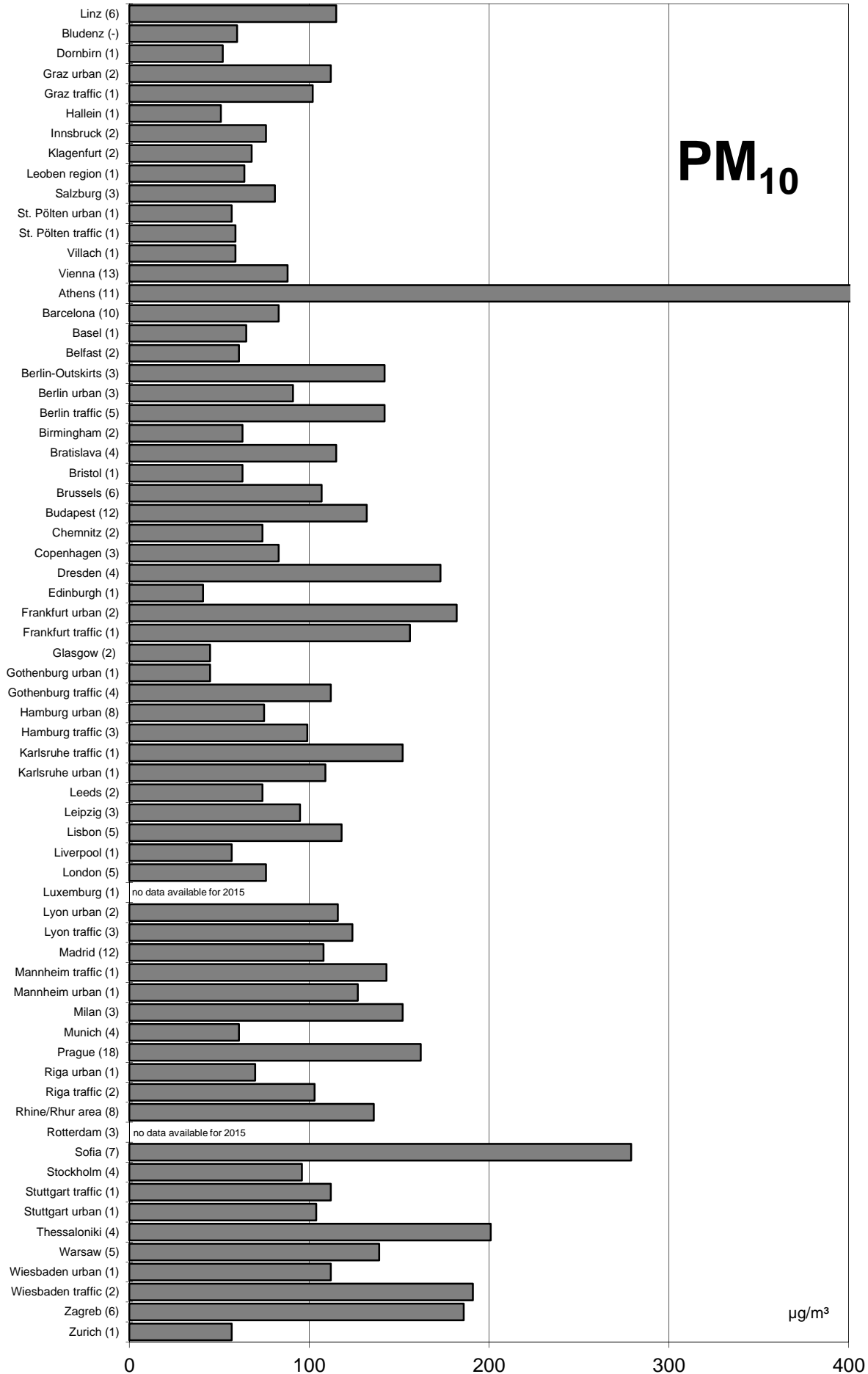
## max. daily mean values (max. stressed monitoring station)

(in parentheses: number of monitoring stations)



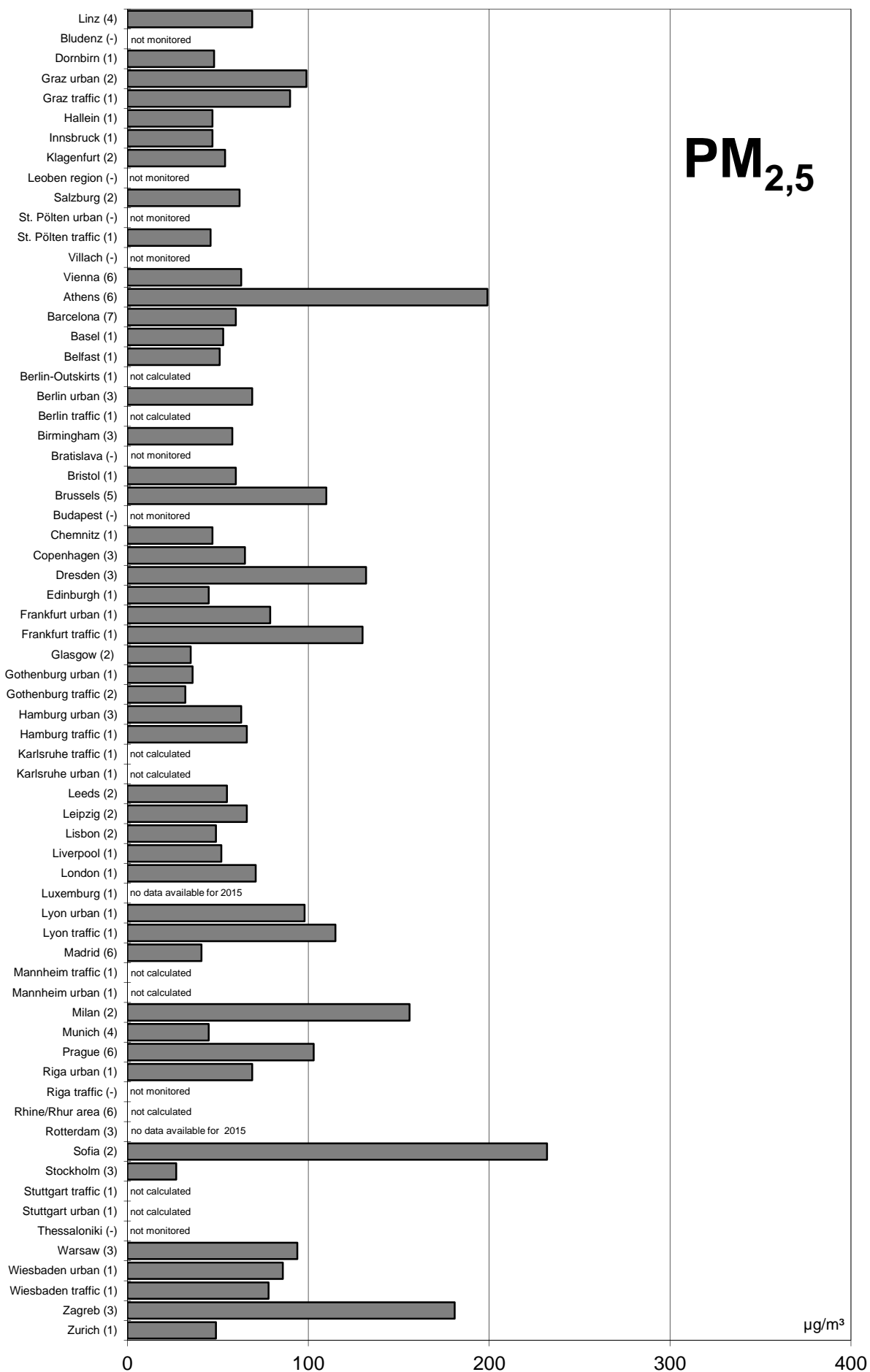
# Comparison of The Air Quality in 2015

max. daily mean values (max. stressed monitoring station)  
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

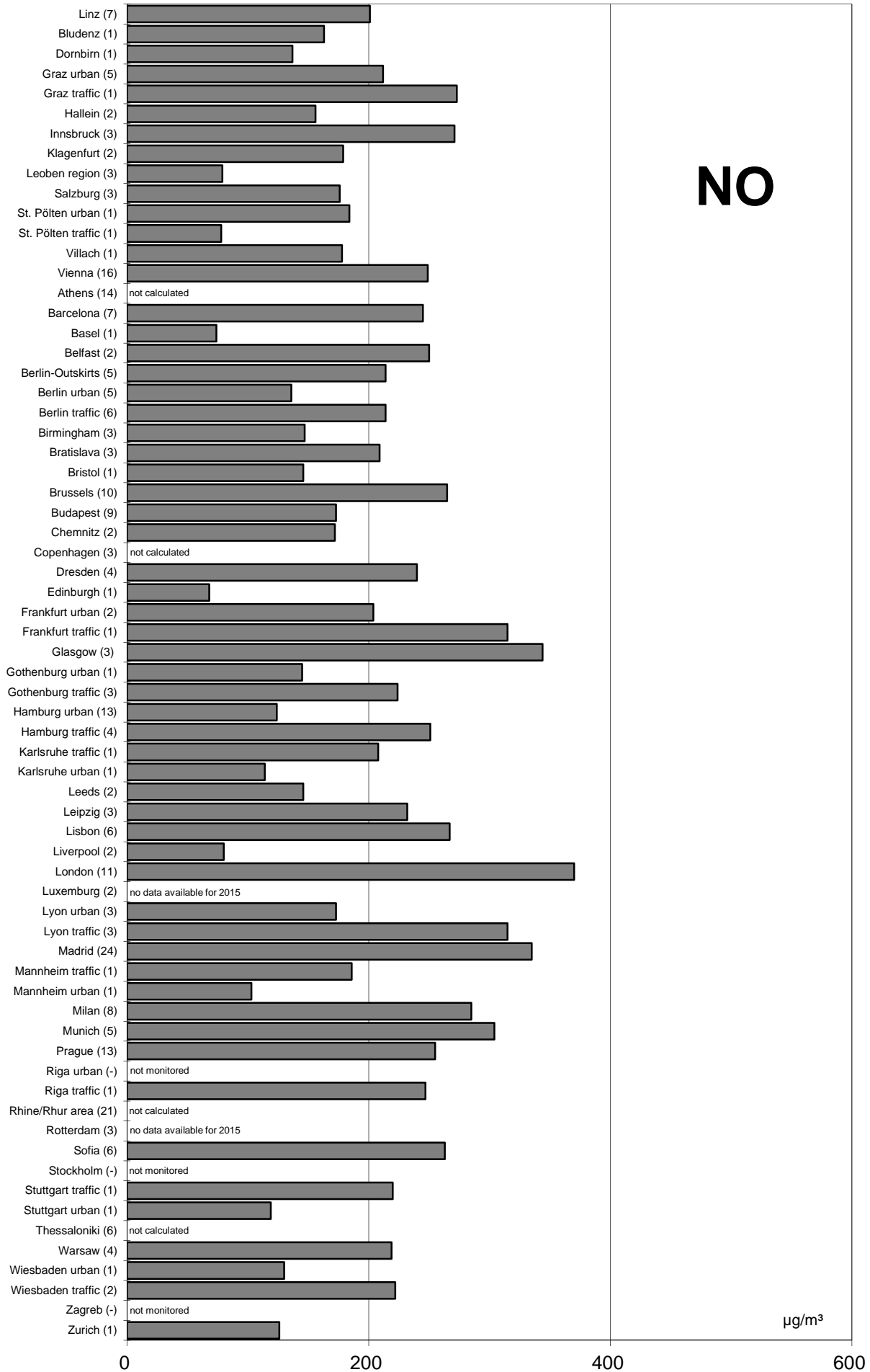
max. daily mean values (max. stressed monitoring station)  
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

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

(in parentheses: number of monitoring stations)

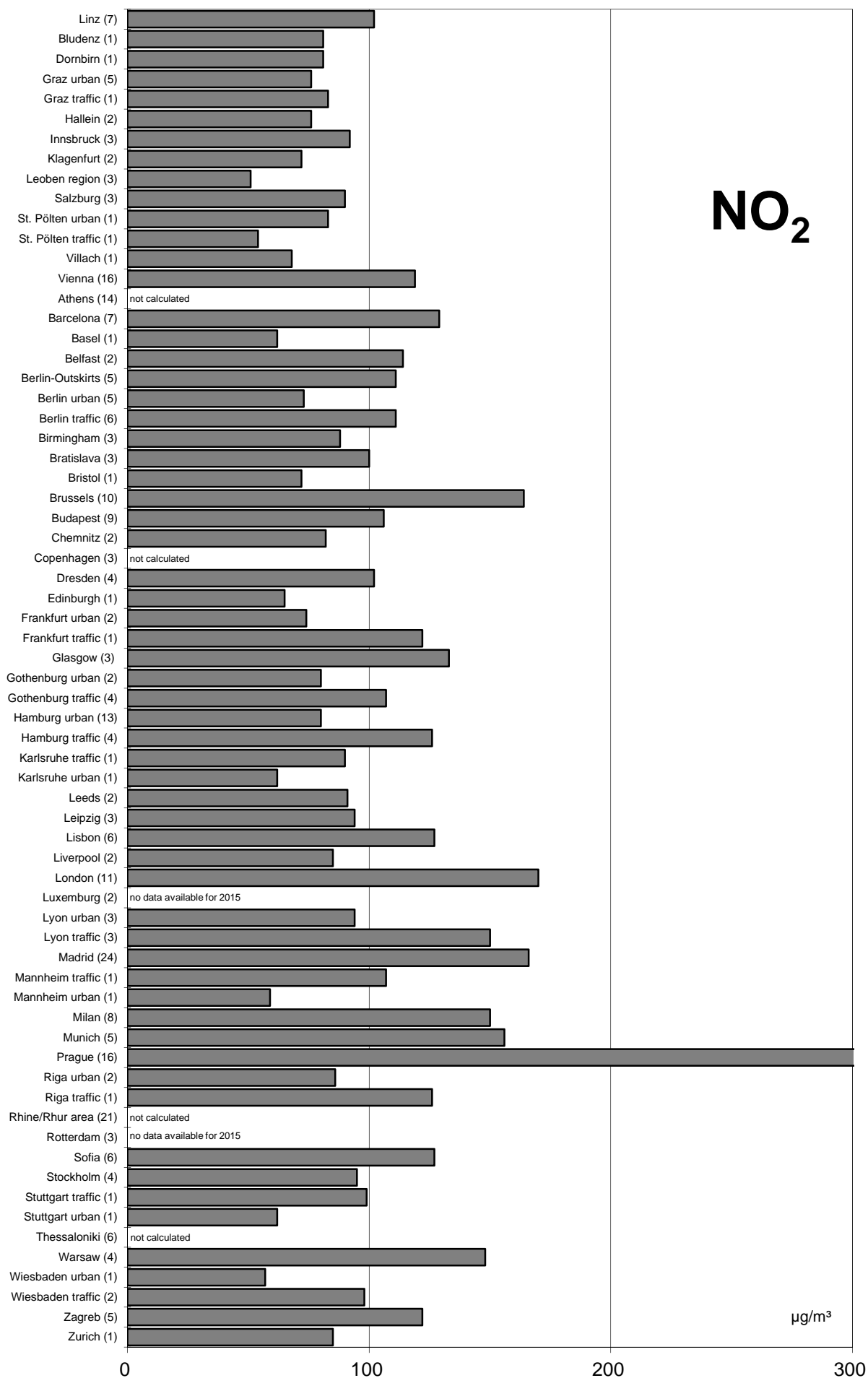


NO

µg/m<sup>3</sup>

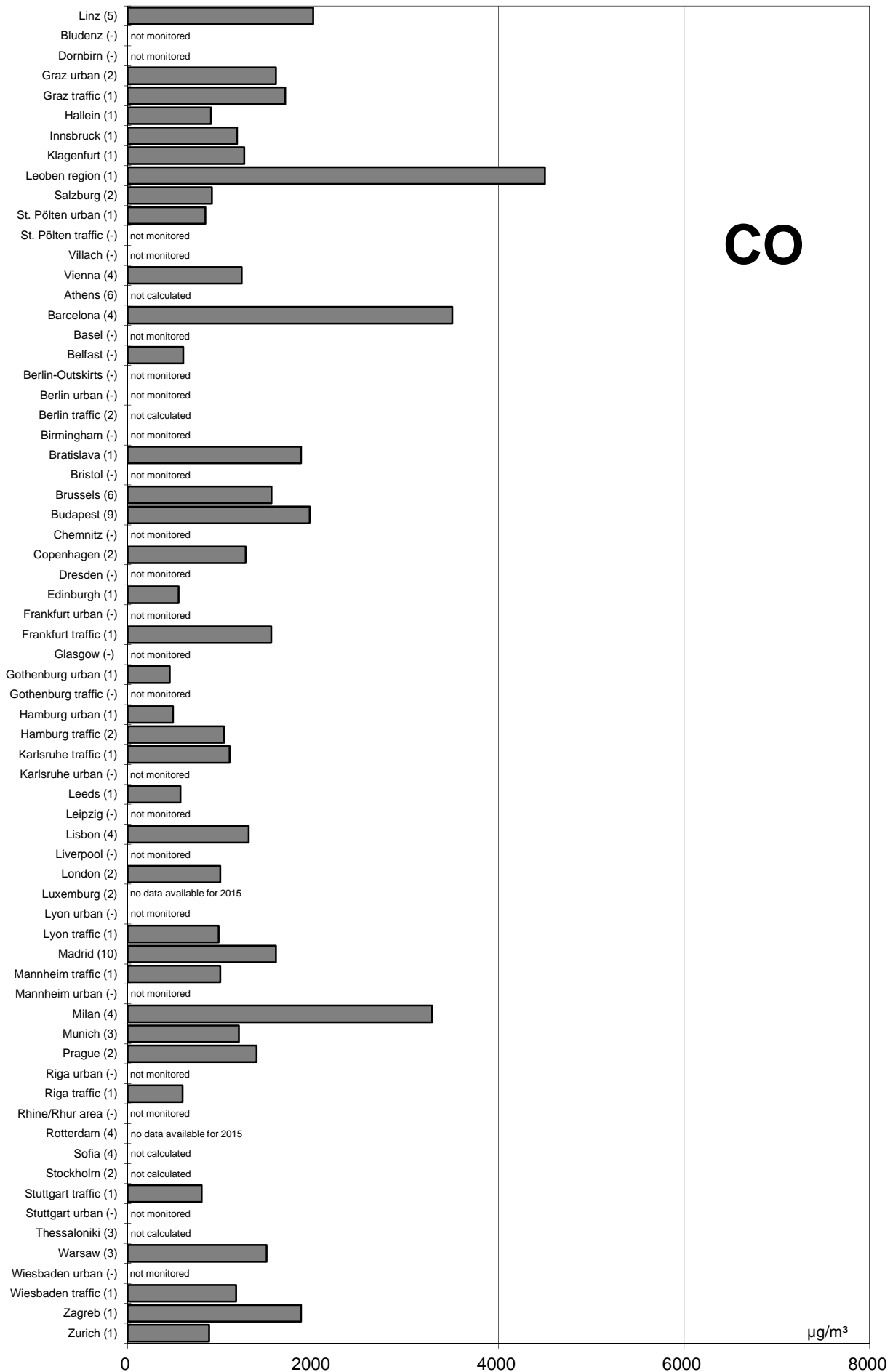
# Comparison of The Air Quality in 2015

**max. daily mean values (max. stressed monitoring station)**  
(in parentheses: number of monitoring stations)



## Comparison of The Air Quality in 2015

**max. daily mean values (max. stressed monitoring station)**  
(in parentheses: number of monitoring stations)

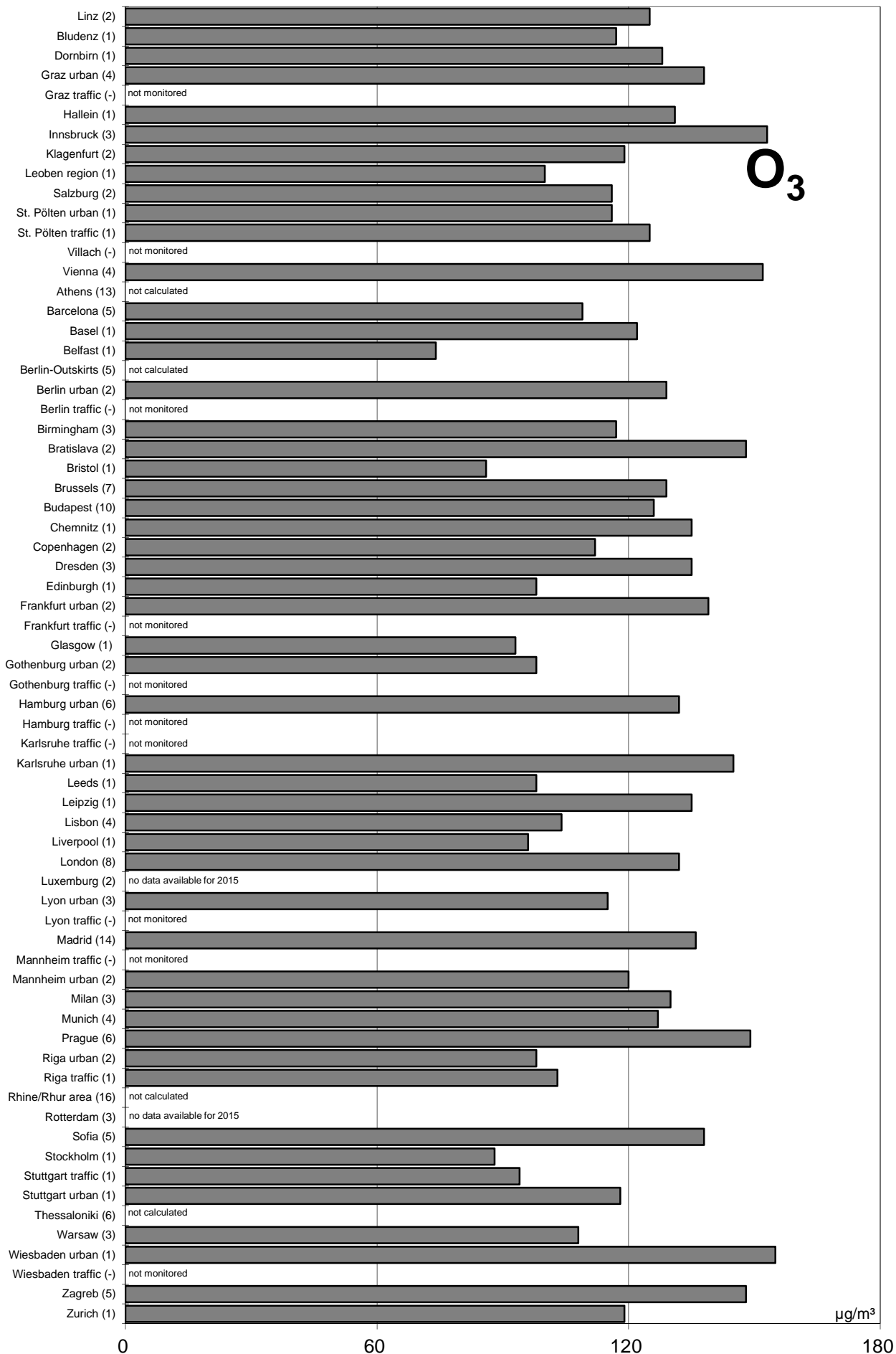




# Comparison of The Air Quality in 2015

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

(in parentheses: number of monitoring stations)





**Luftgütevergleich**

**2015**

**max. 1h-Mittelwerte**

**Comparison of The Air Quality**

**2015**

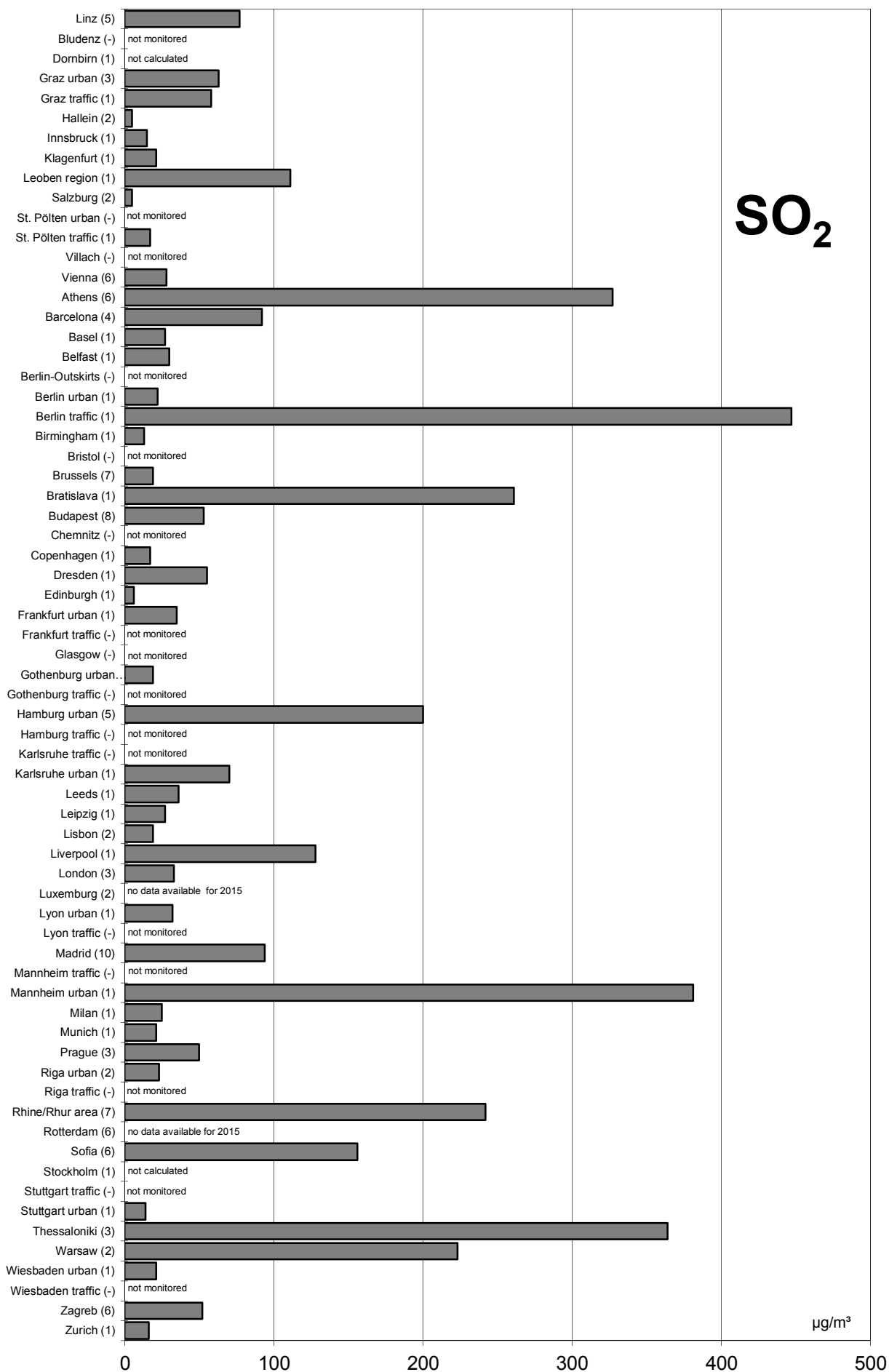
**Max. 1h-Mean Values**



# Comparison of The Air Quality in 2015

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

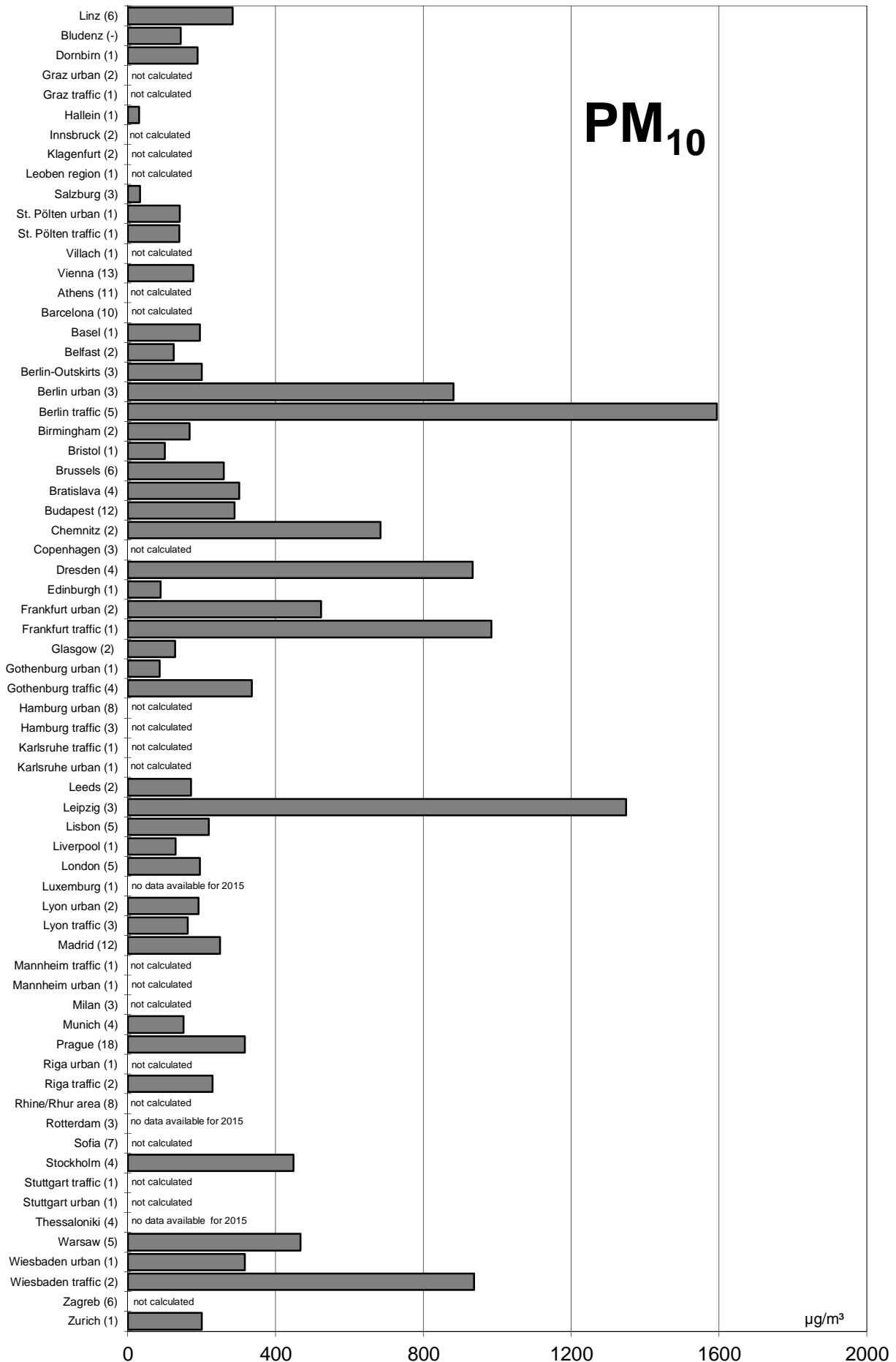
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

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

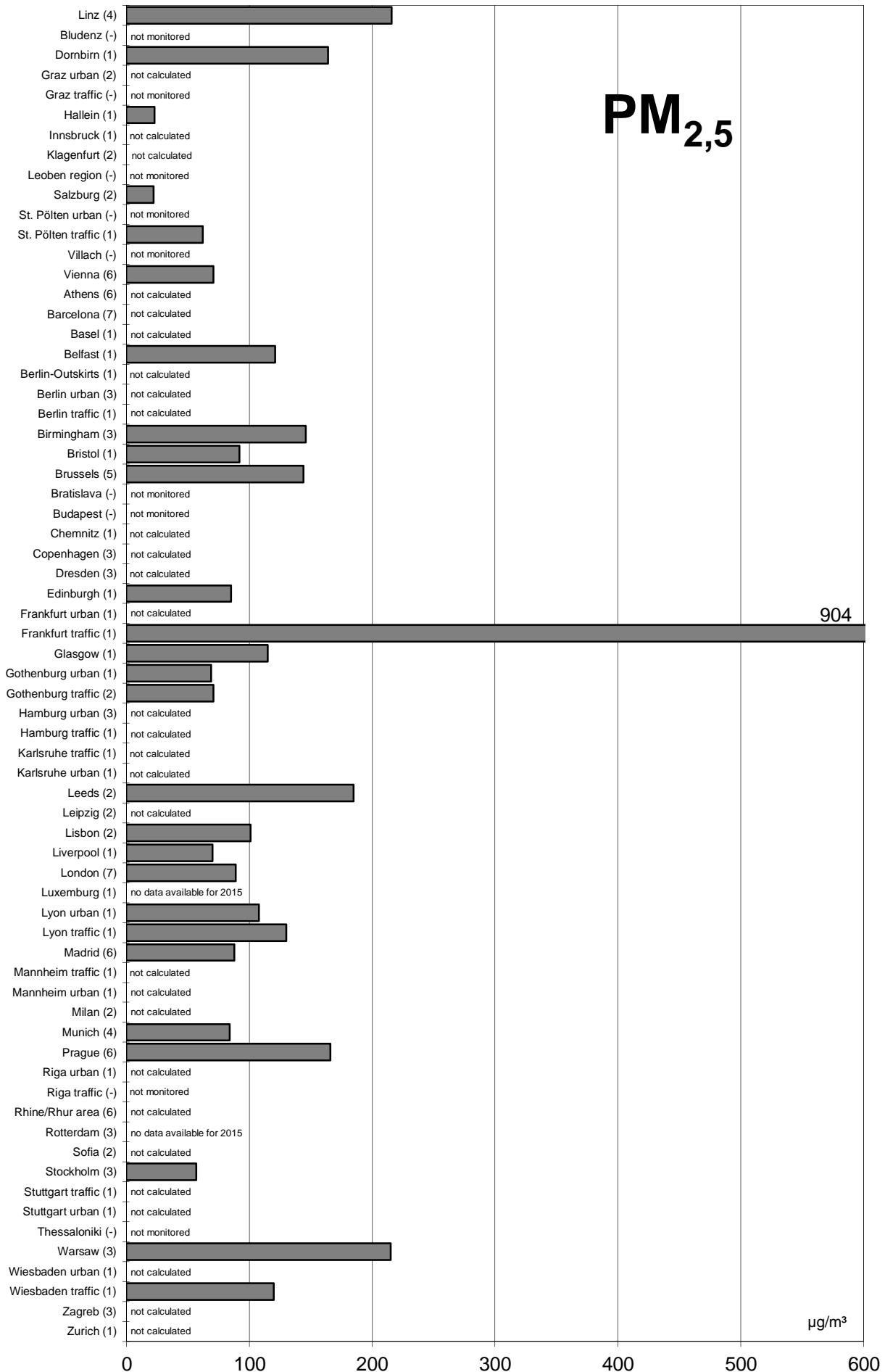
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

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

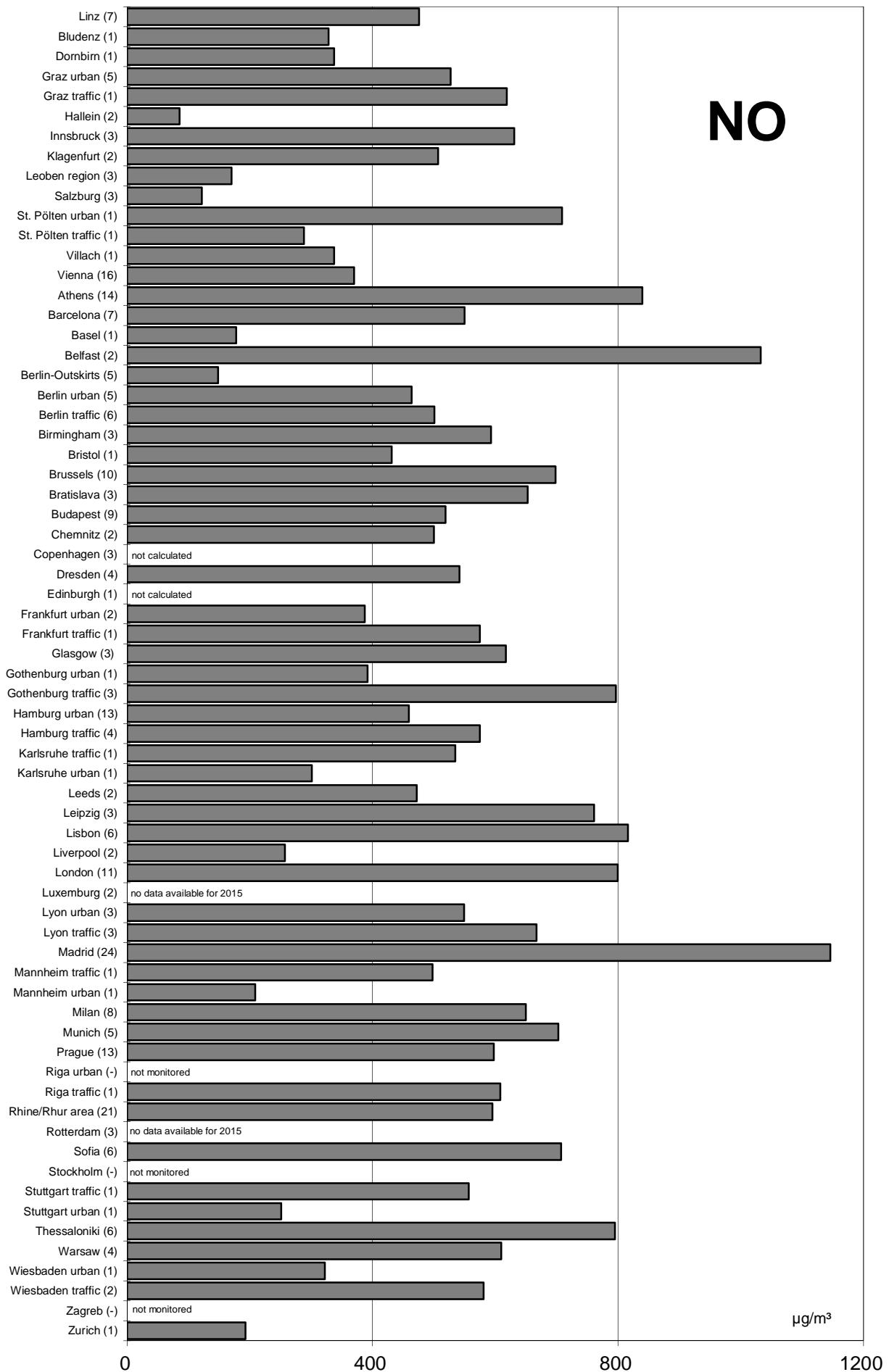
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

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

(in parentheses: number of monitoring stations)

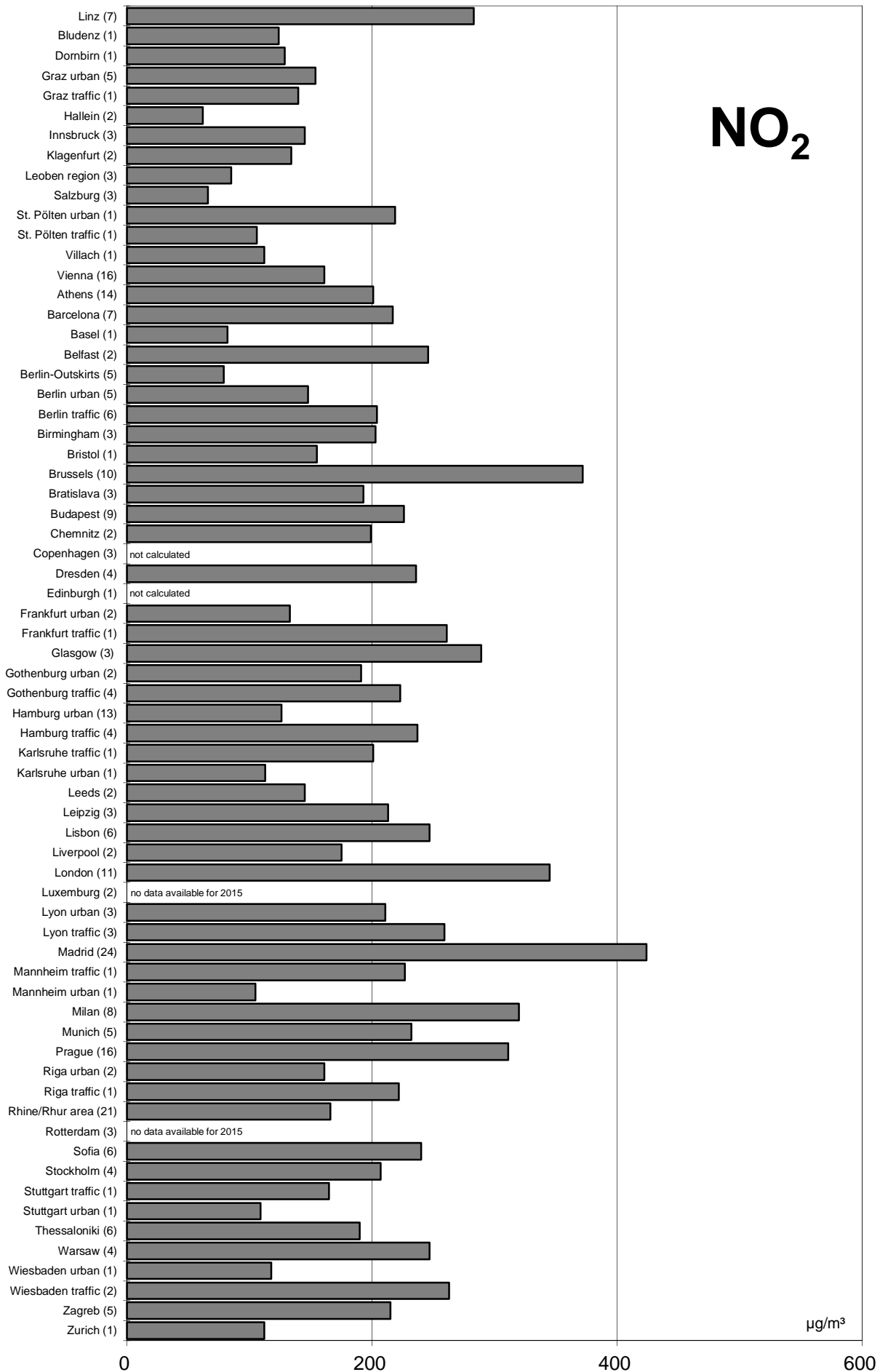




# Comparison of The Air Quality in 2015

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

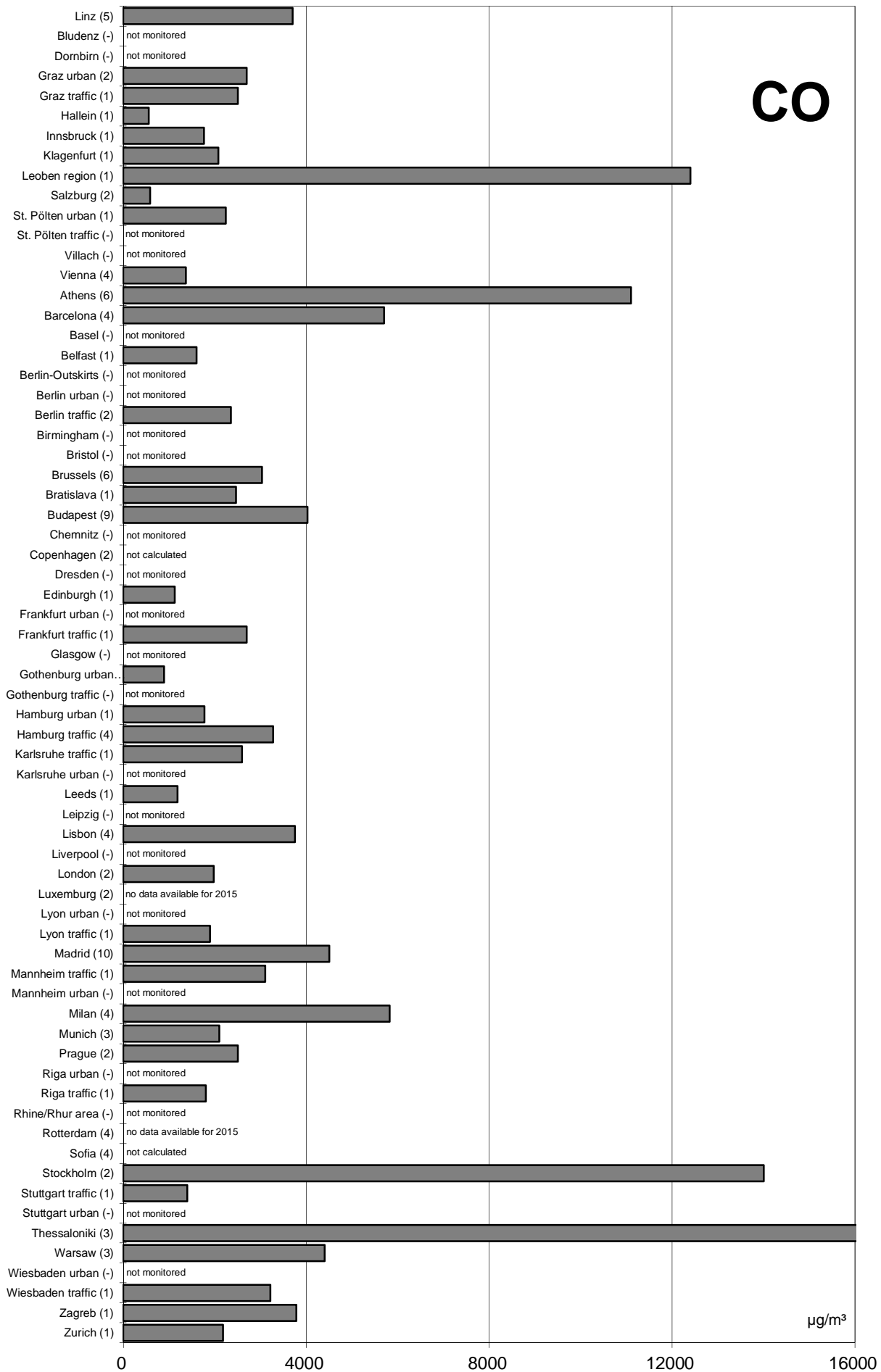
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

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

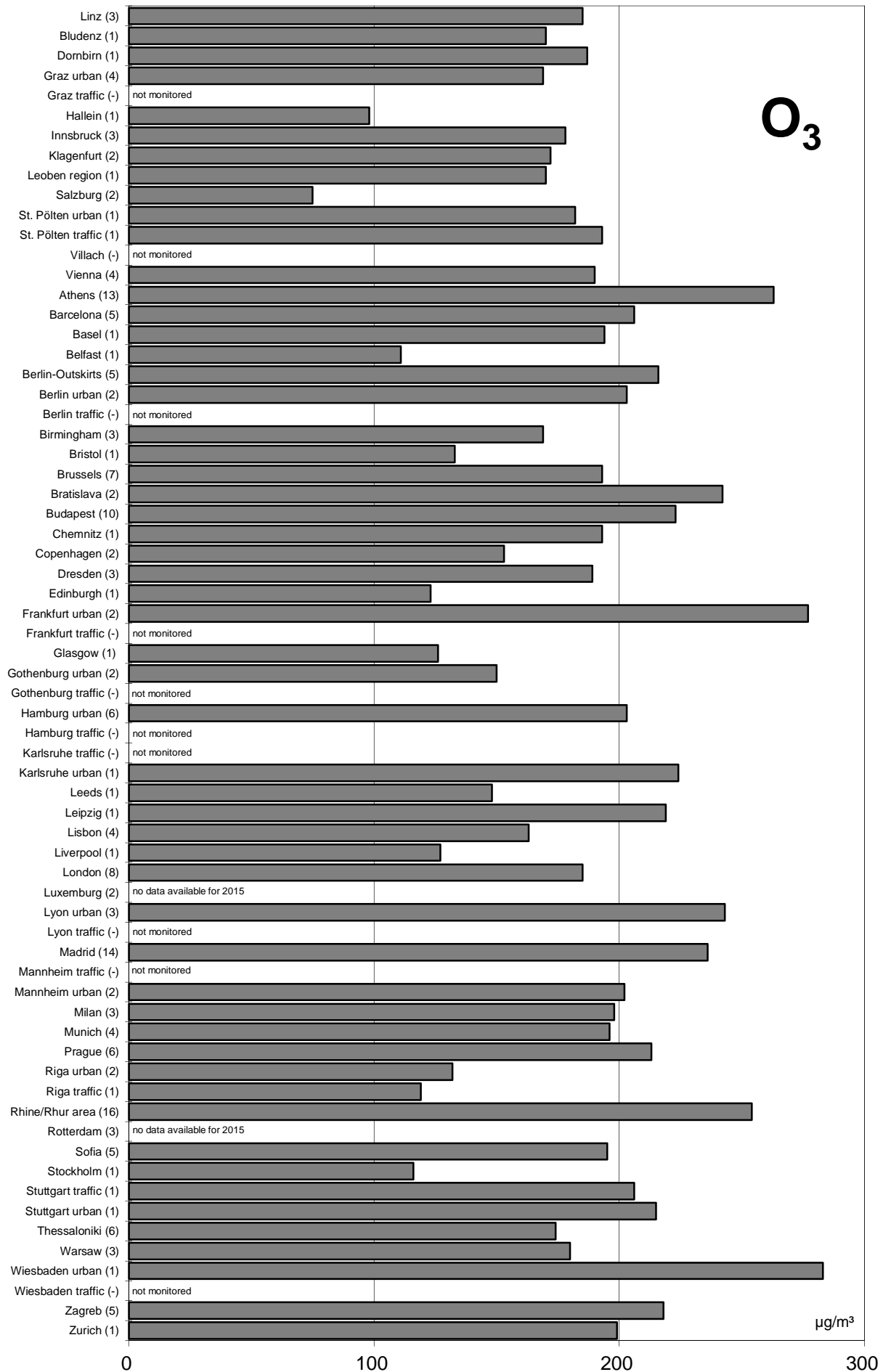
(in parentheses: number of monitoring stations)



# Comparison of The Air Quality in 2015

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

(in parentheses: number of monitoring stations)





**Jahresvergleich**

**1992 - 2015**

**Jahresmittelwerte**

**Comparison of The Air Quality Over The Years**

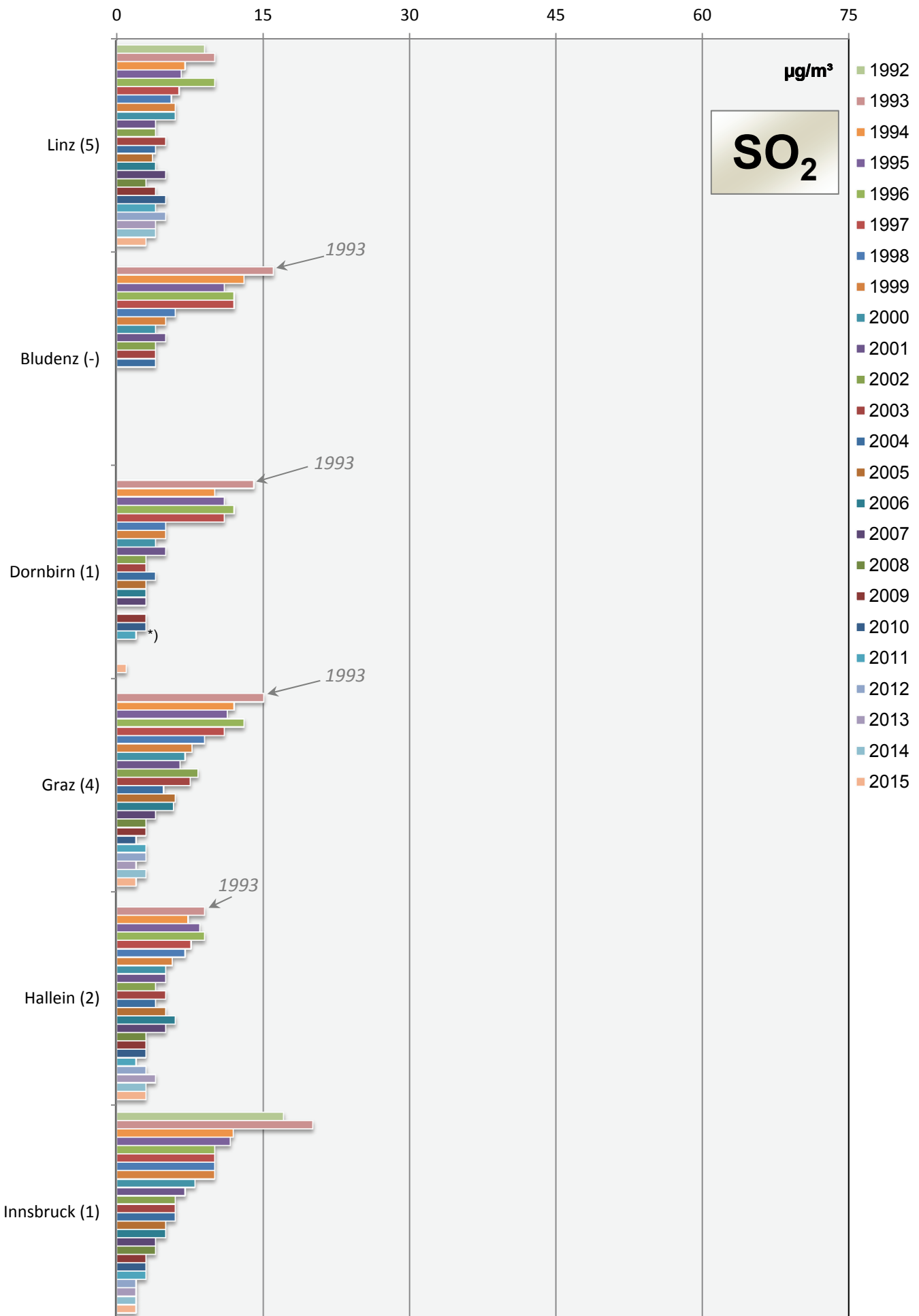
**1992 - 2015**

**Annual Mean Values**



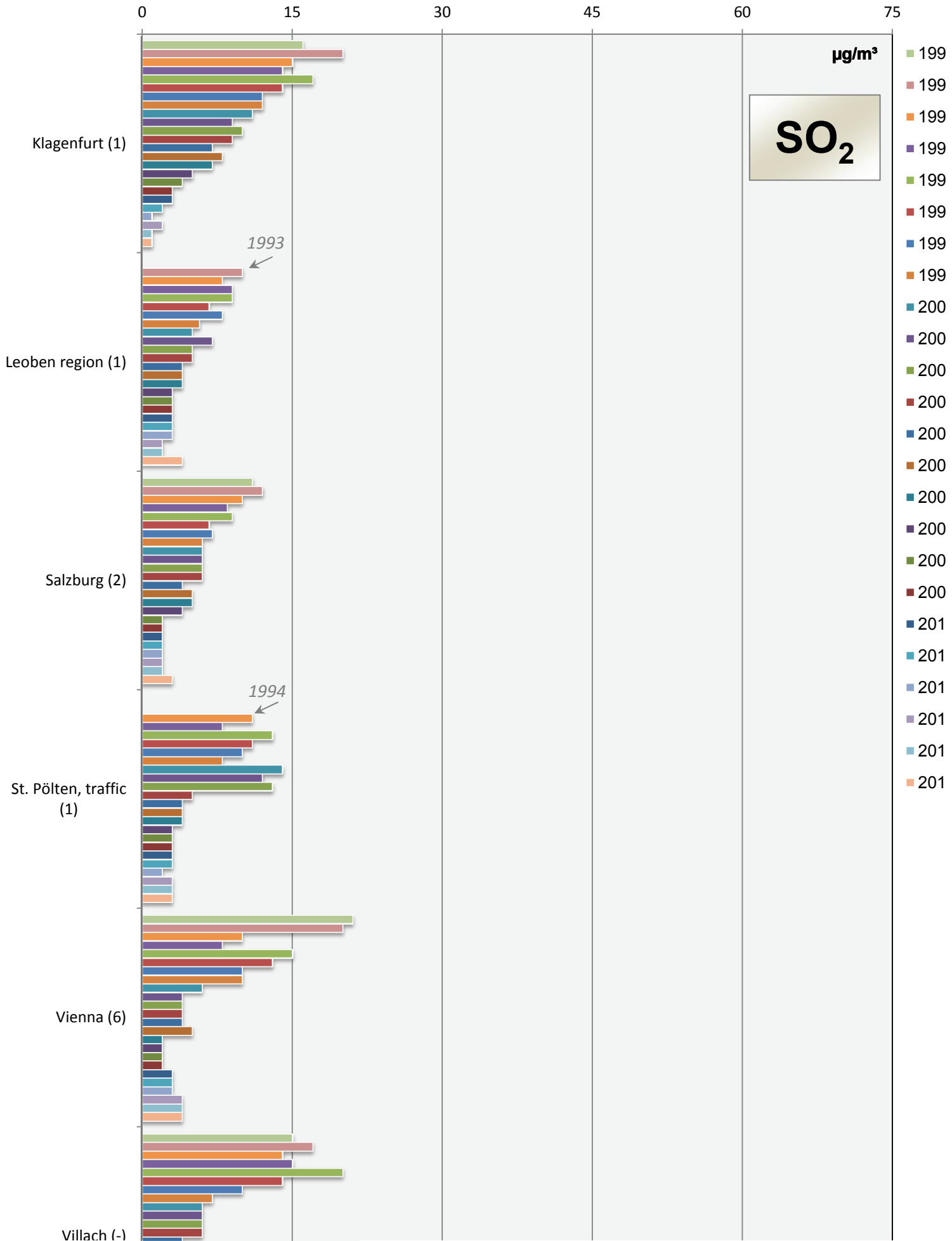
# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)



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

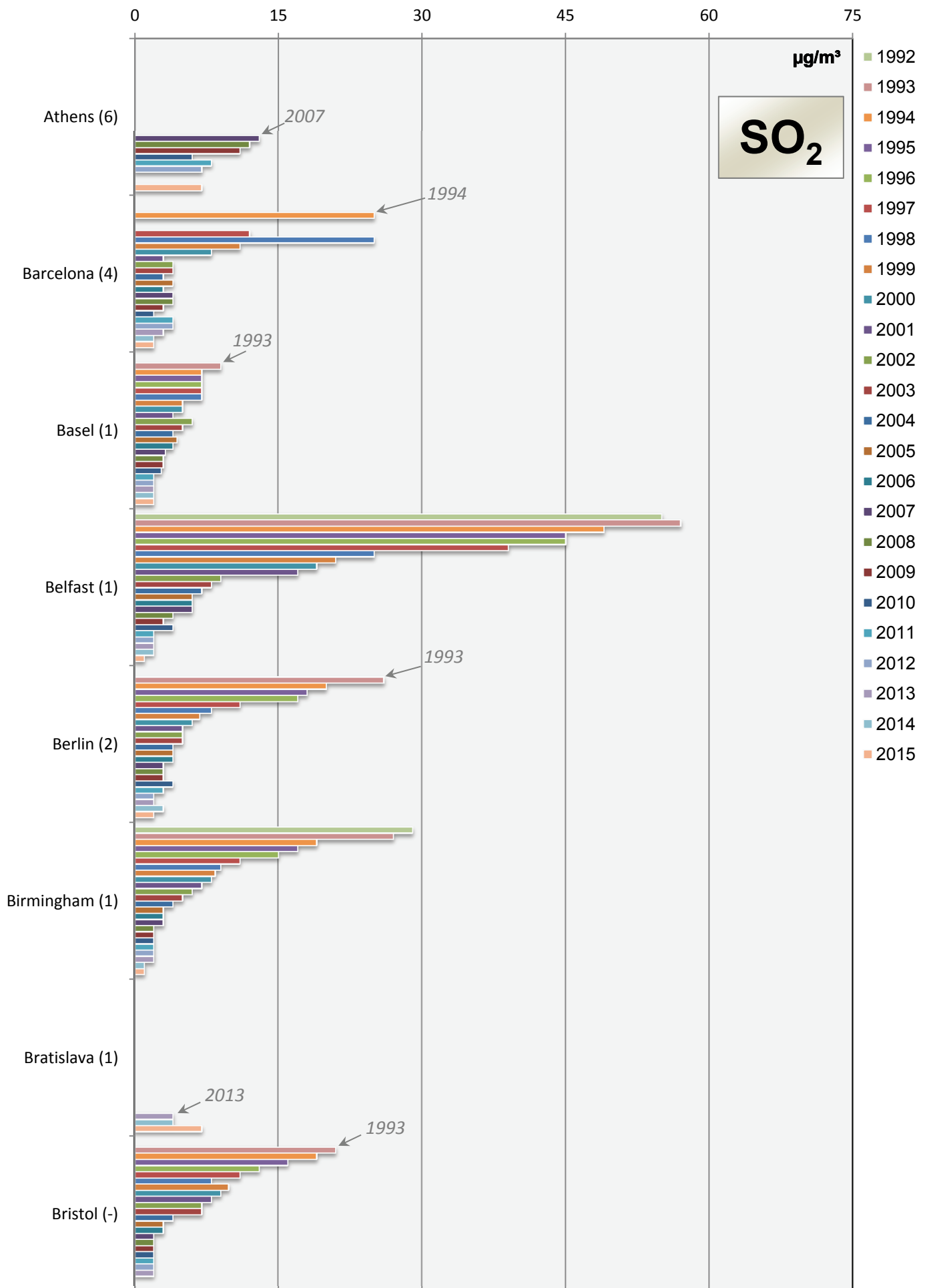
### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



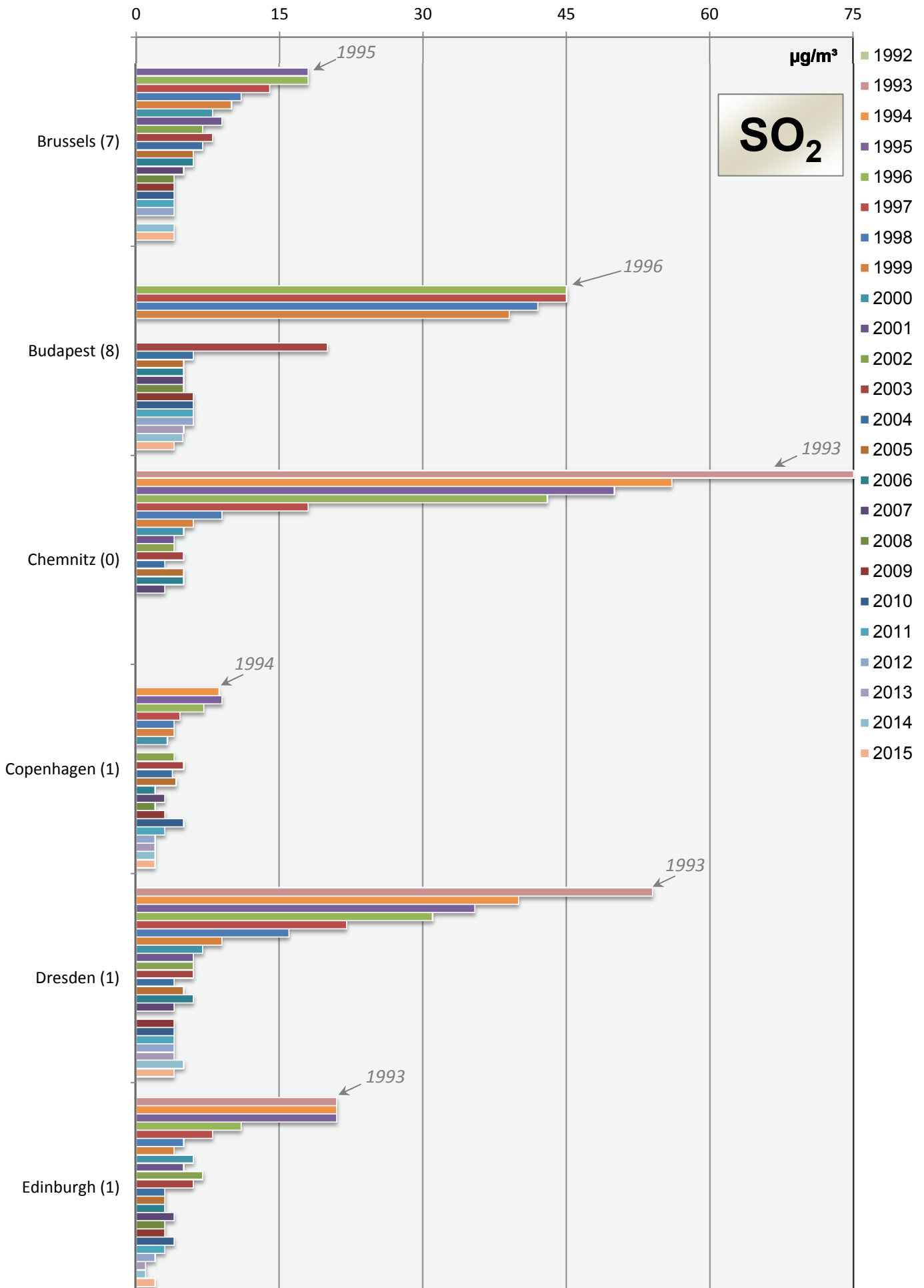


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

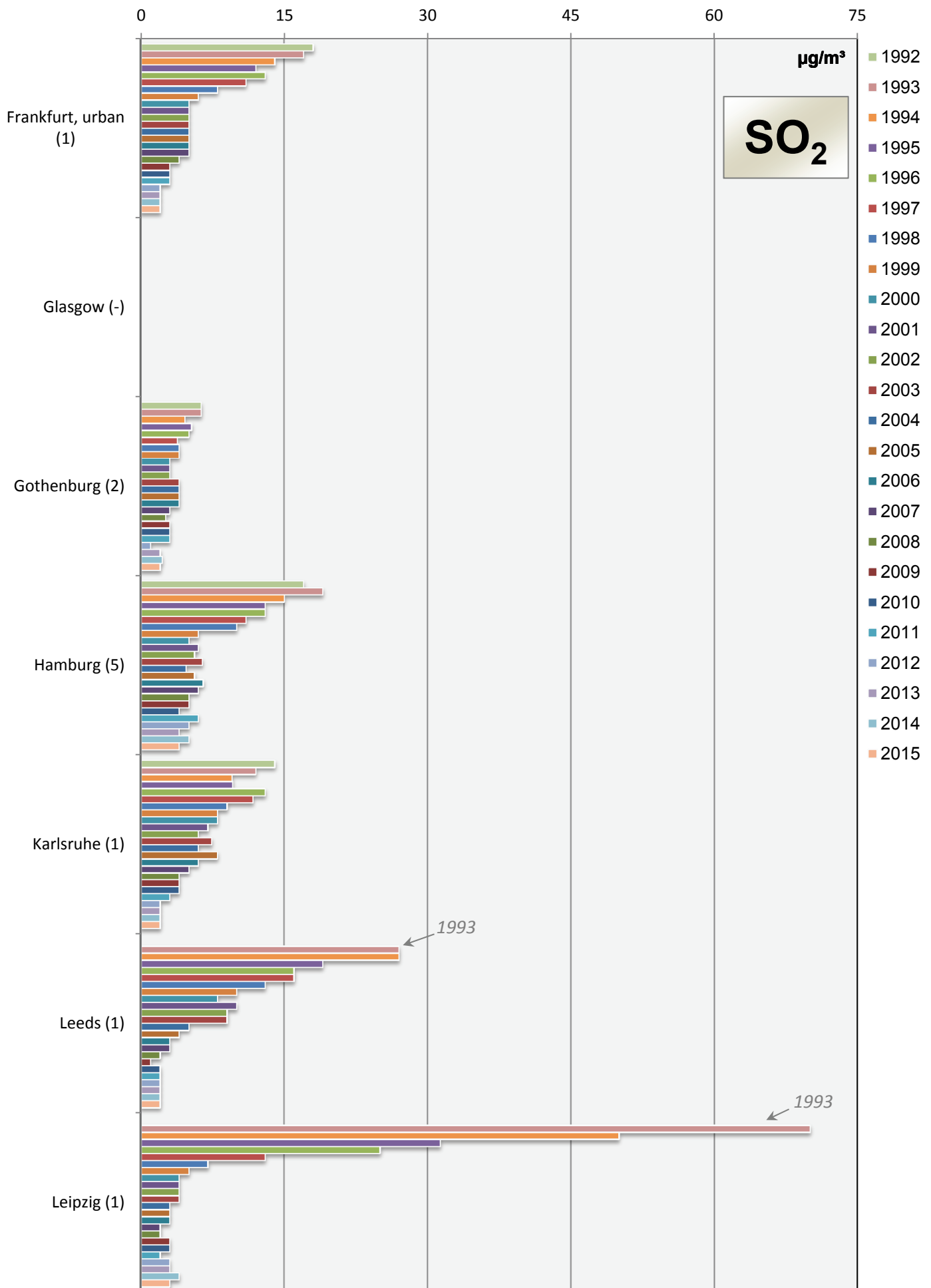


## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

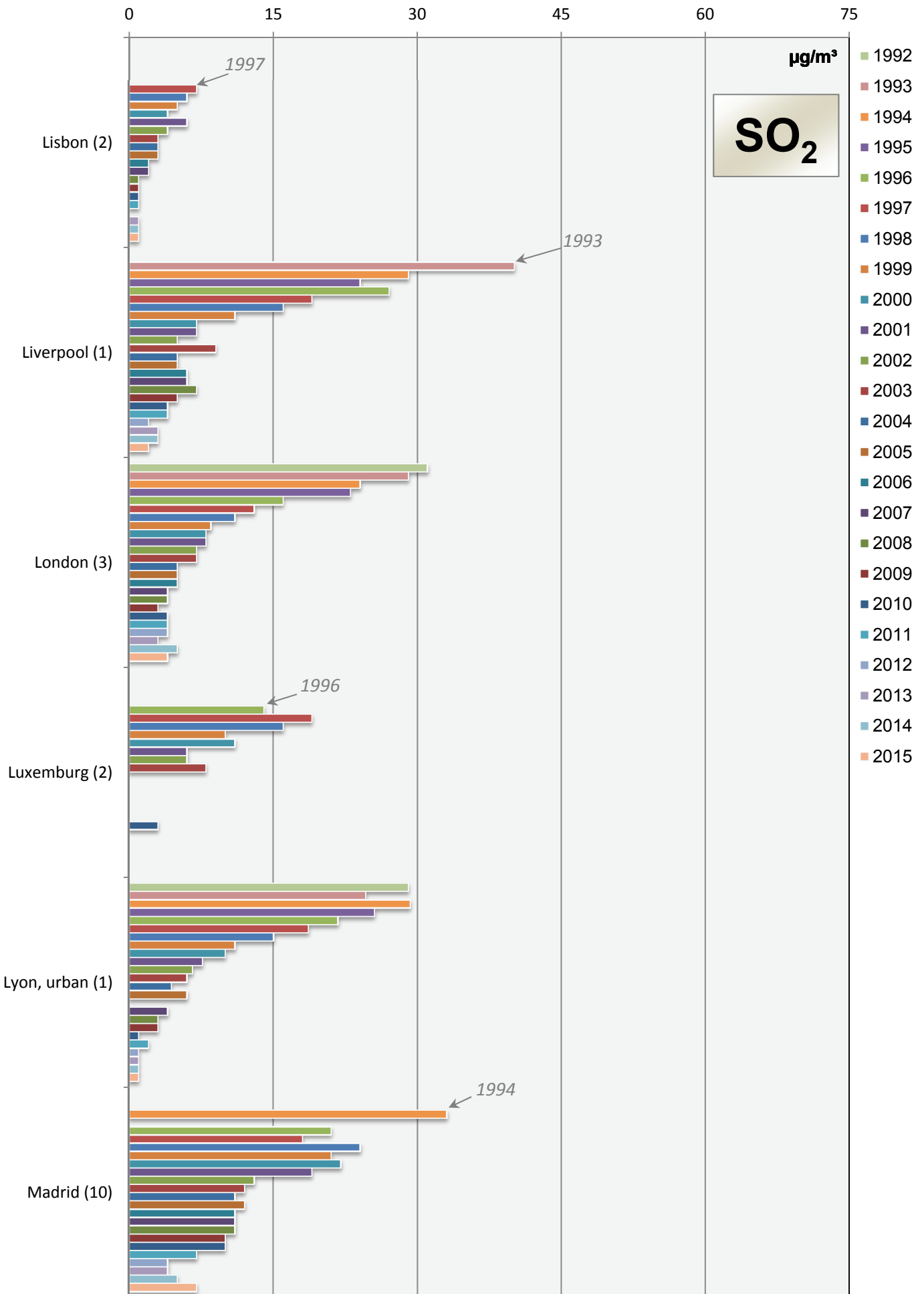


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

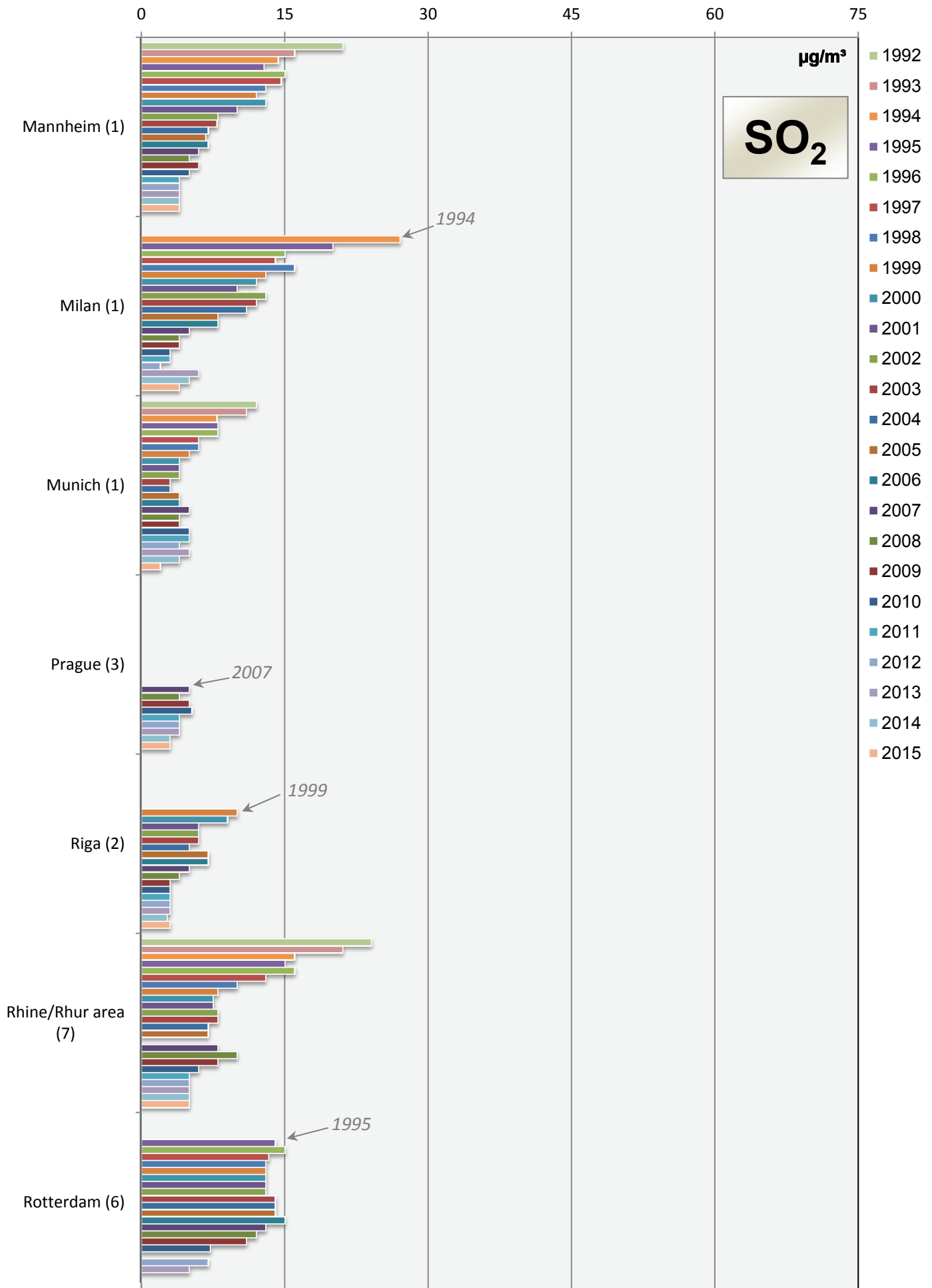


### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

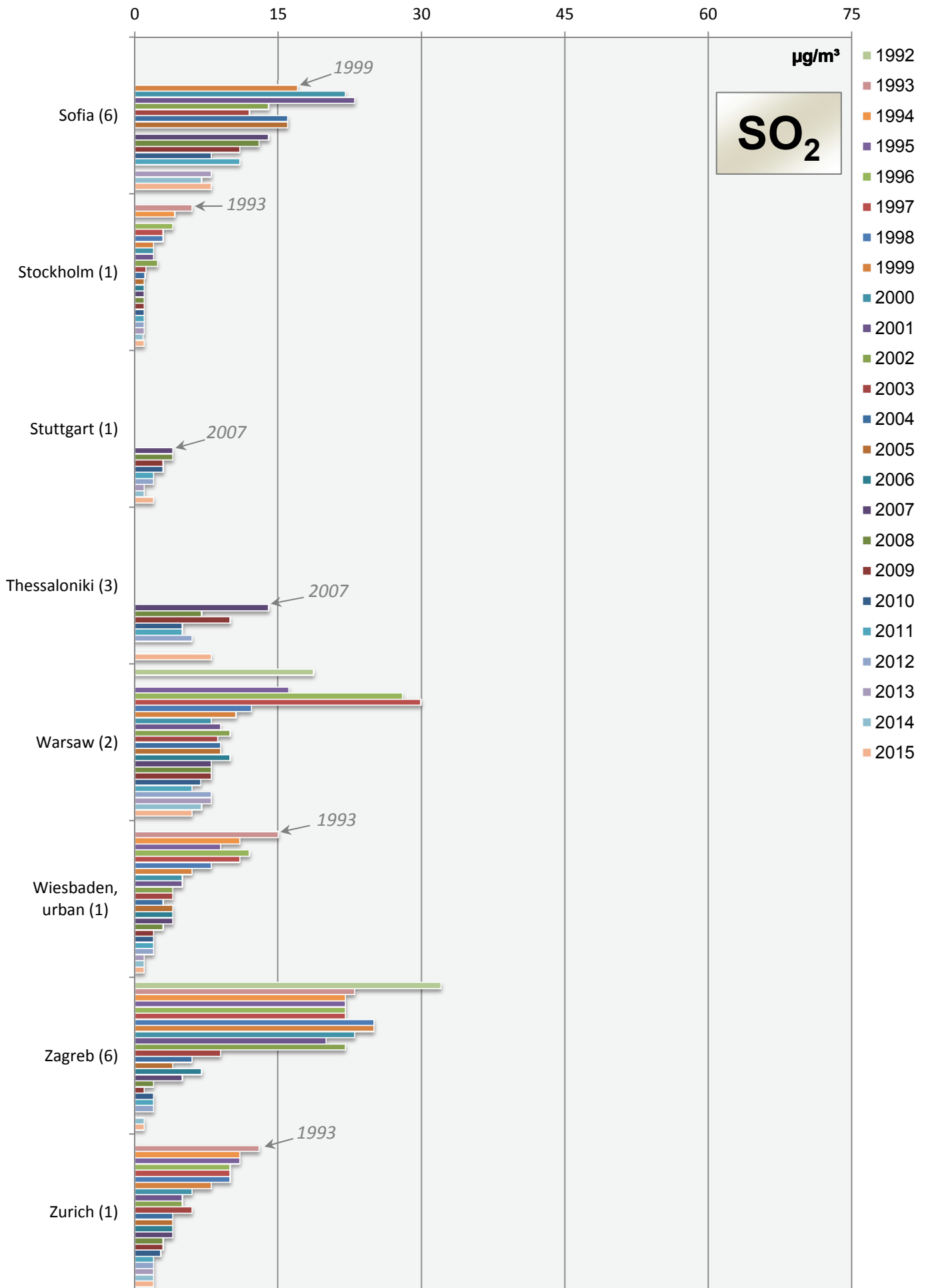


# Comparison of The Air Quality 1992 - 2015

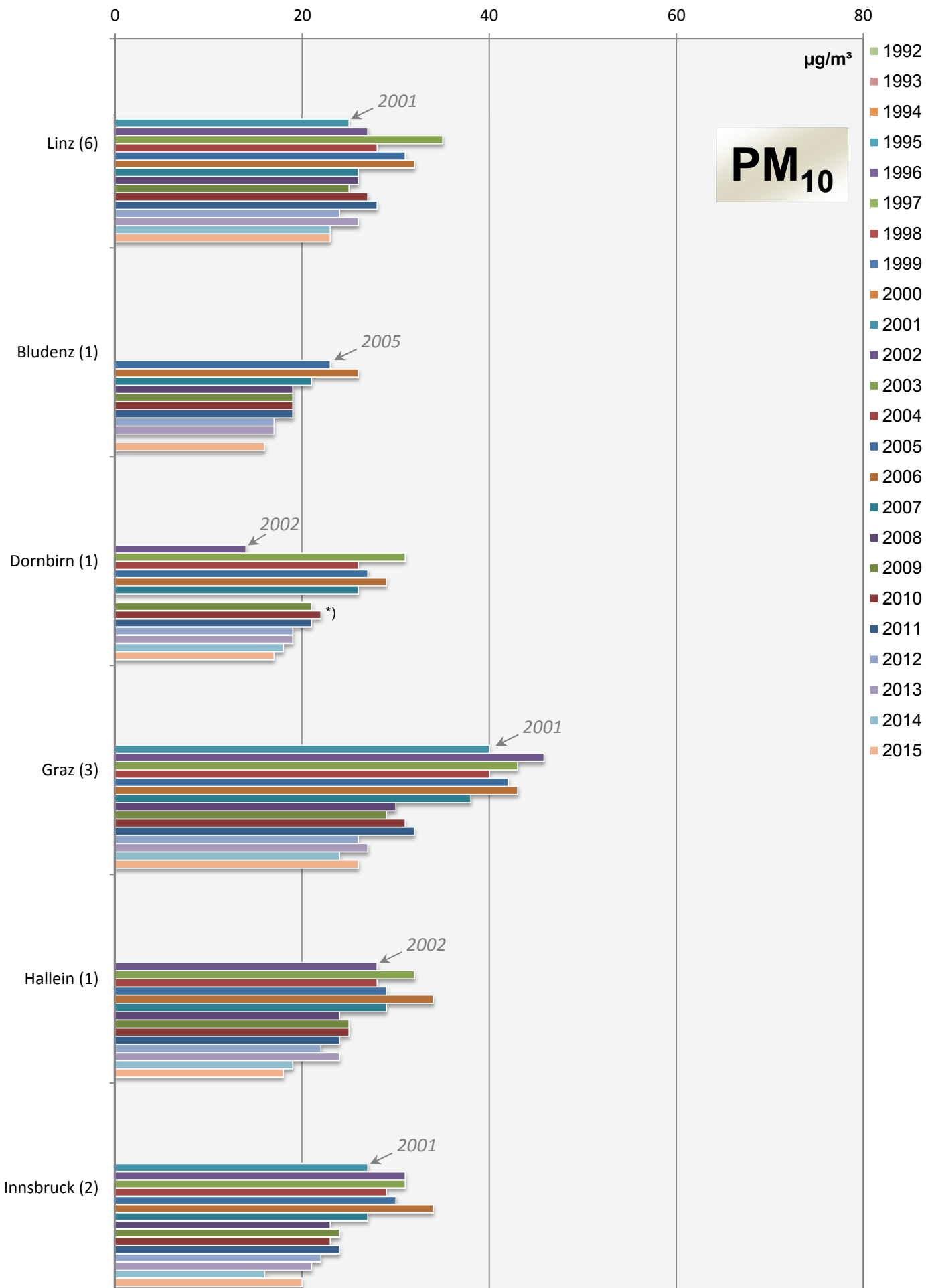
## Annual mean values (mean of all monitoring stations)



## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

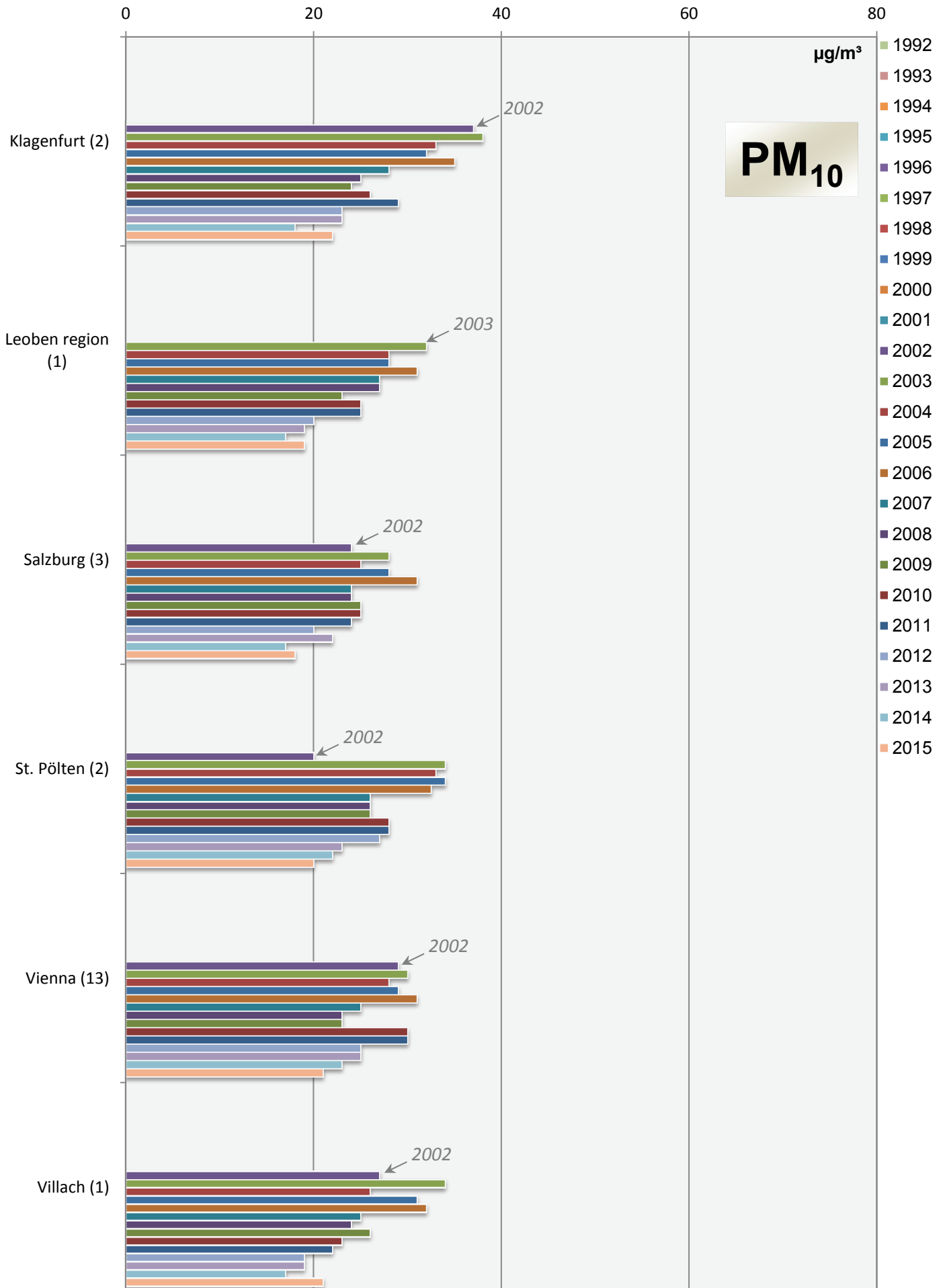


## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



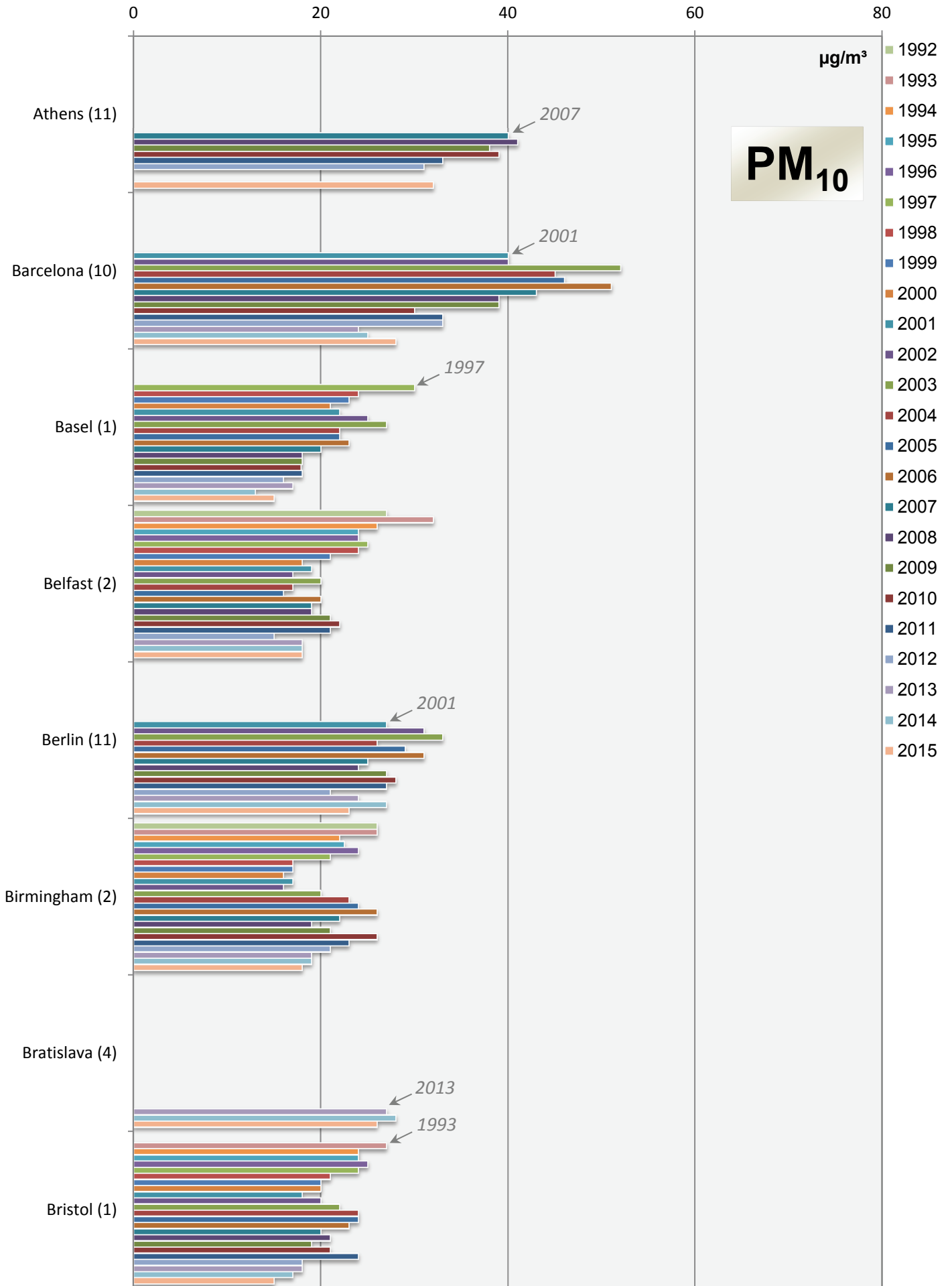
\*) data of the year 2008 are not used for the comparison, because the street near the measurement point was closed for 11 months

### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

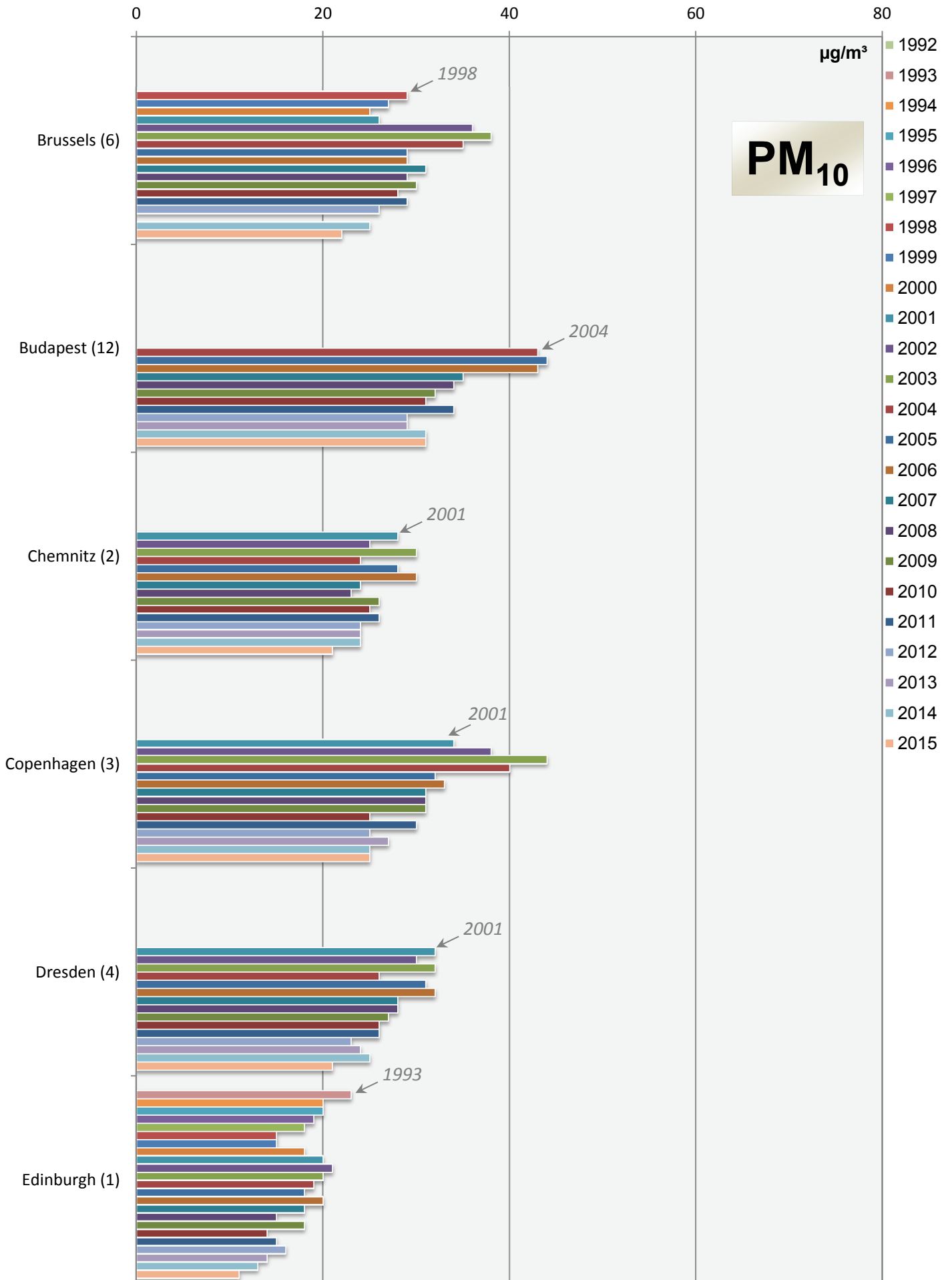




### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

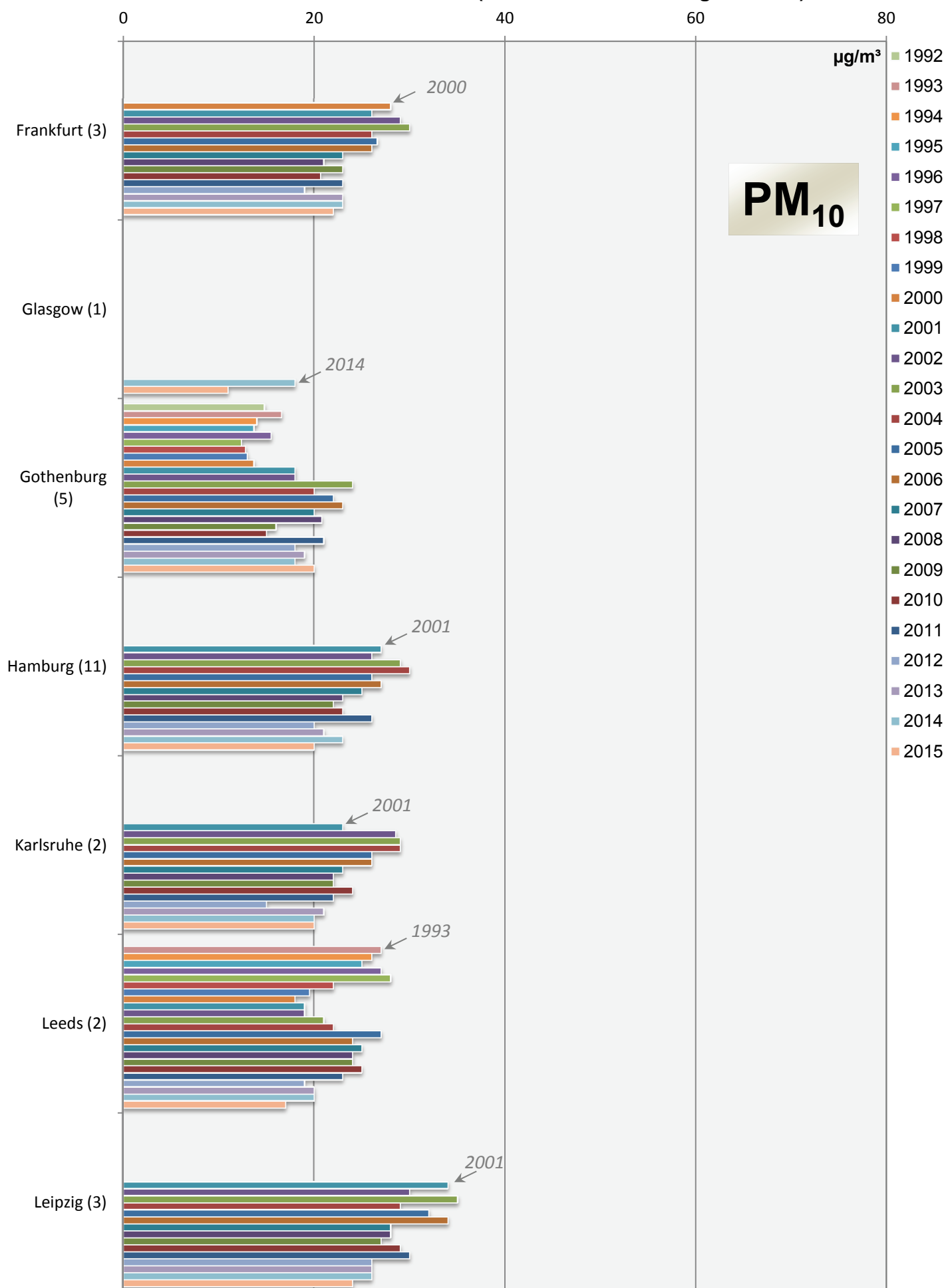


## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

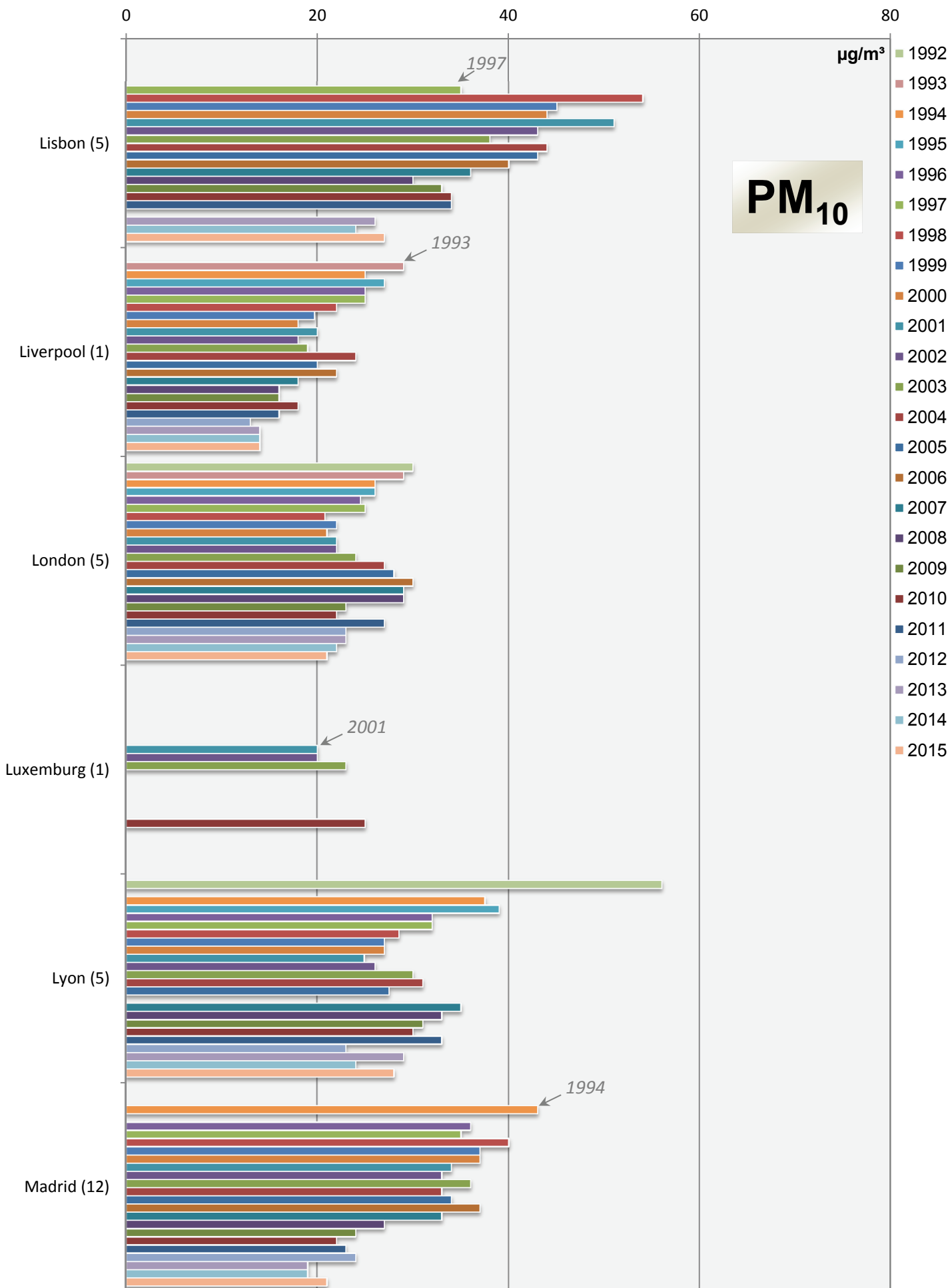


## Comparison of The Air Quality 1992 - 2015

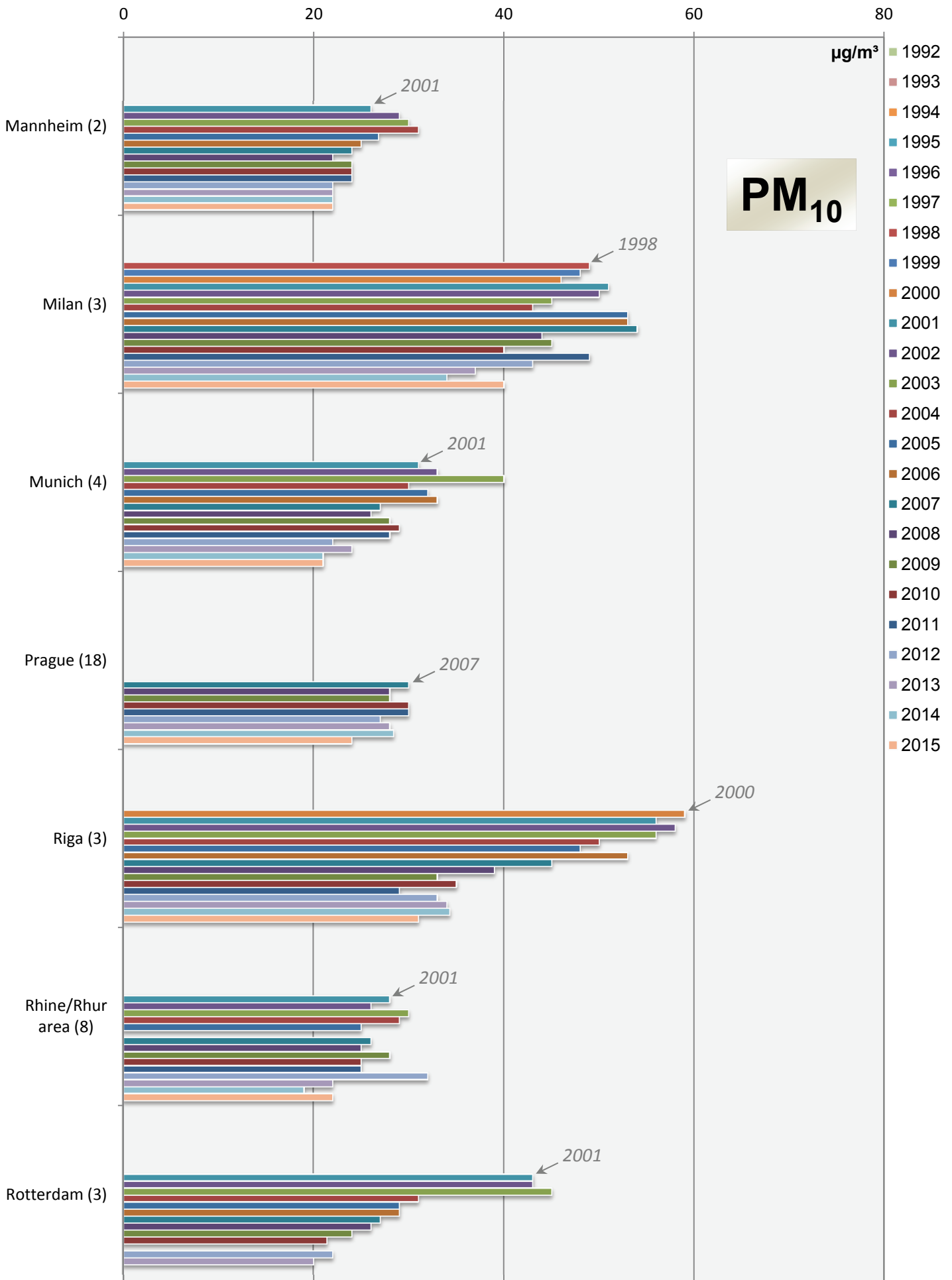
### Annual mean values (mean of all monitoring stations)



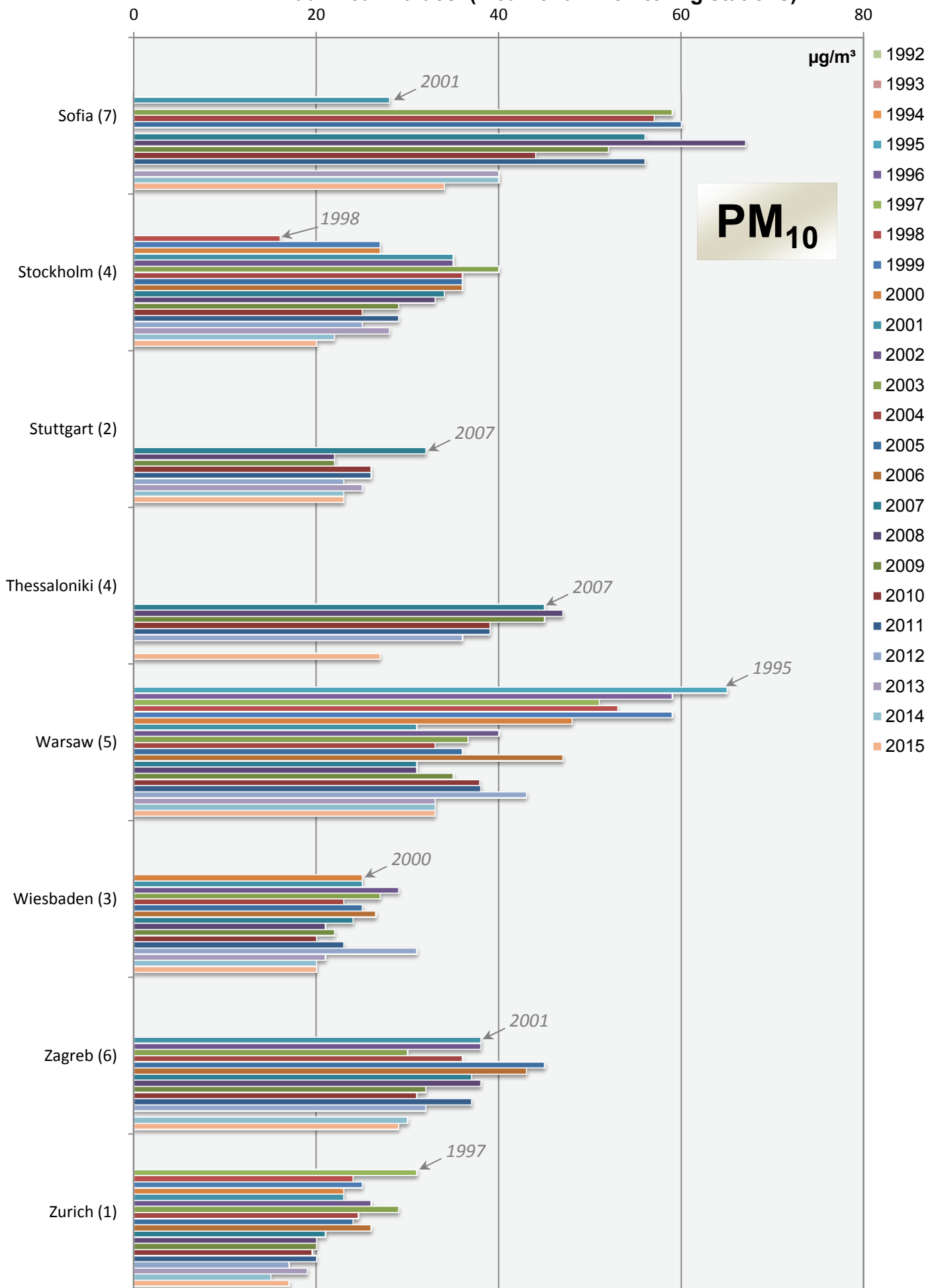
### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



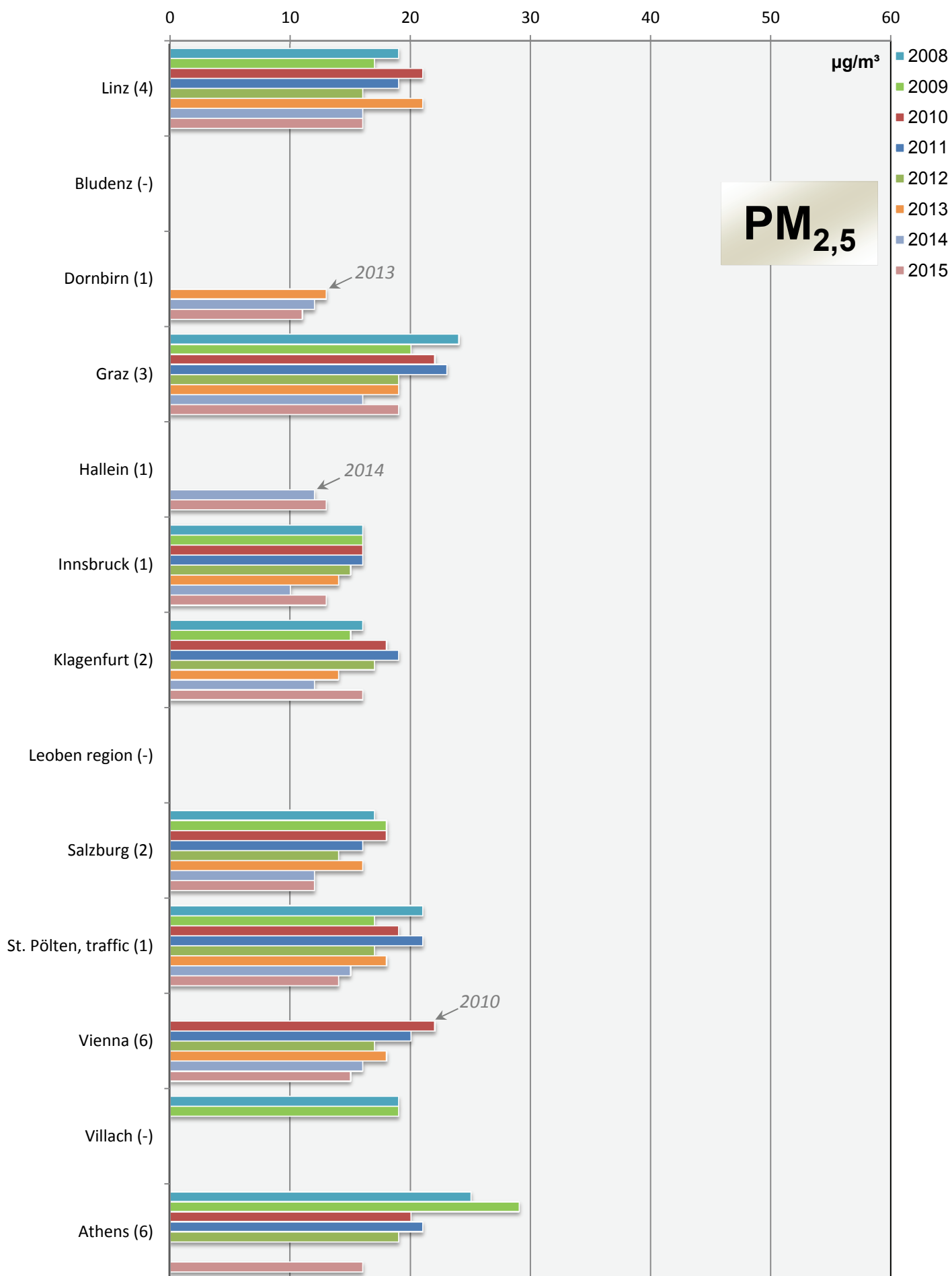
## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



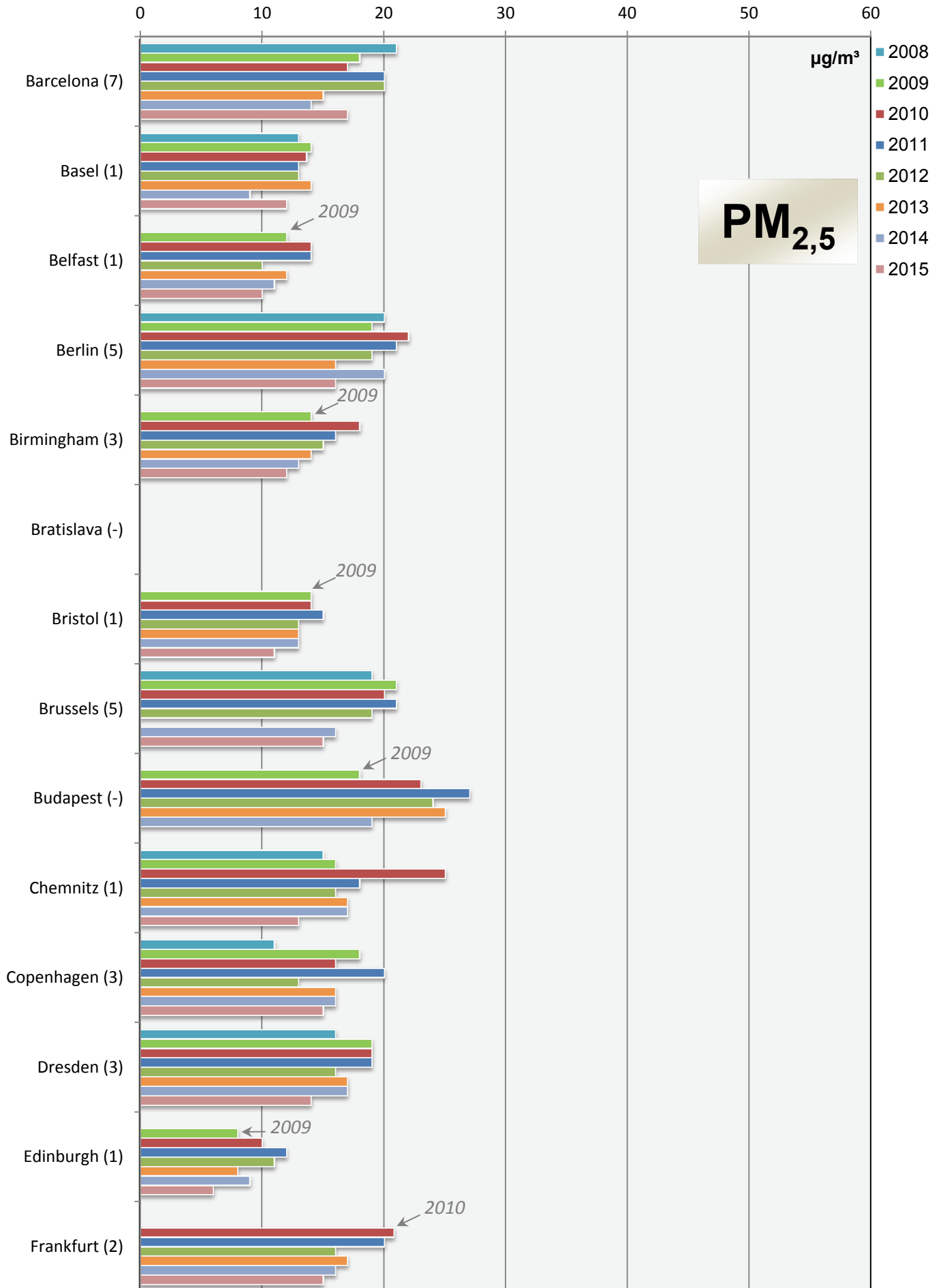
### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



## Comparison of The Air Quality 2008 - 2015 Annual mean values (mean of all monitoring stations)

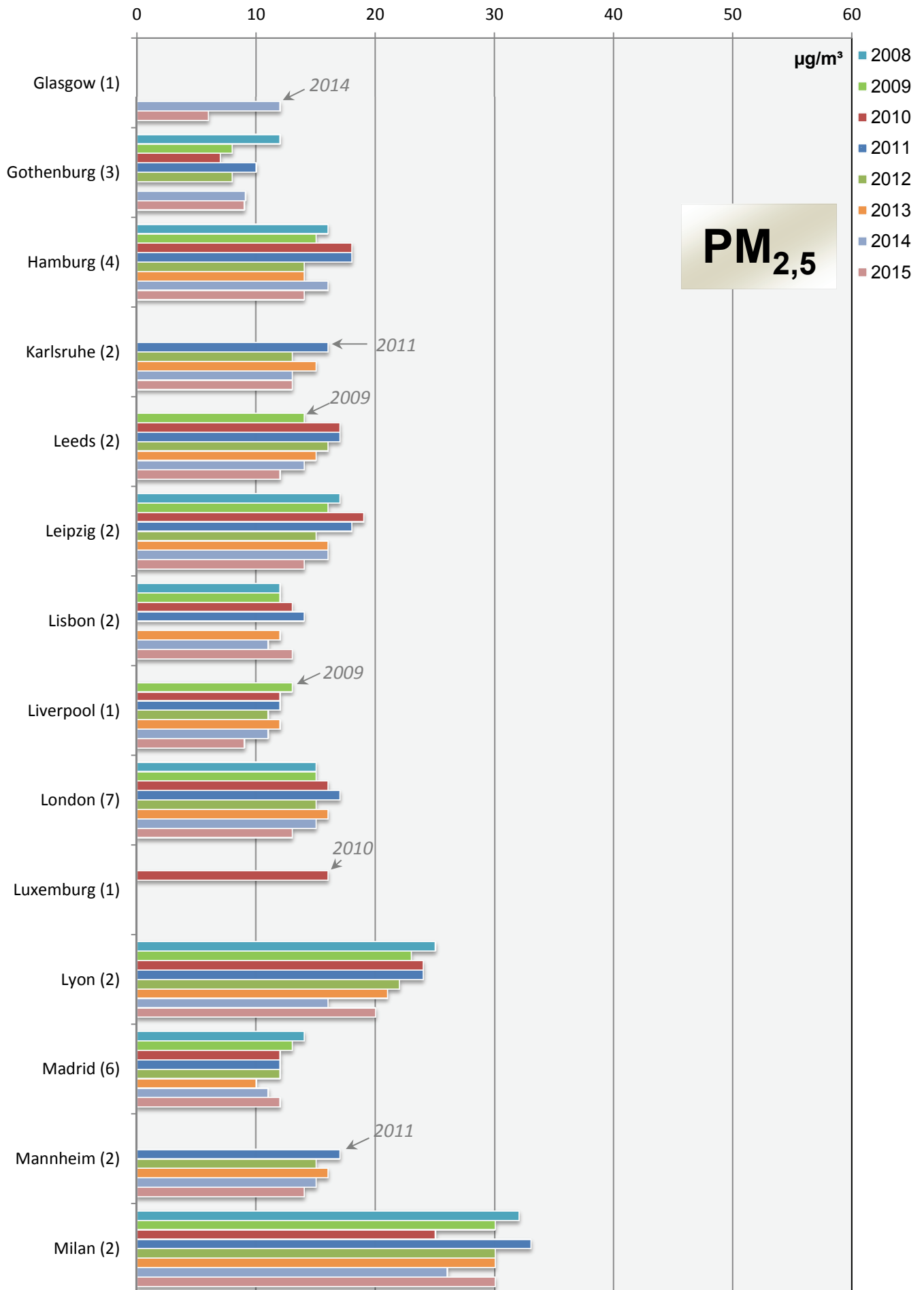


## Comparison of The Air Quality 2008 - 2015 Annual mean values (mean of all monitoring stations)

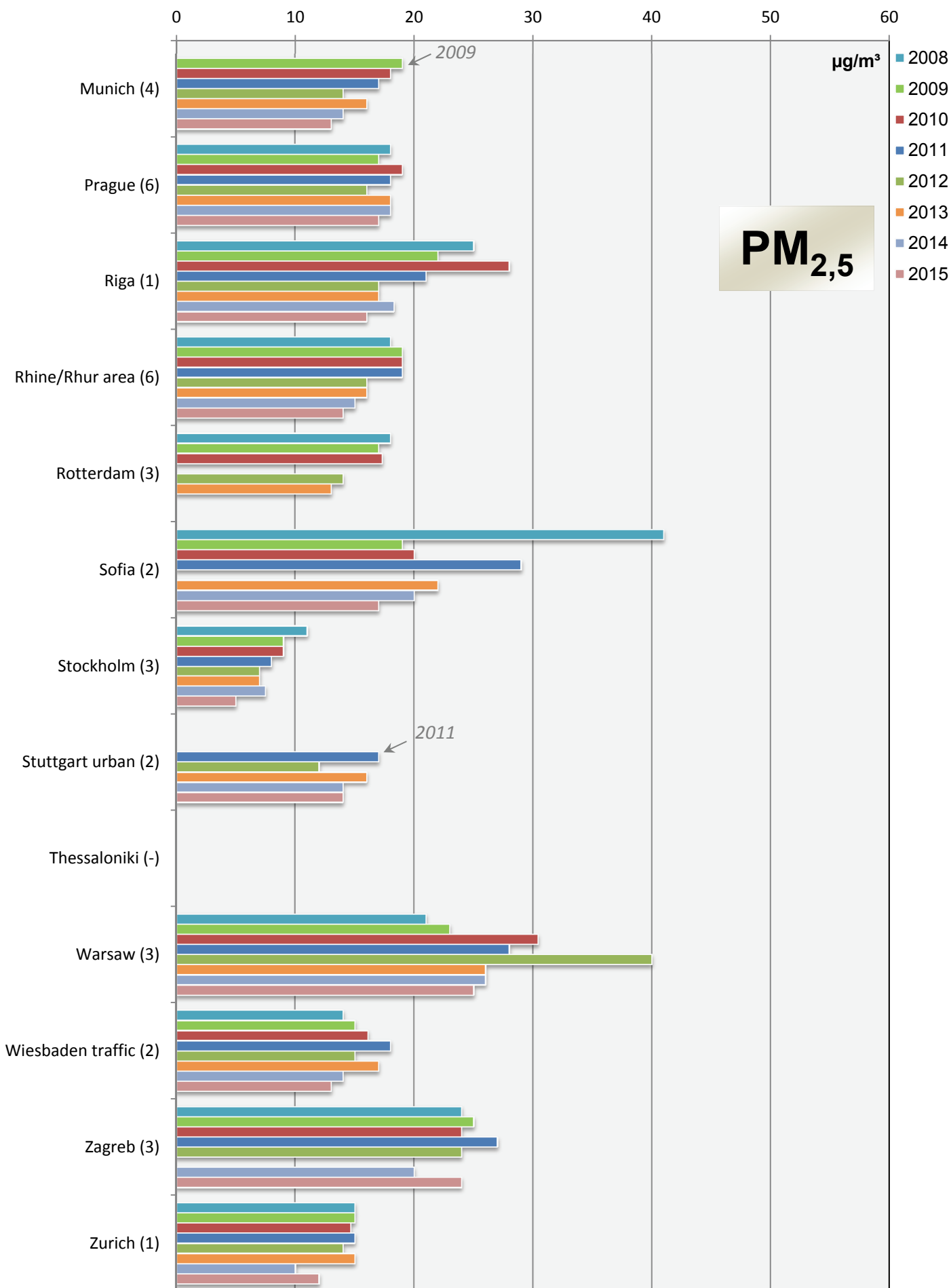




## Comparison of The Air Quality 2008 - 2015 Annual mean values (mean of all monitoring stations)

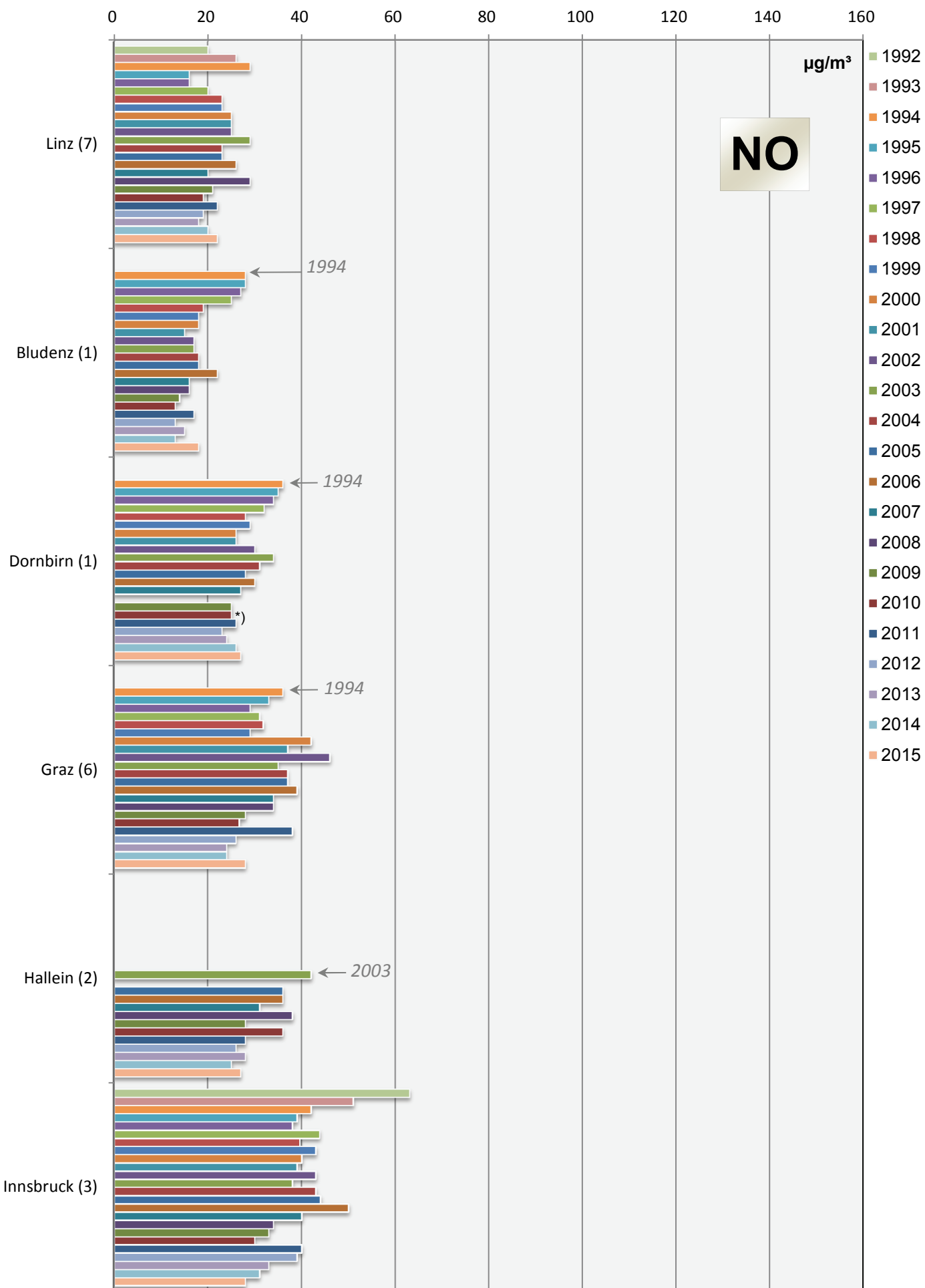


### Comparison of The Air Quality 2008 - 2015 Annual mean values (mean of all monitoring stations)



## Comparison of The Air Quality 1992 - 2015

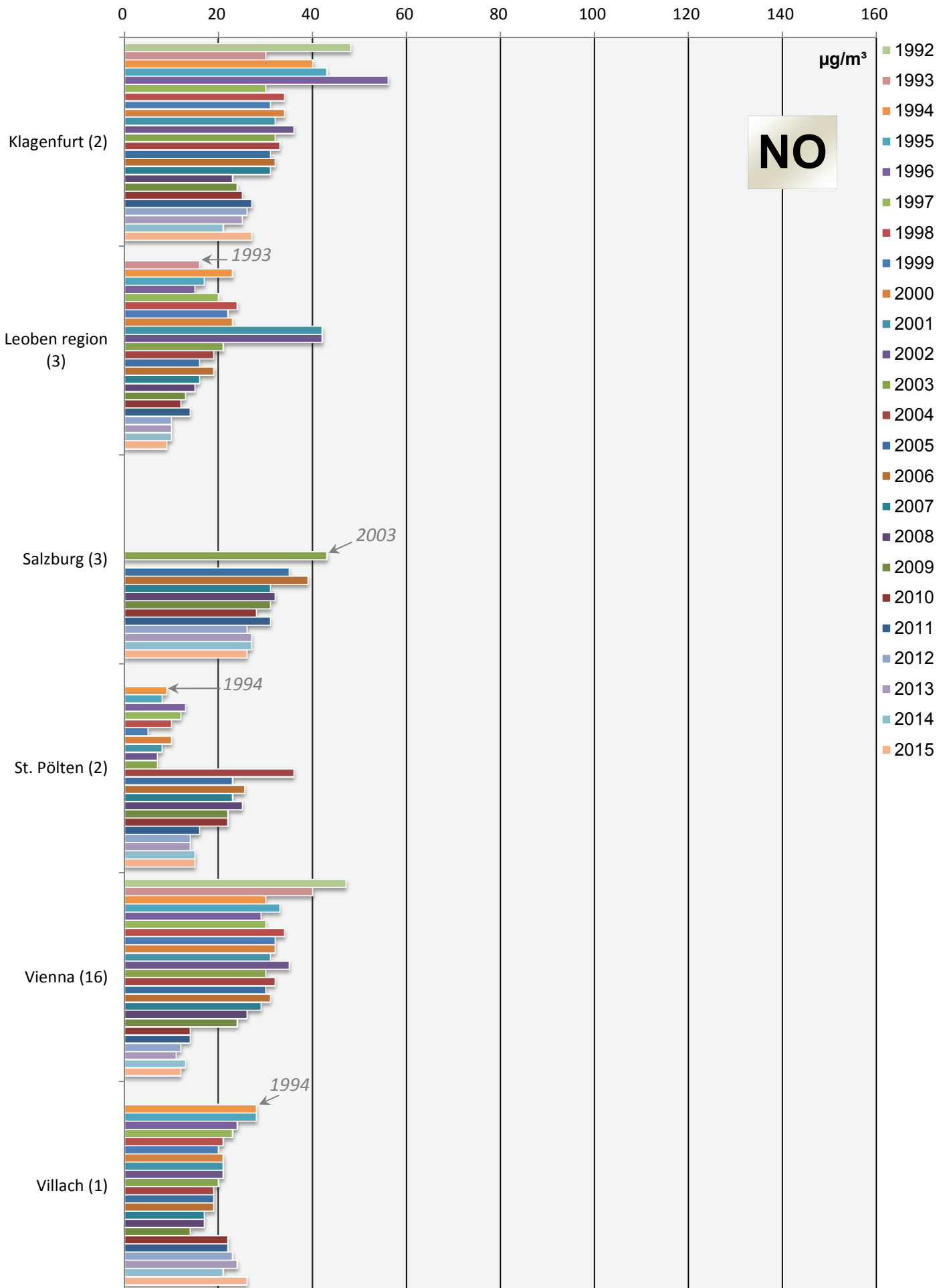
### Annual mean values (mean of all monitoring stations)



NO

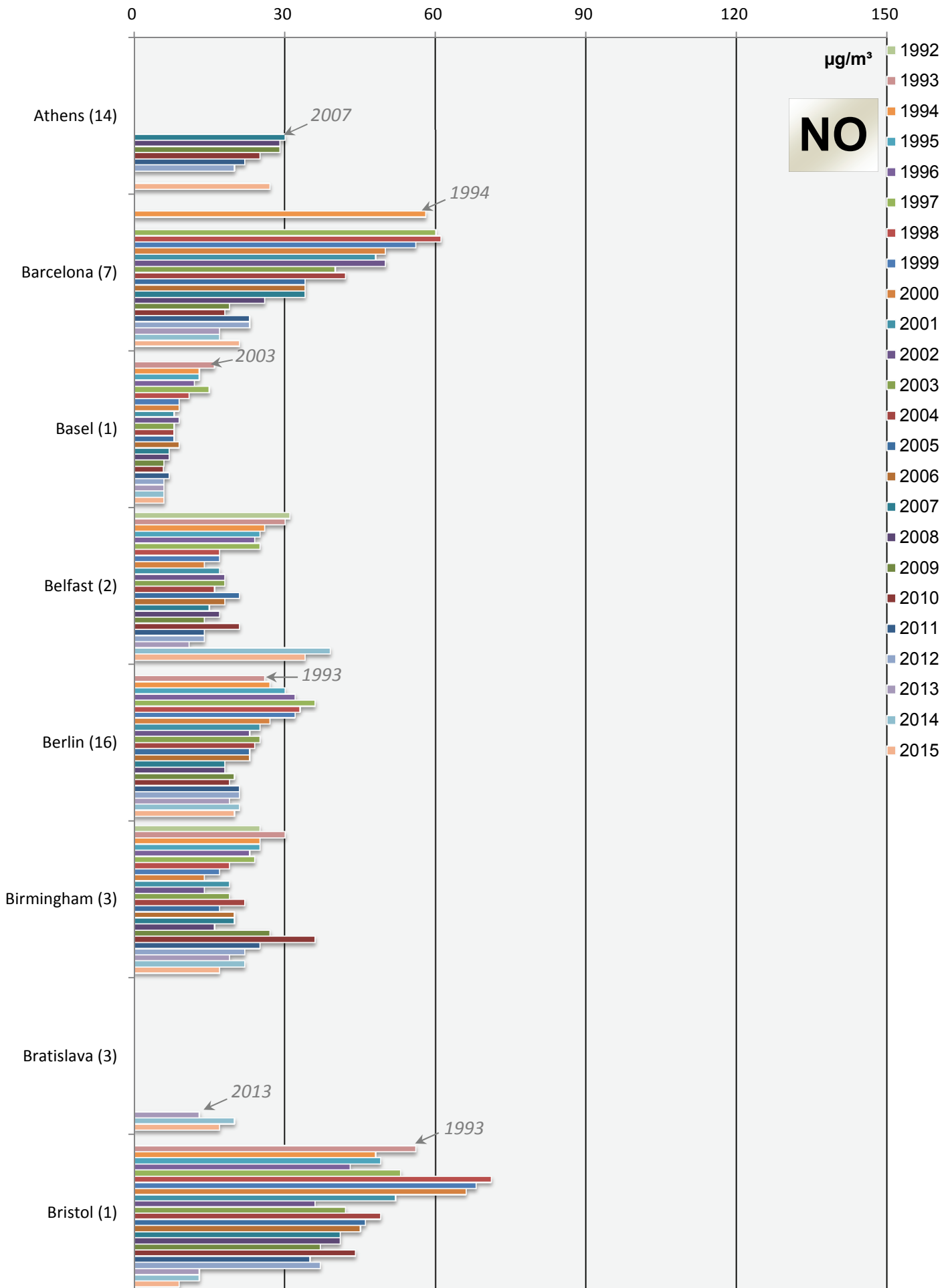
\*) data of the year 2008 are not used for the comparison, because the street near the measurement point was closed for 11 months

## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

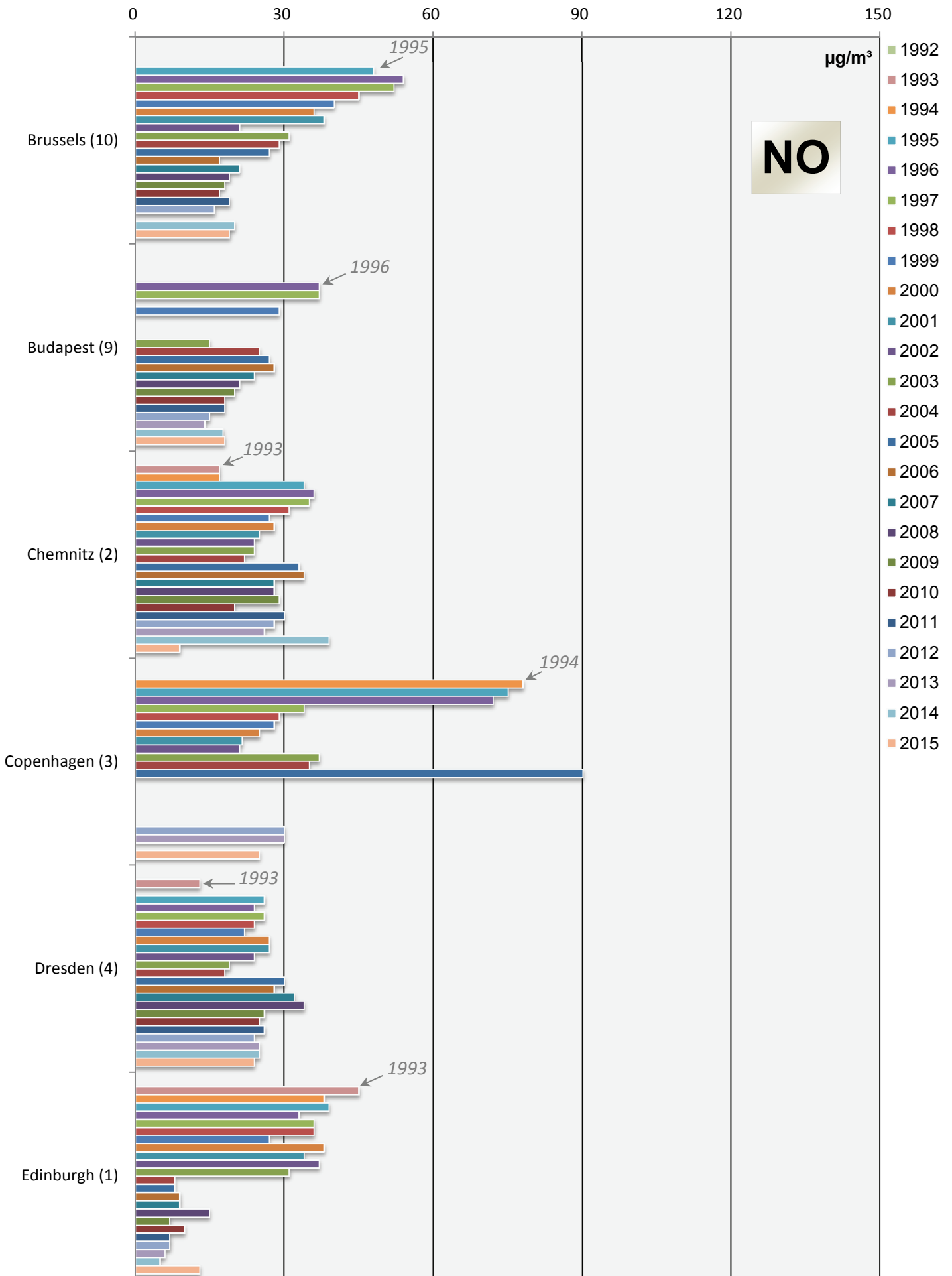


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

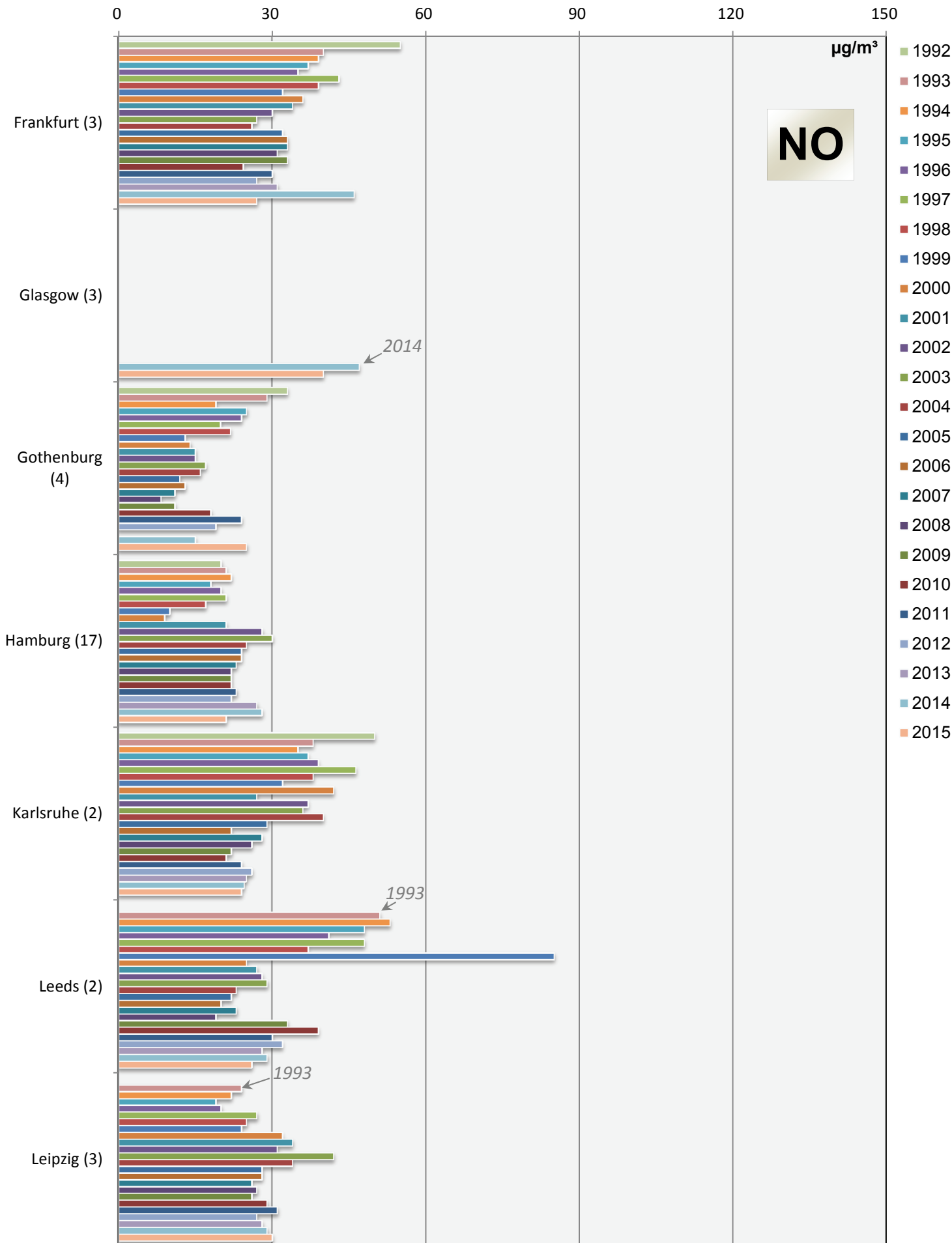


## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



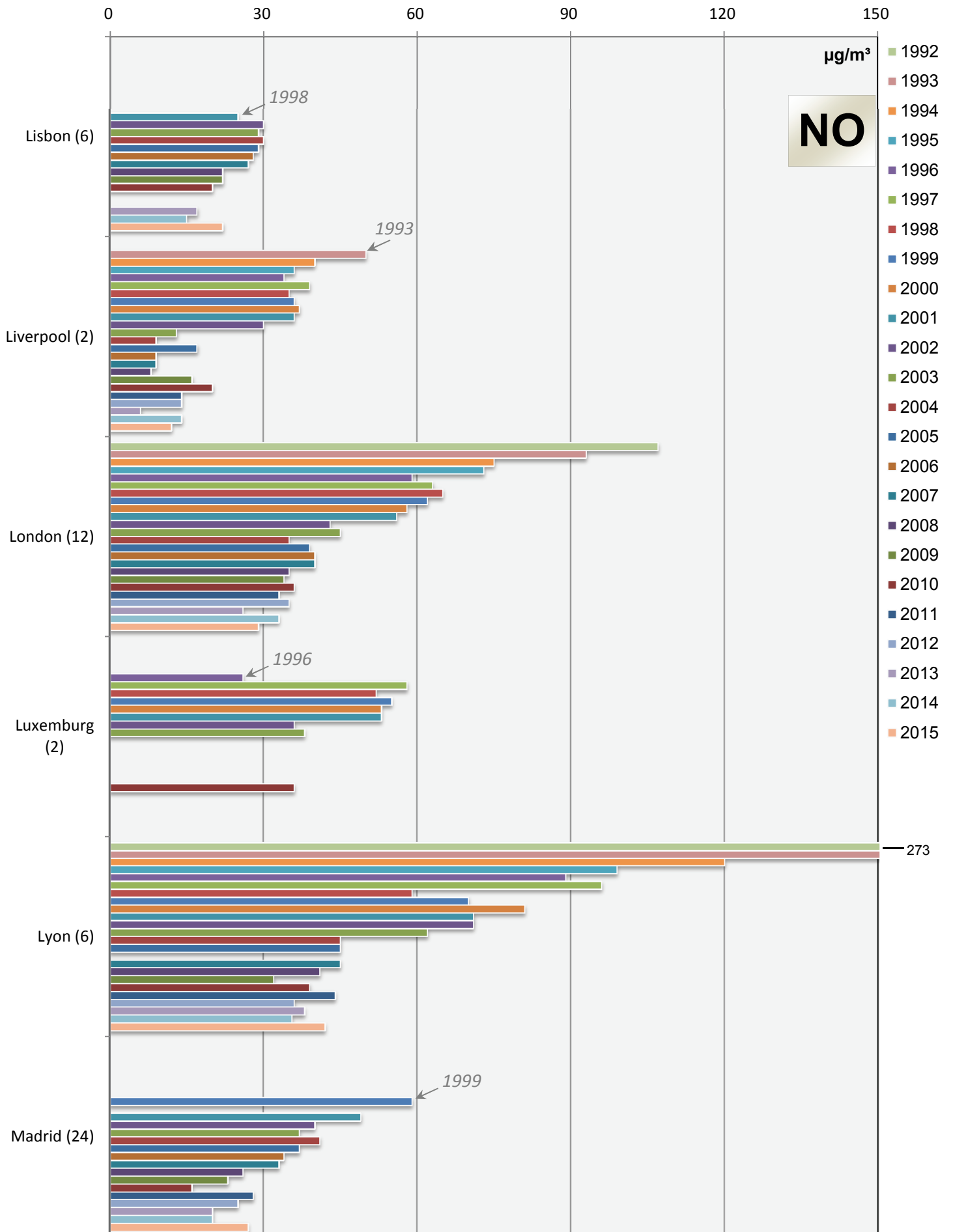
## Comparison of The Air Quality 1992 - 2015

### Annual mean values (mean of all monitoring stations)



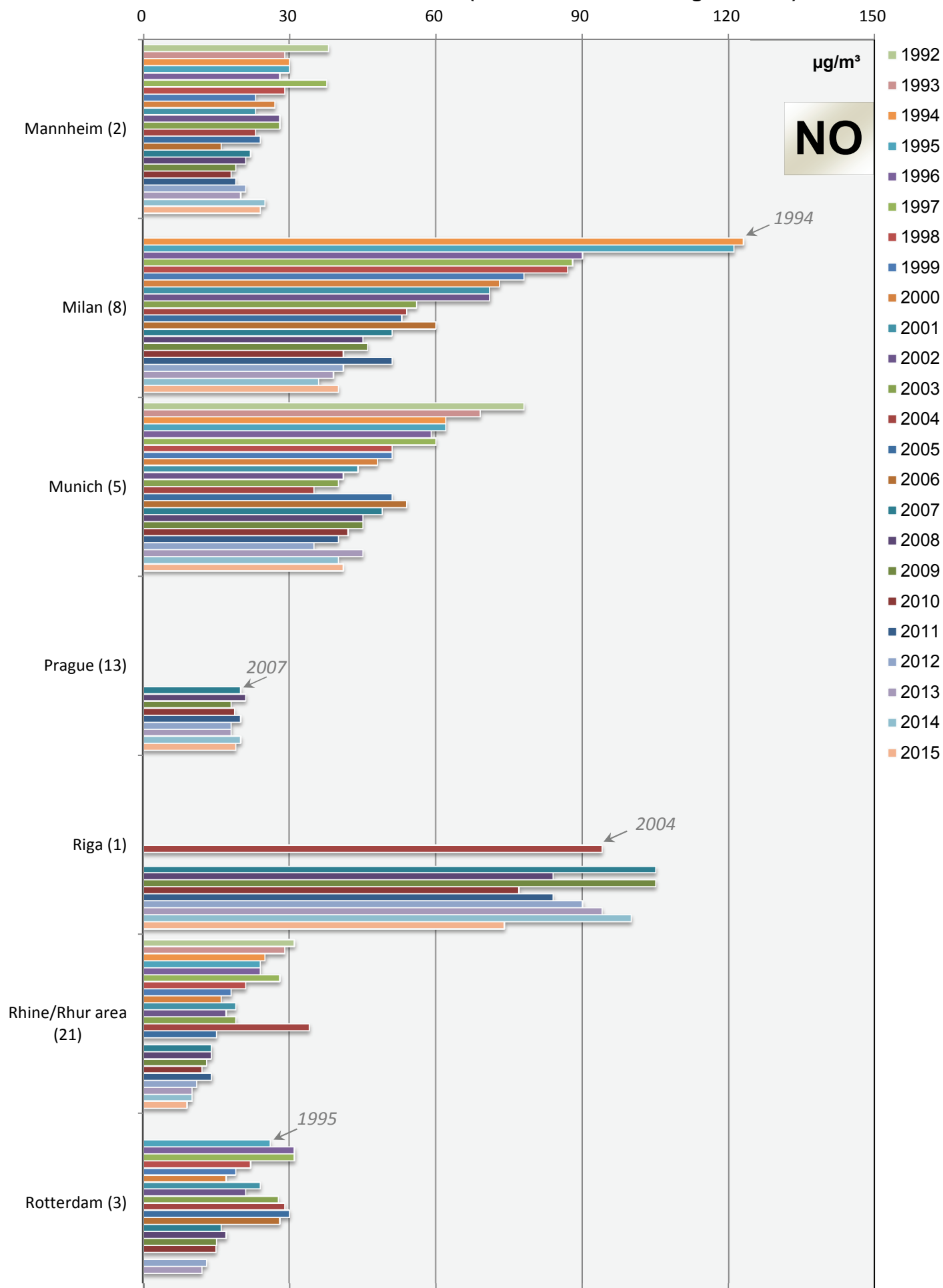
**NO**

## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

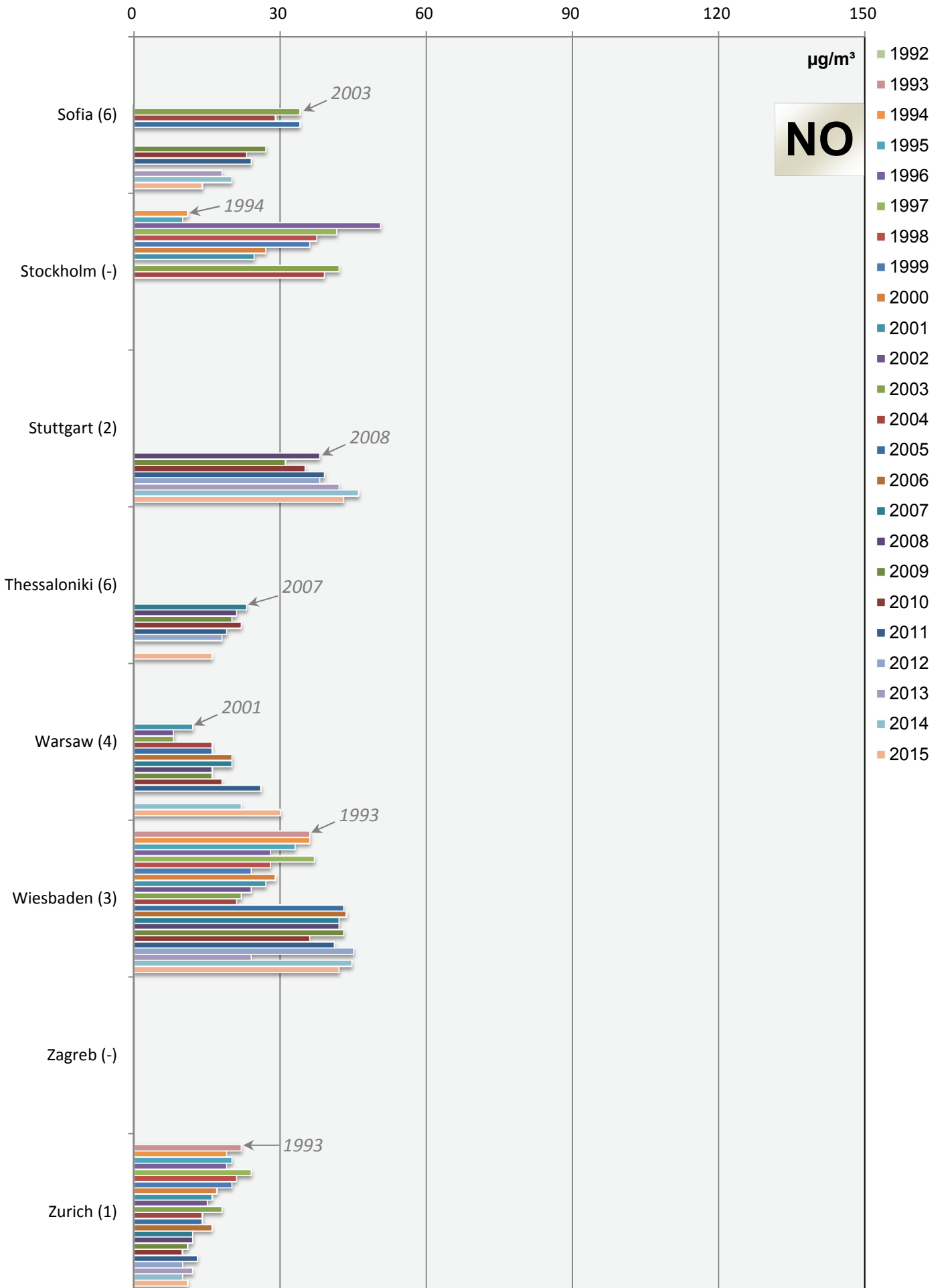




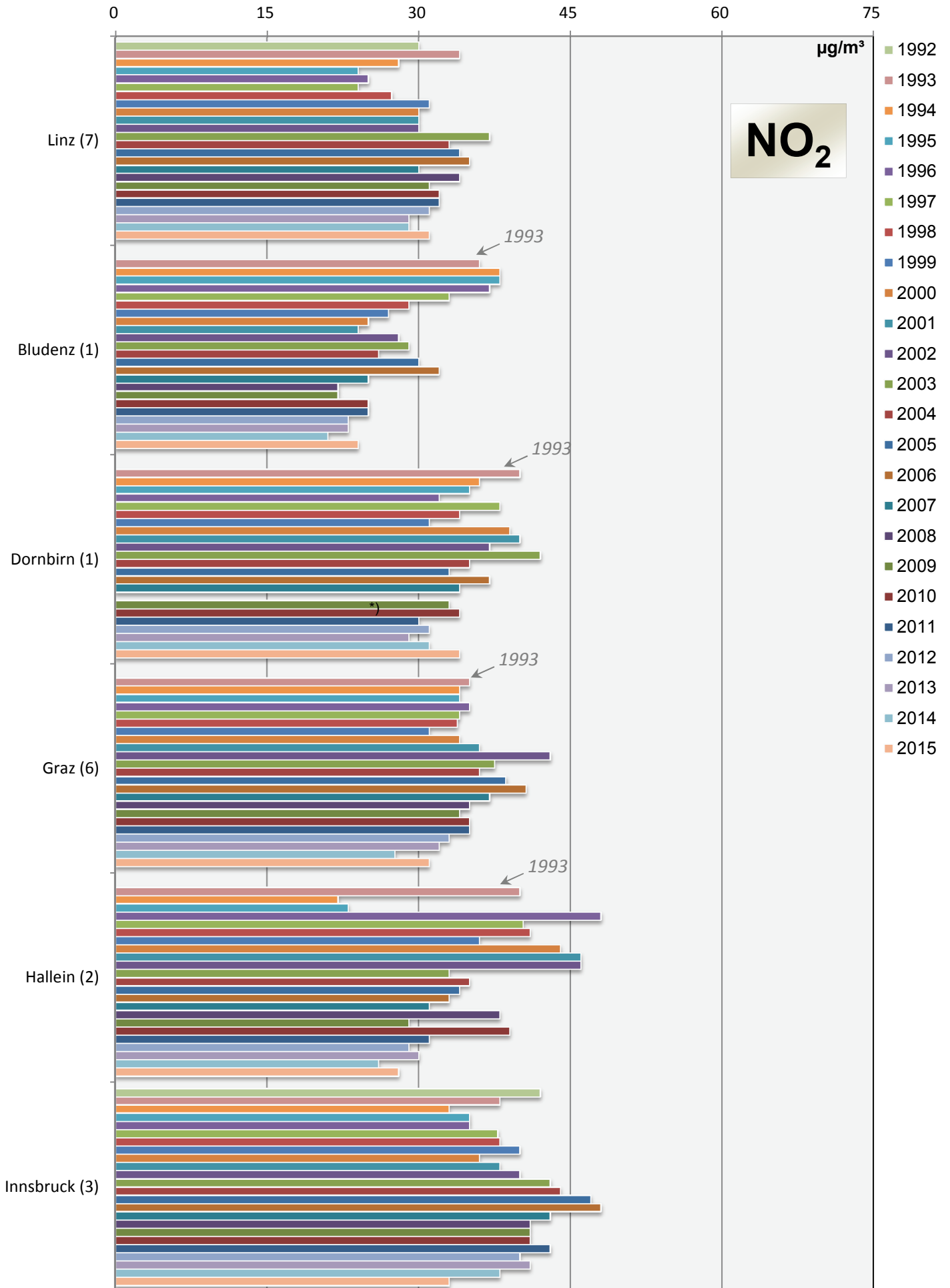
### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

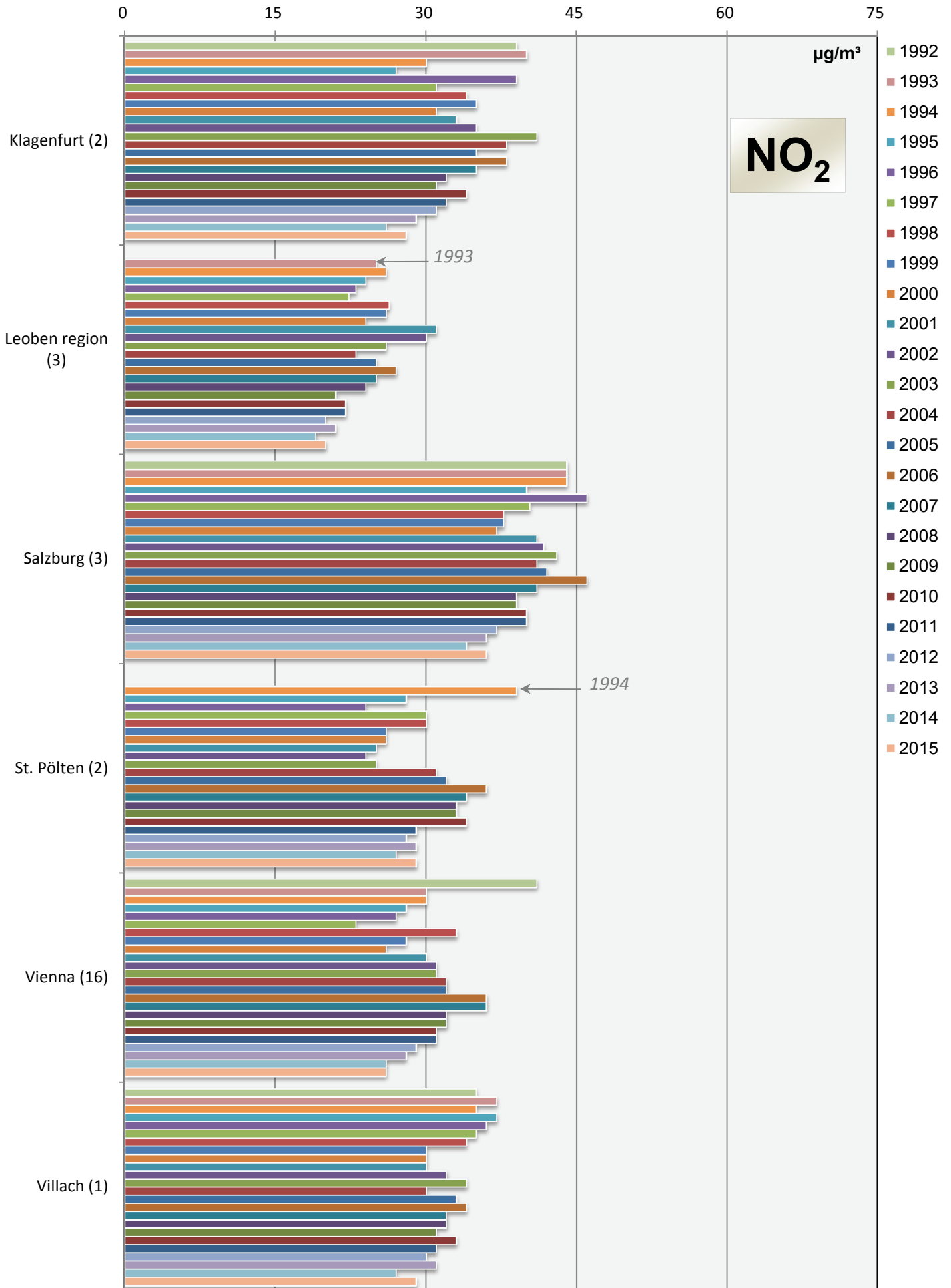


### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



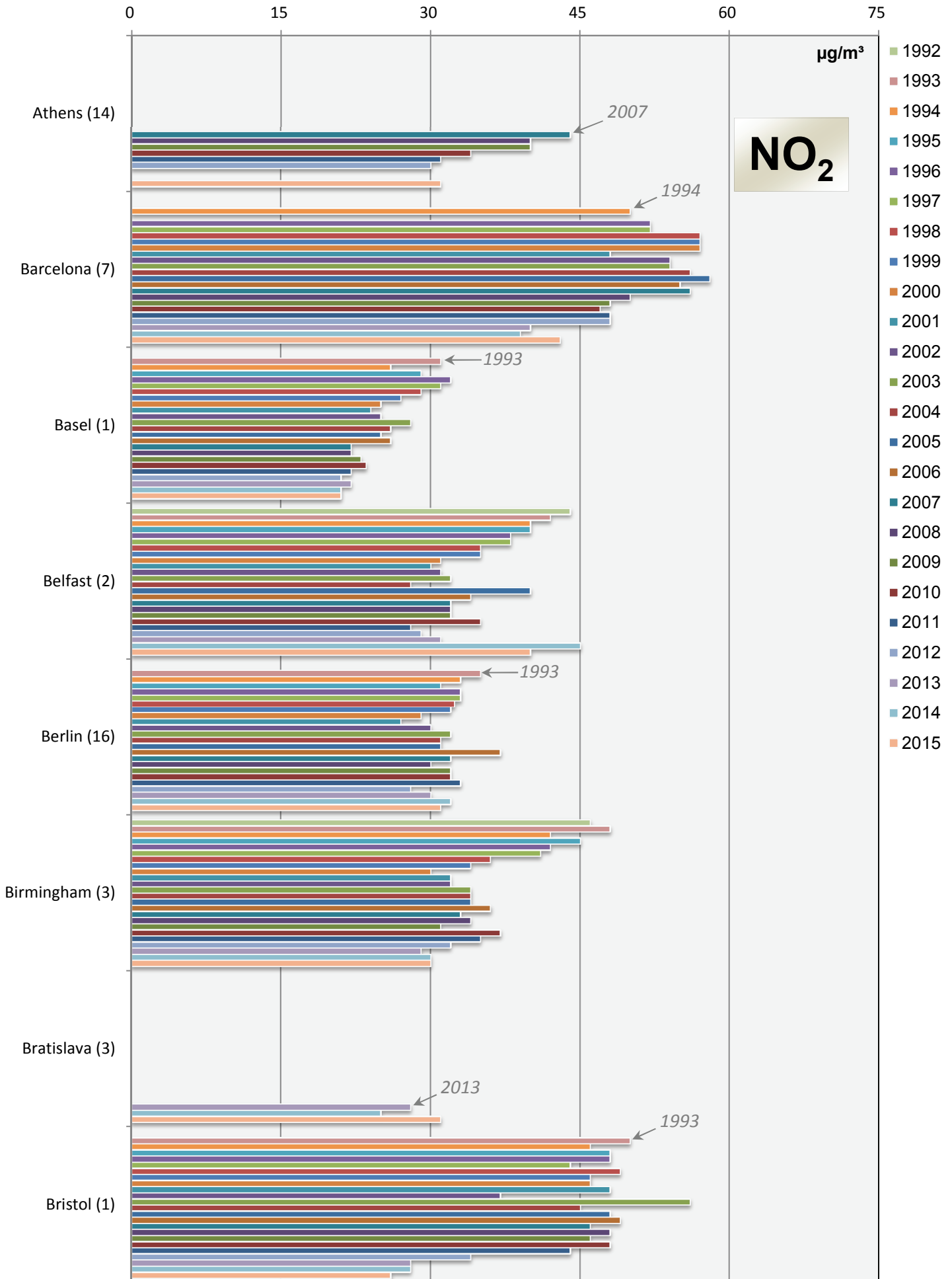
\*) data of the year 2008 are not used for the comparison, because the street near the measurement point was closed for 11 months

### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

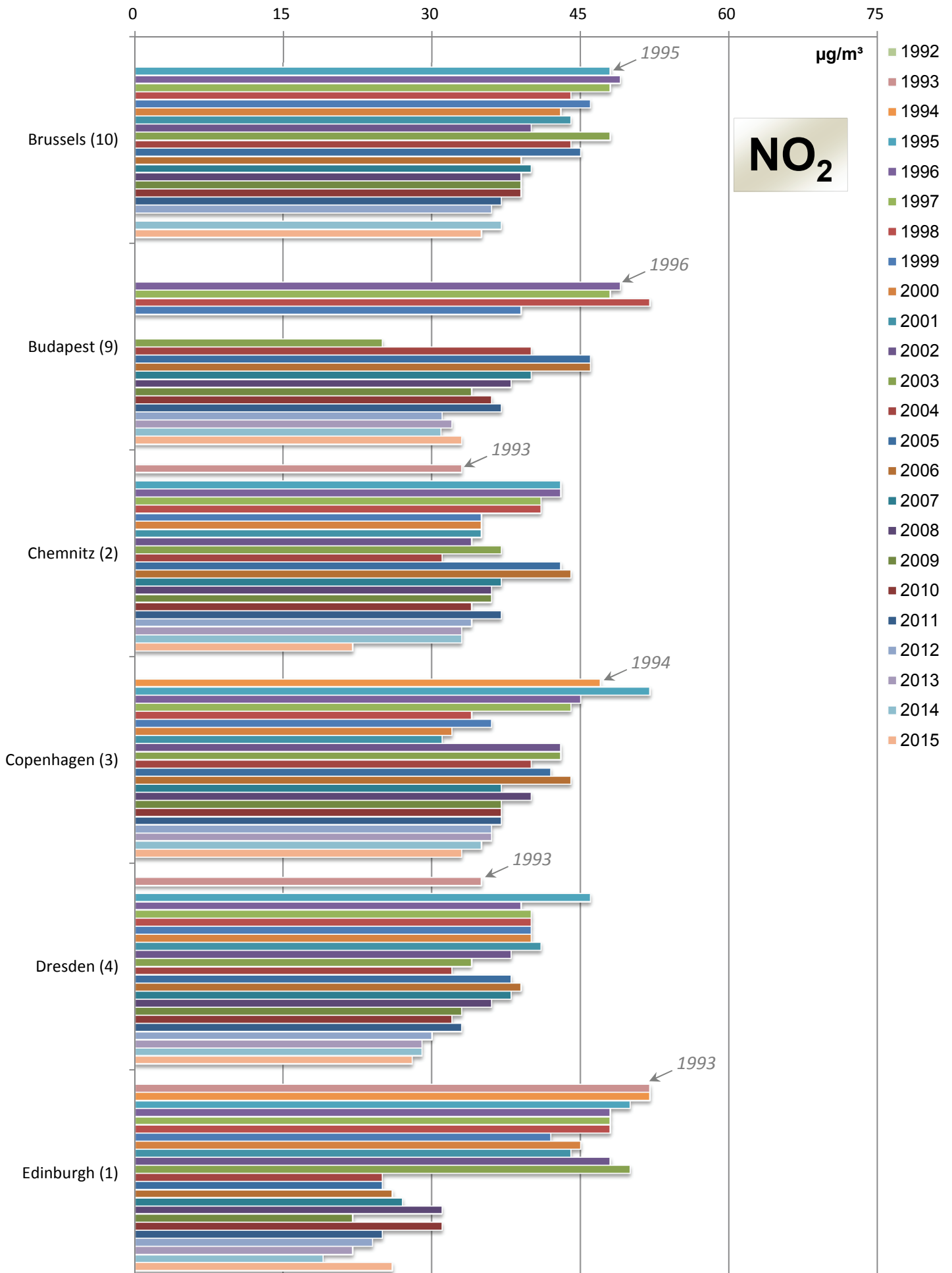


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

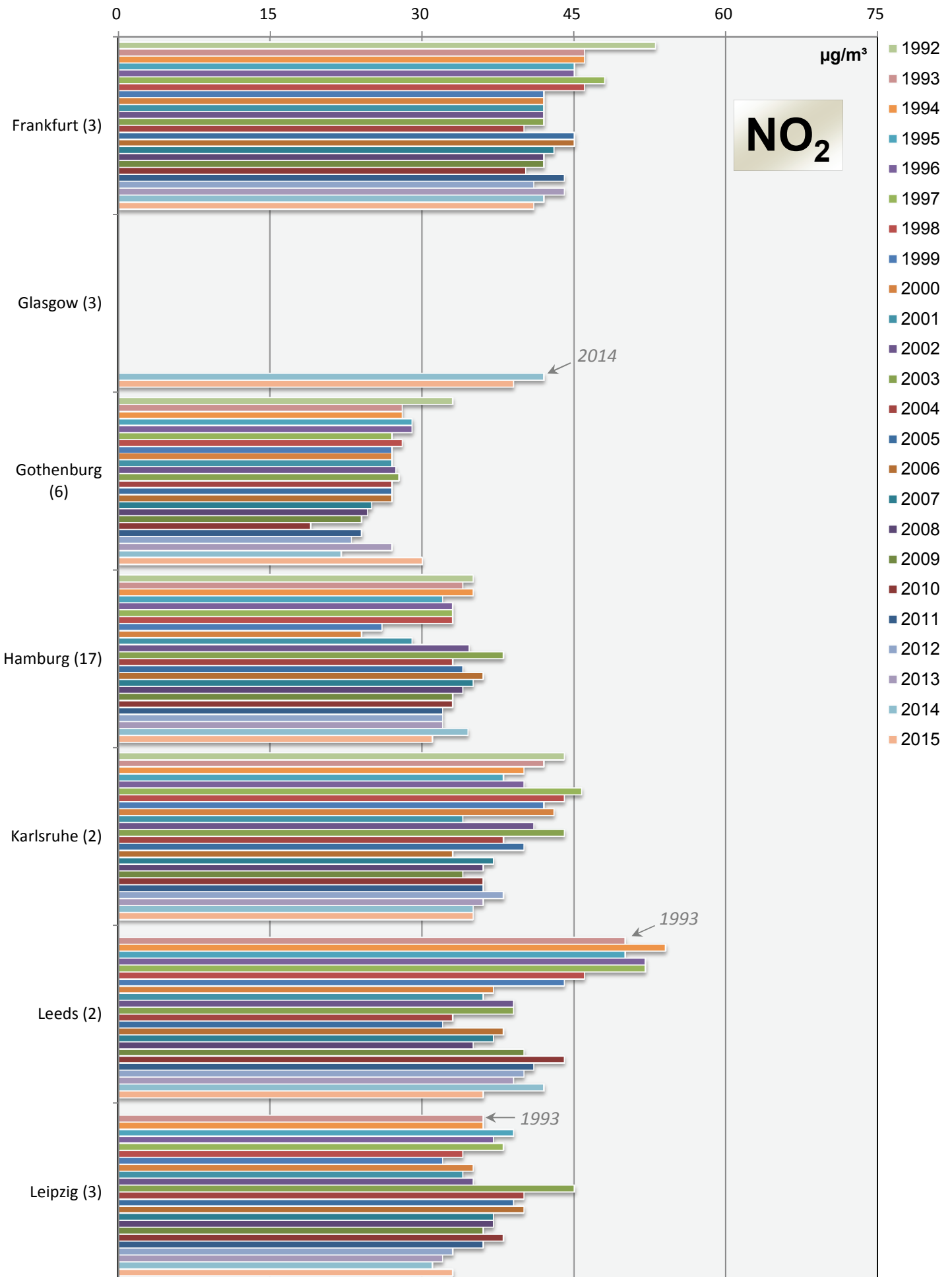


### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



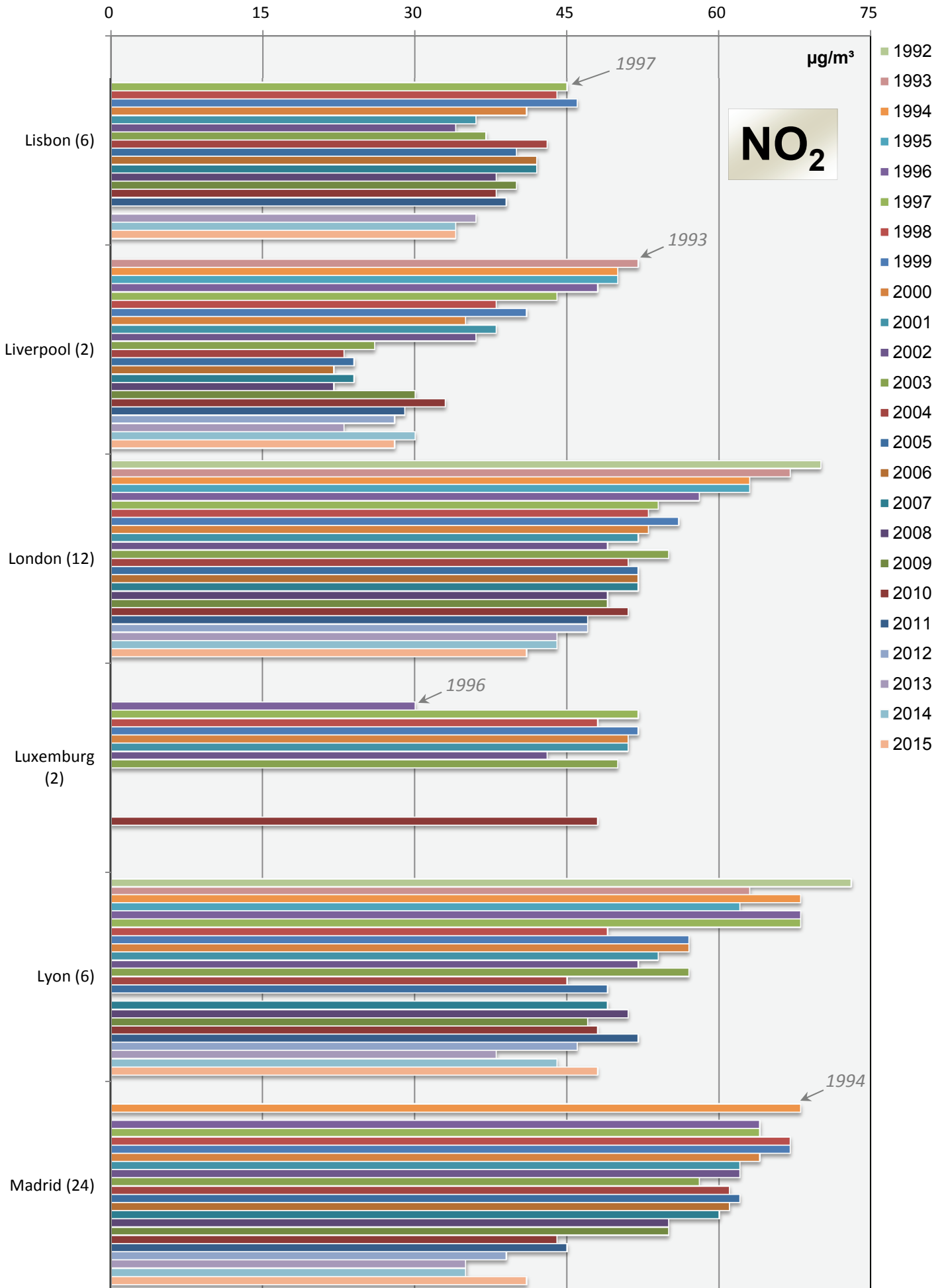
# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)



# Comparison of The Air Quality 1992 - 2015

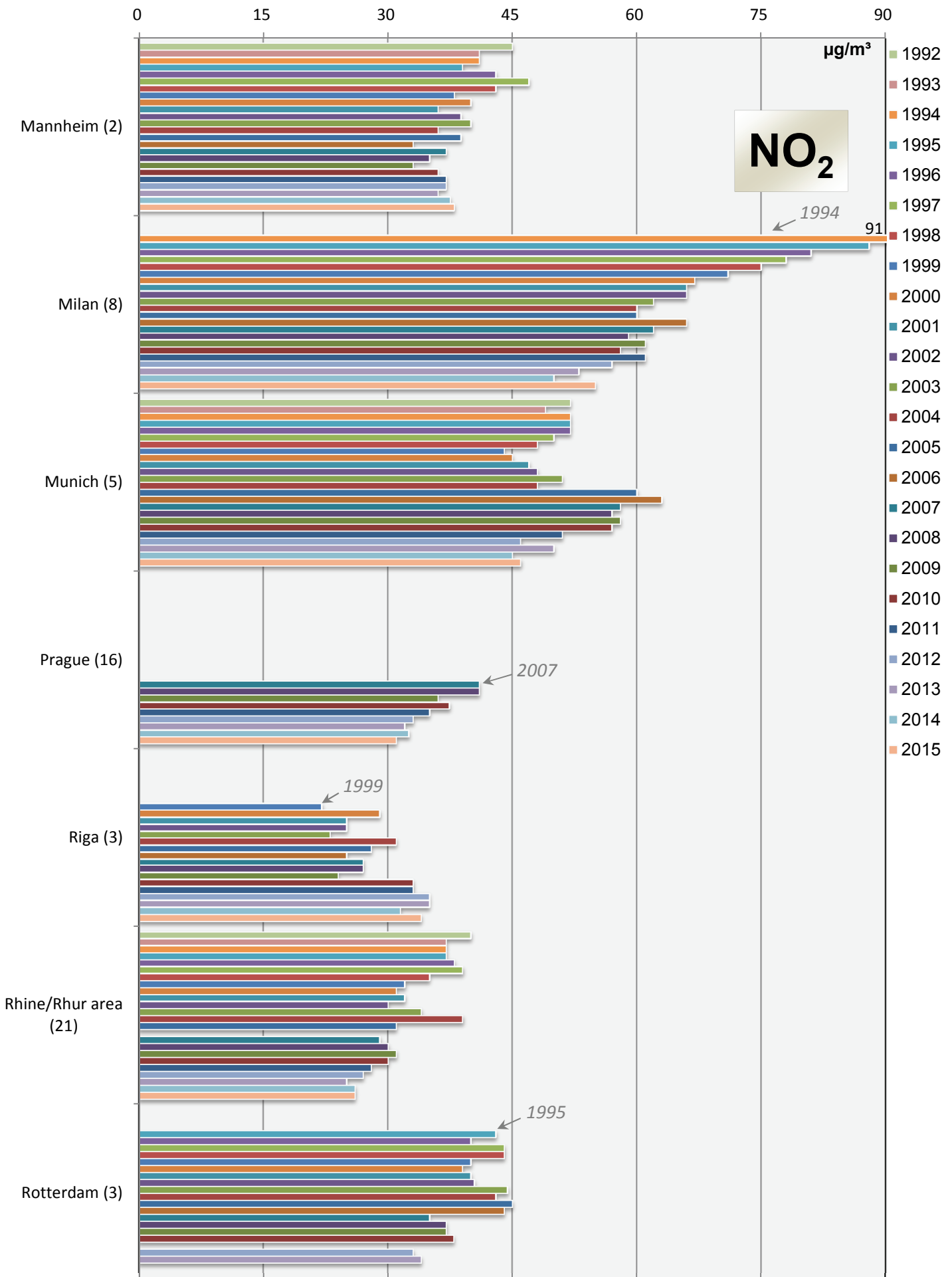
## Annual mean values (mean of all monitoring stations)





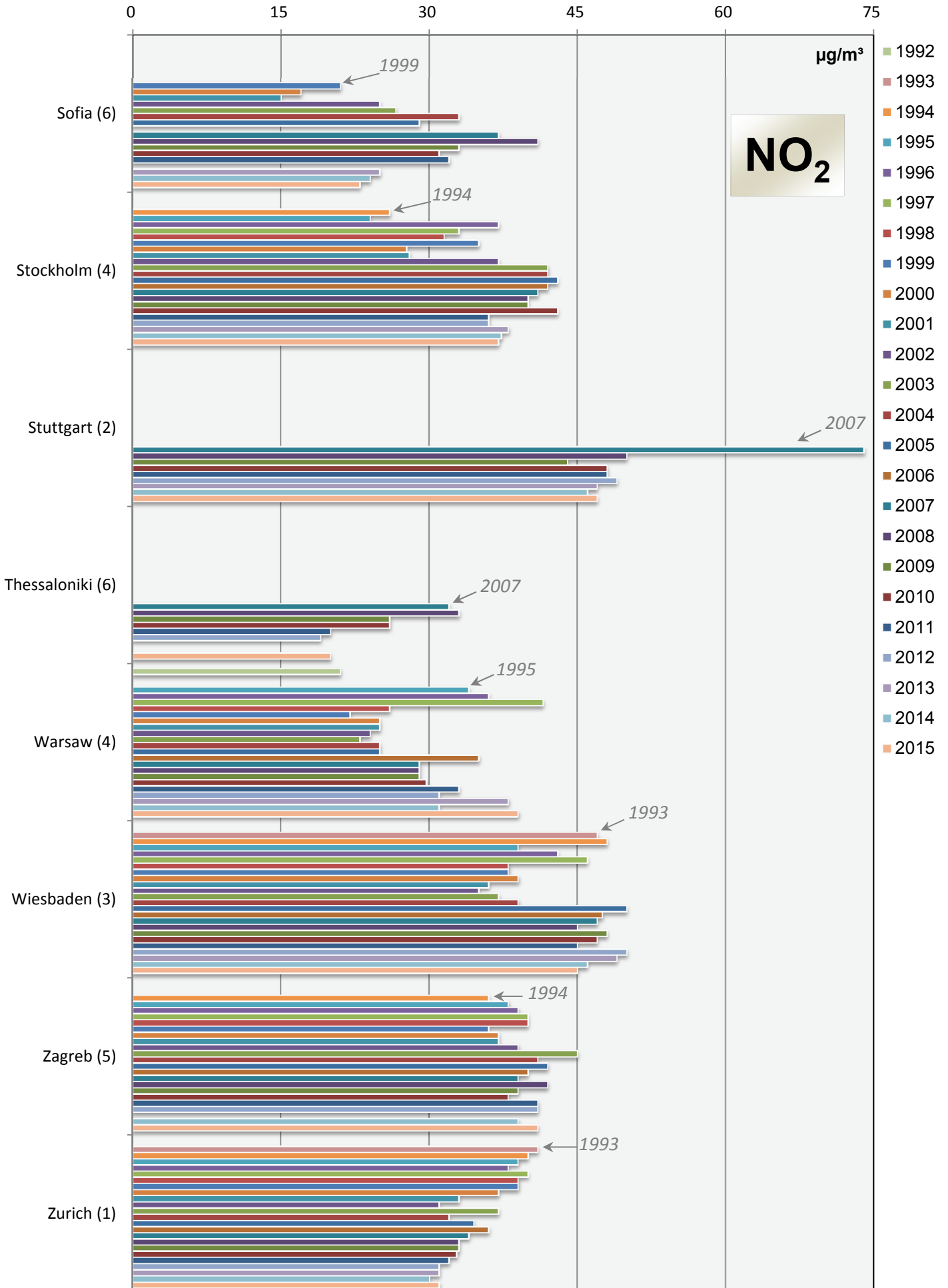
# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

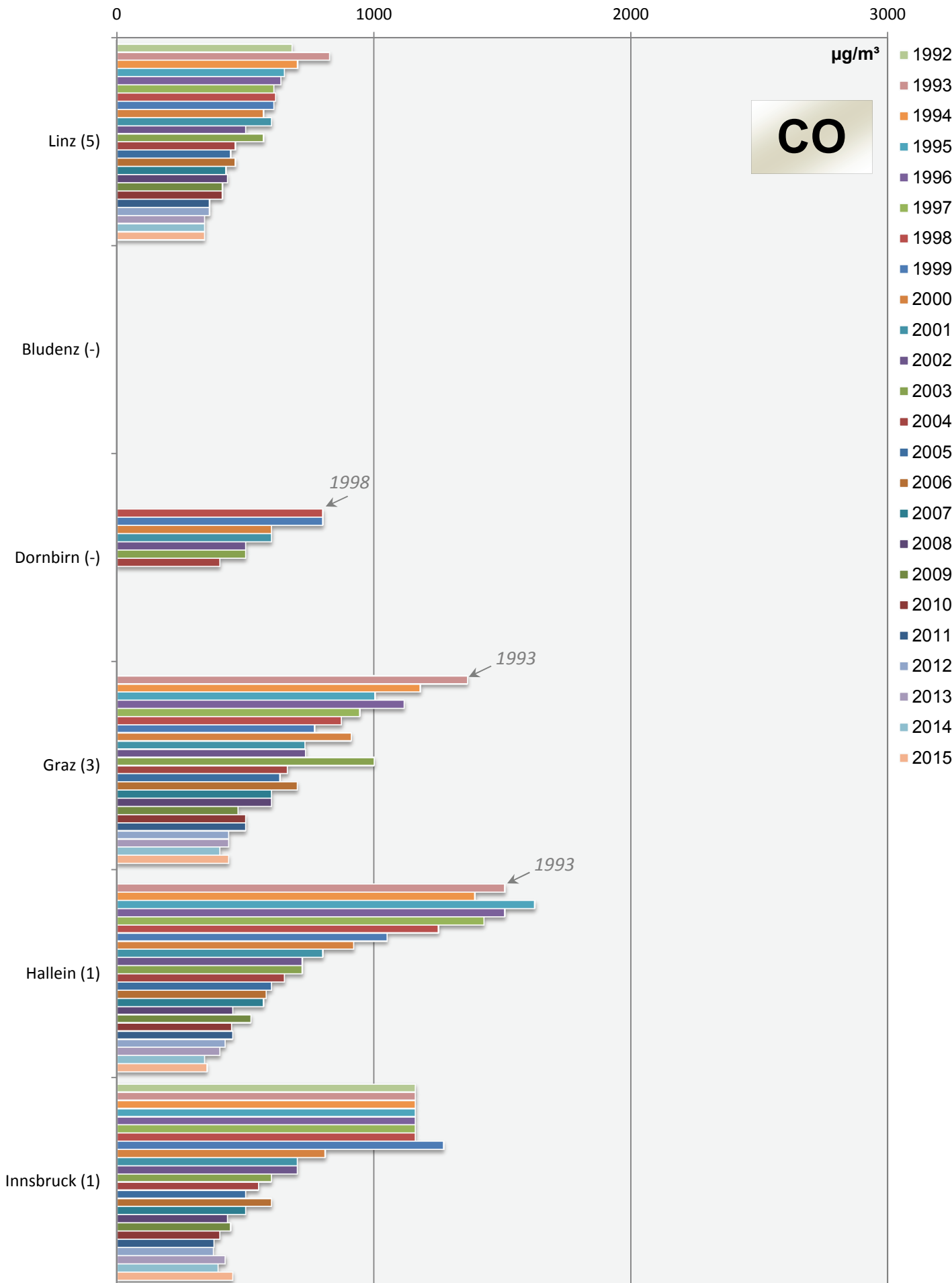


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

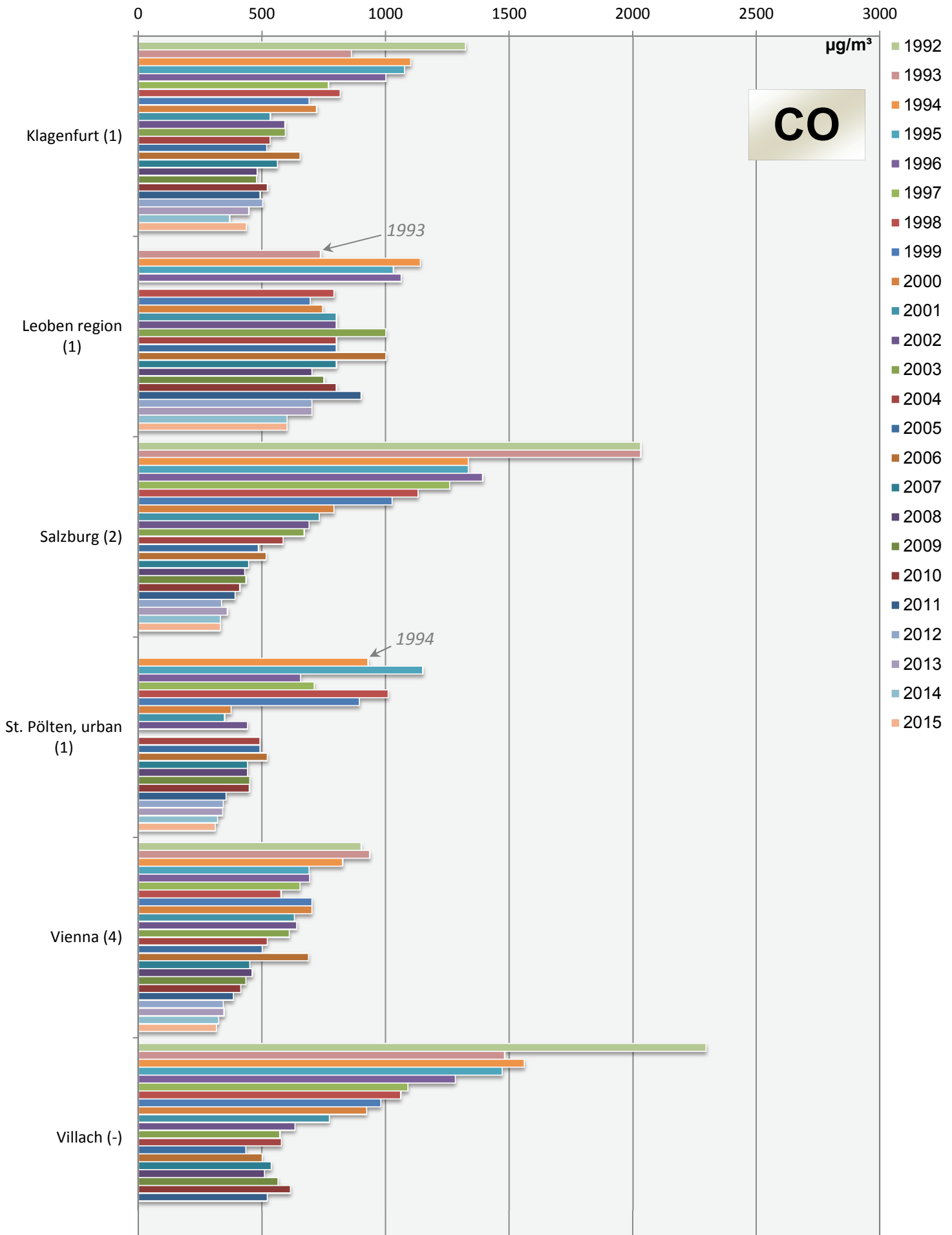


### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

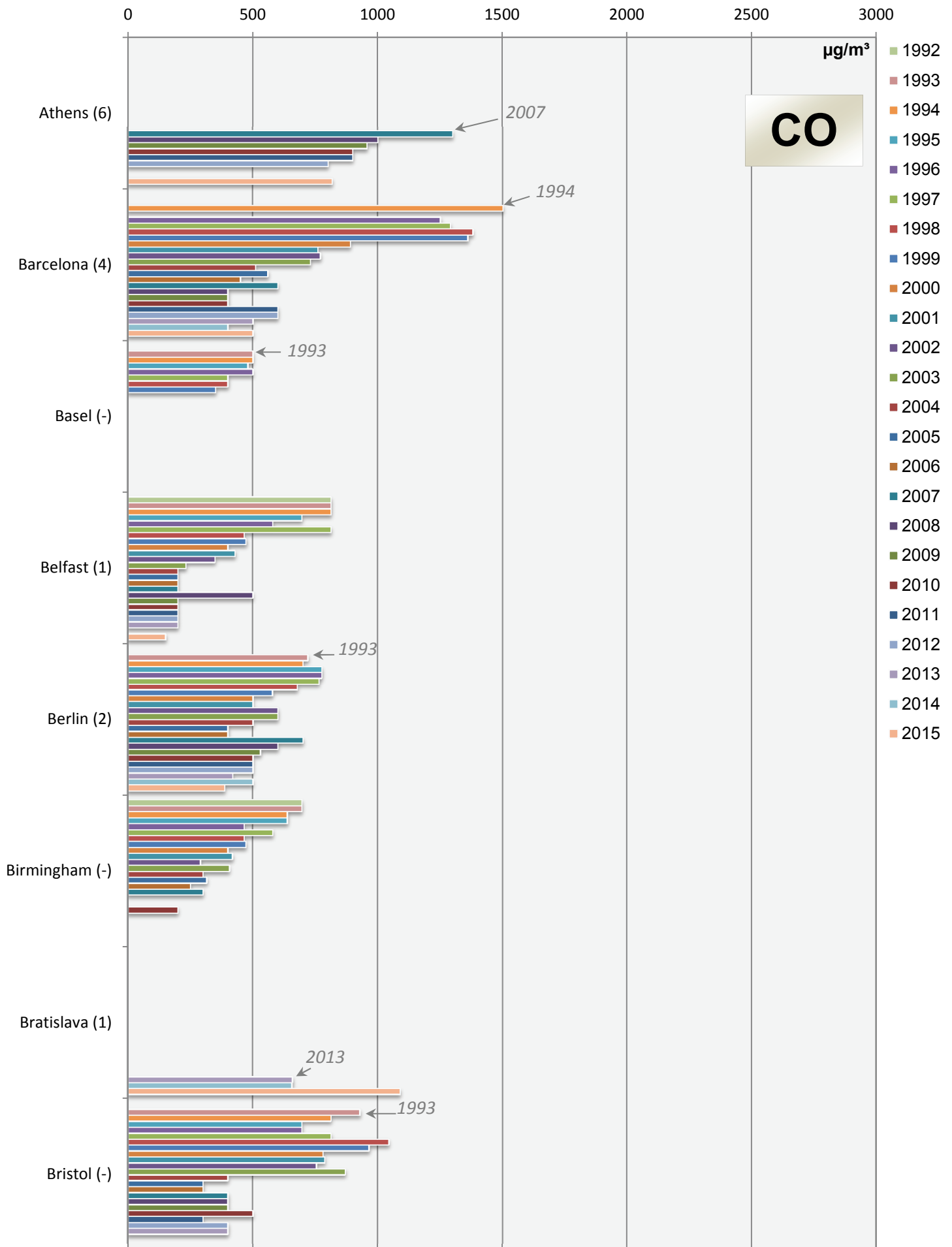


# Comparison of The Air Quality 1992 - 2015

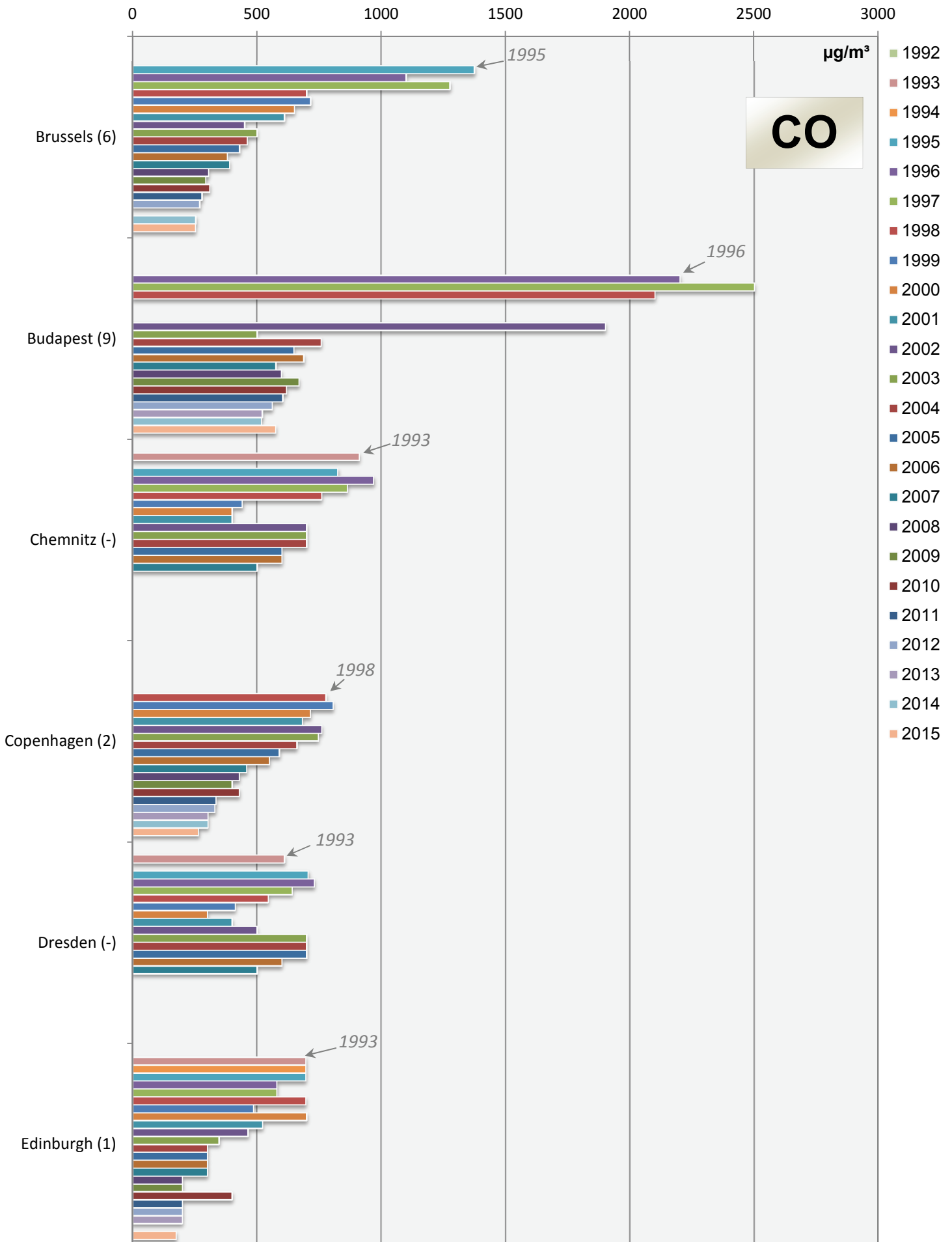
## Annual mean values (mean of all monitoring stations)



### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

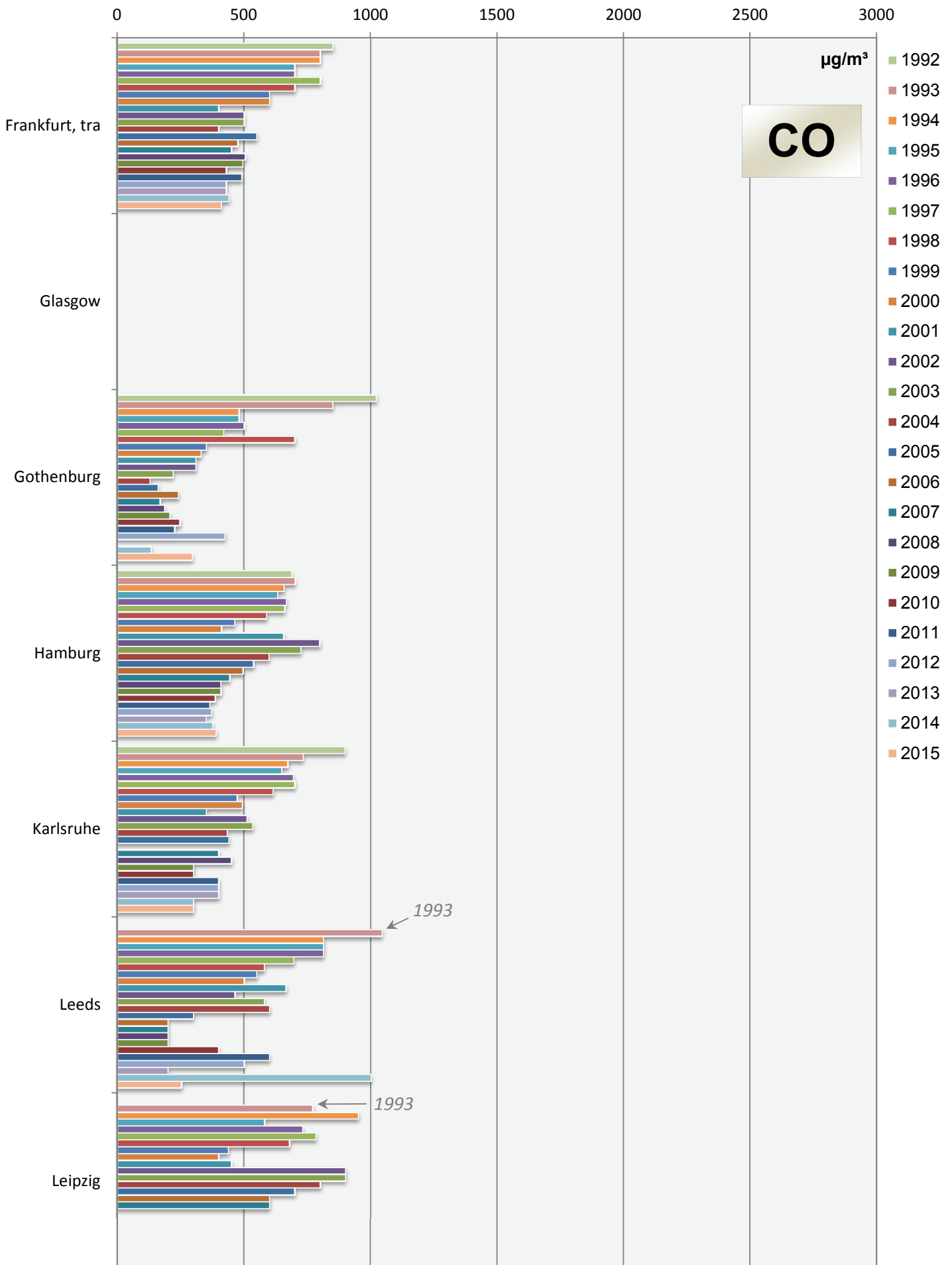


## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

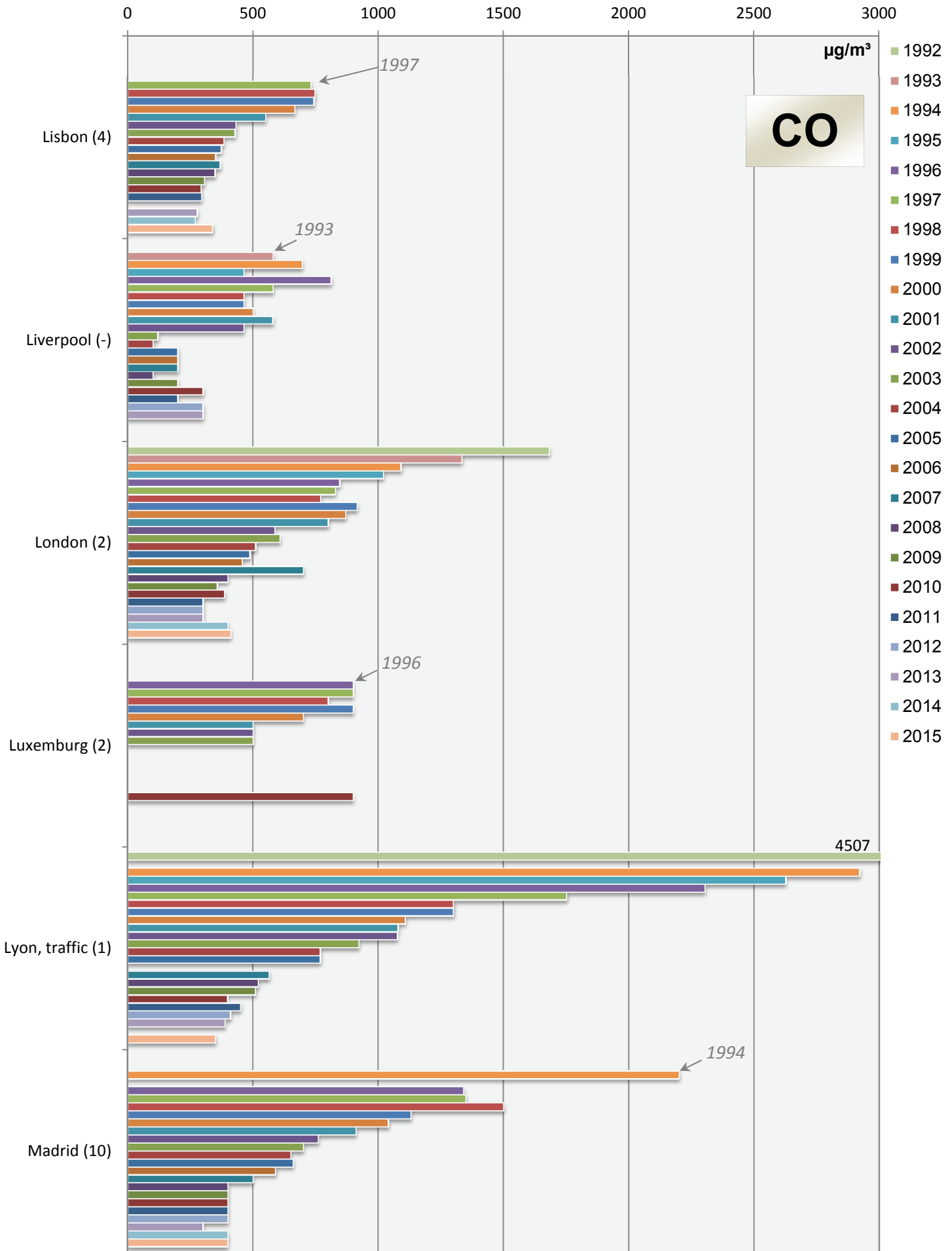


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)

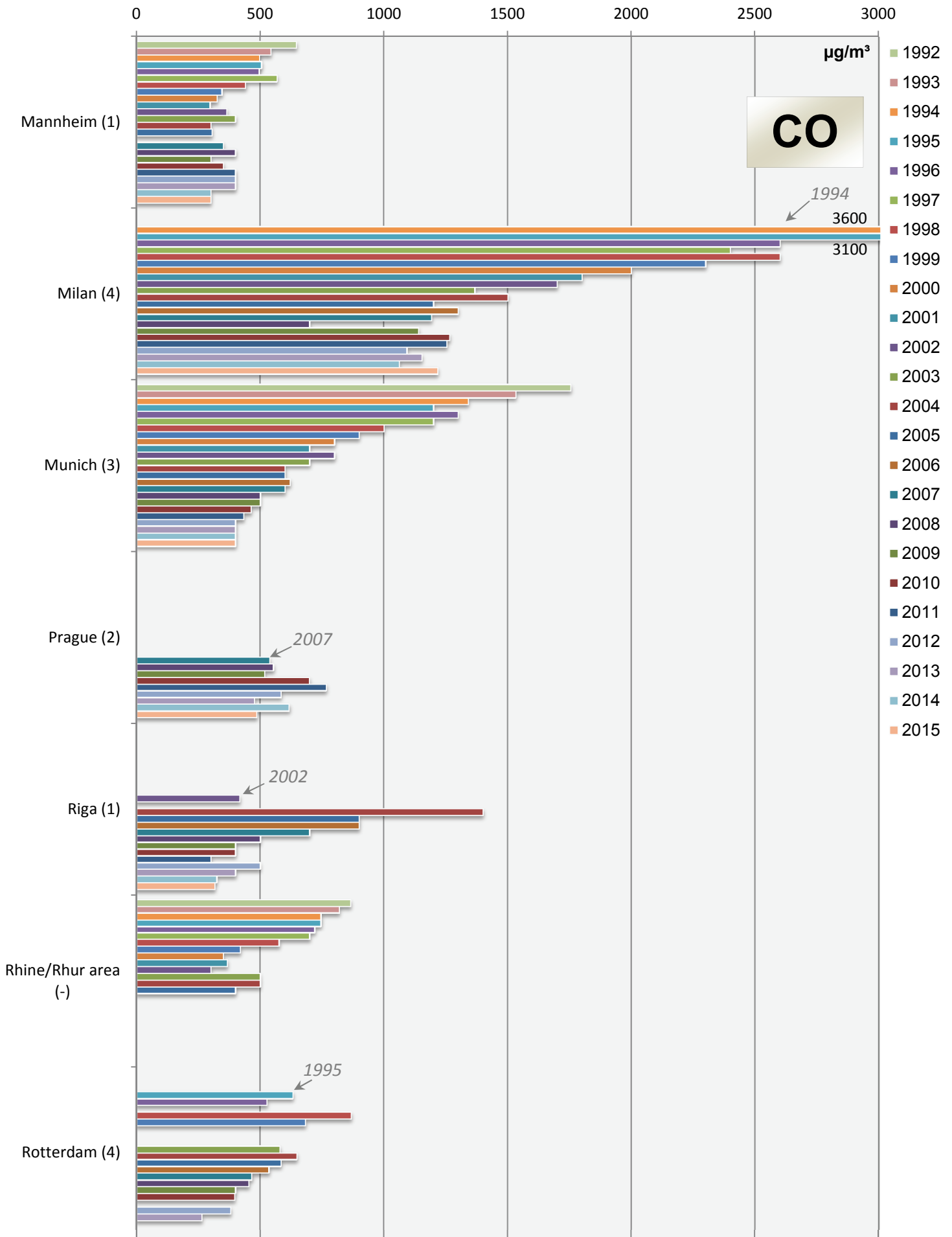


### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

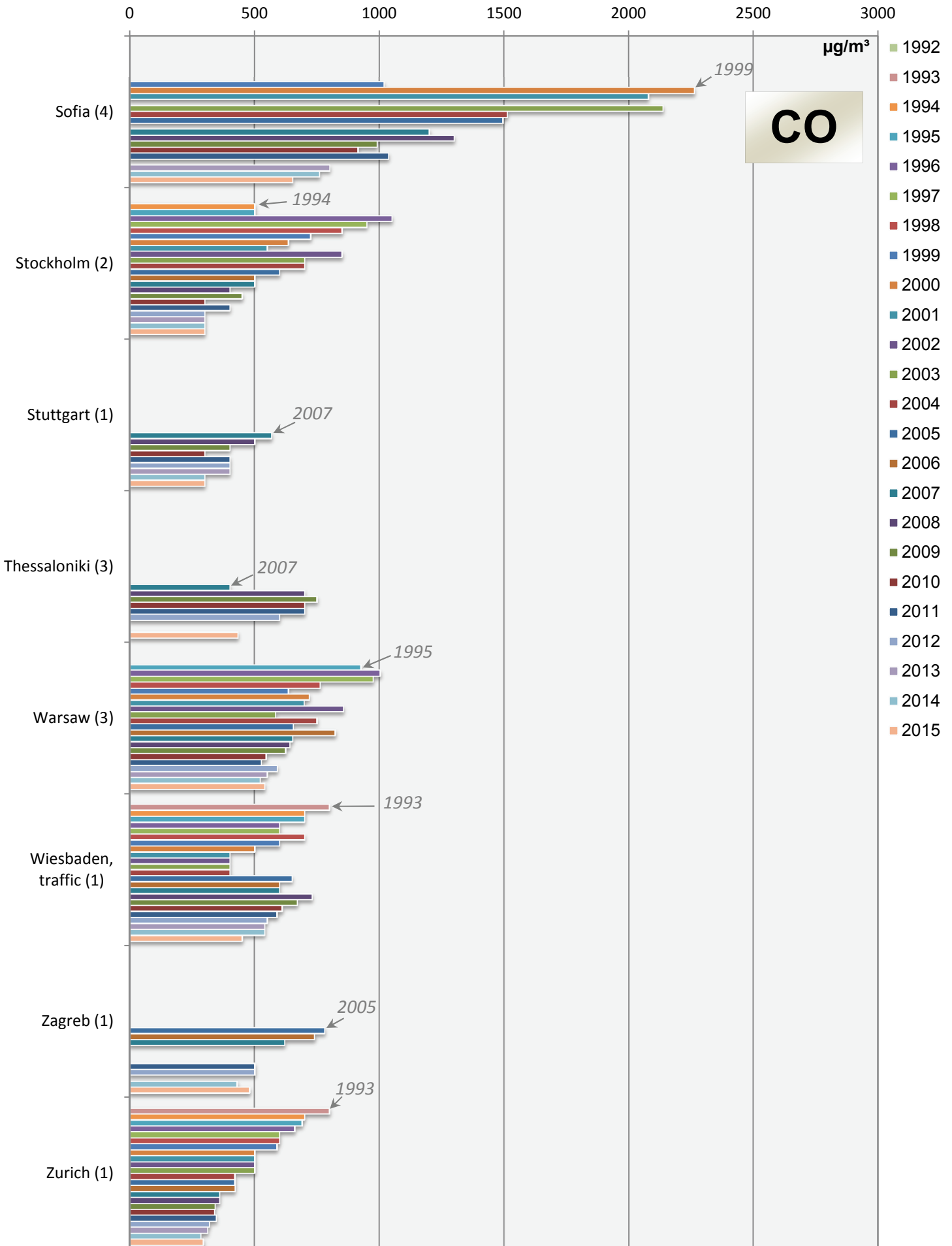




## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)

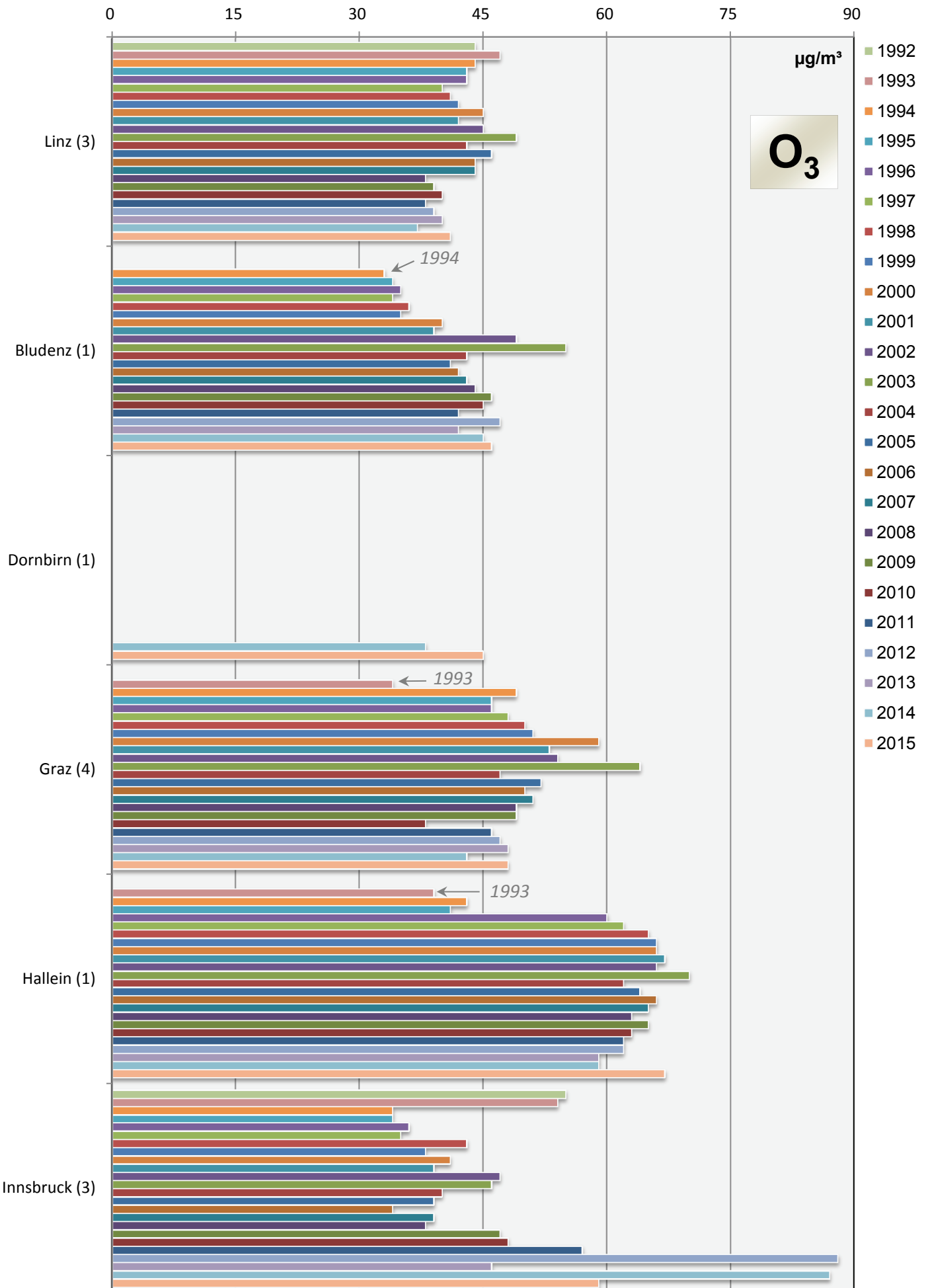


### Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



# Comparison of The Air Quality 1992 - 2015

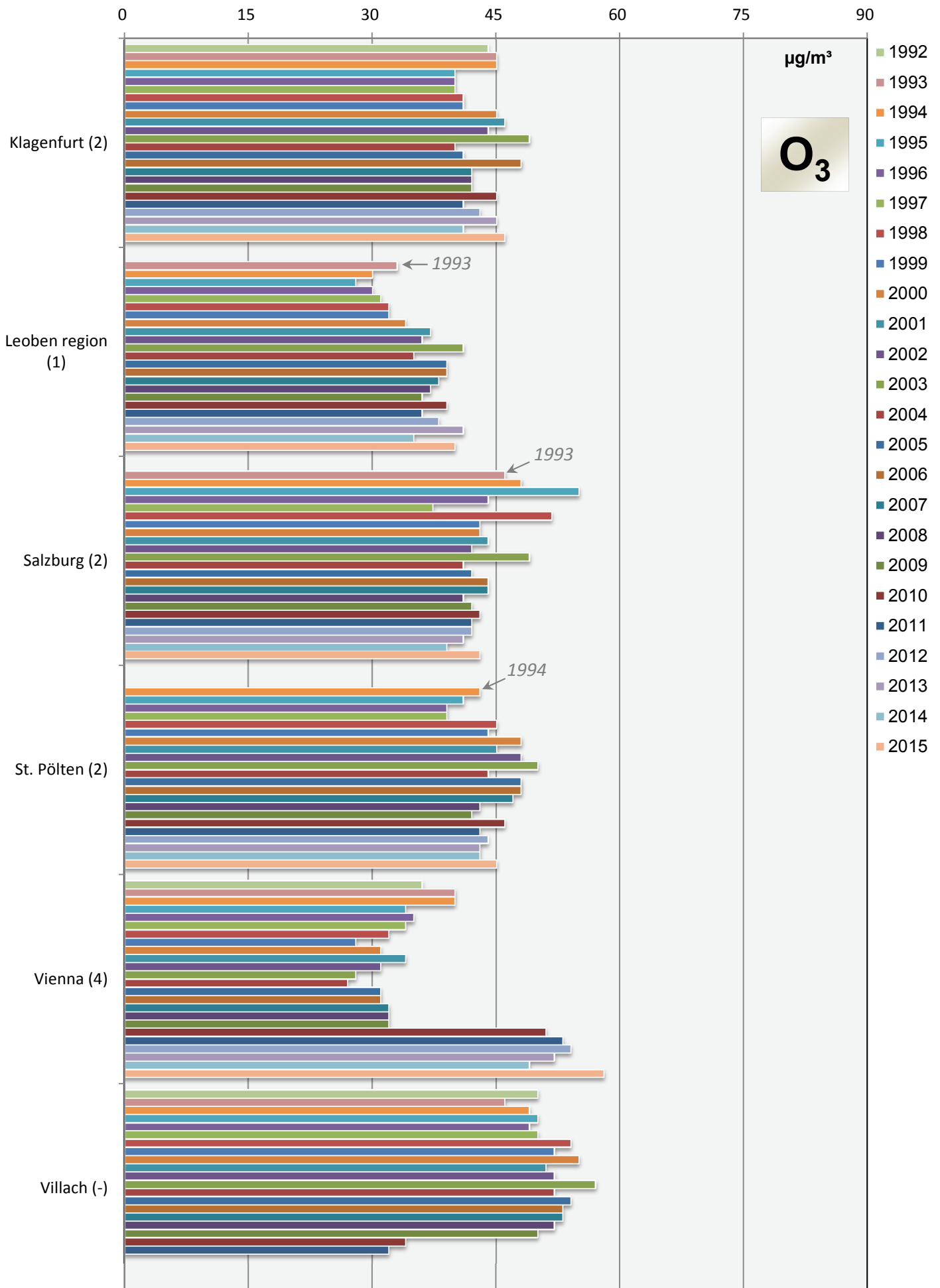
## Annual mean values (mean of all monitoring stations)



# Comparison of The Air Quality 1992 - 2015

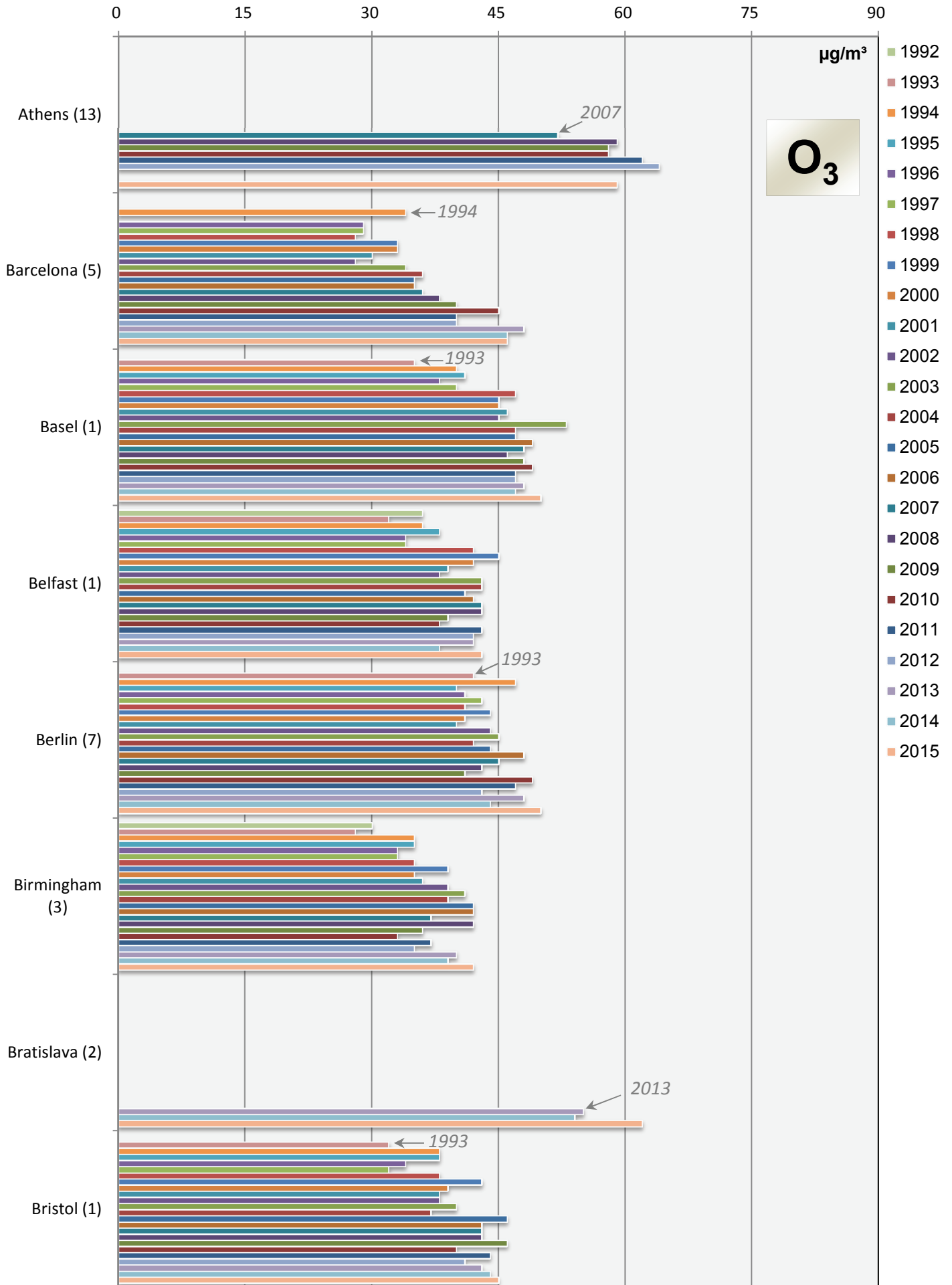
## Annual mean values (mean of all monitoring stations)

108



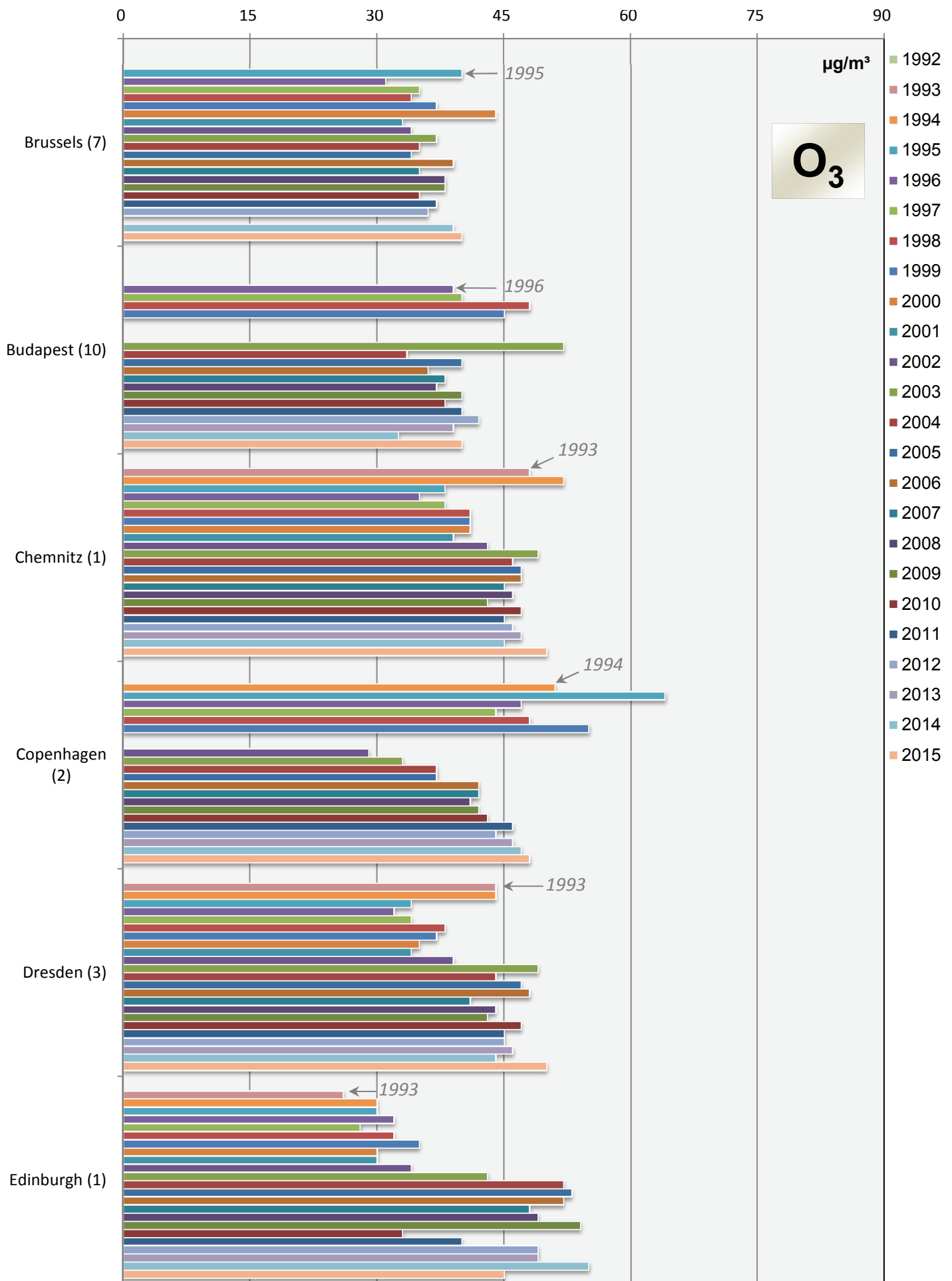
# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)



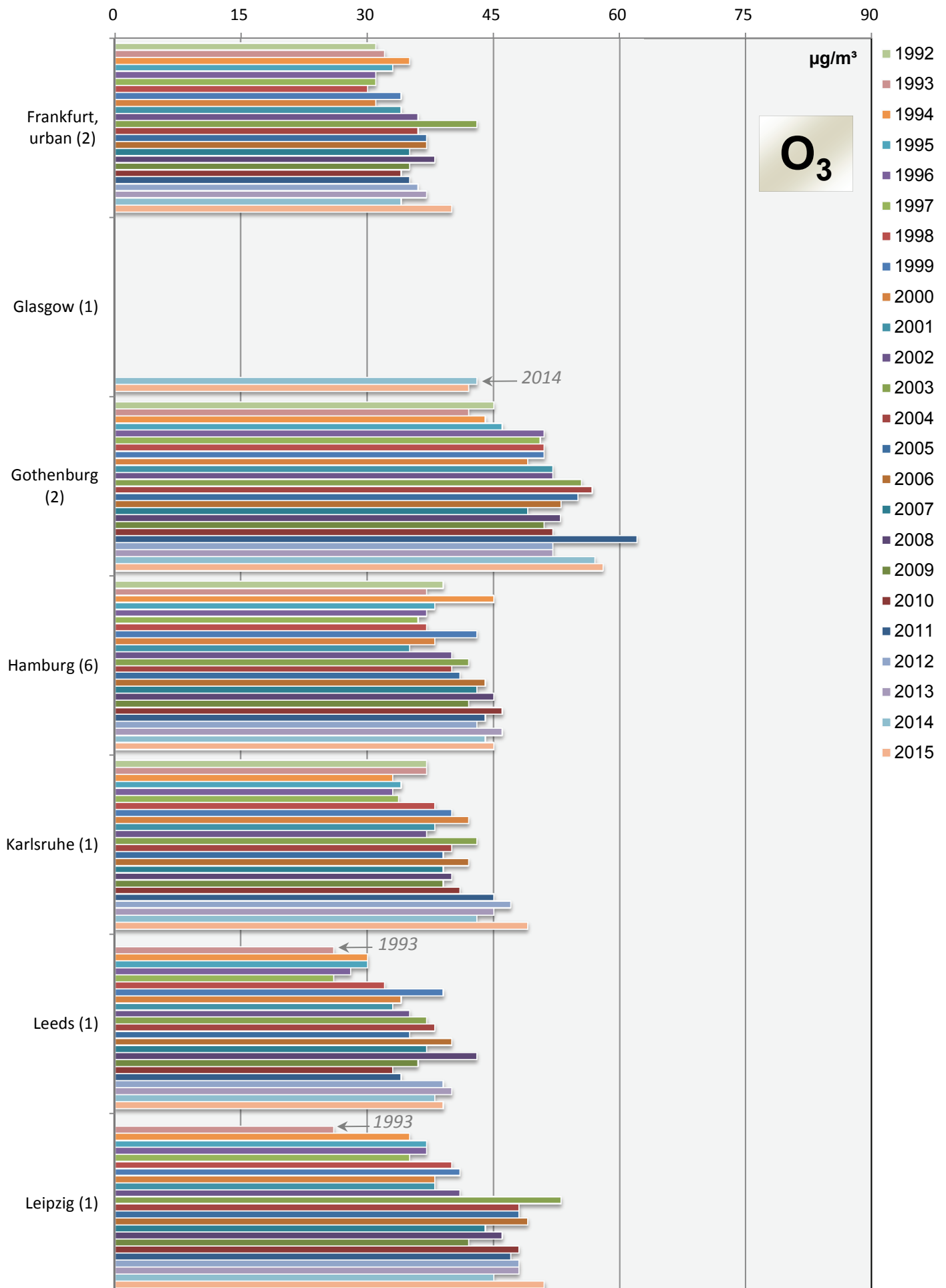
## Comparison of The Air Quality 1992 - 2015

### Annual mean values (mean of all monitoring stations)



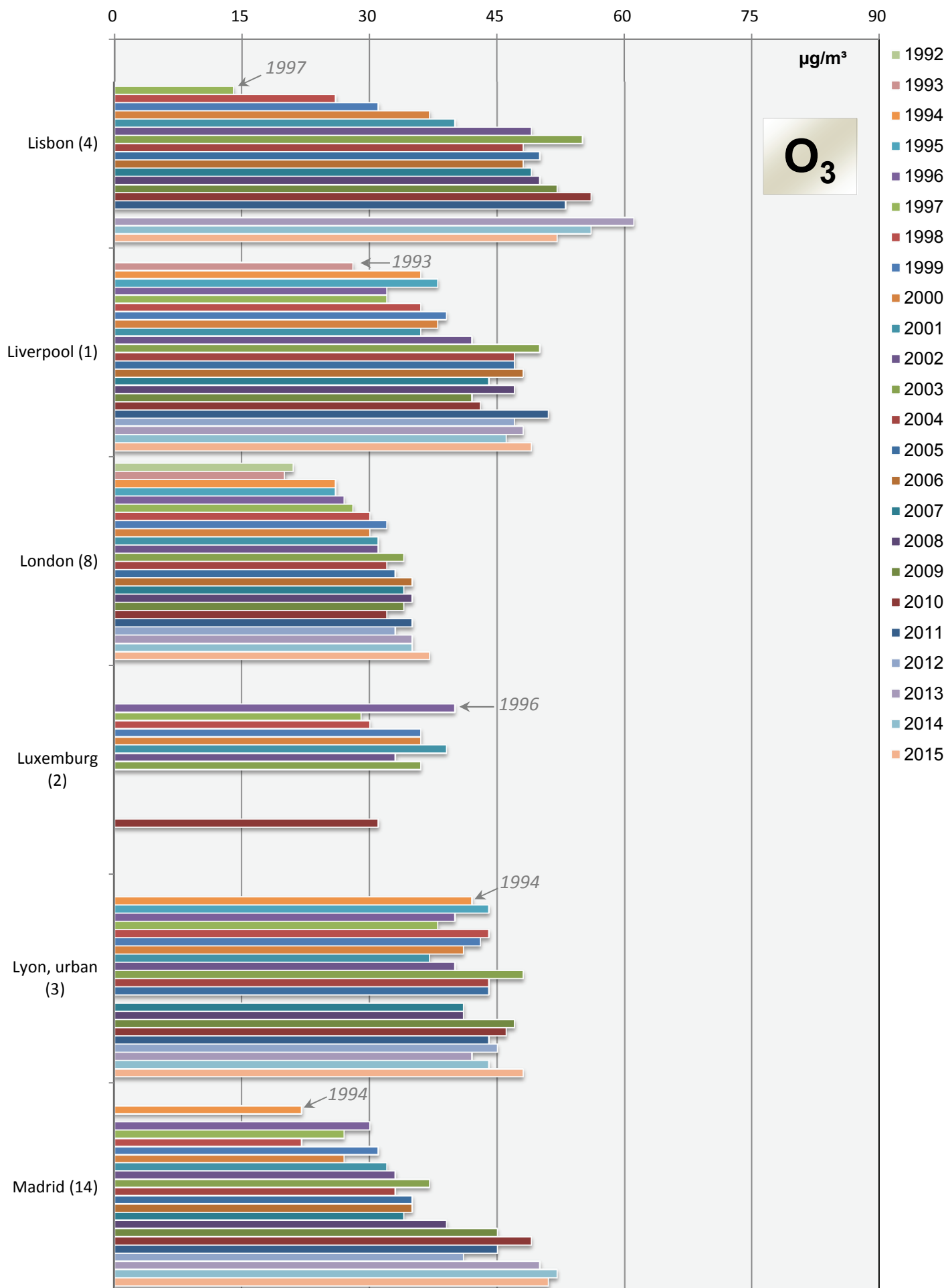
# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)



## Comparison of The Air Quality 1992 - 2015

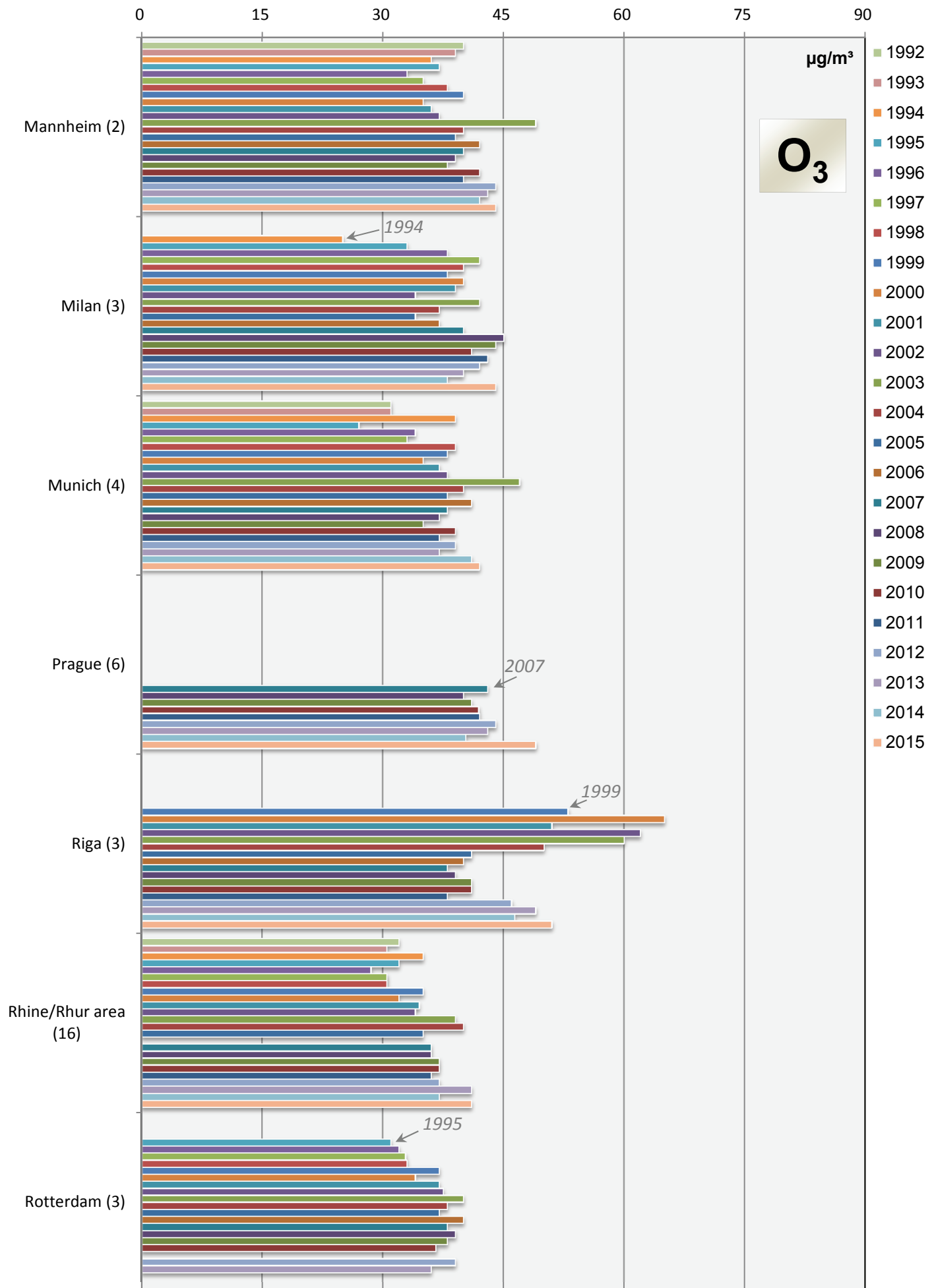
### Annual mean values (mean of all monitoring stations)



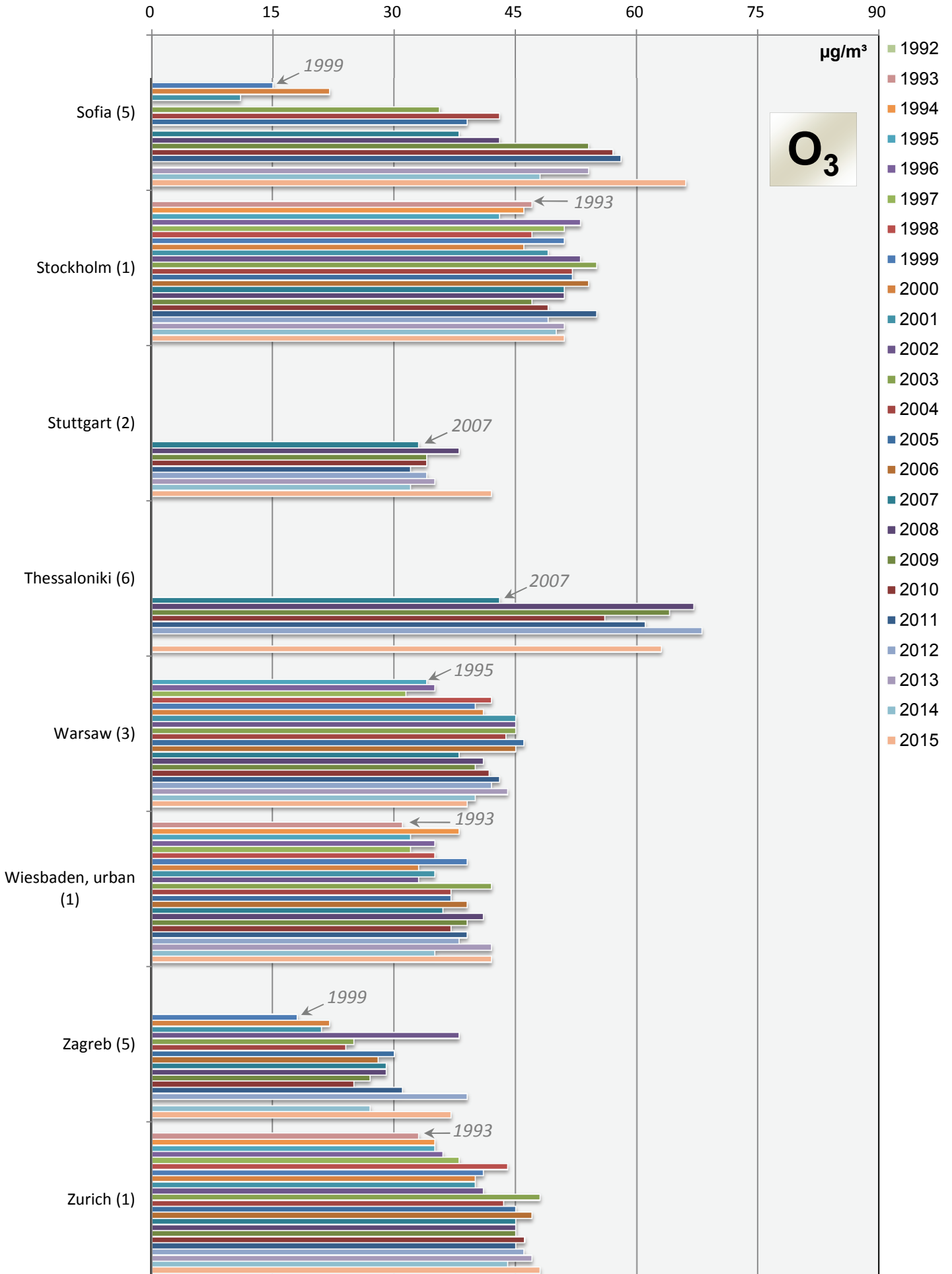


# Comparison of The Air Quality 1992 - 2015

## Annual mean values (mean of all monitoring stations)



## Comparison of The Air Quality 1992 - 2015 Annual mean values (mean of all monitoring stations)



**Jahresvergleich**

**1992 - 2015**

**max. Tagesmittelwerte**

**Comparison of The Air Quality Over The Years**

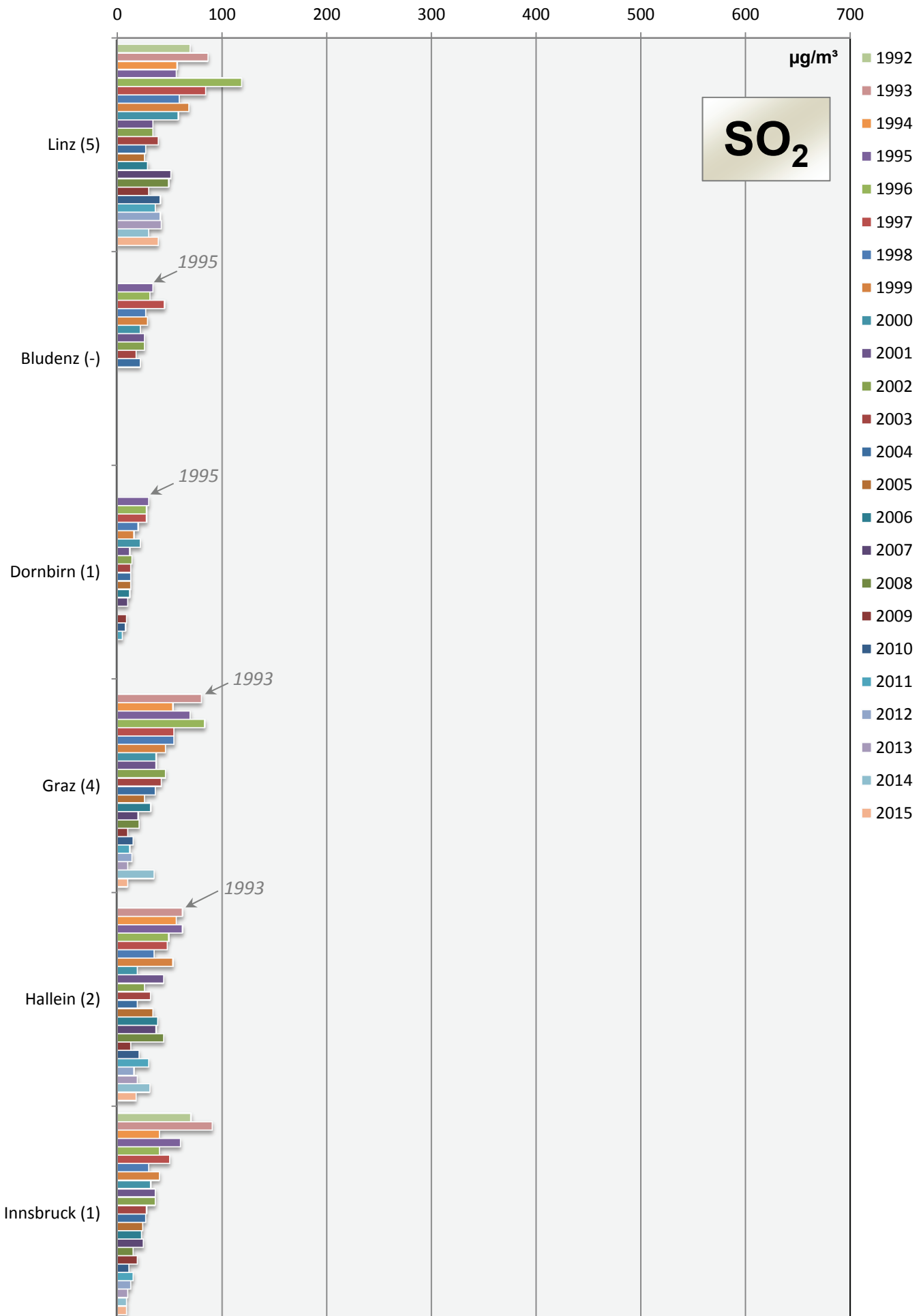
**1992 - 2015**

**Max. Daily Mean Values**

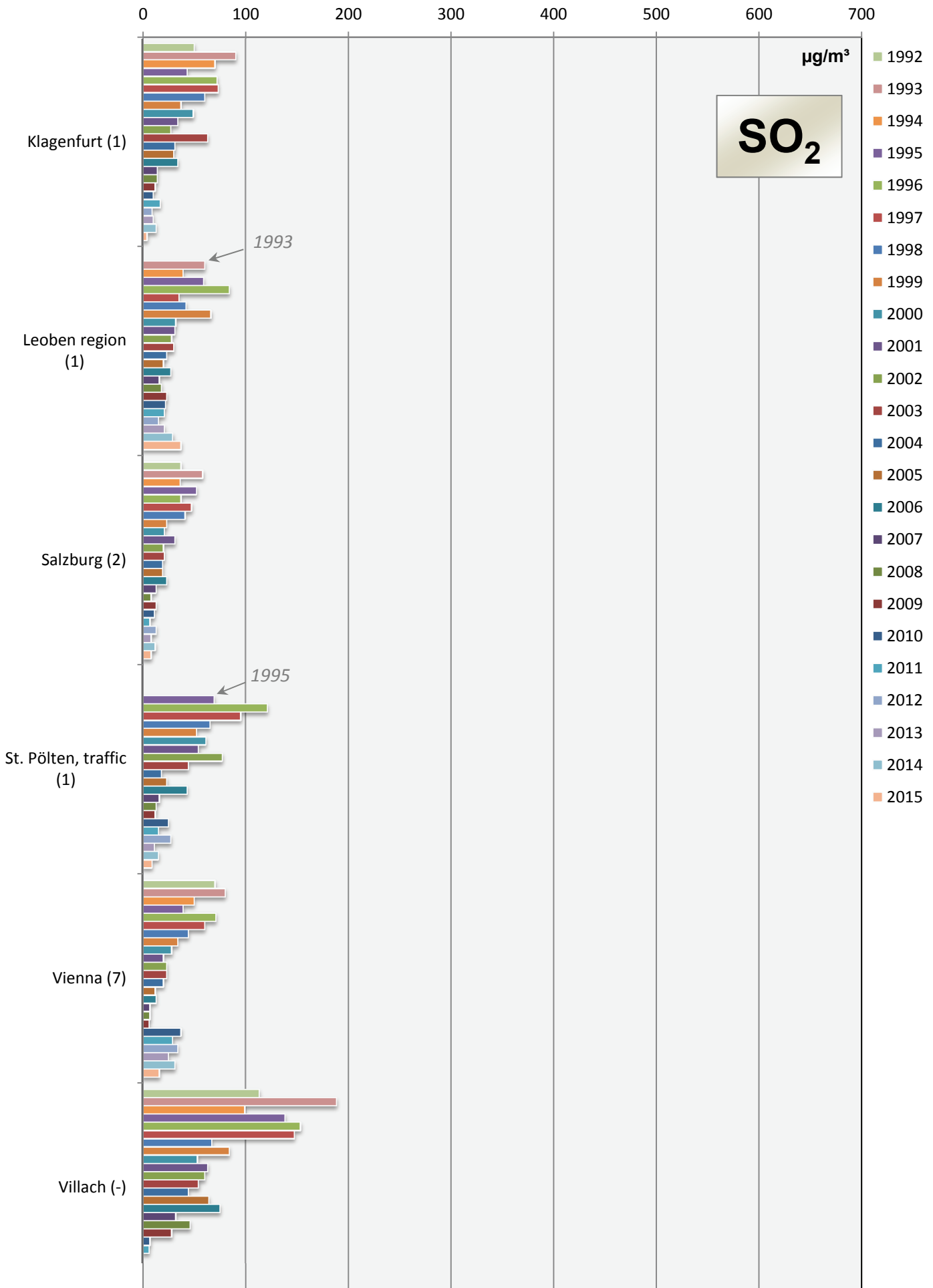


# Comparison of The Air Quality 1992 - 2015

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

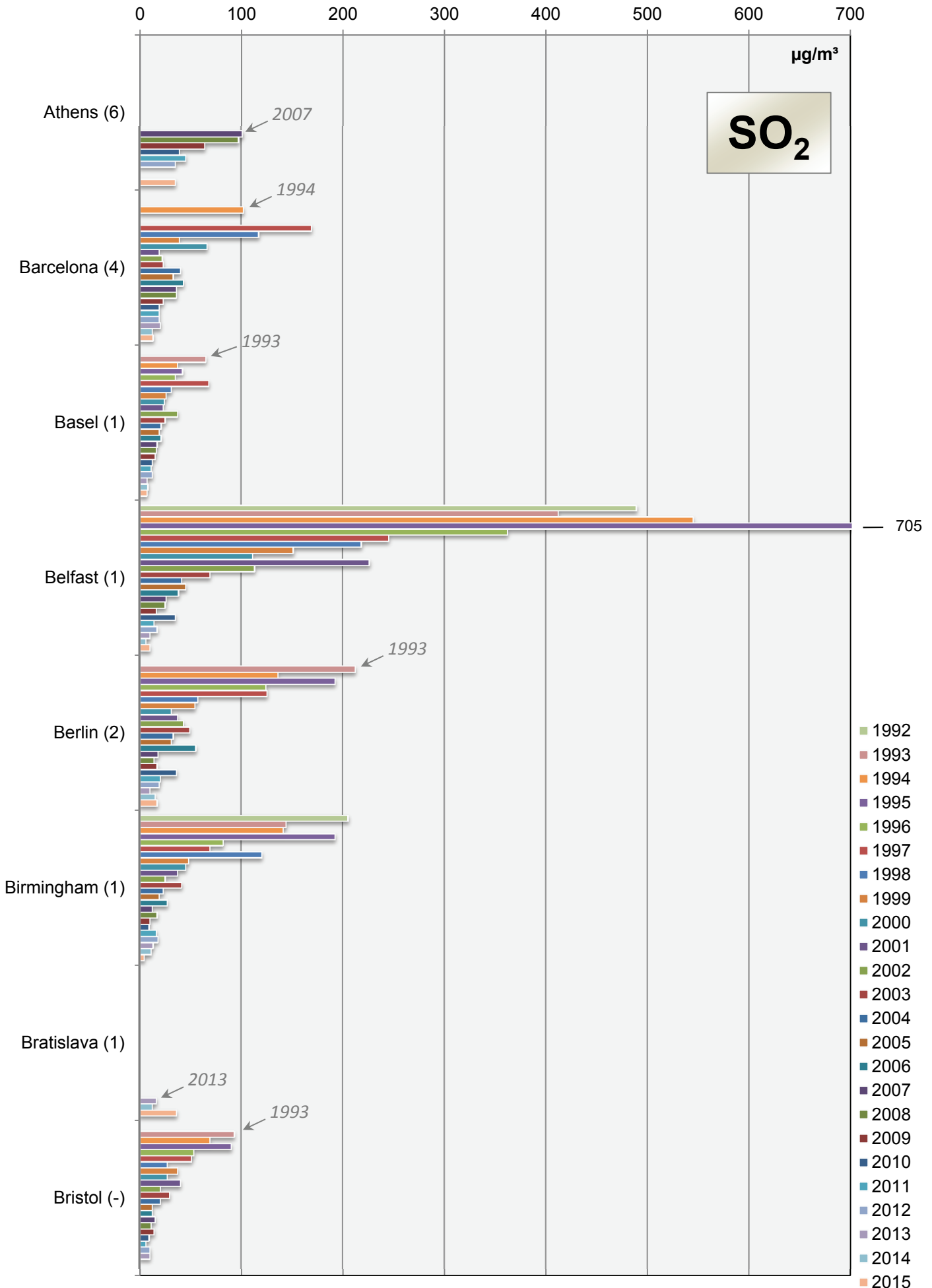


## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

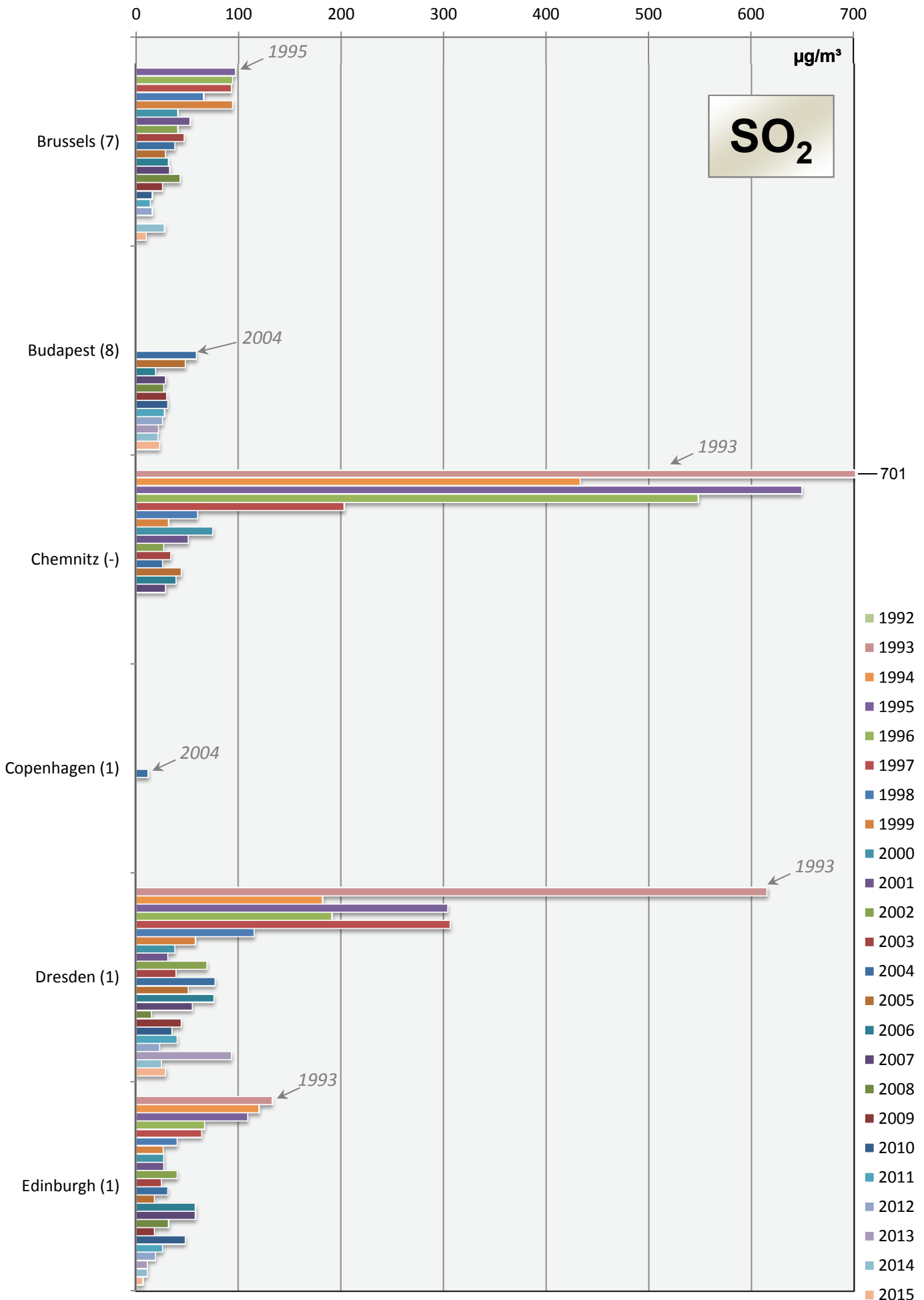


# Comparison of The Air Quality 1992 - 2015

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



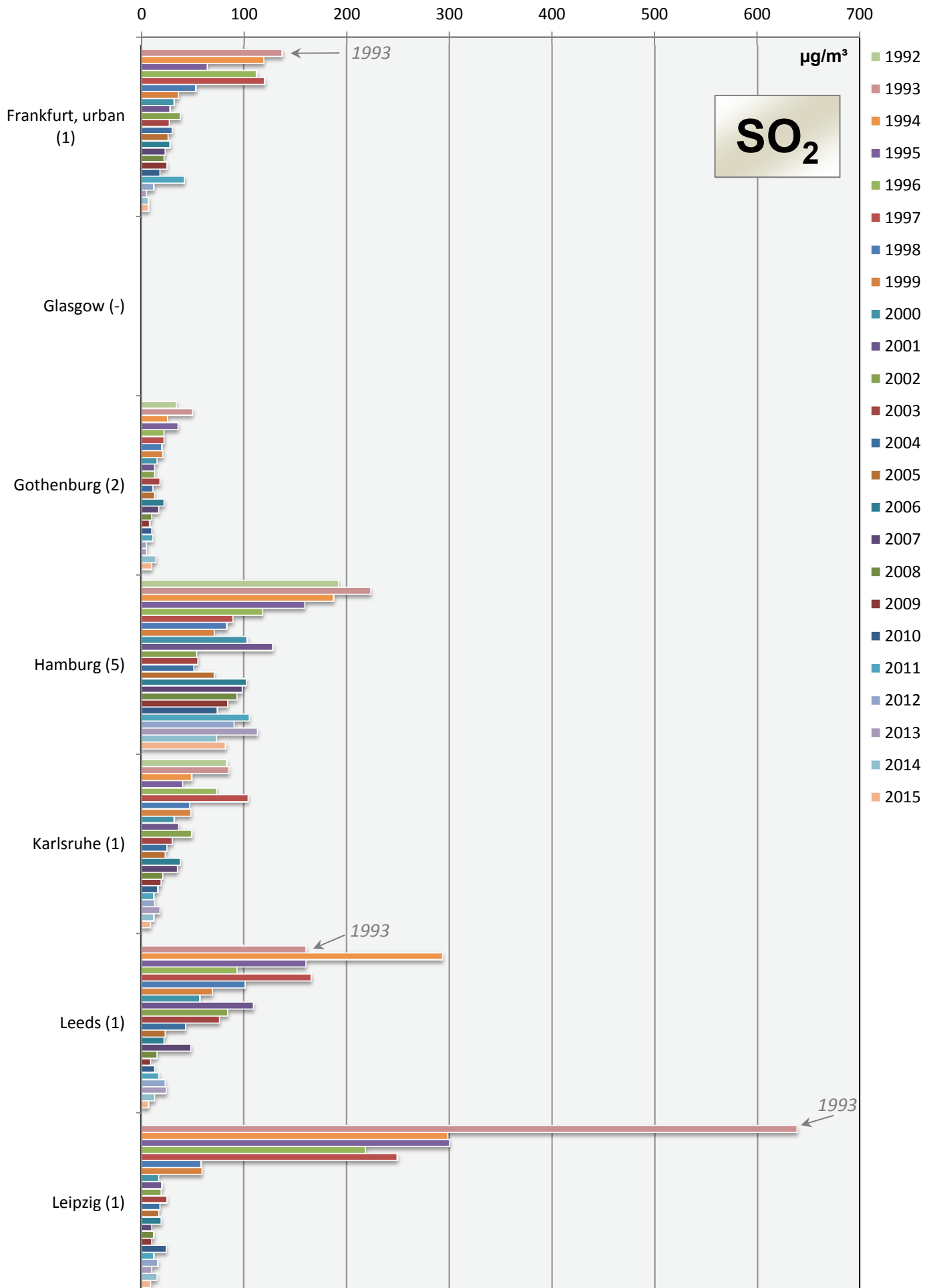
## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



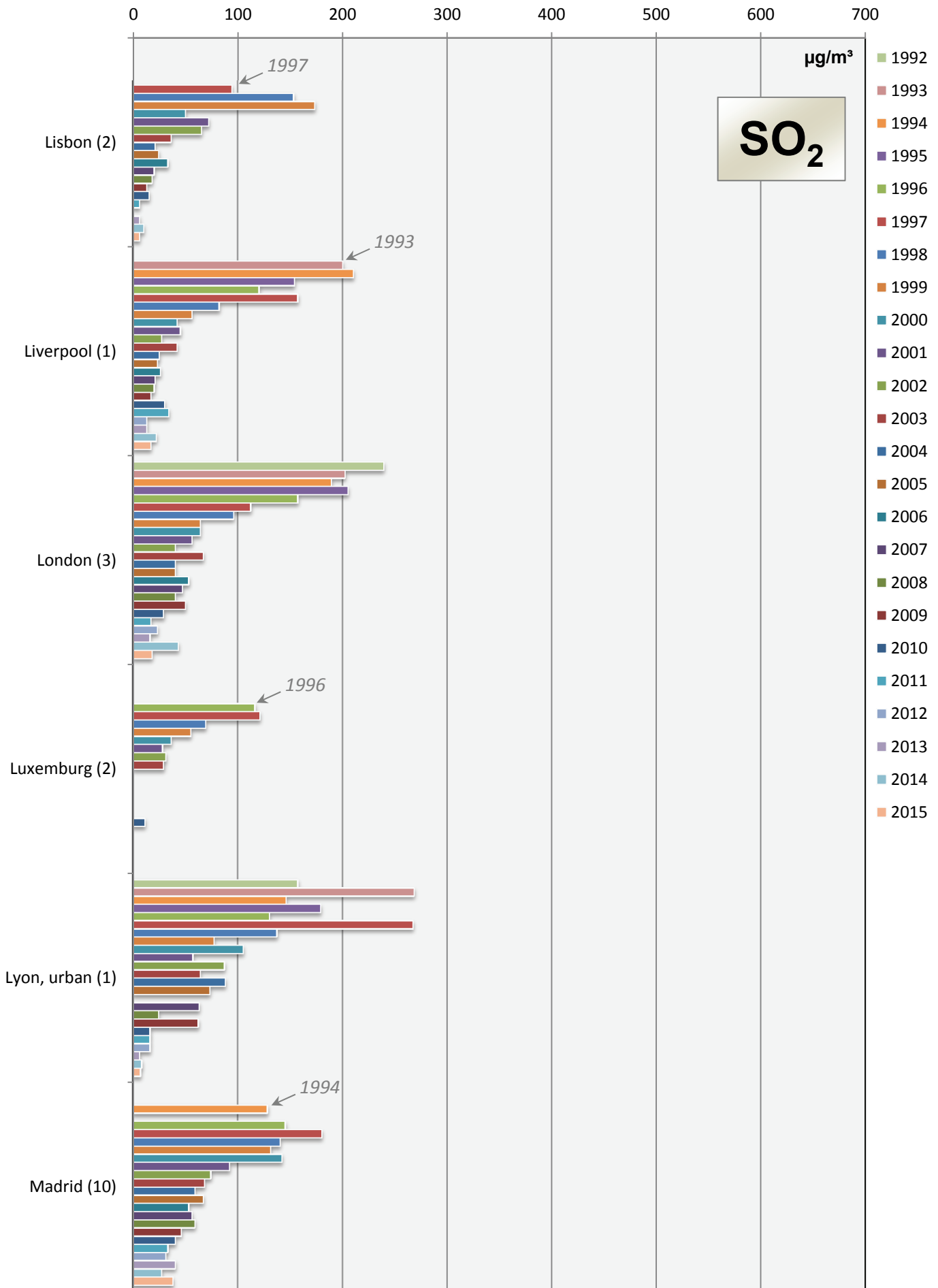


# Comparison of The Air Quality 1992 - 2015

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

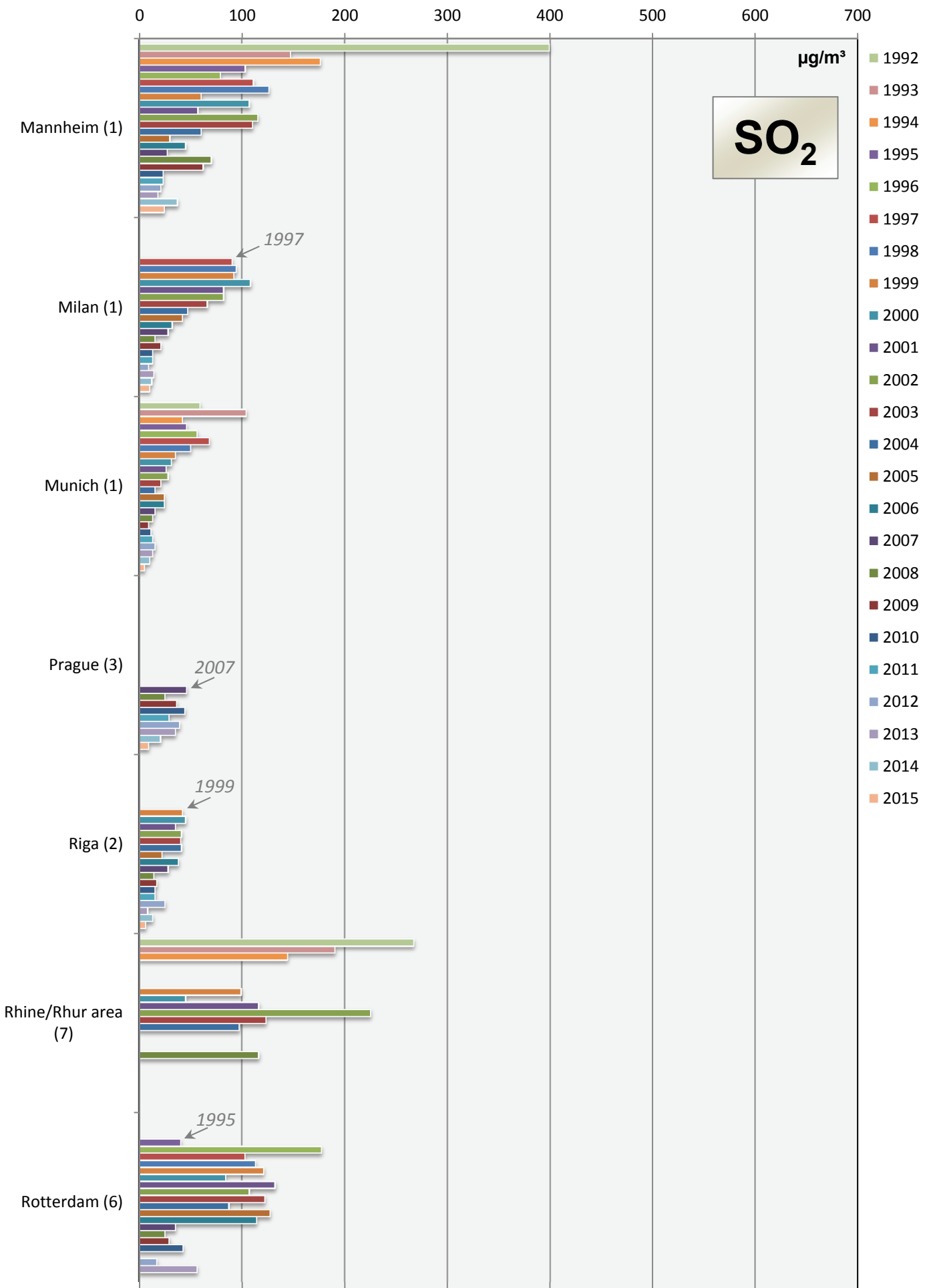


### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

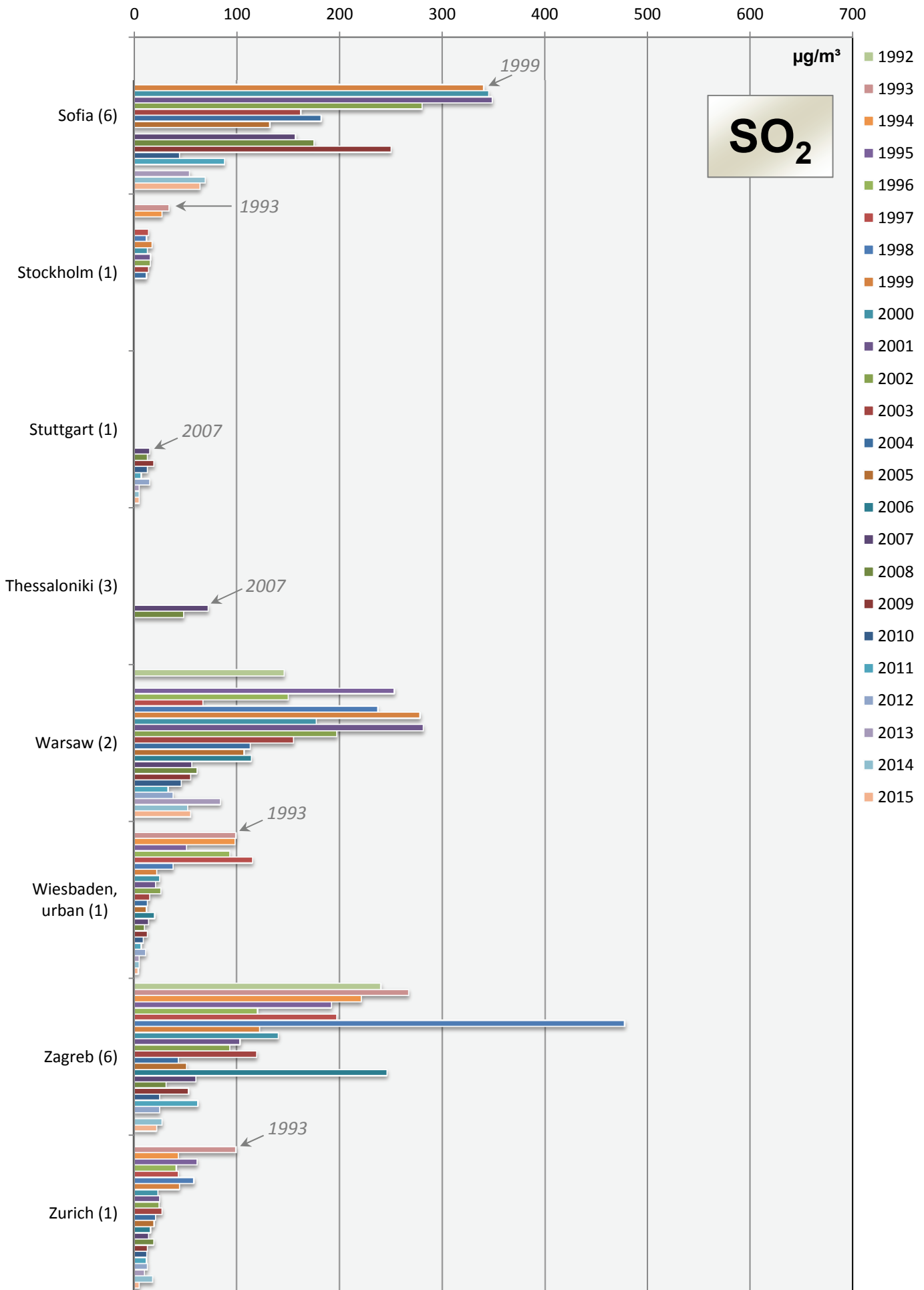


# Comparison of The Air Quality 1992 - 2015

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



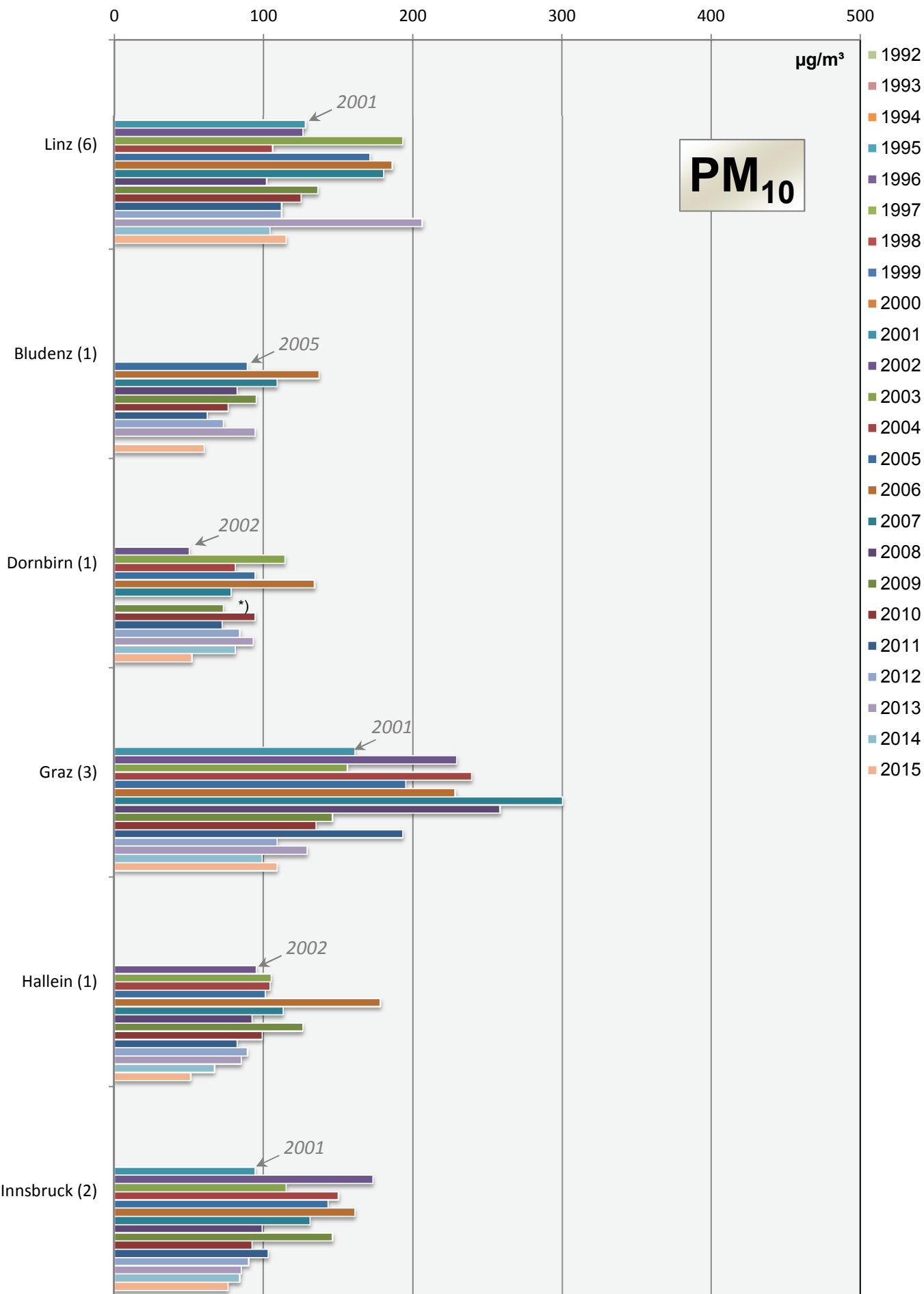
### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



# Comparison of The Air Quality 1992 - 2015

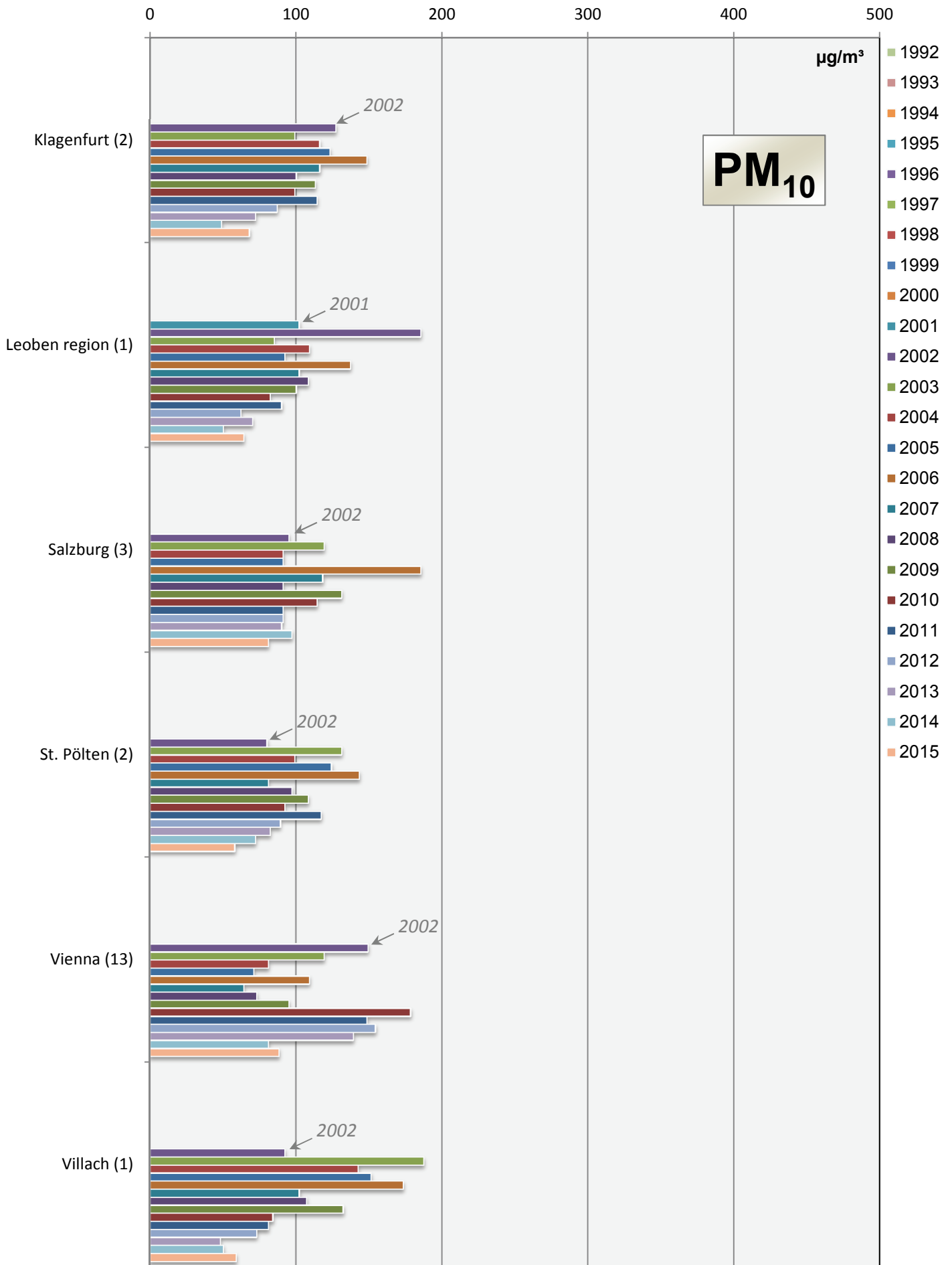
## max. daily mean values (peak-stressed monitoring station)

**PM<sub>10</sub>**



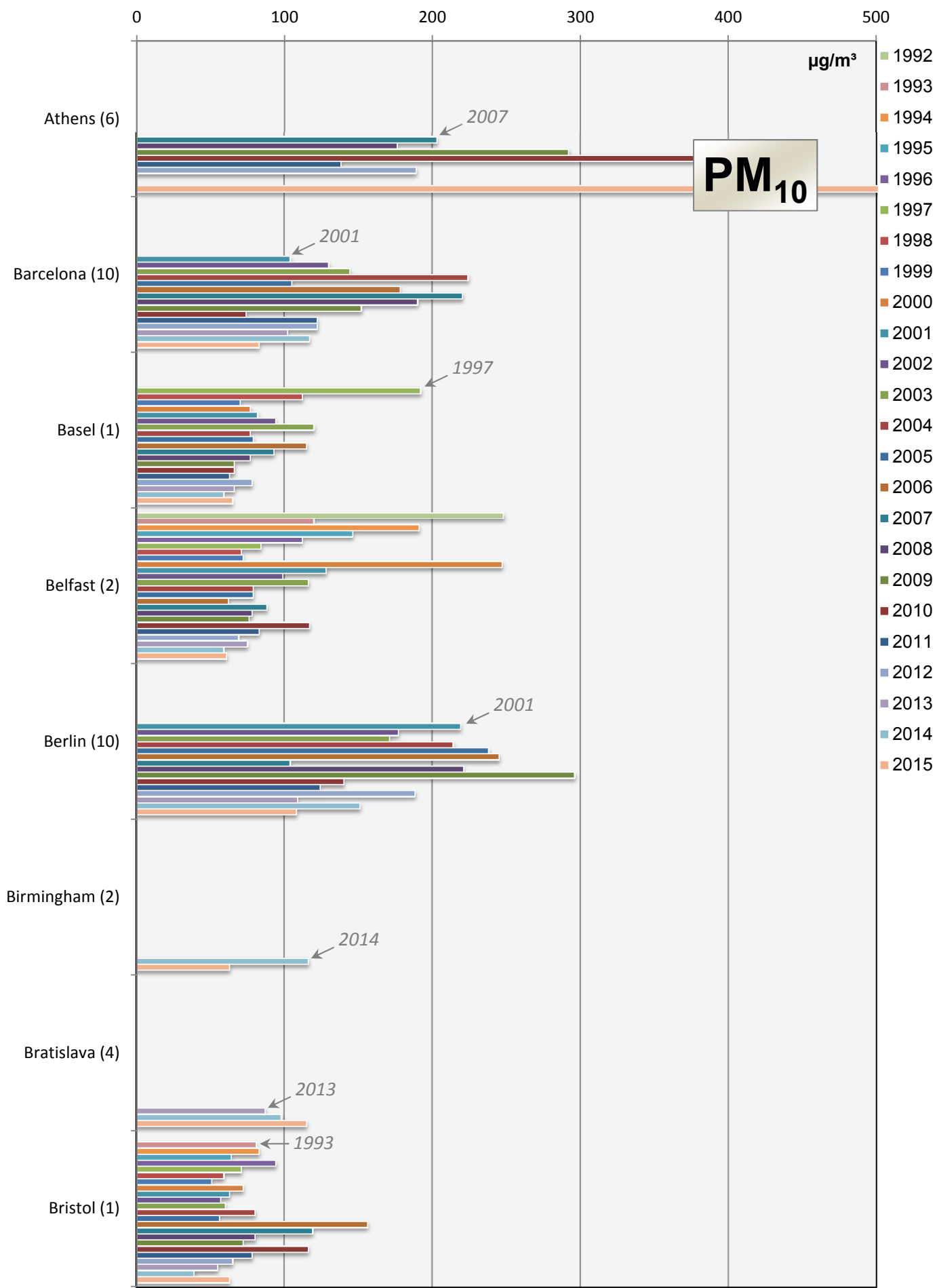
\*) data of the year 2008 are not used for the comparison, because the street near the measurement point was closed for 11 months

### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

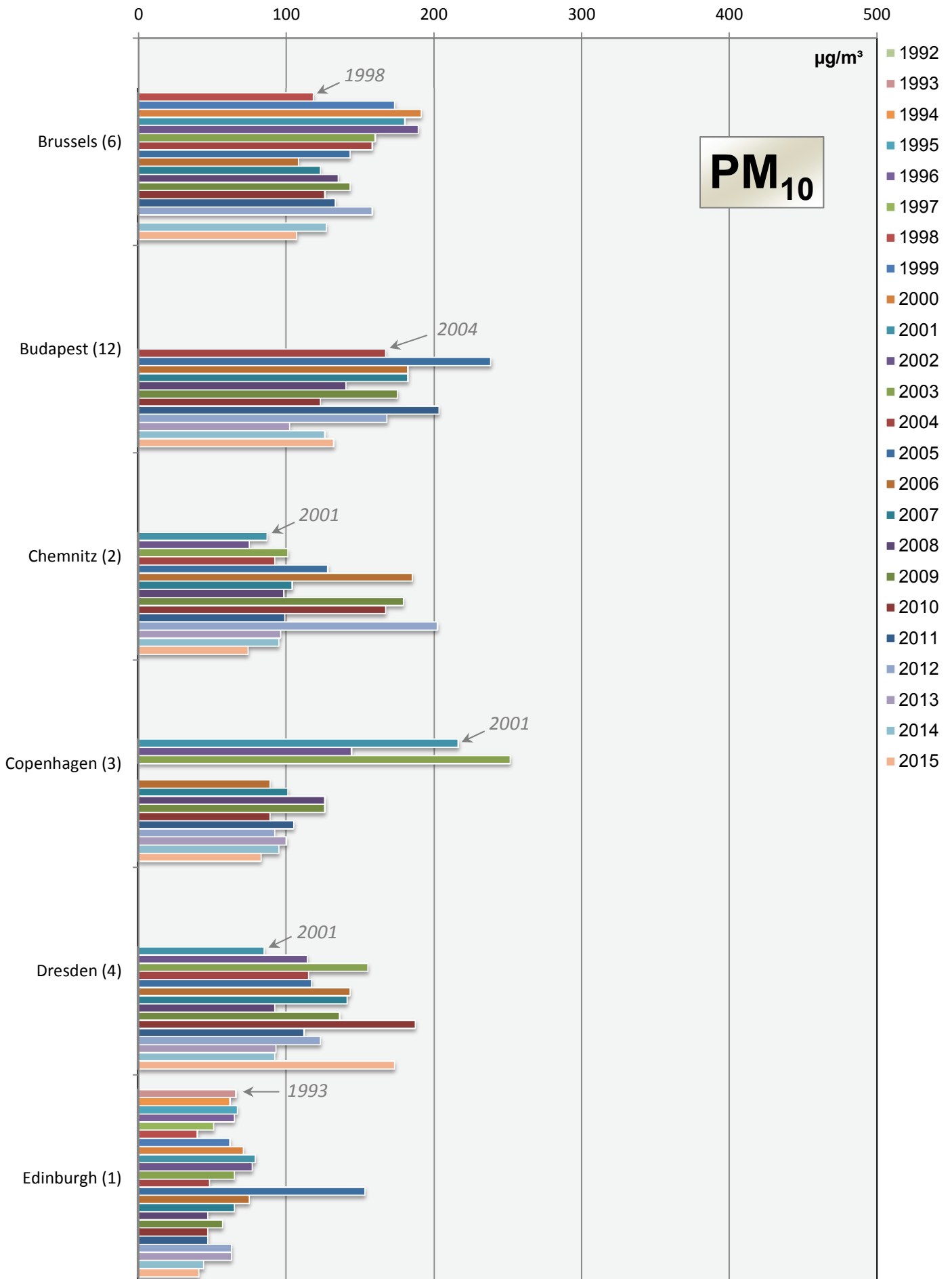


# Comparison of The Air Quality 1992 - 2015

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



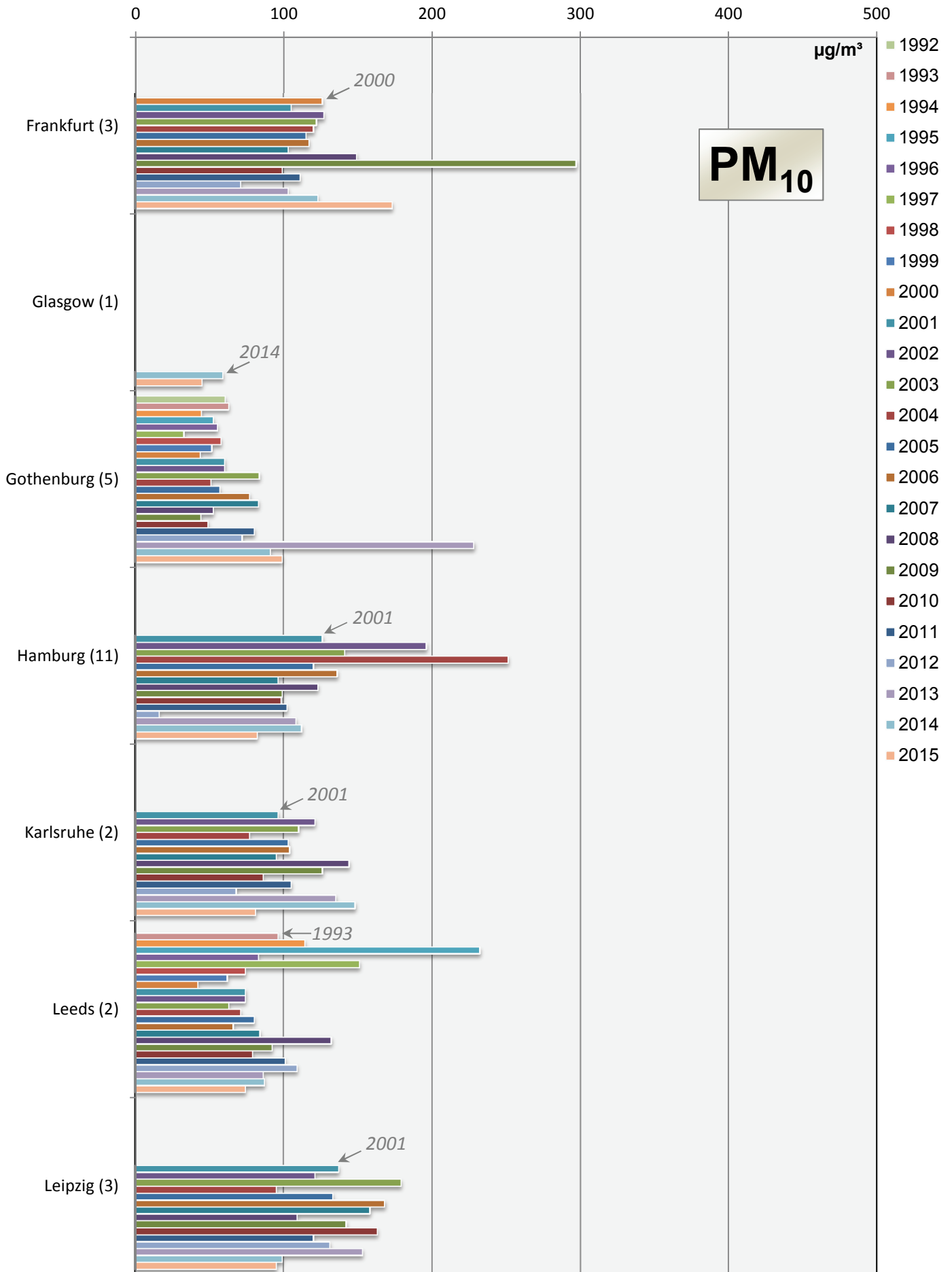
## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



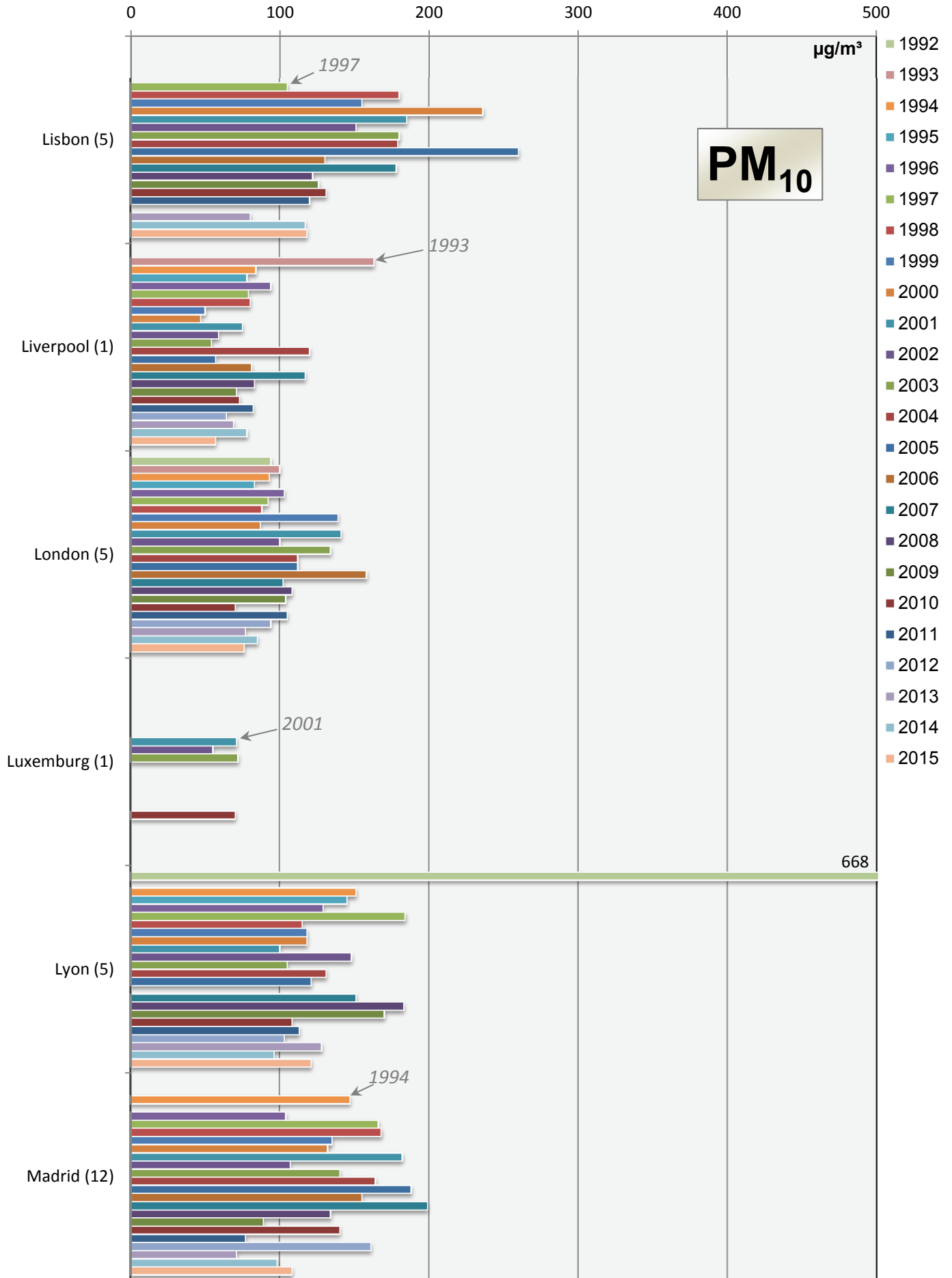


# Comparison of The Air Quality 1992 - 2015

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

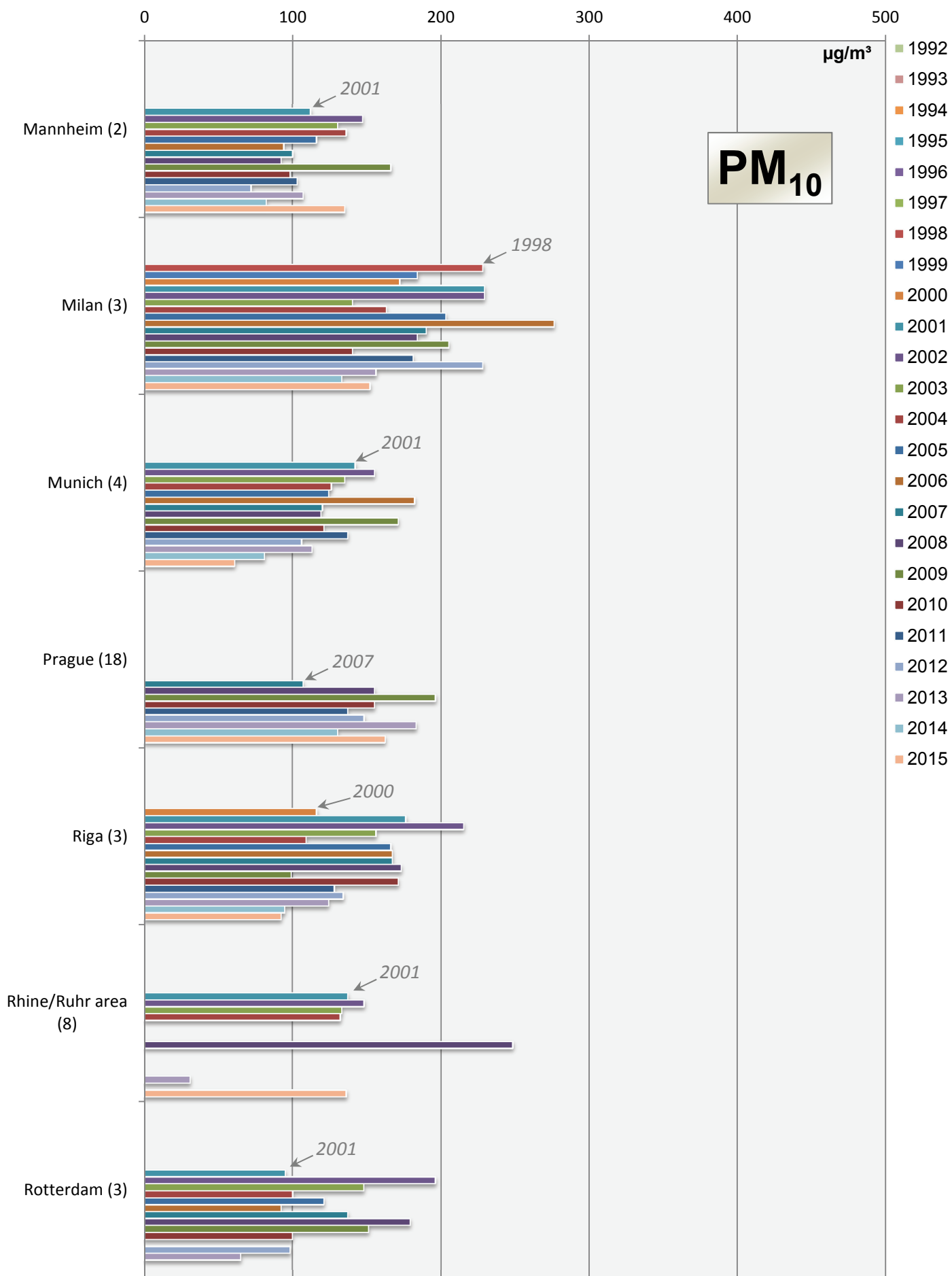


### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

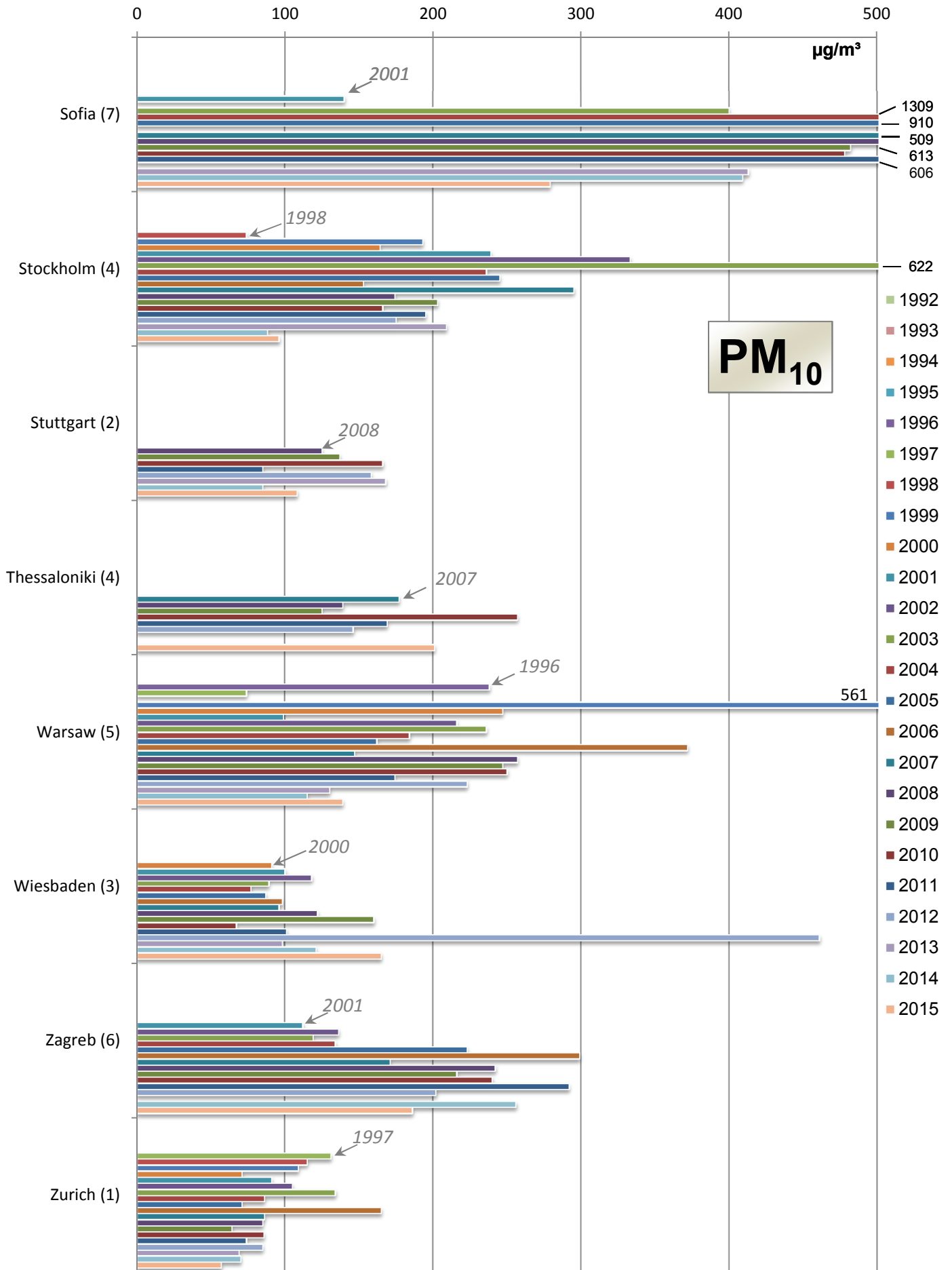


# Comparison of The Air Quality 1992 - 2015

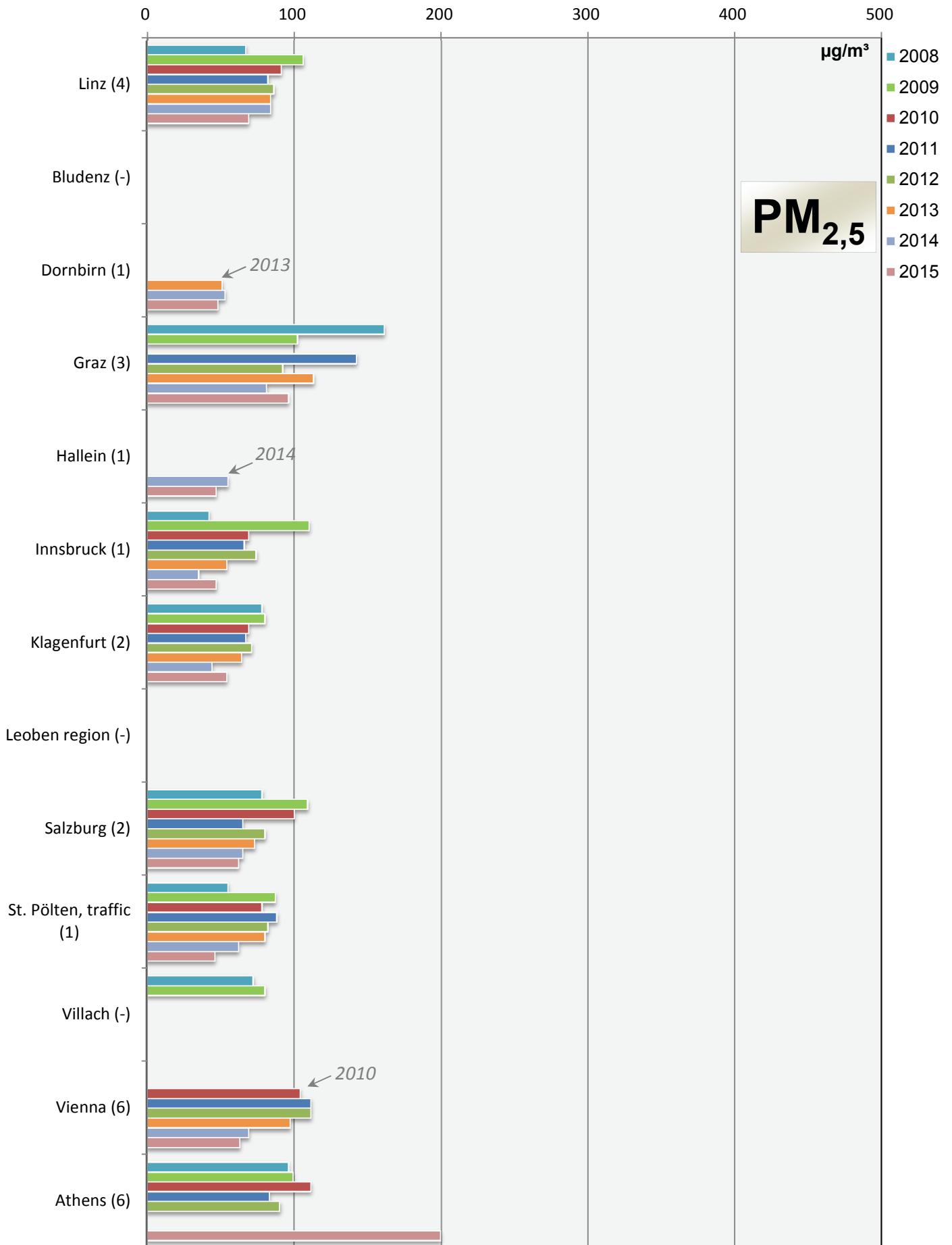
## max. daily mean values (peak-stressed monitoring station)



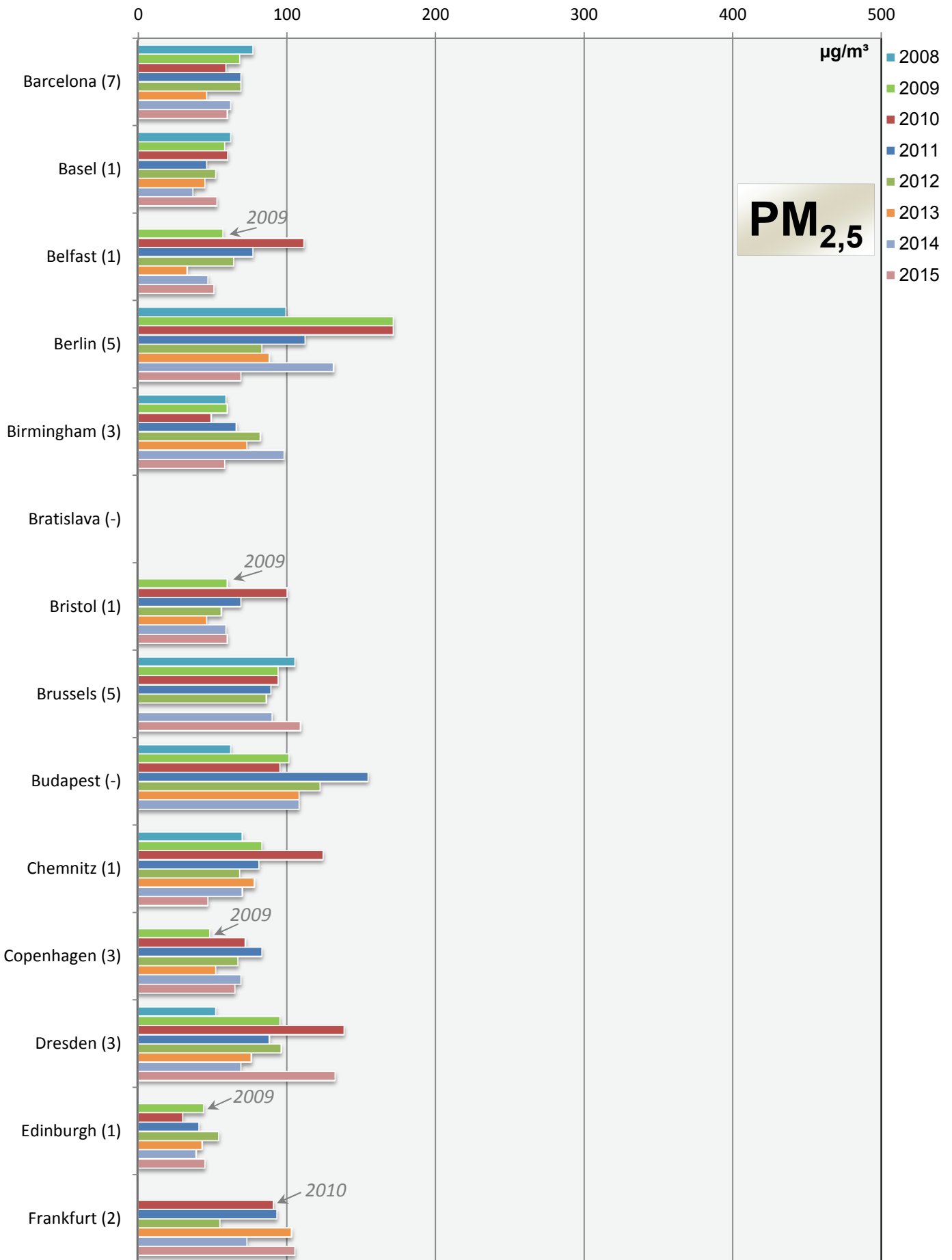
## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



### Comparison of The Air Quality 2008 - 2015 max. daily mean values (peak-stressed monitoring station)

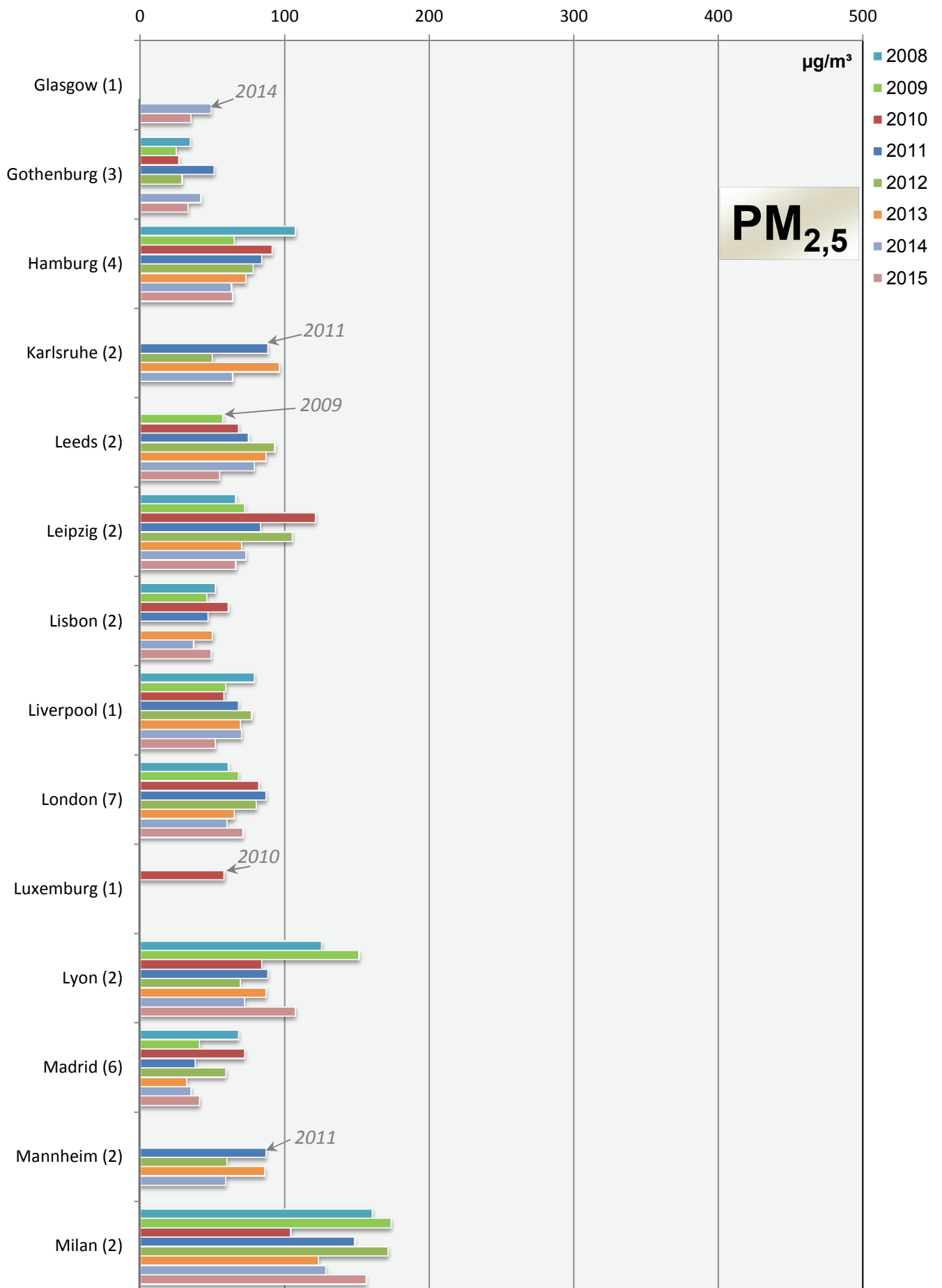


### Comparison of The Air Quality 2008 - 2015 max. daily mean values (peak-stressed monitoring station)

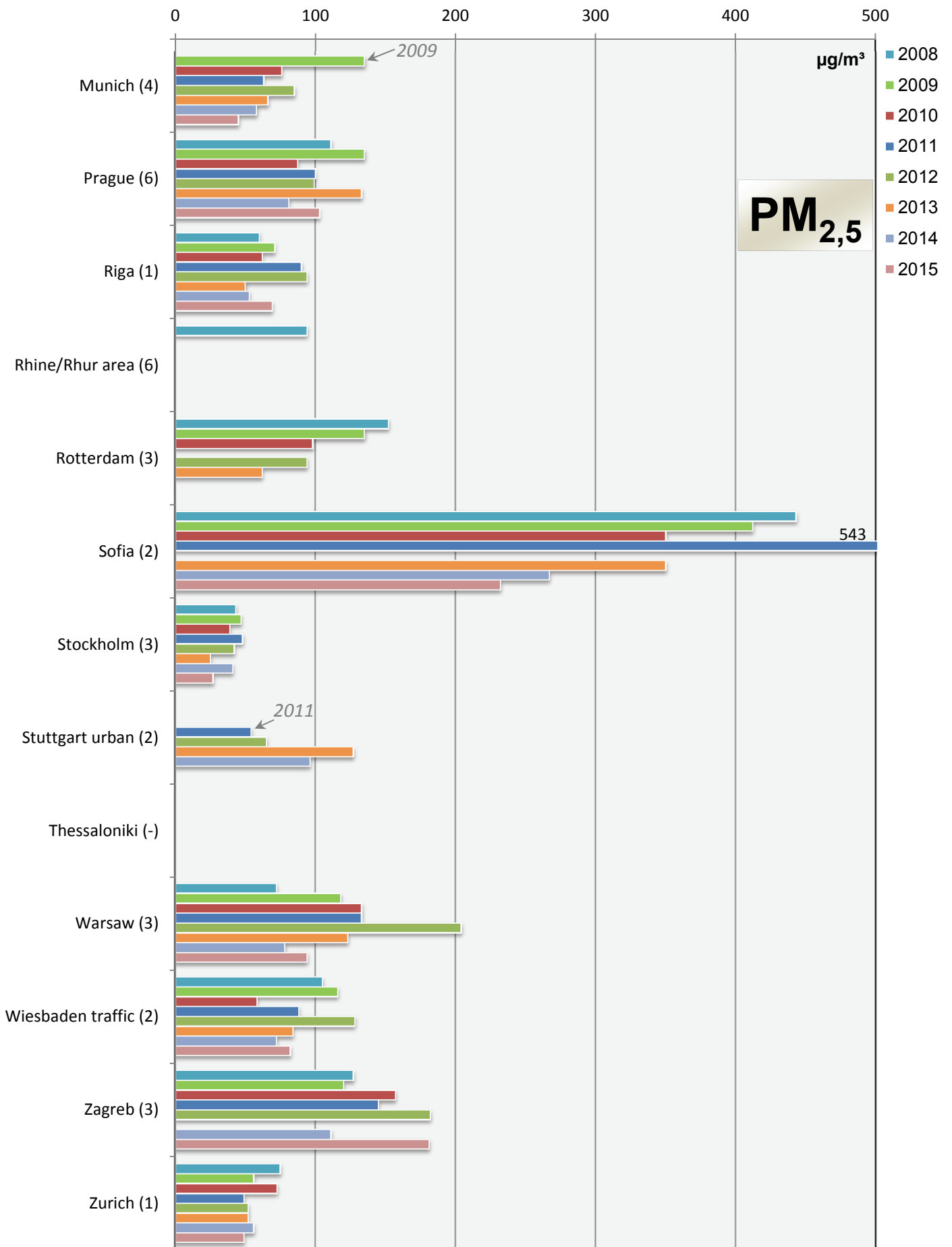


# Comparison of The Air Quality 2008 - 2015

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



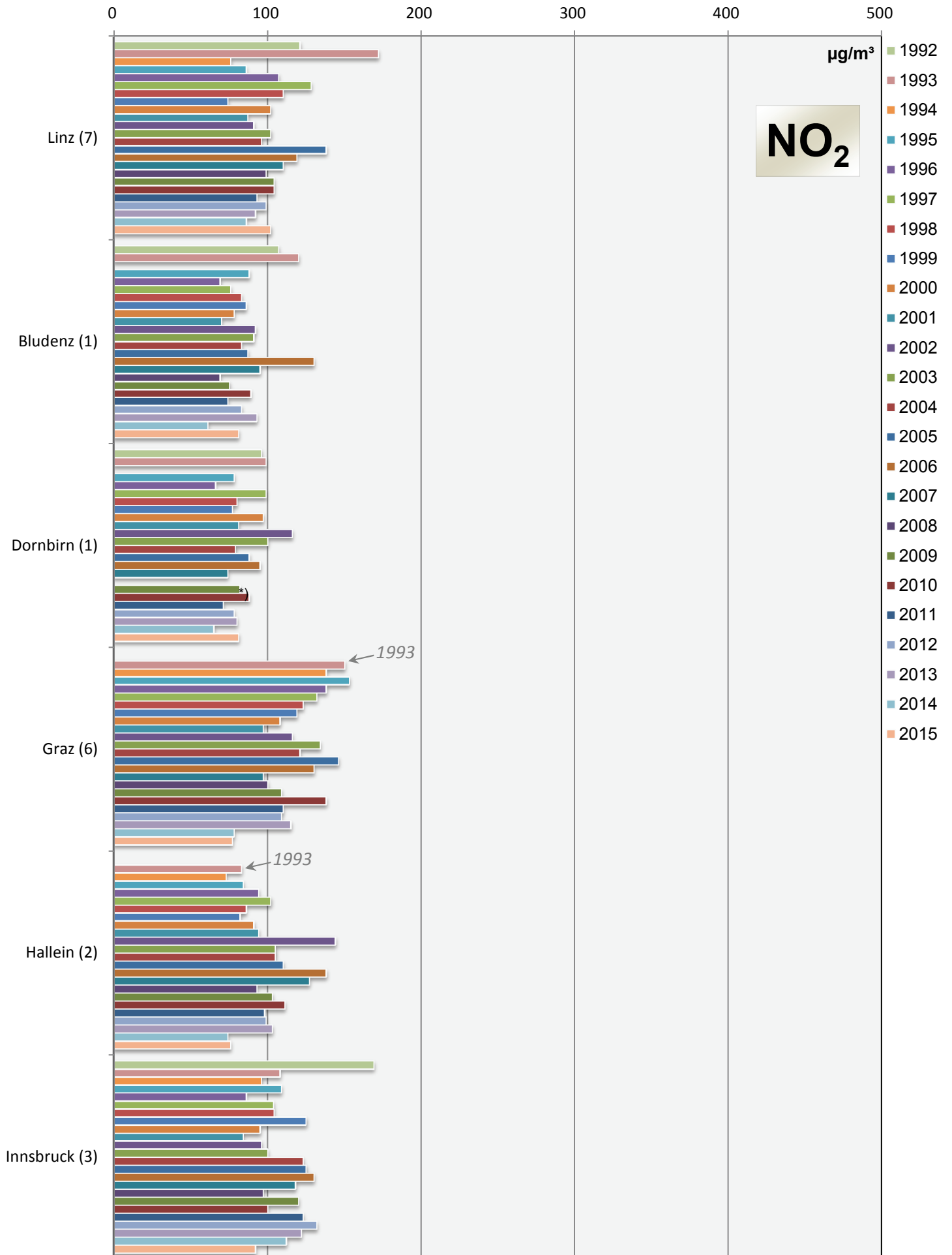
## Comparison of The Air Quality 2008 - 2015 max. daily mean values (peak-stressed monitoring station)





# Comparison of The Air Quality 1992 - 2015

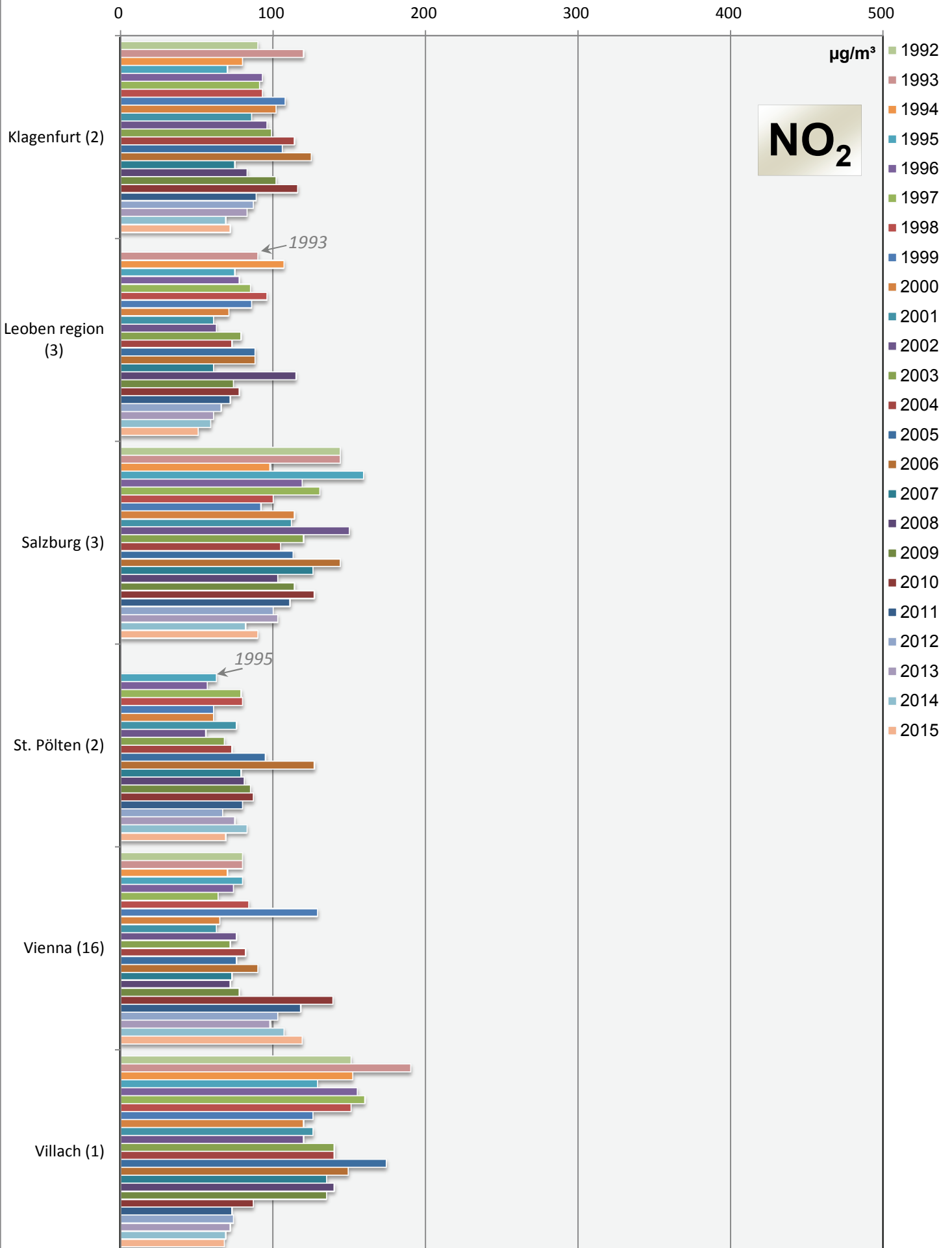
## max. daily mean values (peak-stressed monitoring station)



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

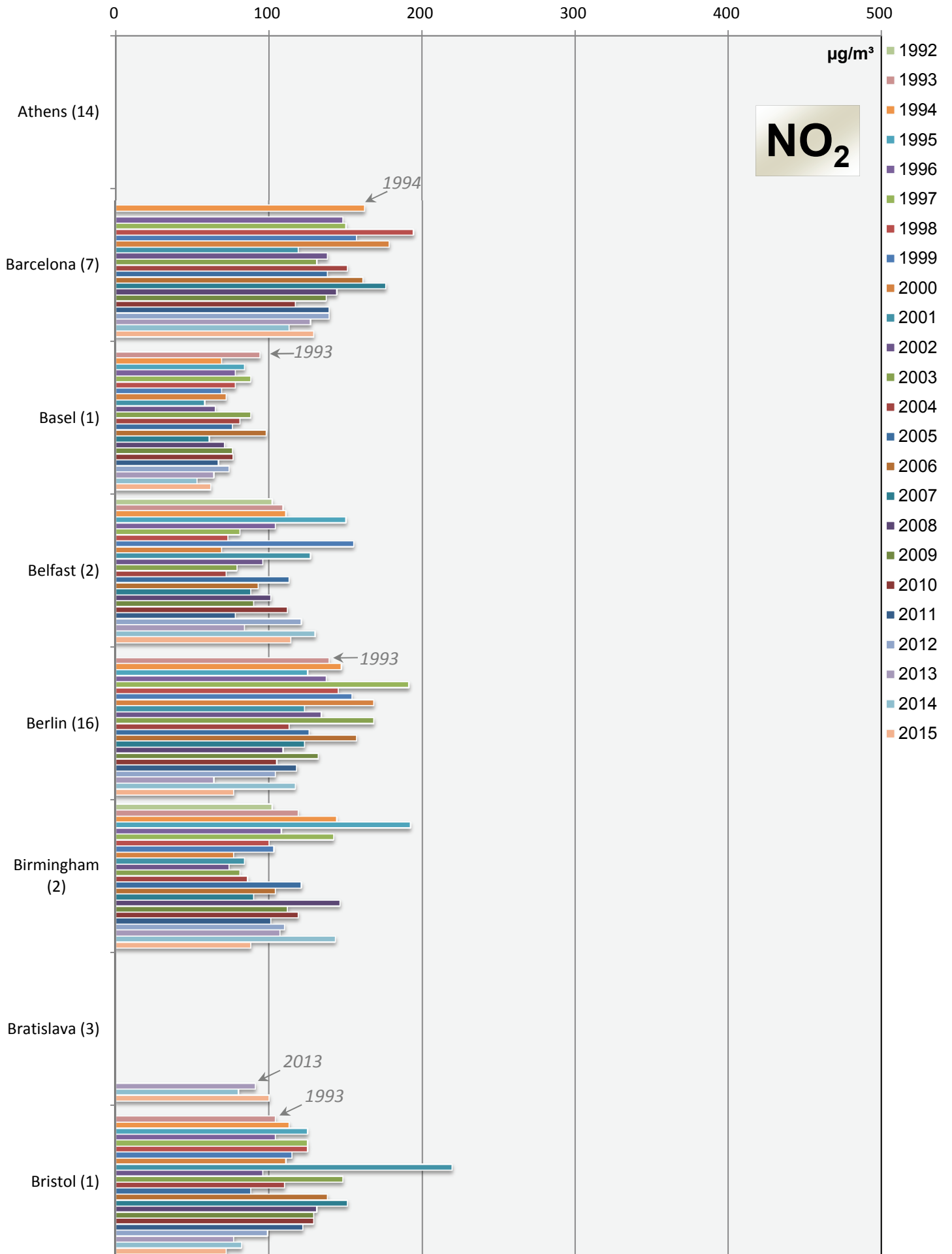
## Comparison of The Air Quality 1992 - 2015

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

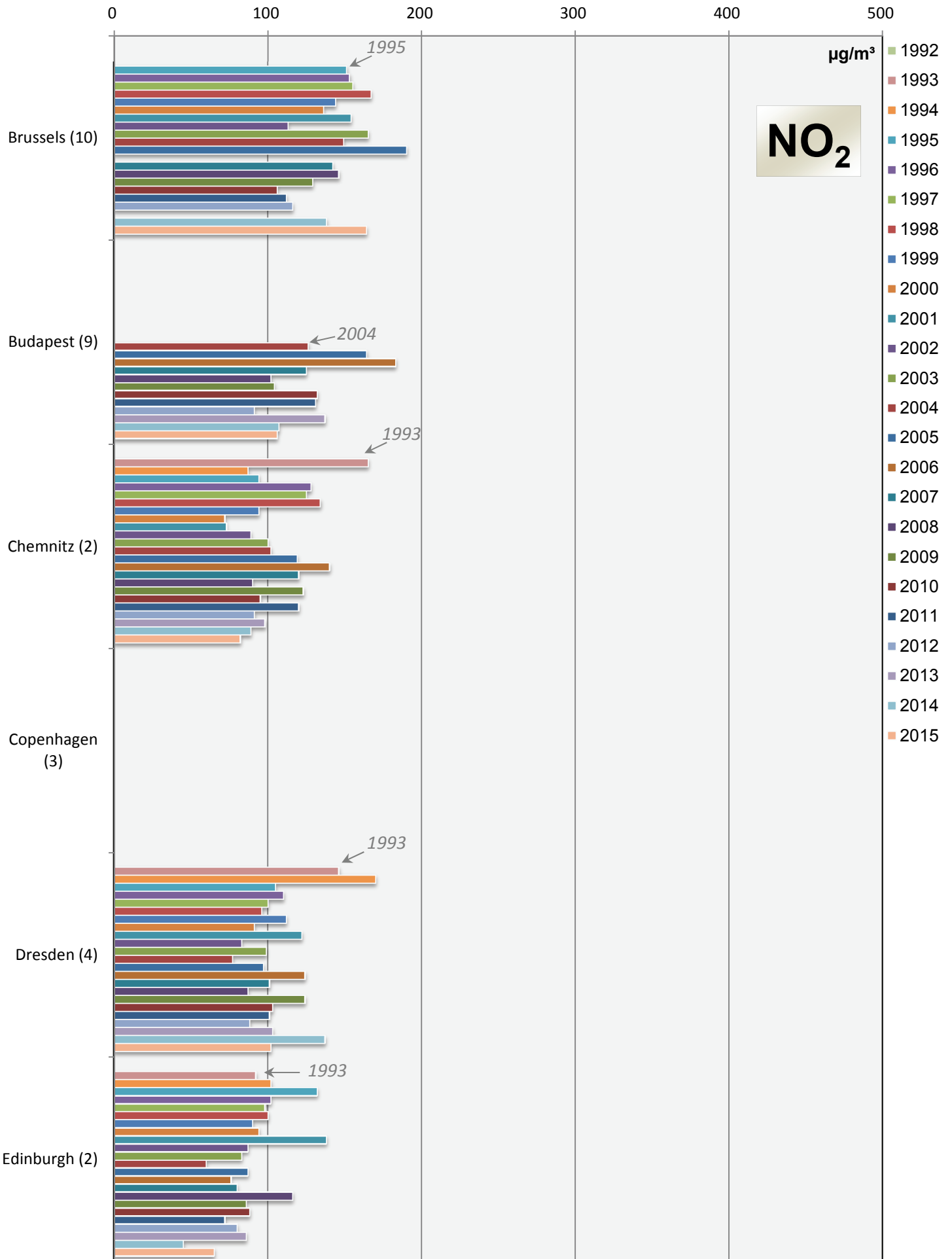


# Comparison of The Air Quality 1992 - 2015

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

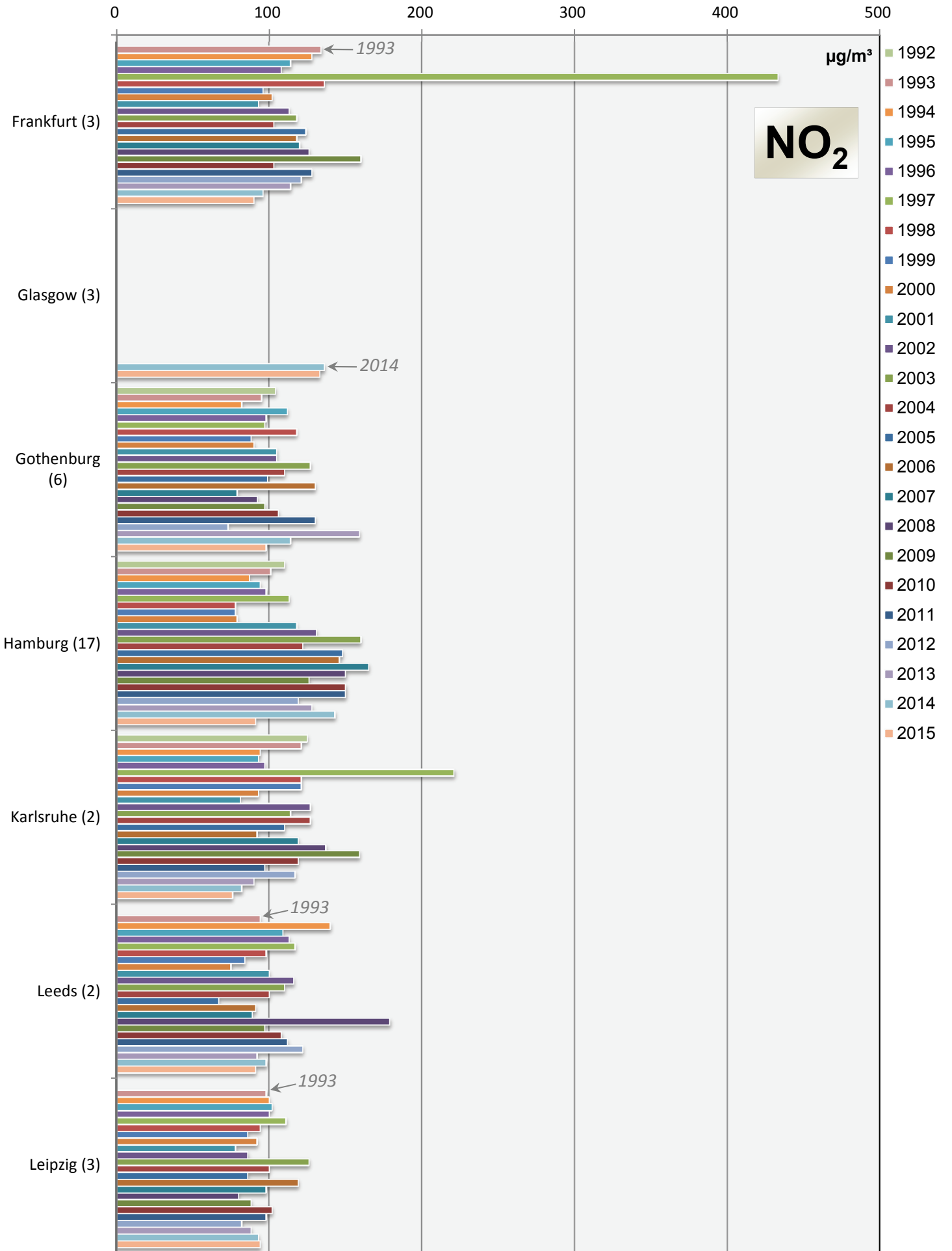


## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



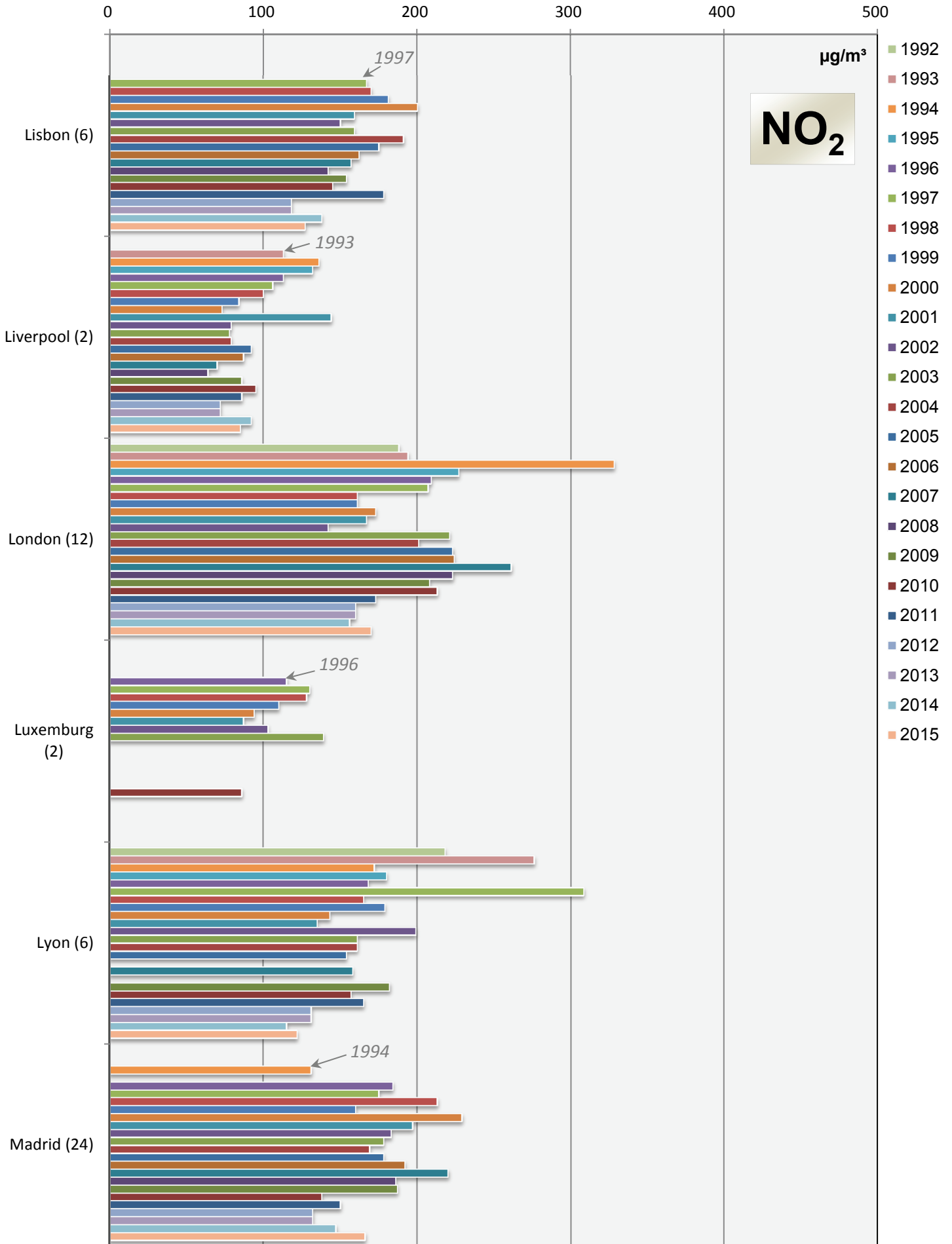
# Comparison of The Air Quality 1992 - 2015

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



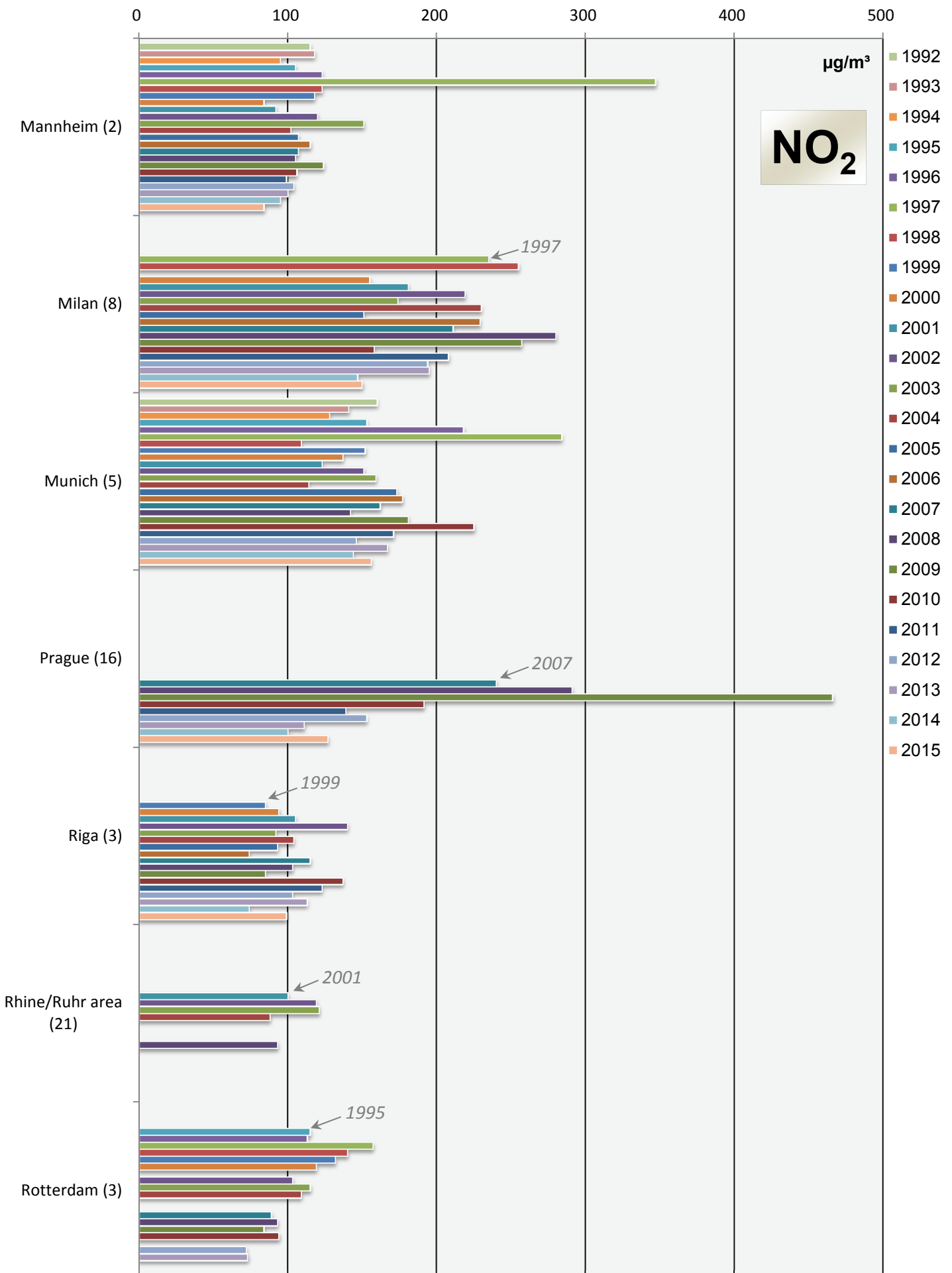
## Comparison of The Air Quality 1992 - 2015

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

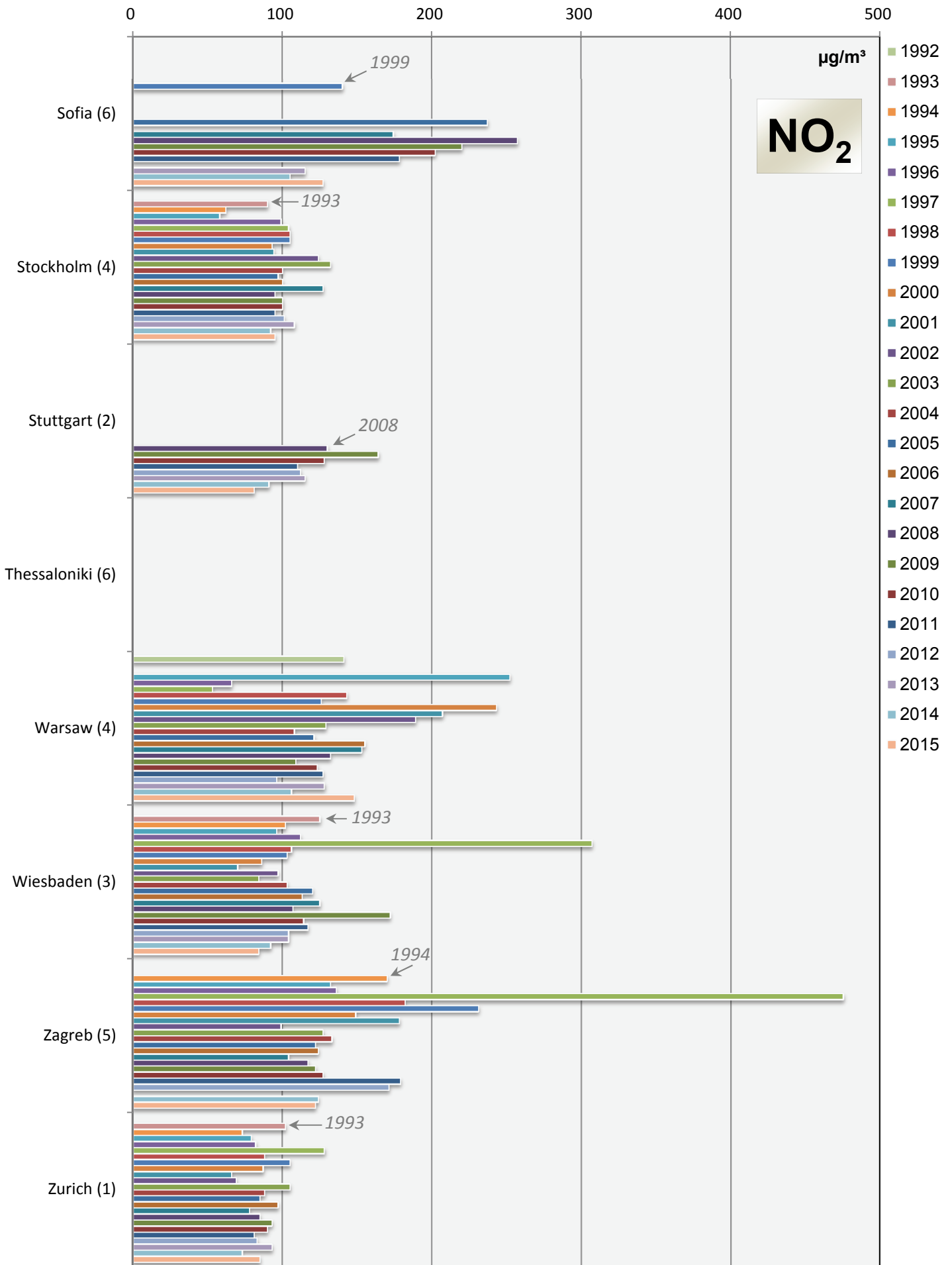


# Comparison of The Air Quality 1992 - 2015

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



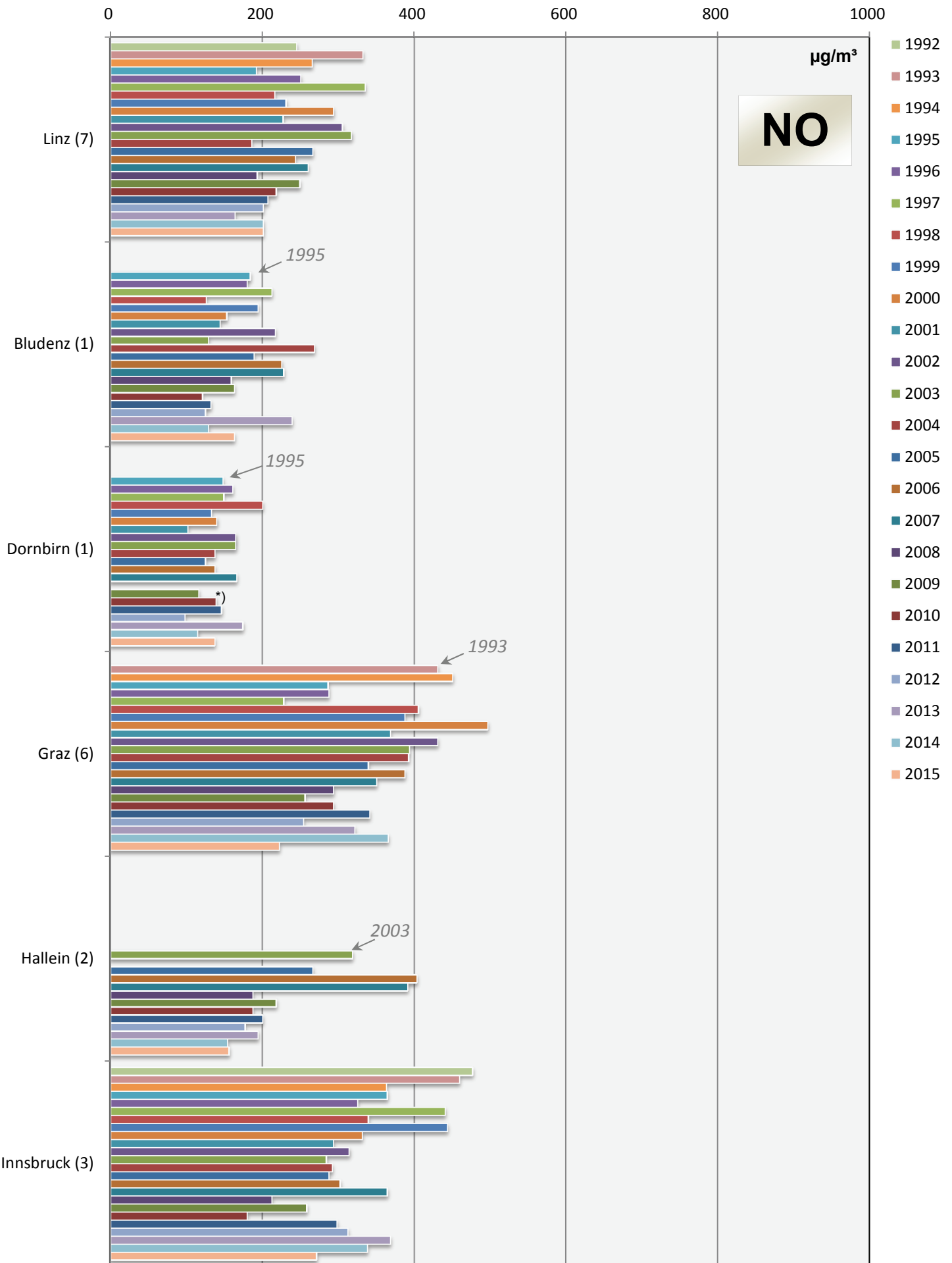
### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)





# Comparison of The Air Quality 1992 - 2015

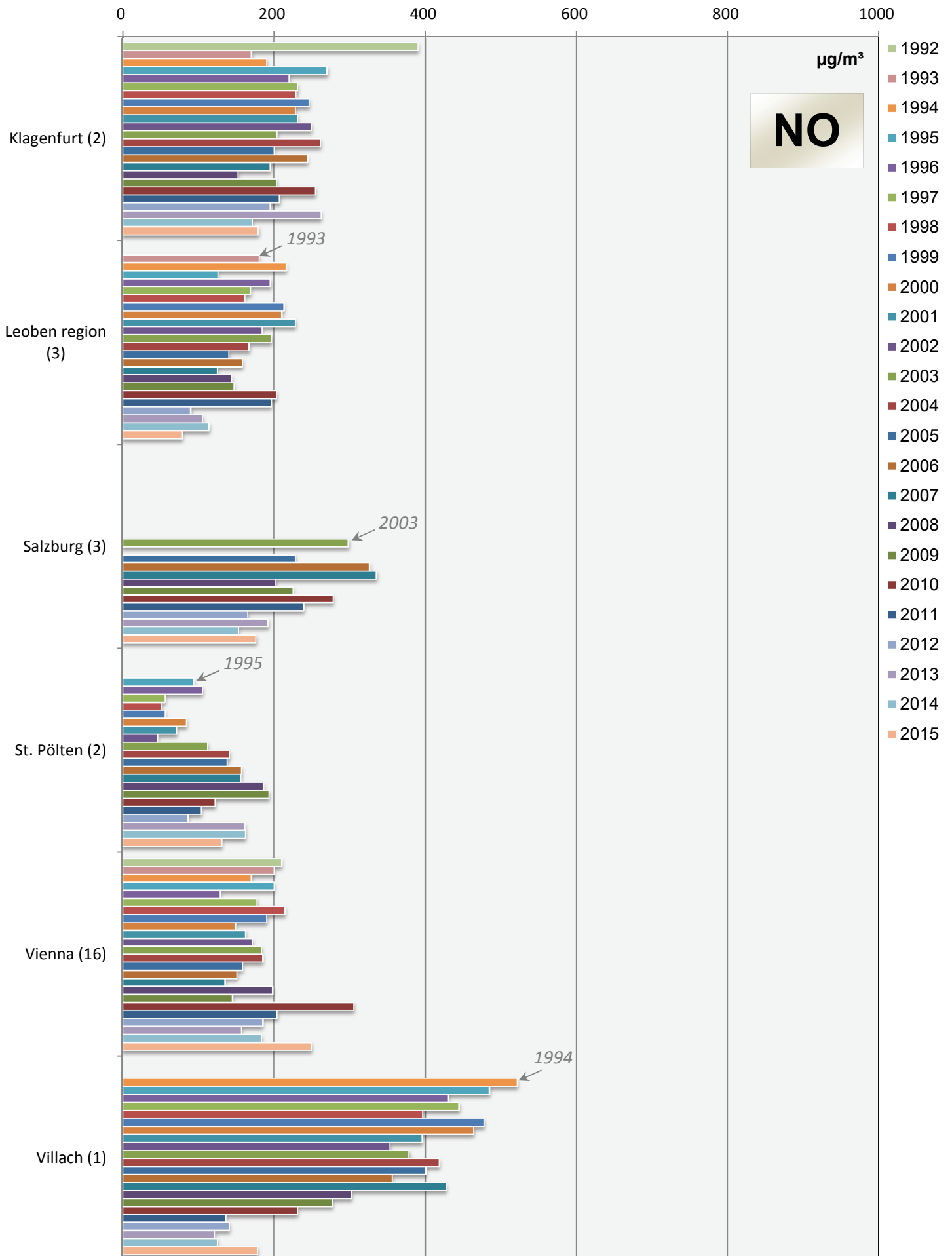
## max. daily mean values (peak-stressed monitoring station)



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

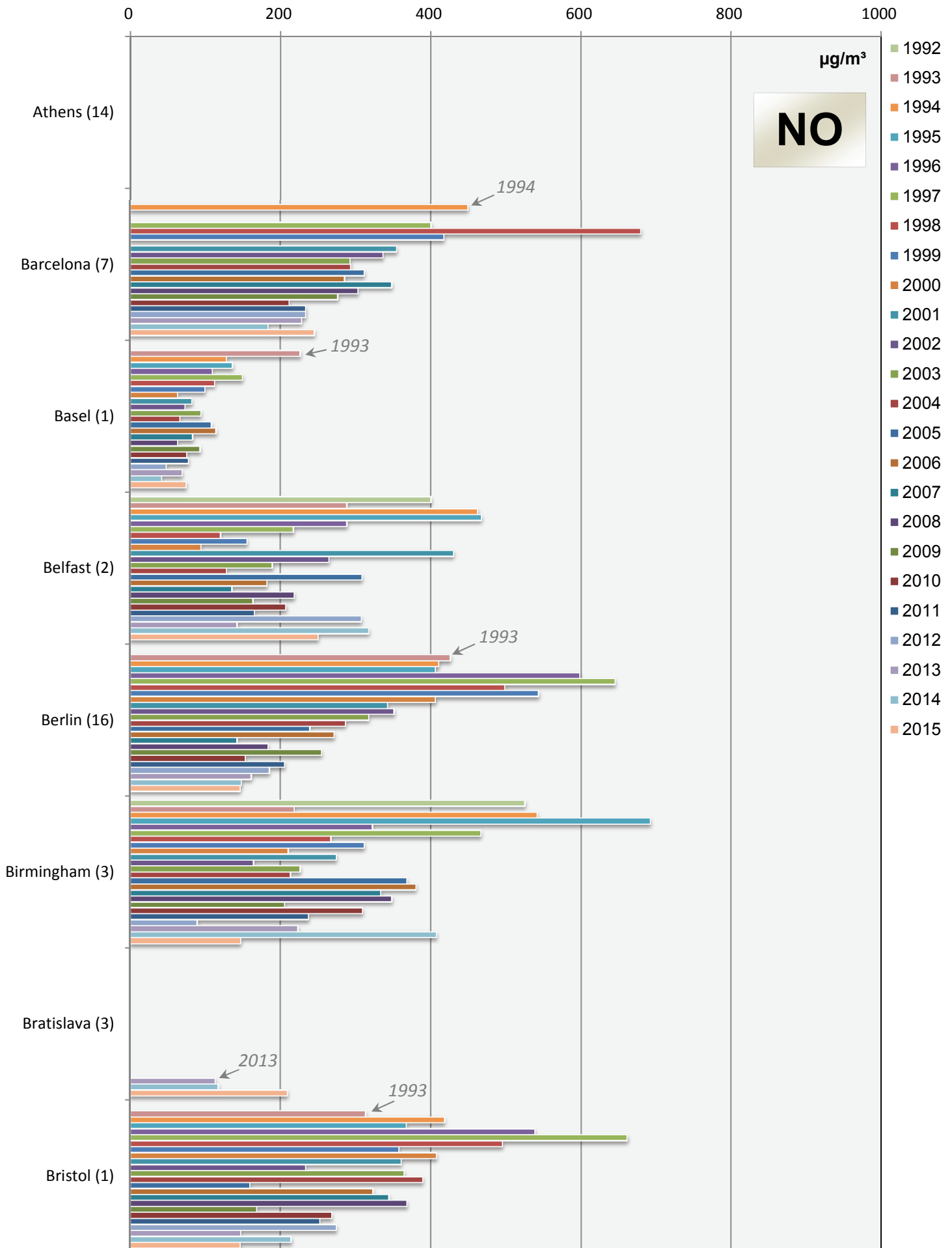
## Comparison of The Air Quality 1992 - 2015

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



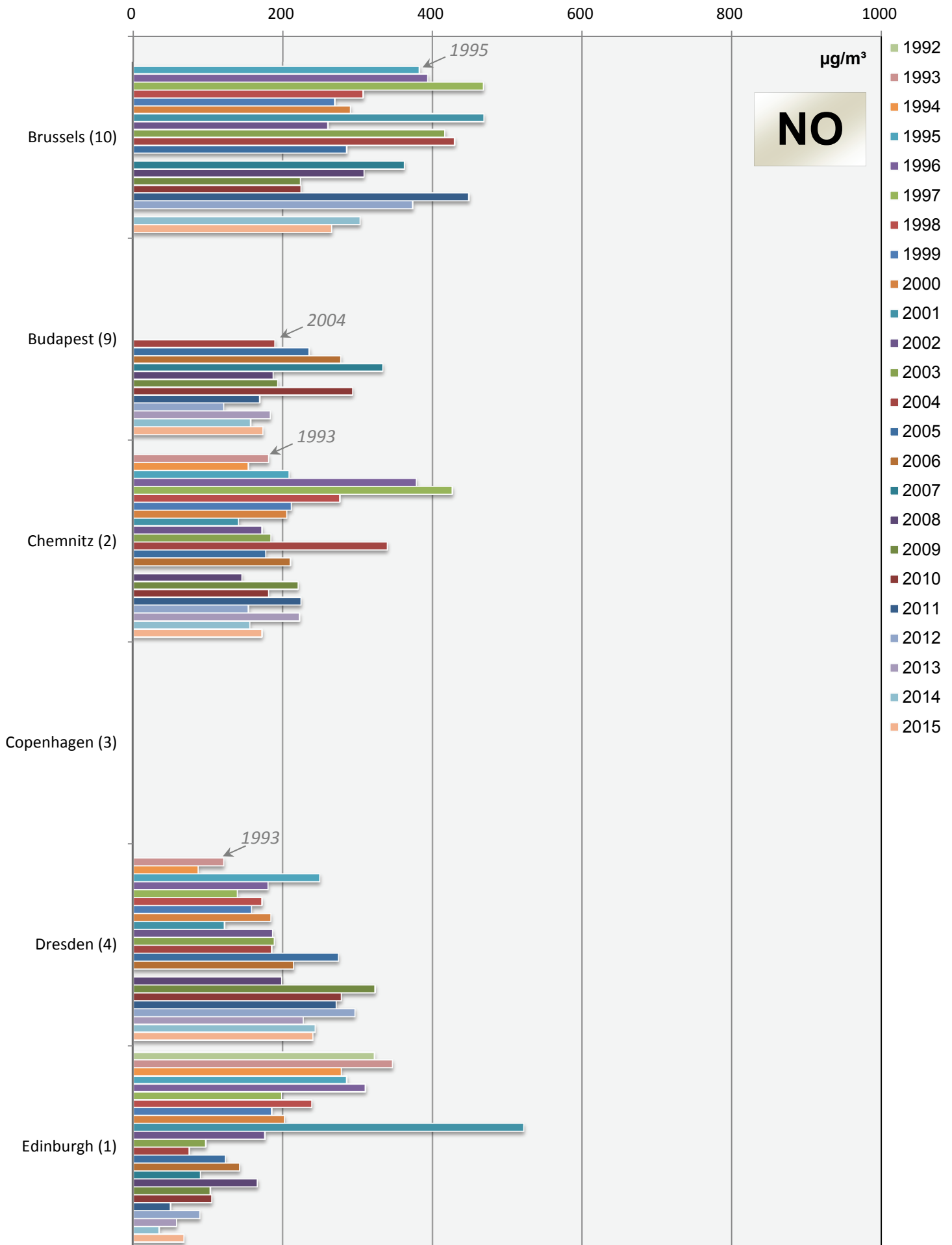
# Comparison of The Air Quality 1992 - 2015

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



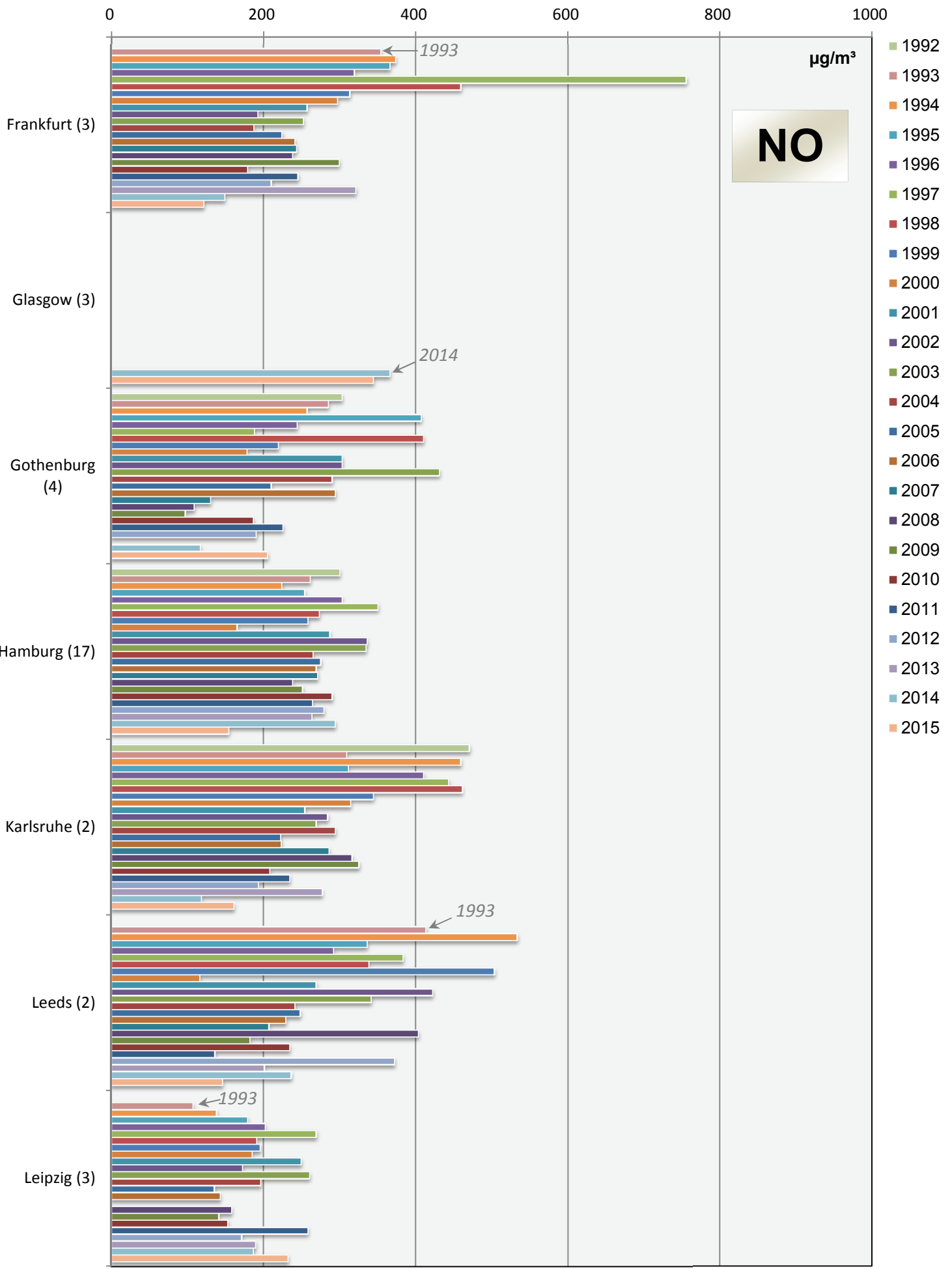
## Comparison of The Air Quality 1992 - 2015

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



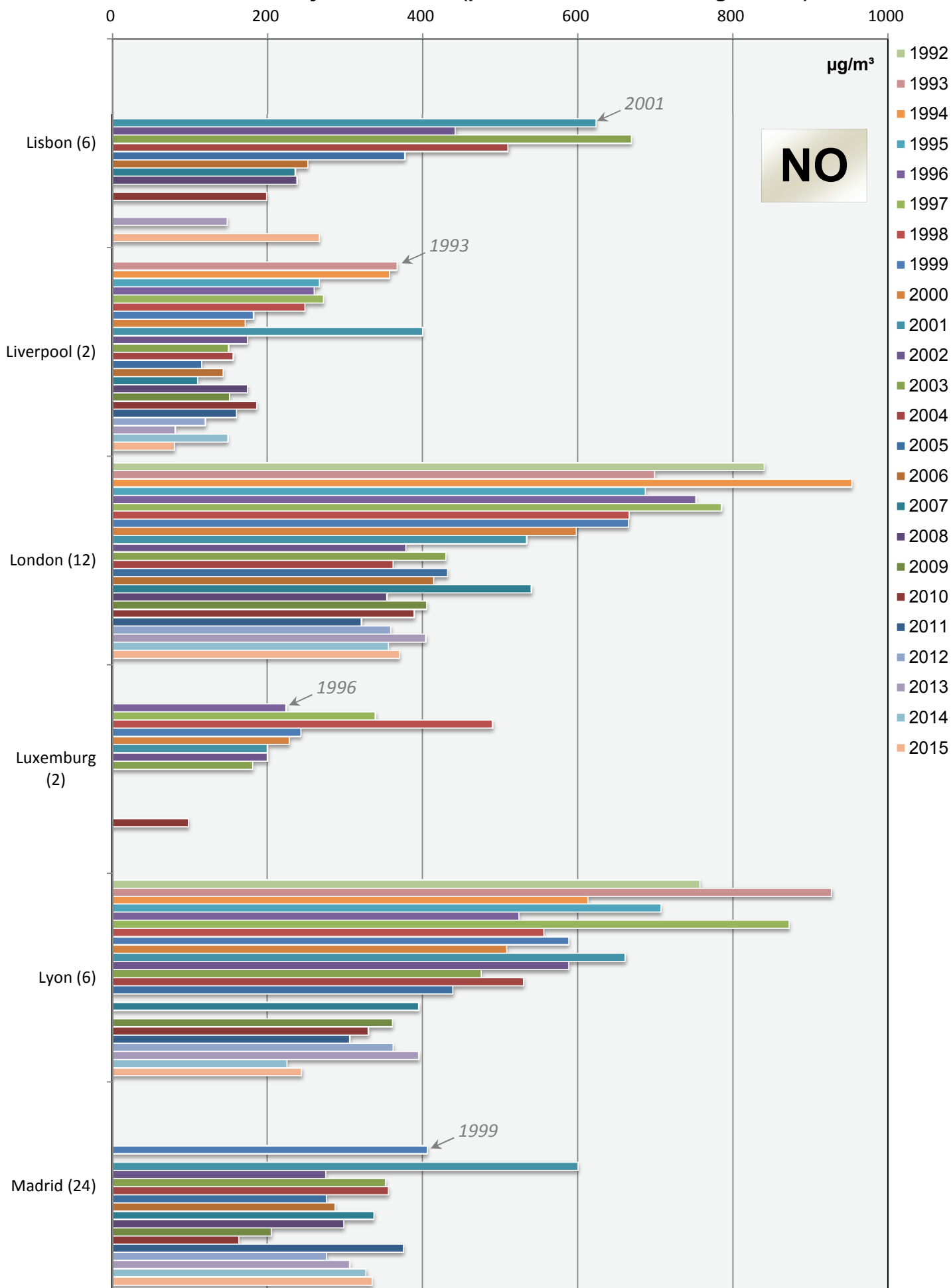
# Comparison of The Air Quality 1992 - 2015

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



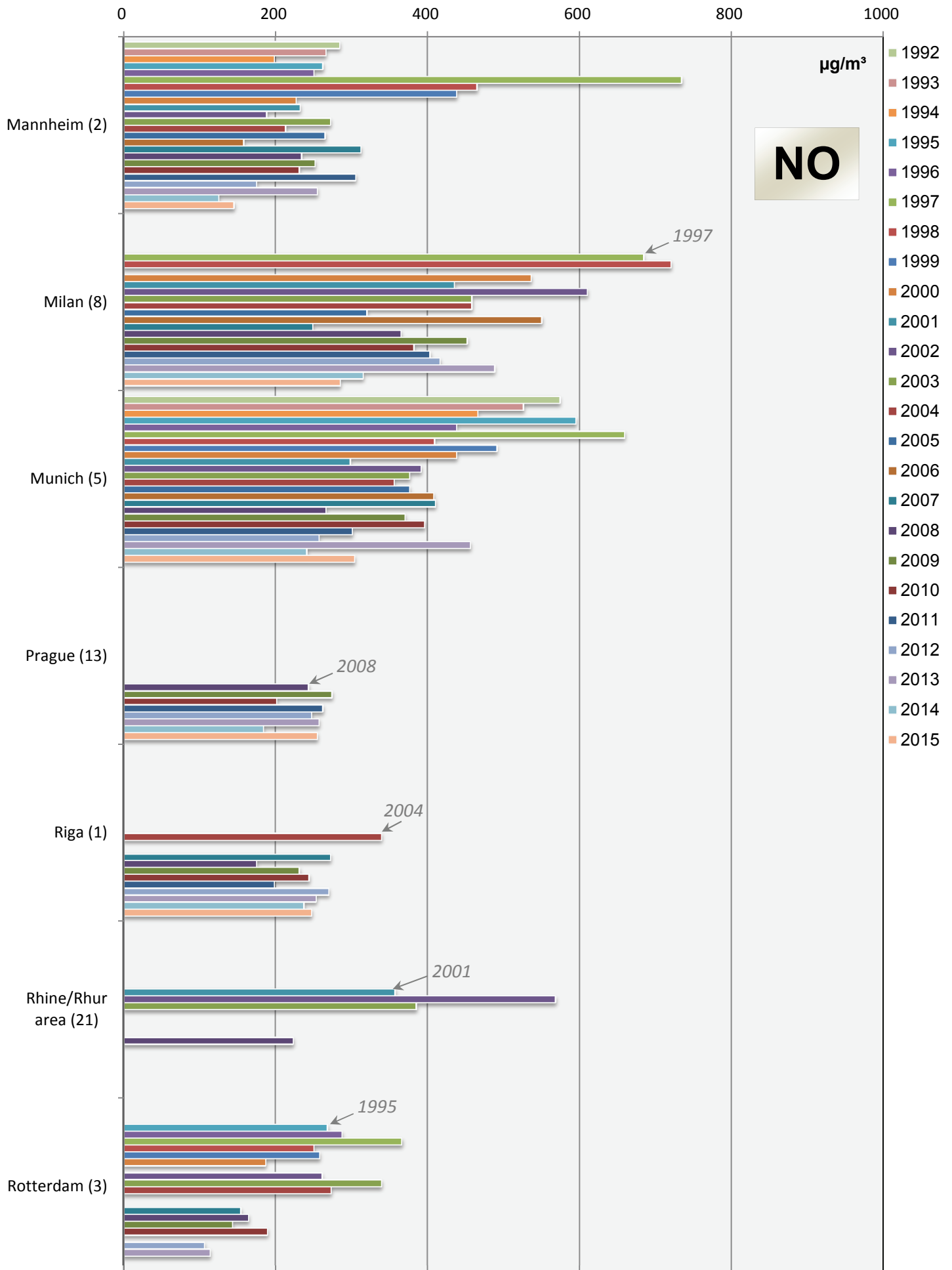
# Comparison of The Air Quality 1992 - 2015

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



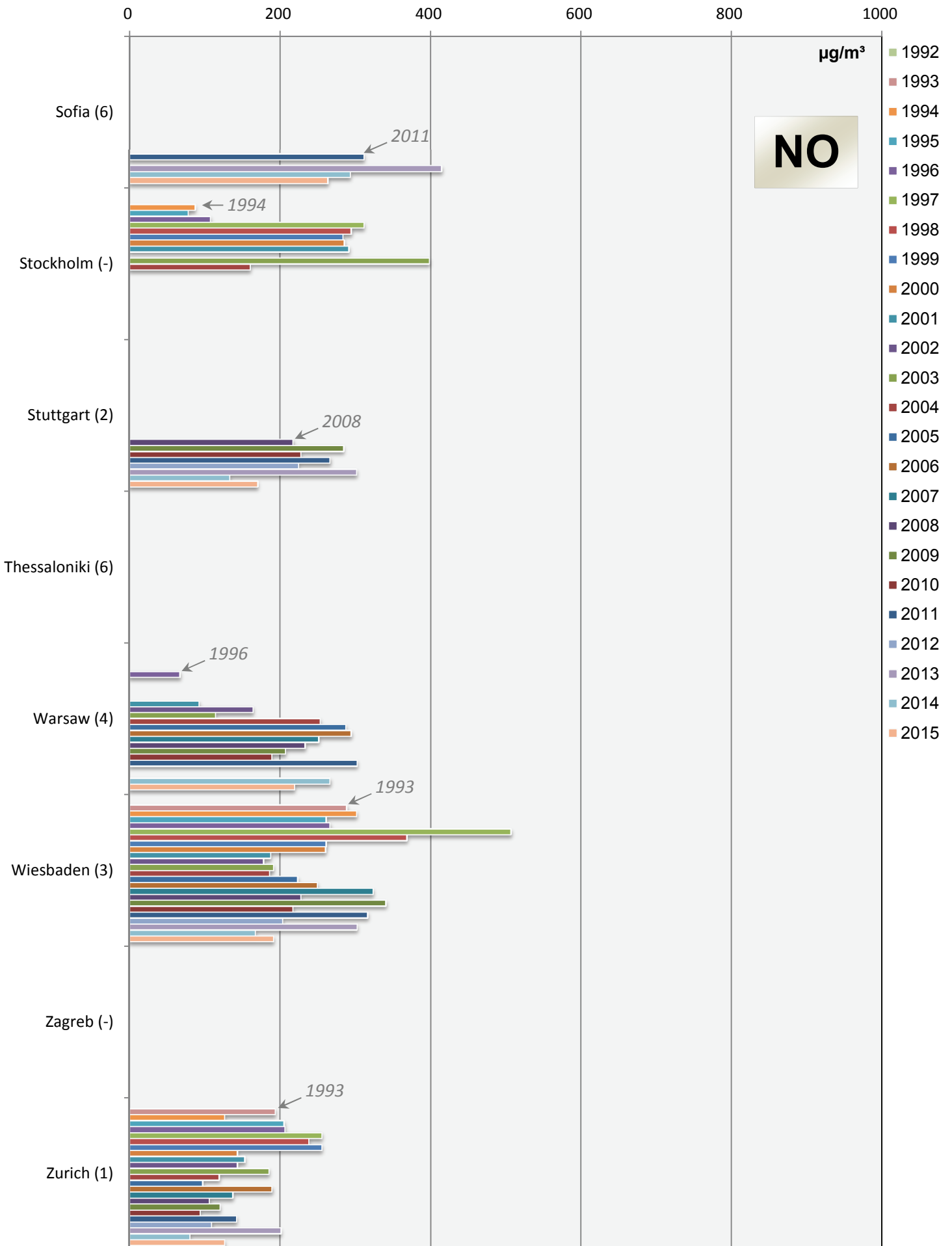
# Comparison of The Air Quality 1992 - 2015

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



## Comparison of The Air Quality 1992 - 2015

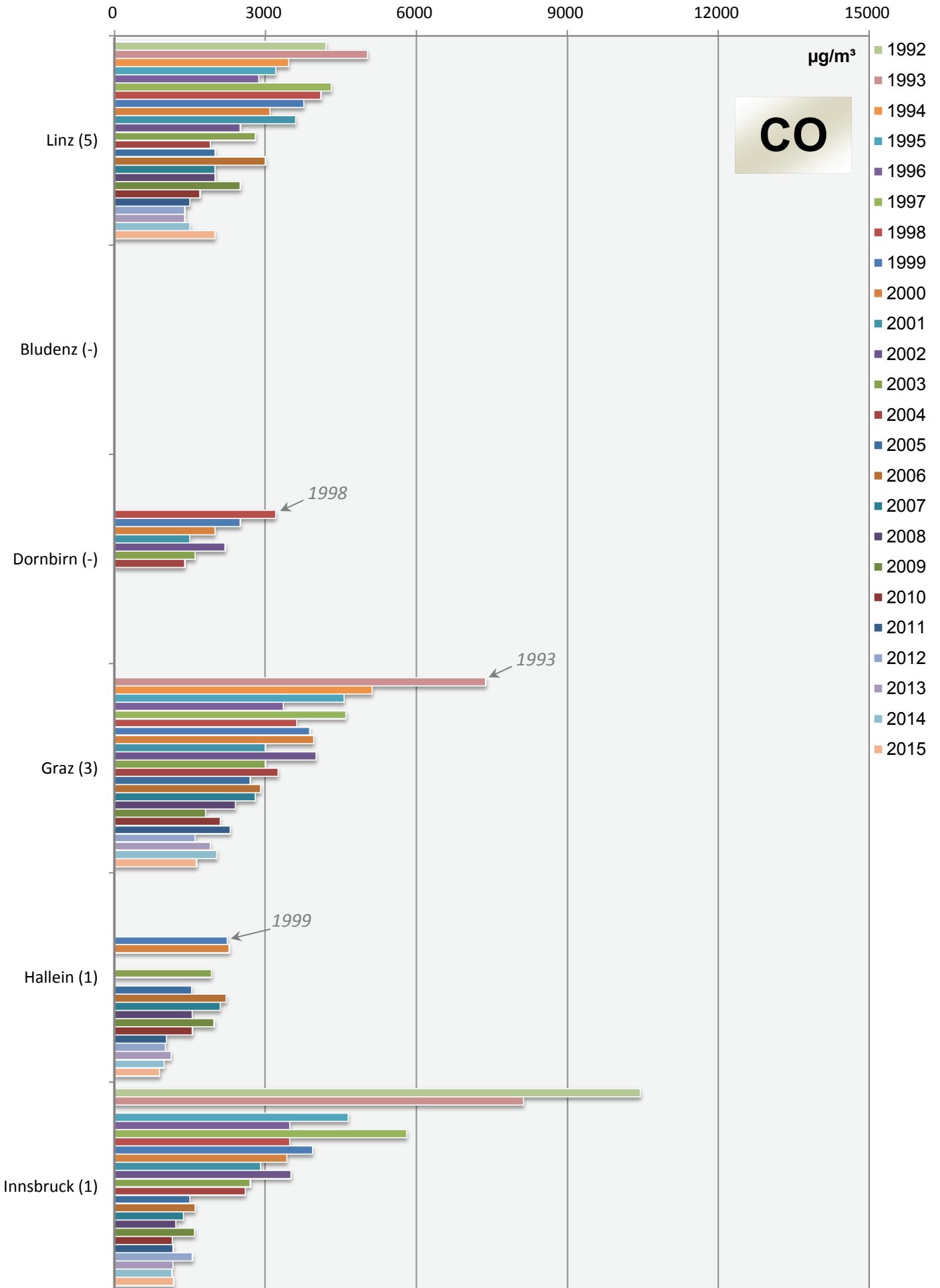
max. daily mean values (peak-stressed monitoring station)



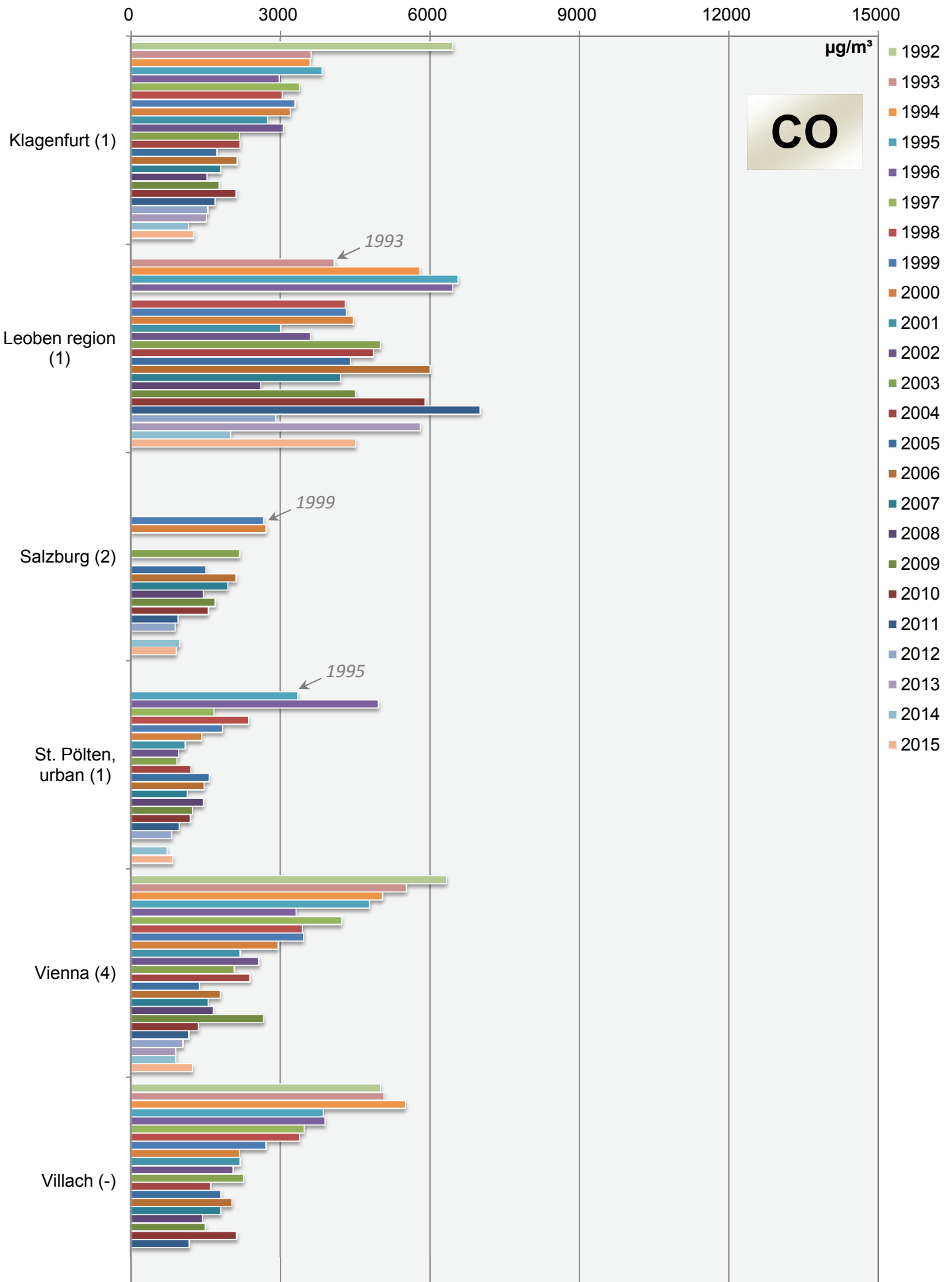


# Comparison of The Air Quality 1992 - 2015

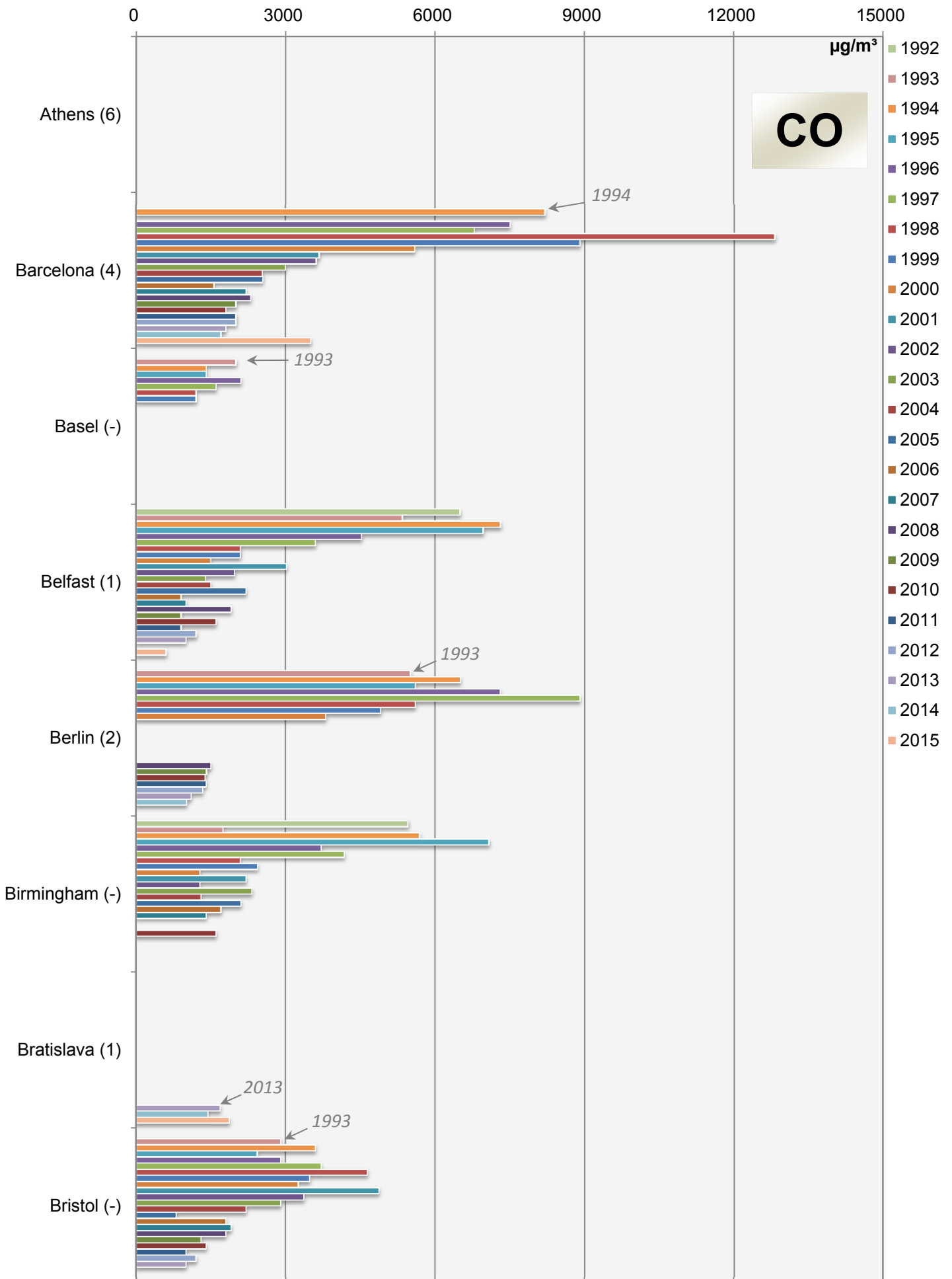
## max. daily mean values (peak-stressed monitoring station)



### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

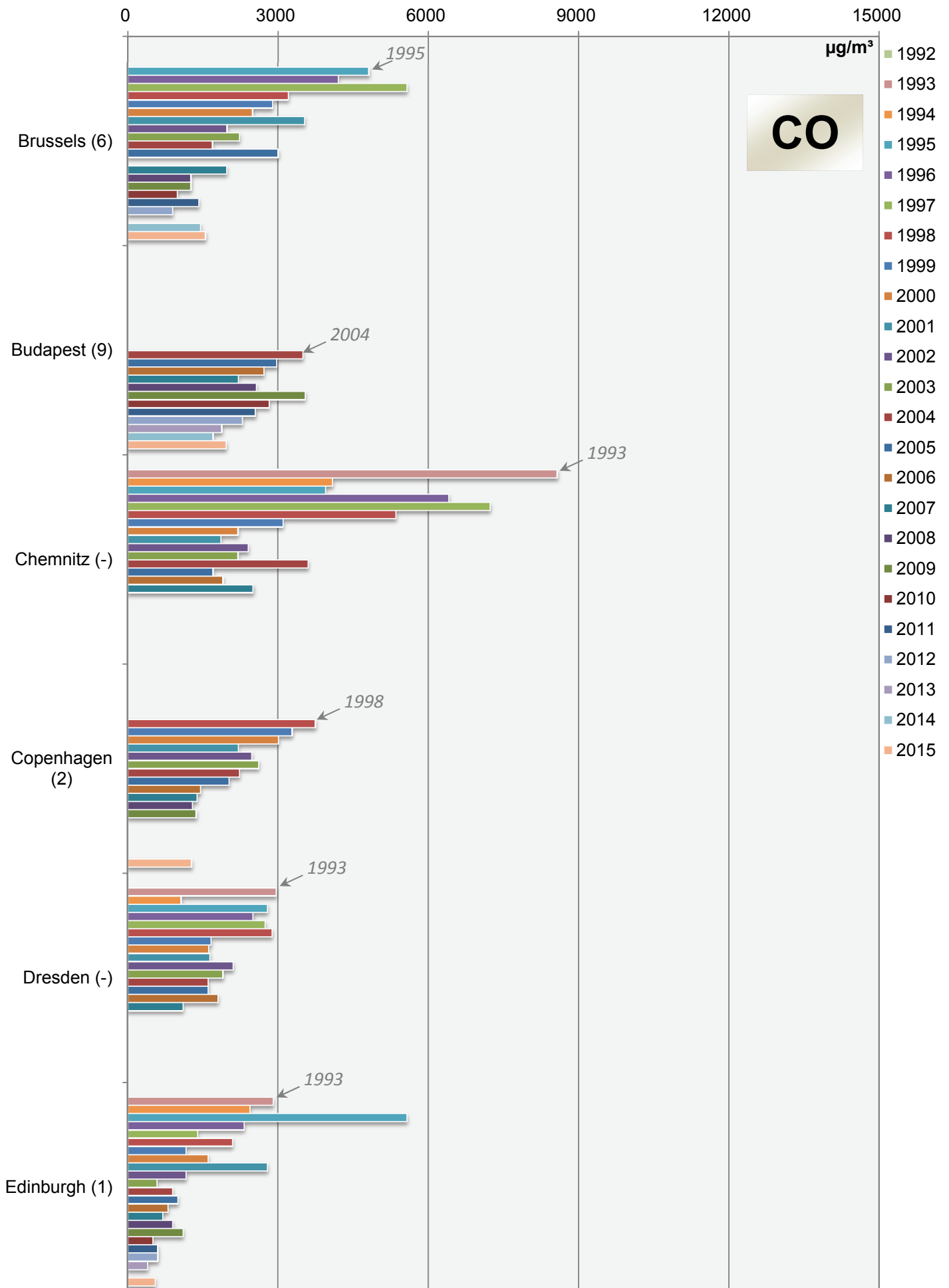


### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

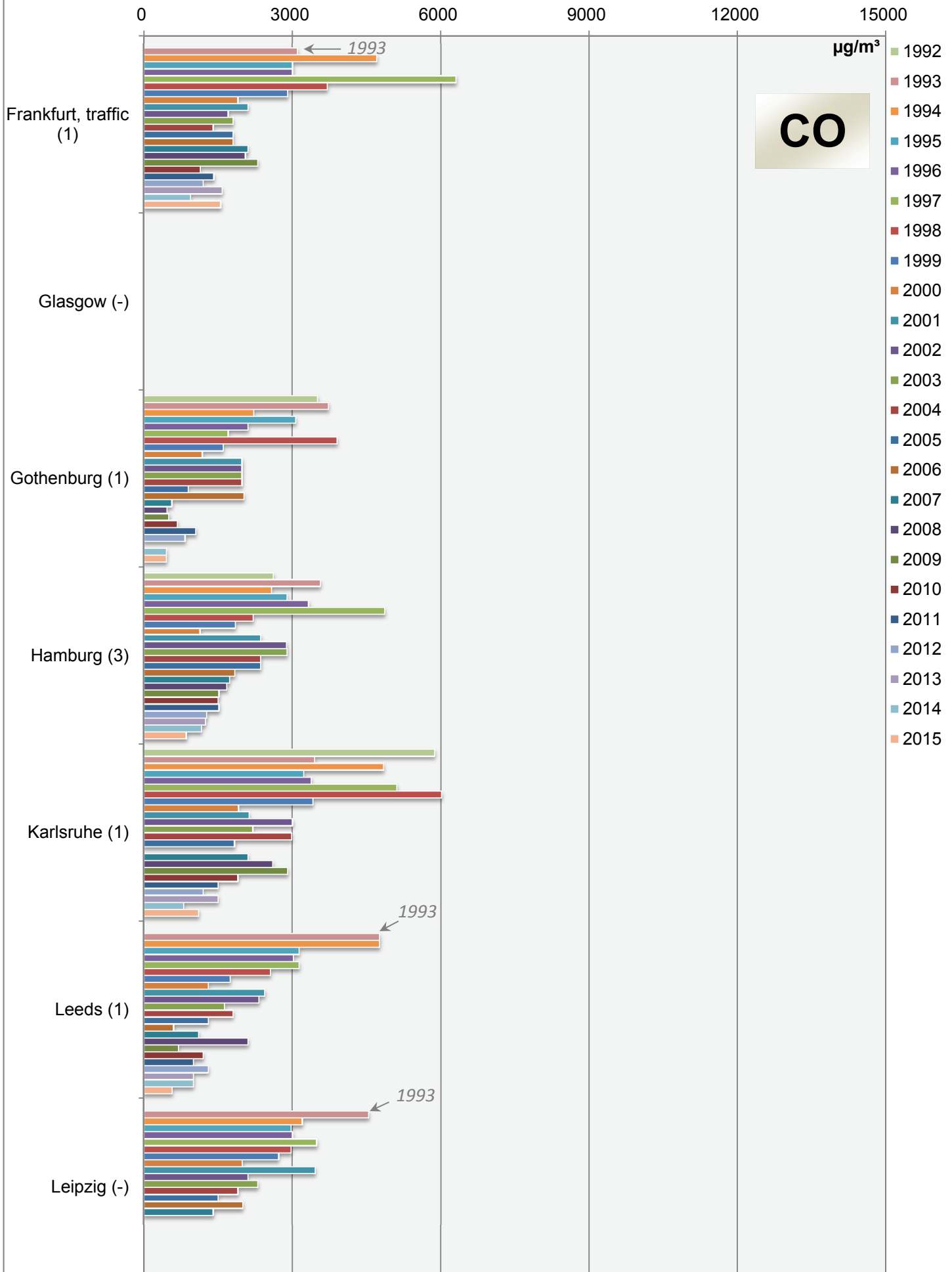


## Comparison of The Air Quality 1992 - 2015

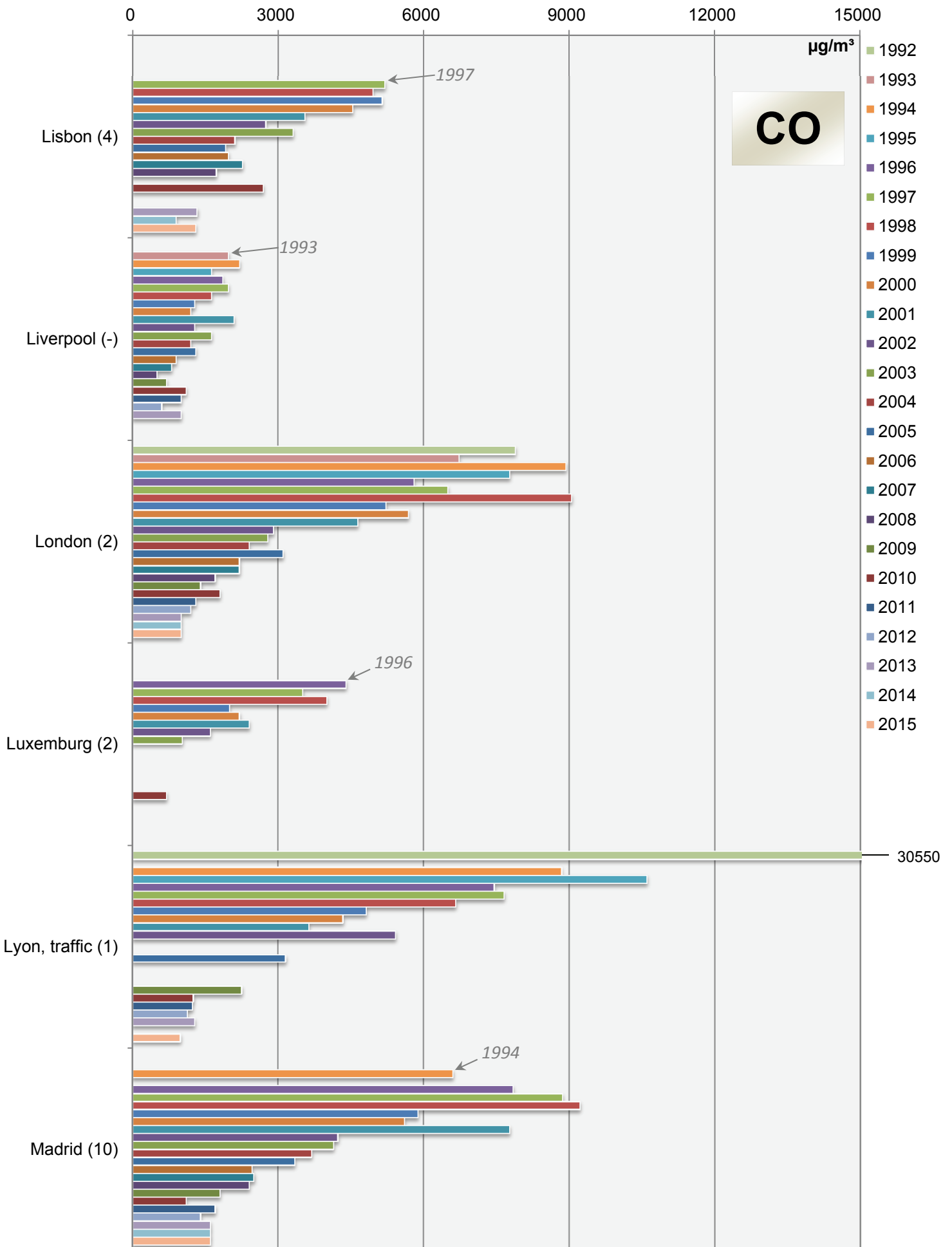
max. daily mean values (peak-stressed monitoring station)



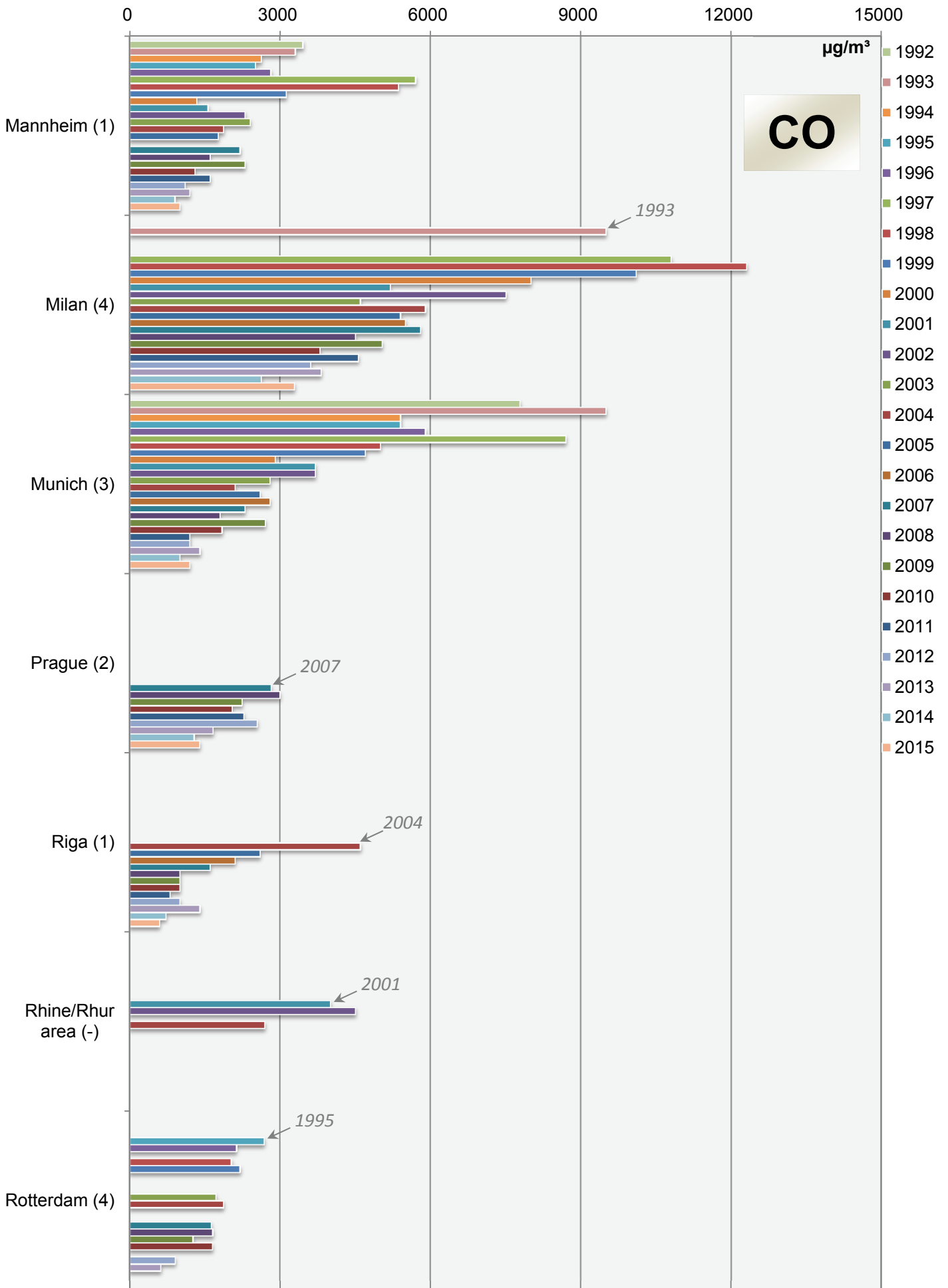
### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



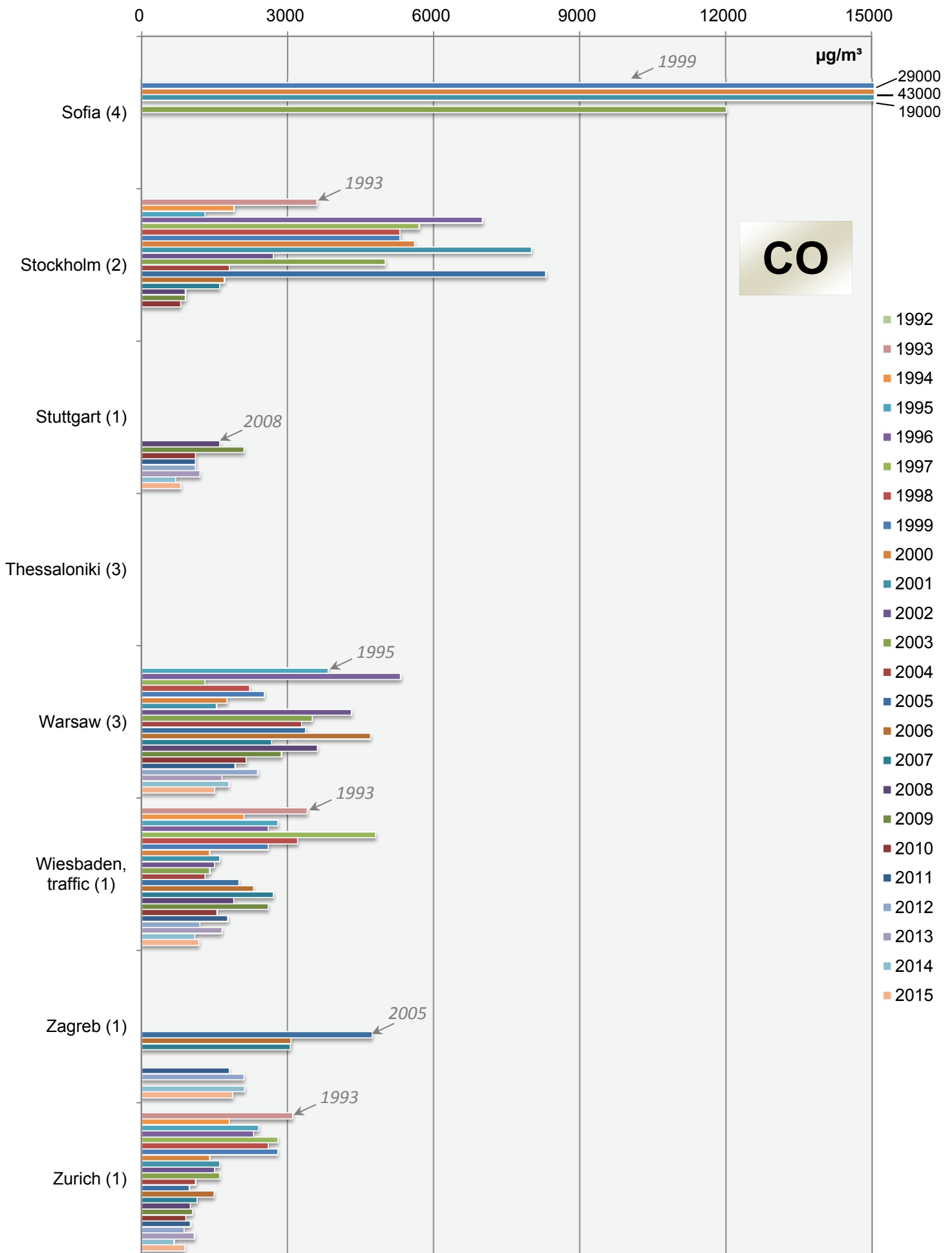
## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



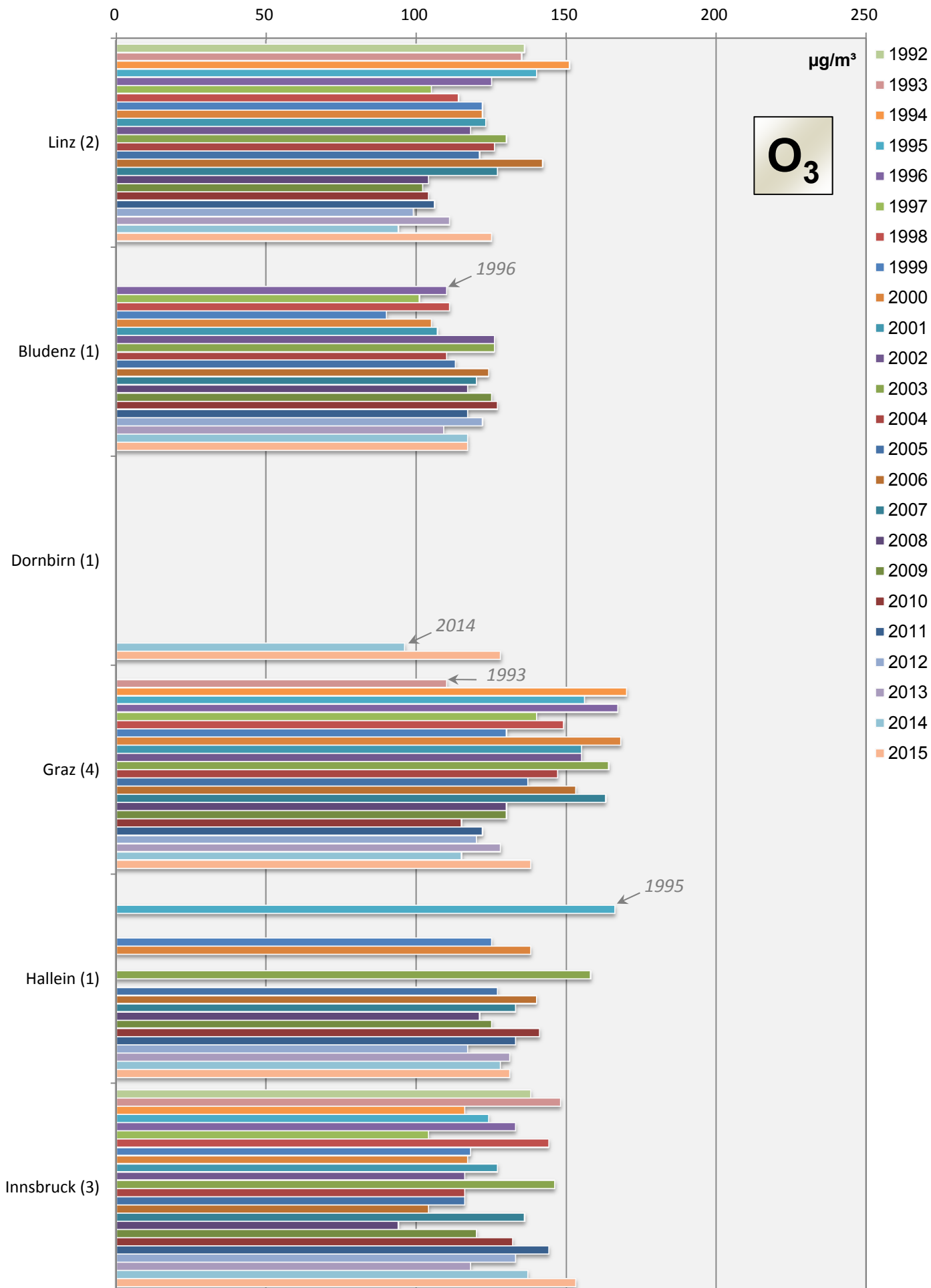
## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)





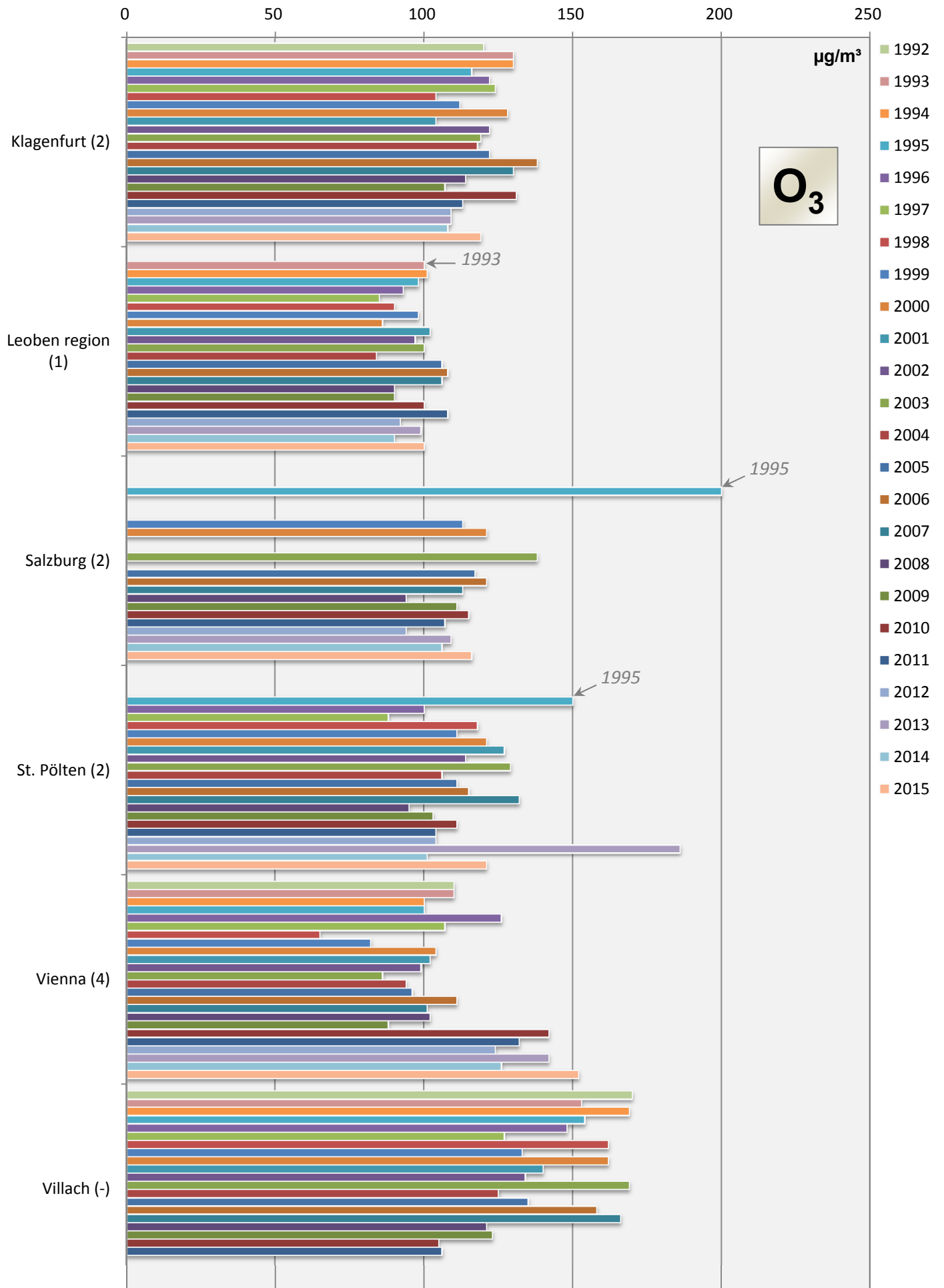
## Comparison of The Air Quality 1992 - 2015

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

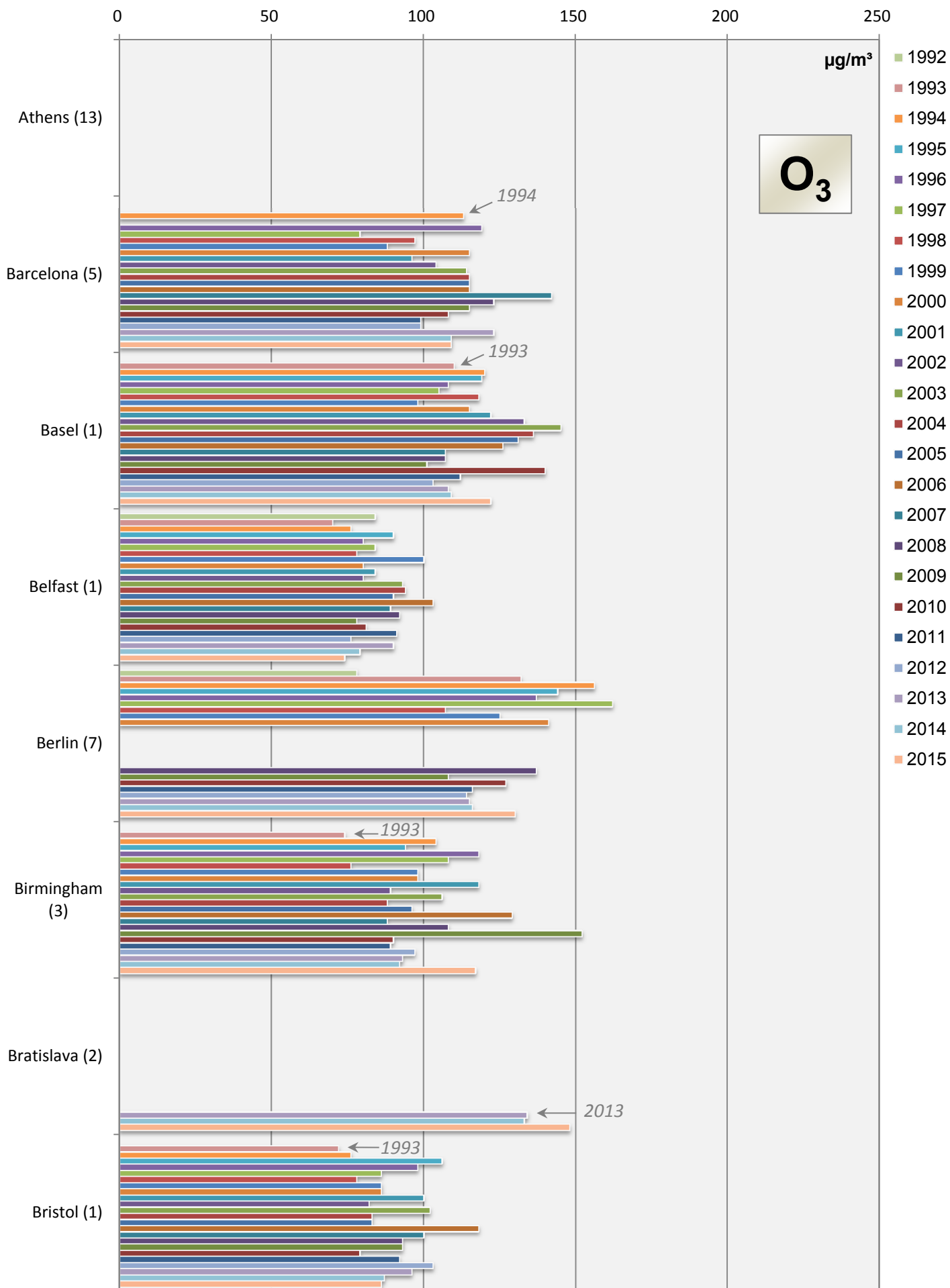


## Comparison of The Air Quality 1992 - 2015

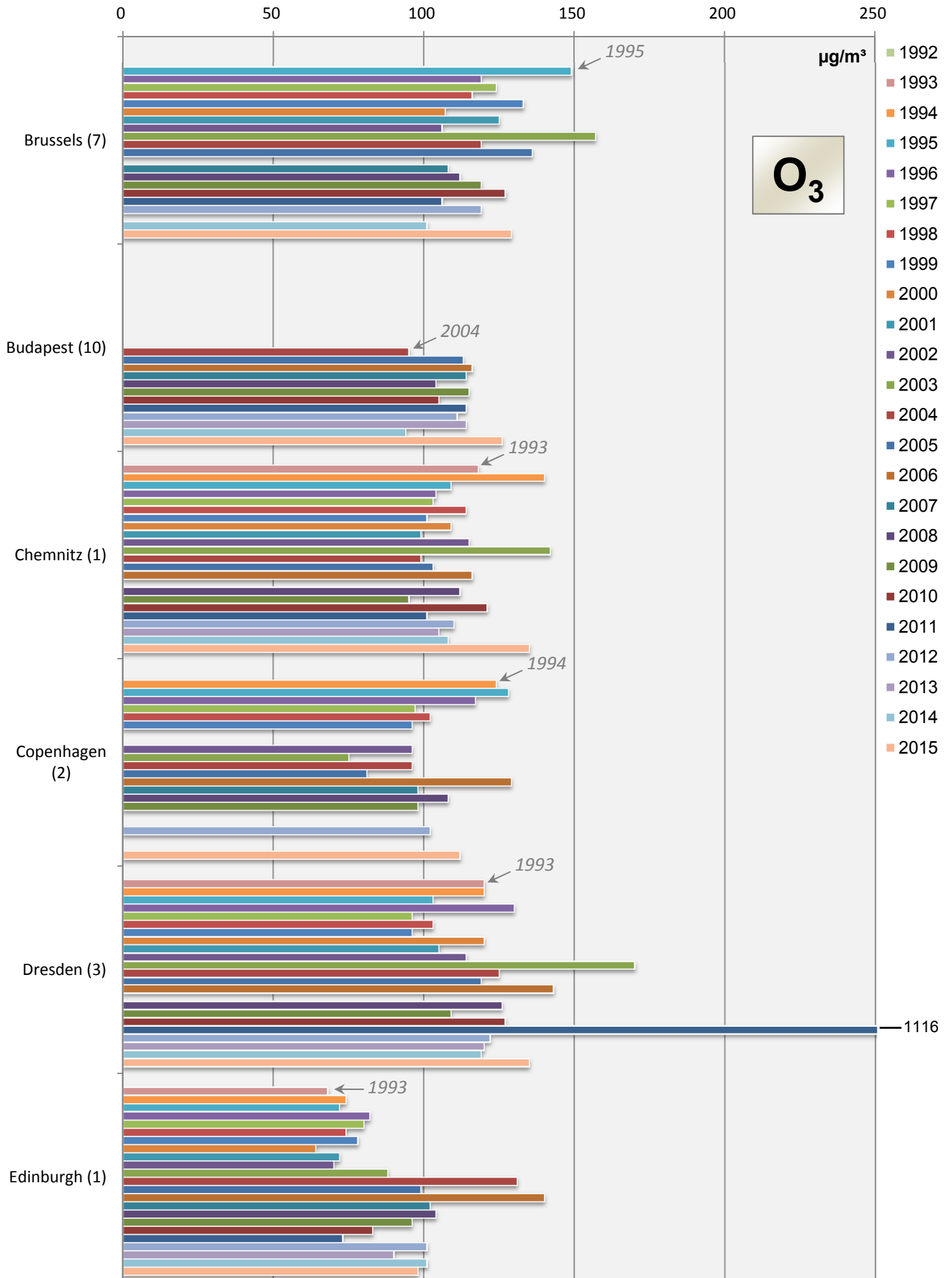
max. daily mean values (peak-stressed monitoring station)



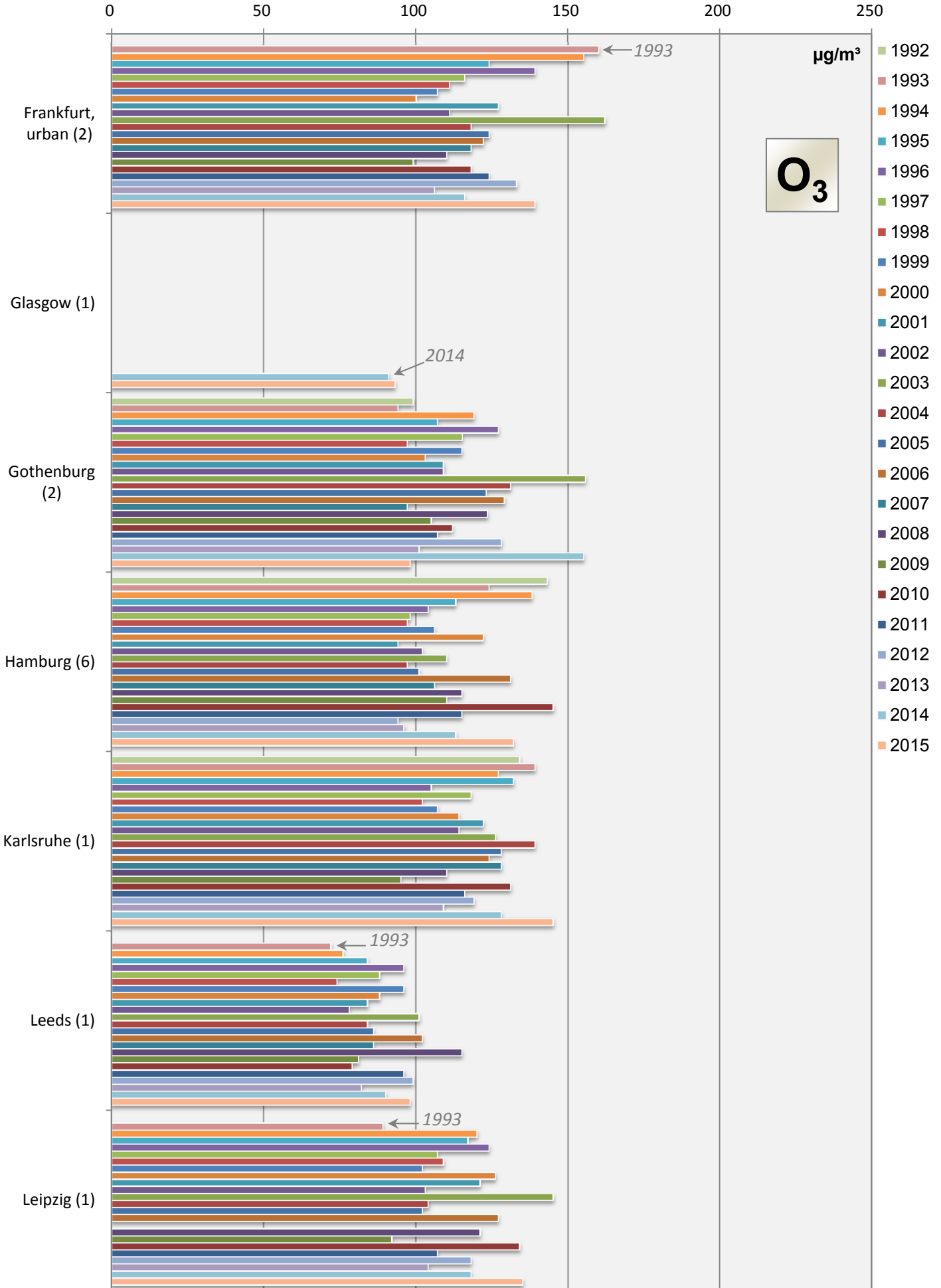
## Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



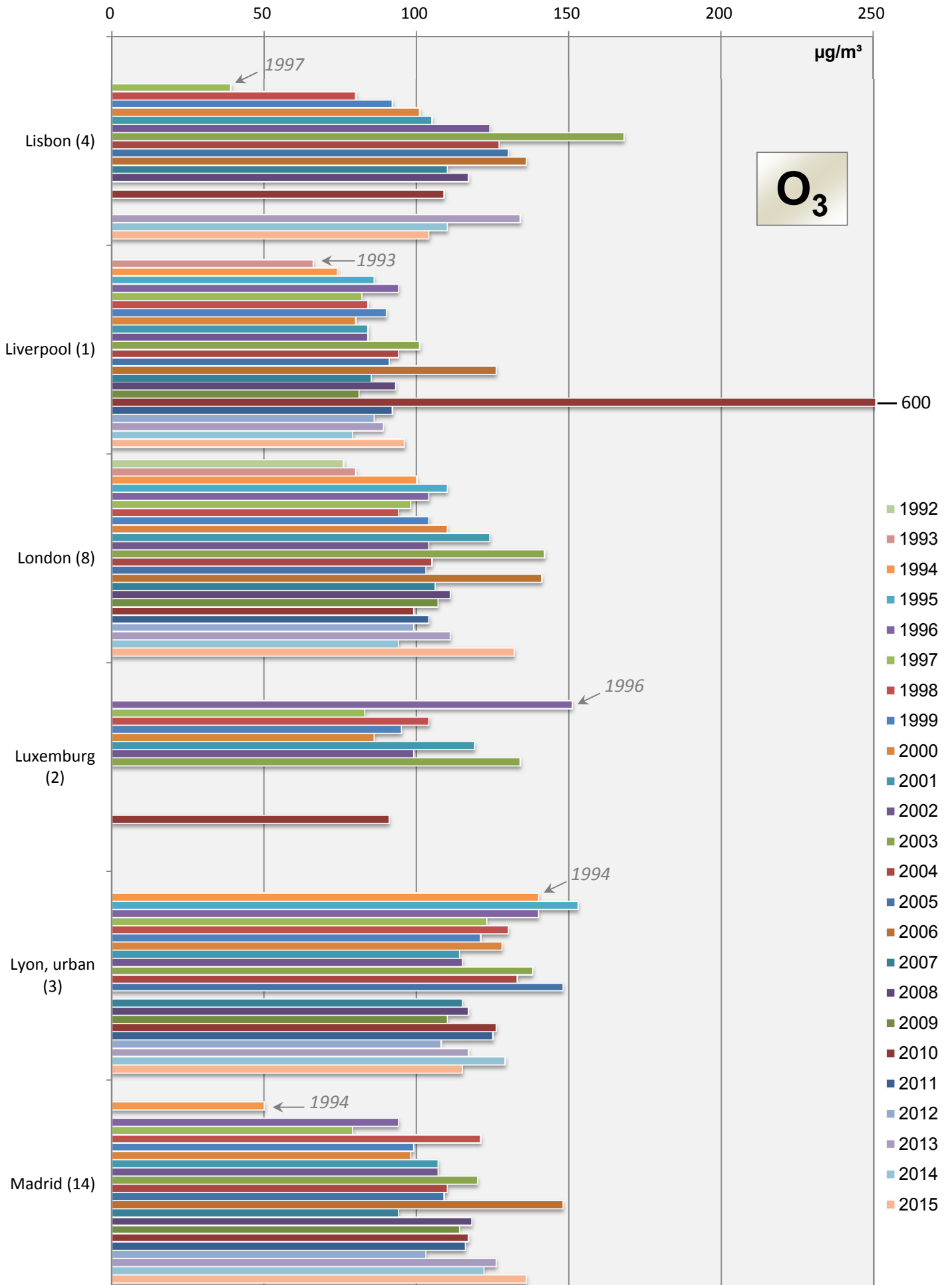
### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)

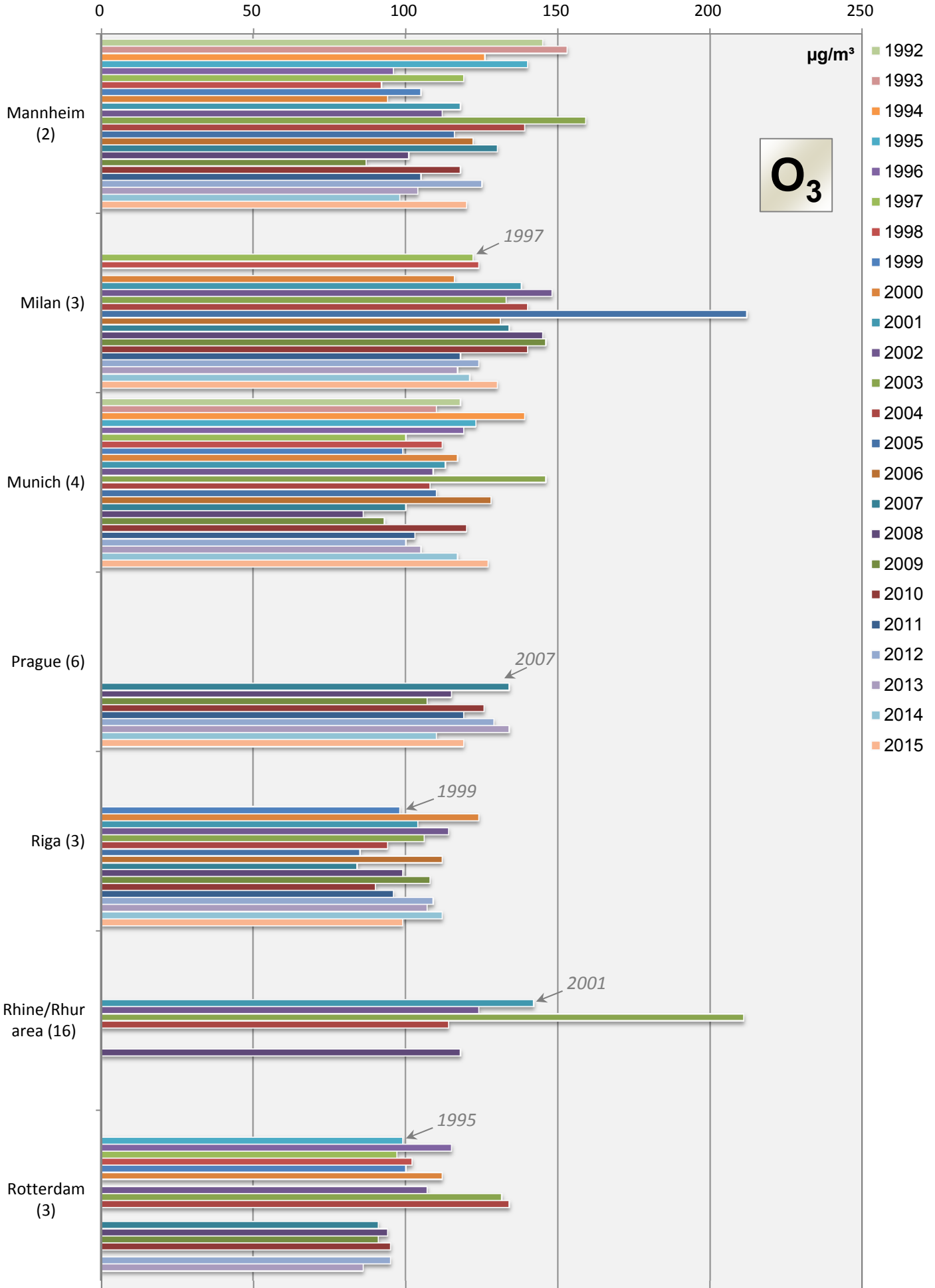


### Comparison of The Air Quality 1992 - 2015 max. daily mean values (peak-stressed monitoring station)



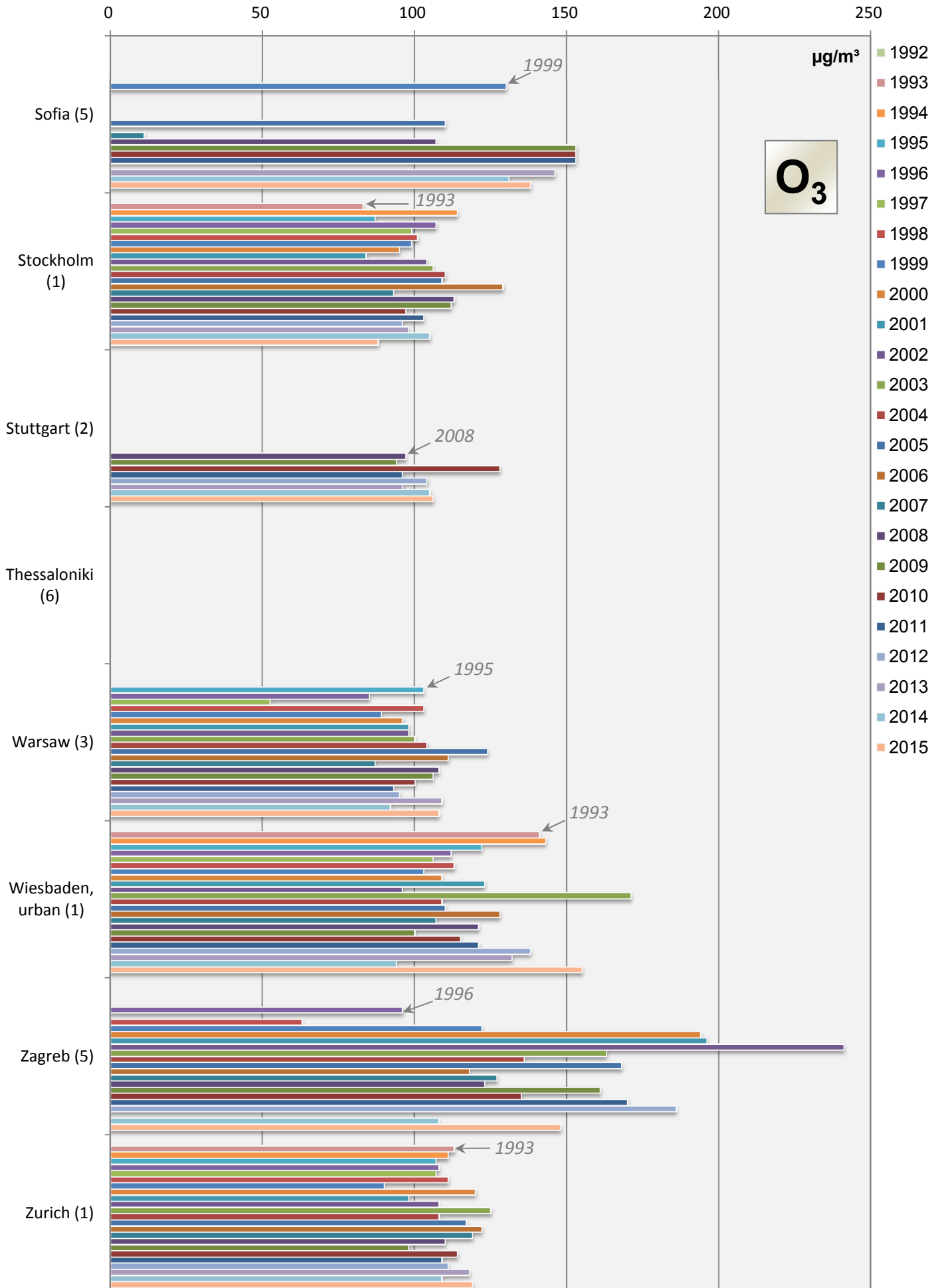
# Comparison of The Air Quality 1992 - 2015

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



## Comparison of The Air Quality 1992 - 2015

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





**Jahresvergleich**

**1993 - 2015**

**Jahresmittelwerte,  $\Sigma$  SO<sub>2</sub>, TSP/PM10, NO<sub>2</sub>**

**Comparison Of The Air Quality**

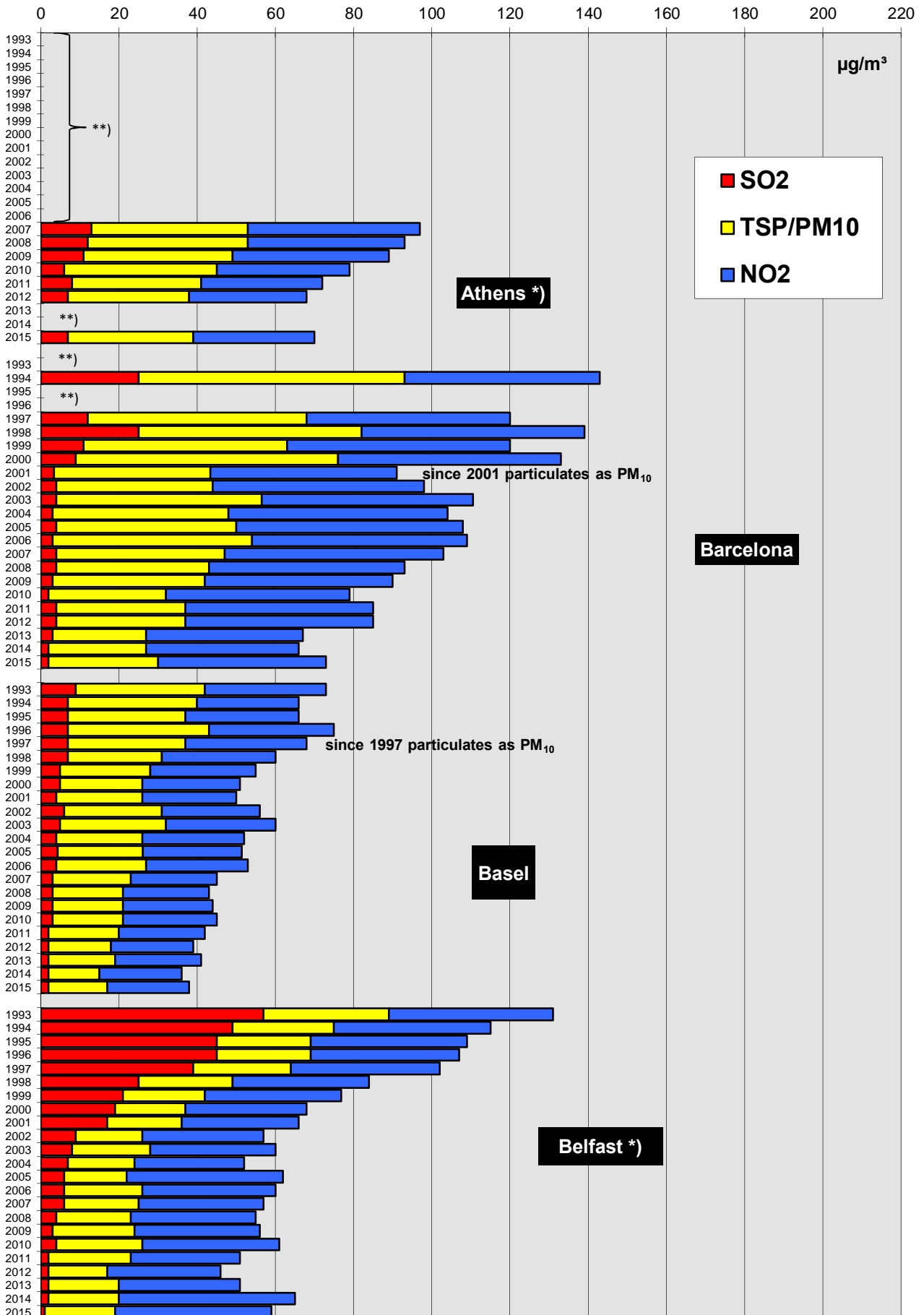
**1993 - 2015**

**Annual Mean Values,  $\Sigma$  SO<sub>2</sub>, TSP/PM10, NO<sub>2</sub>**



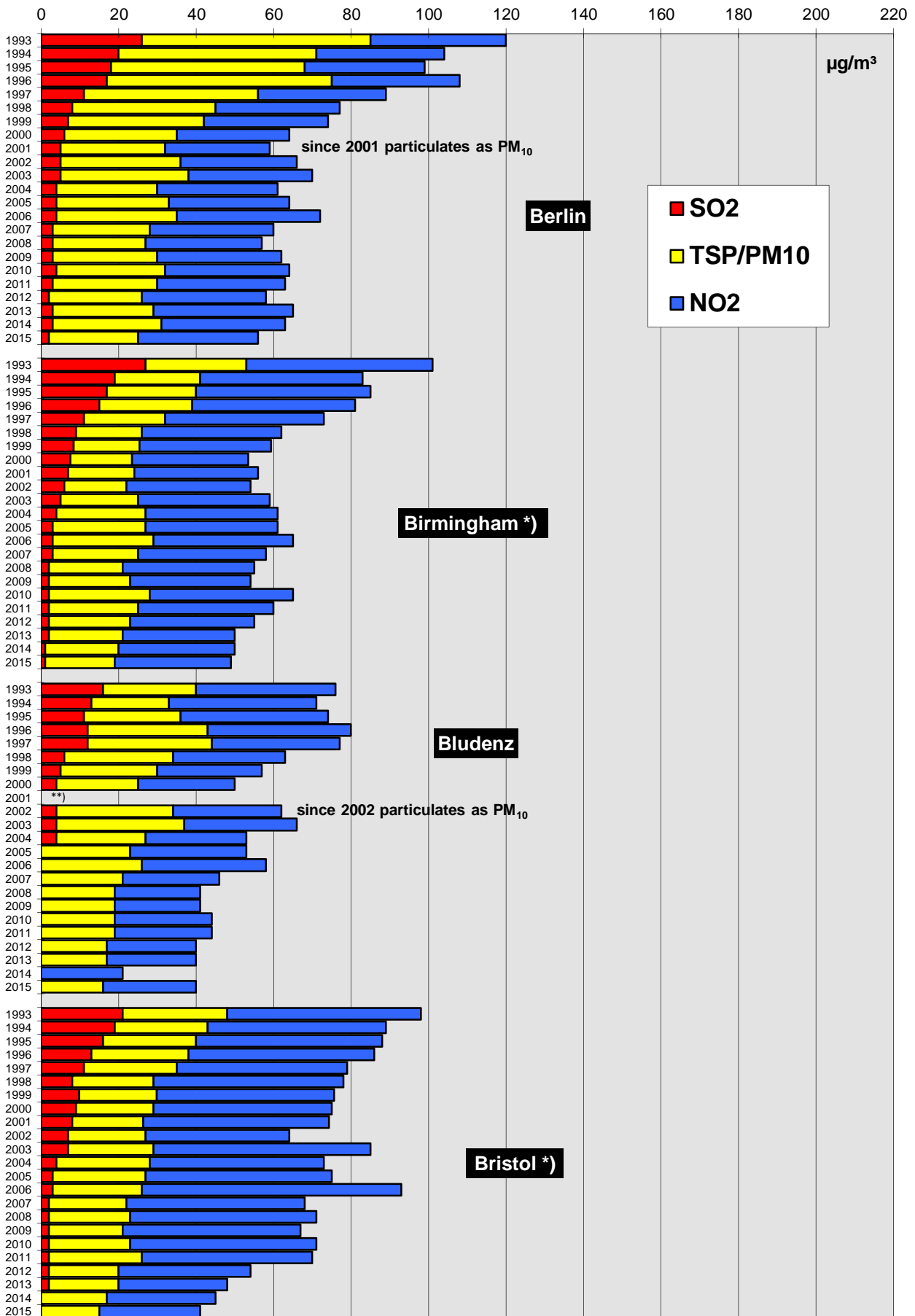
# Comparison Of The Air Quality 1993-2015

## Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



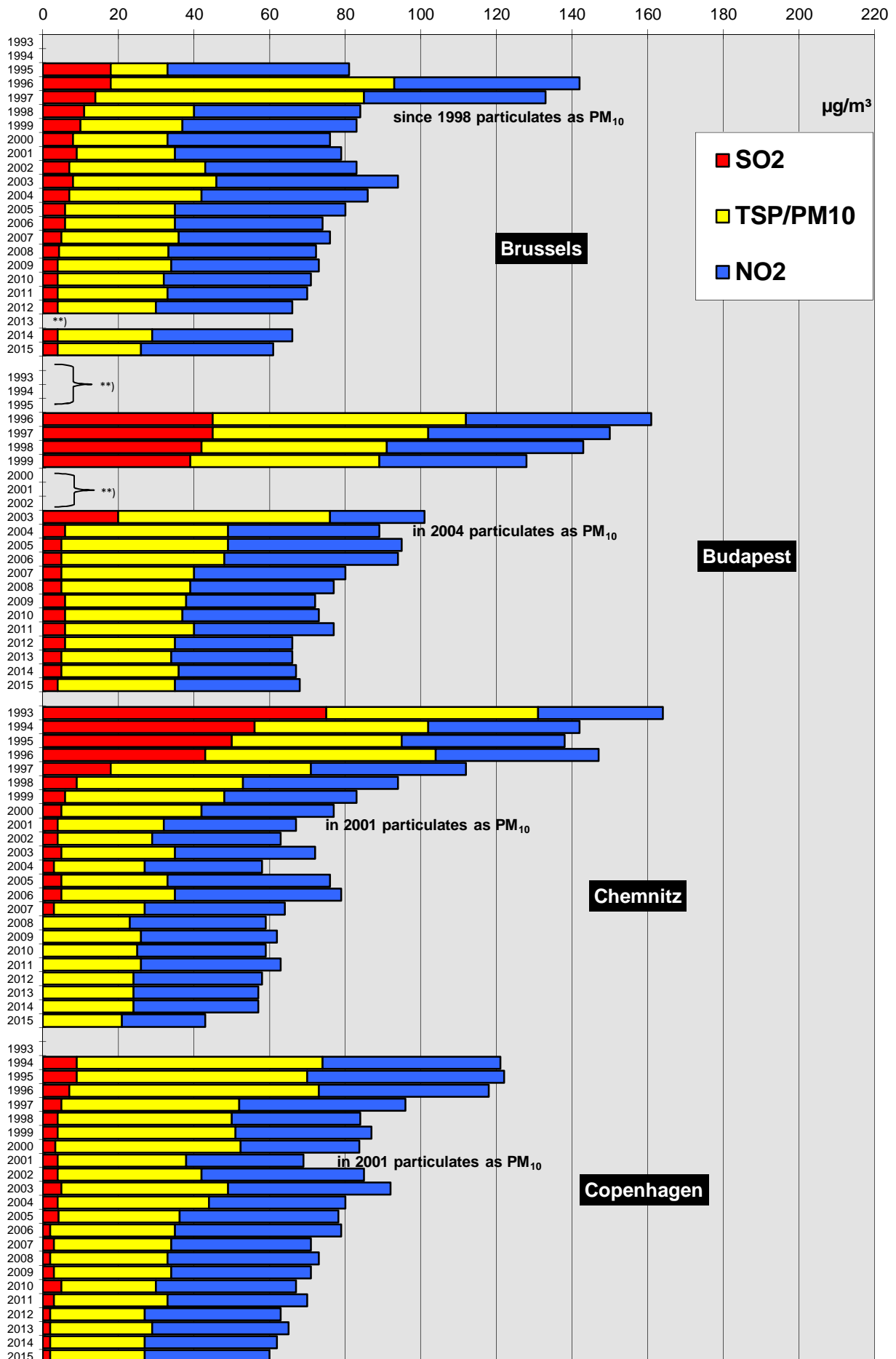
\*) particulates calculated as PM<sub>10</sub> \*\*) no data

### Comparison Of The Air Quality 1993-2015 Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



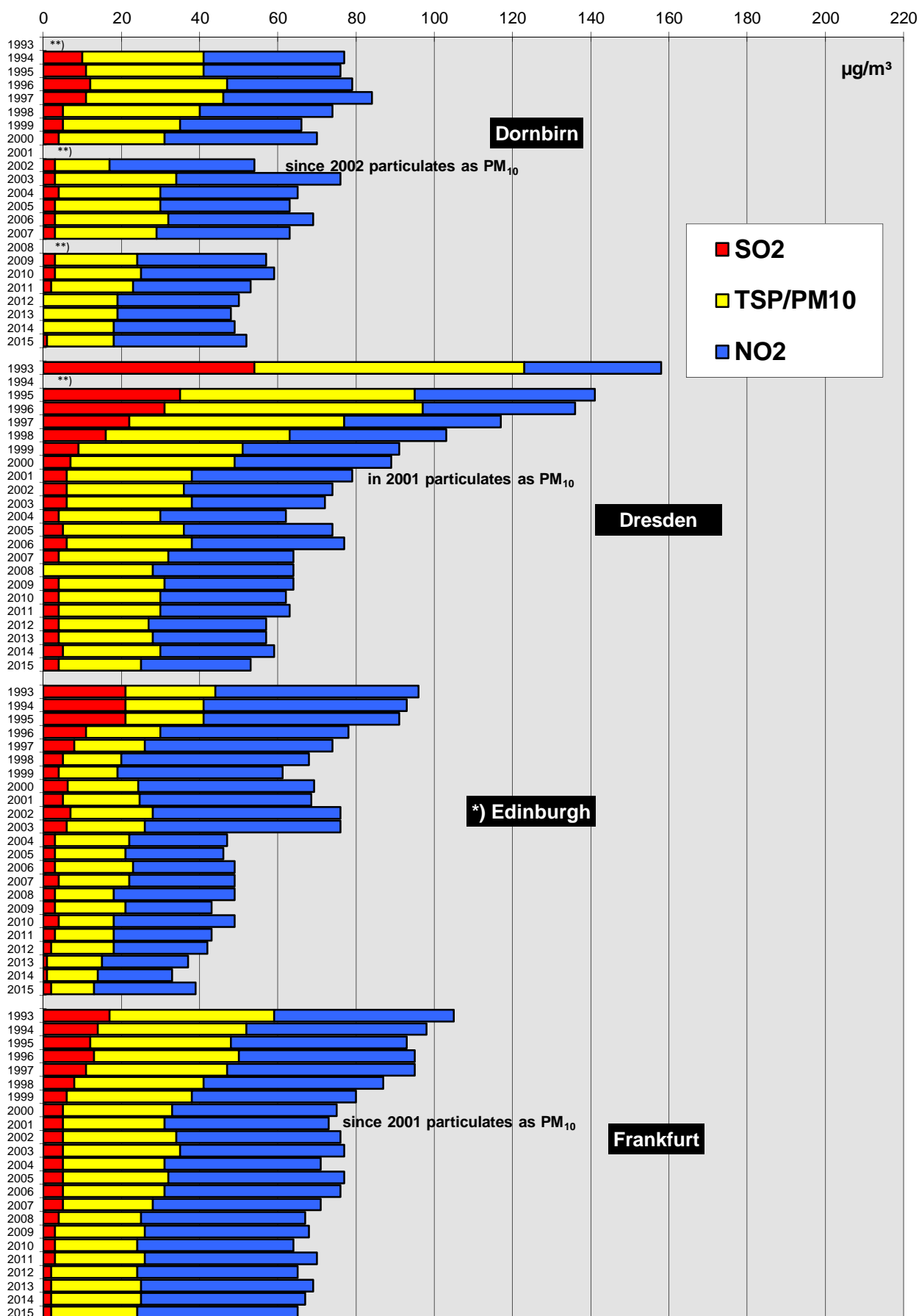
\*) particulates calculated as PM<sub>10</sub> \*\*) no data

### Comparison Of The Air Quality 1993-2015 Development of the annual mean values $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



) particulates calculated as PM10 \*\*) no data

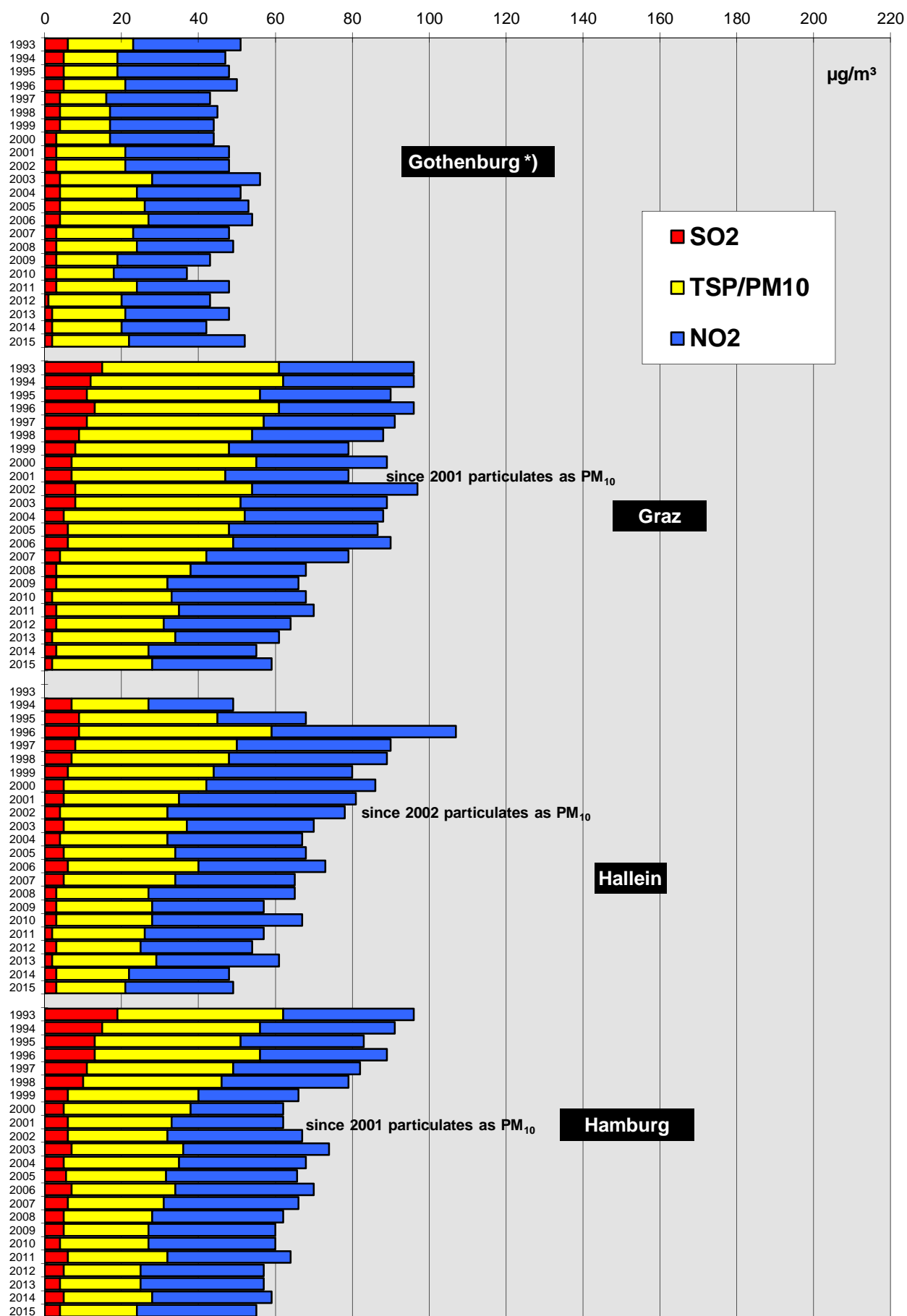
### Comparison Of The Air Quality 1993-2015 Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



\*) particulates calculated as PM<sub>10</sub> \*\*) no data

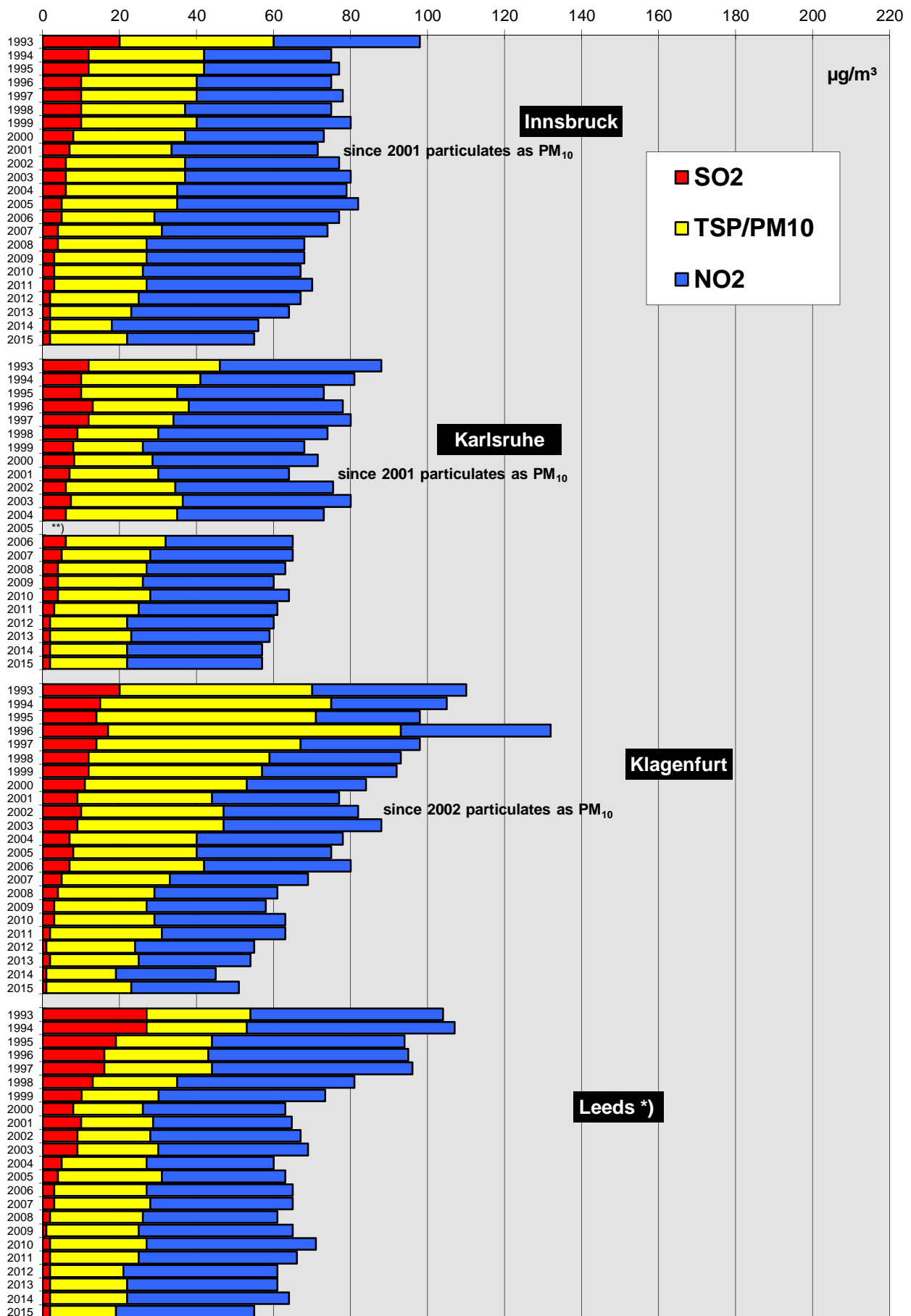
# Comparison Of The Air Quality 1993-2015

## Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



\*) particulates calculated as PM<sub>10</sub> \*\*) no data

### Comparison Of The Air Quality 1993-2015 Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)

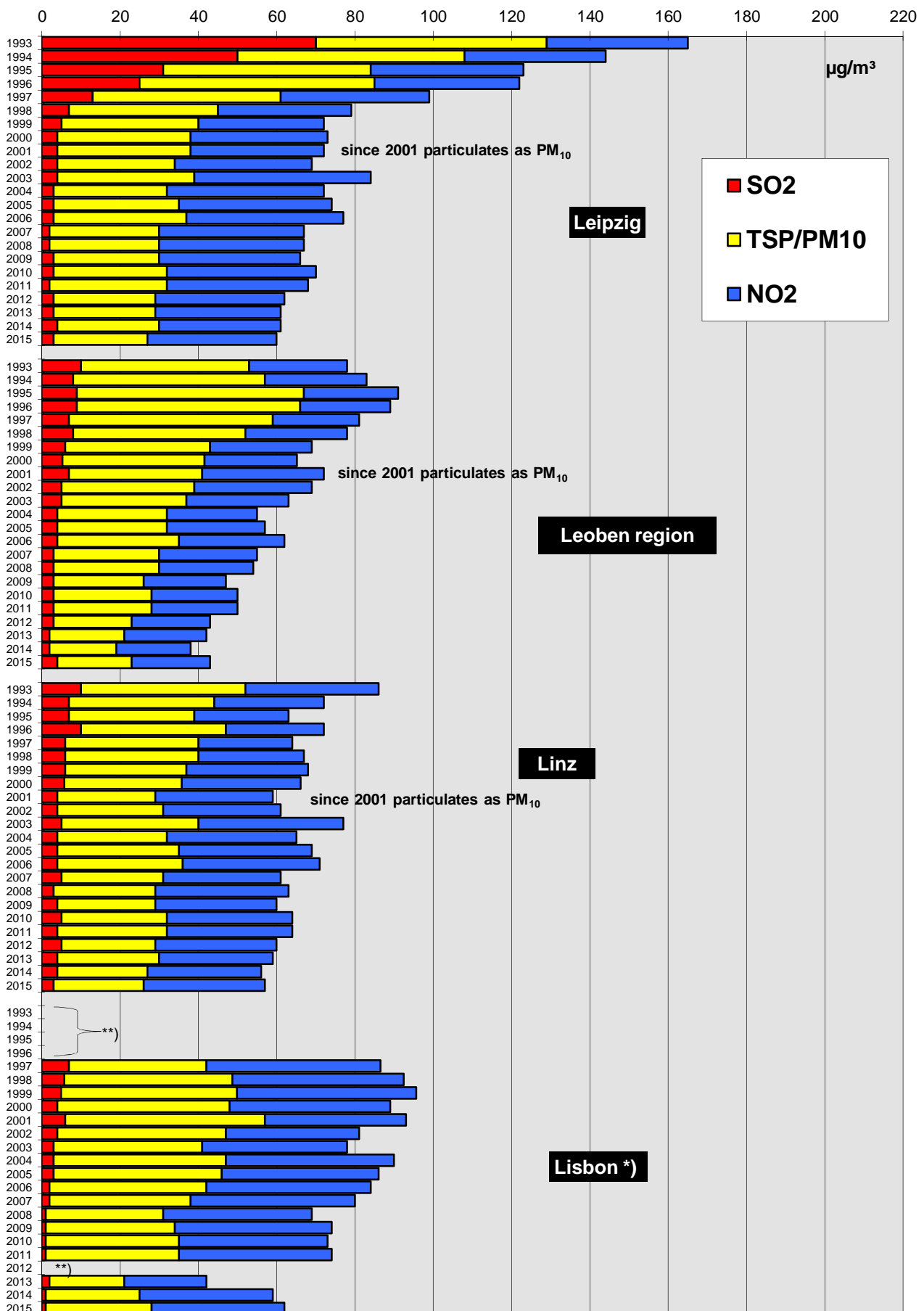


\*) particulates calculated as PM<sub>10</sub> \*\*) no data



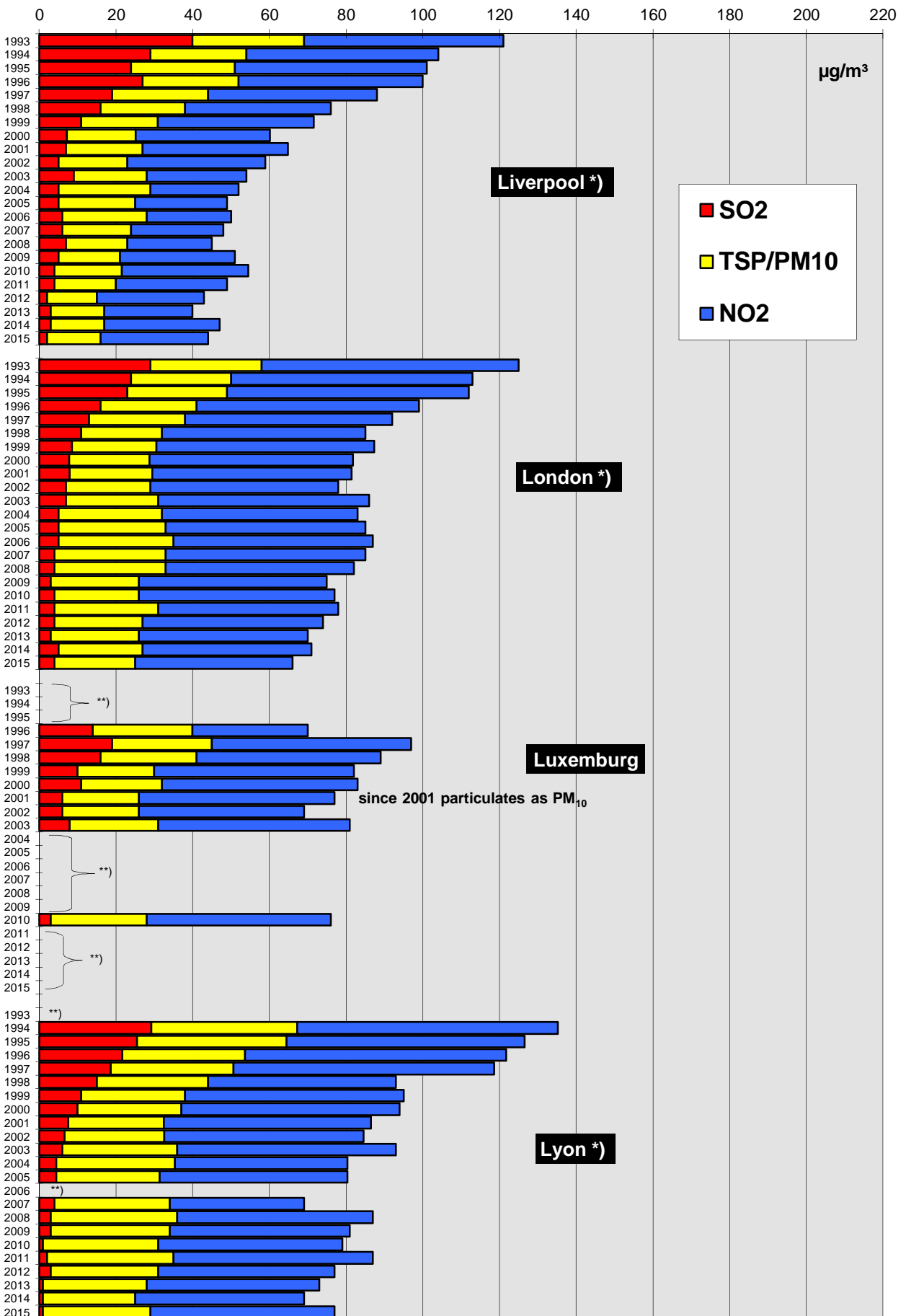
# Comparison Of The Air Quality 1993-2015

## Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



\*) particulates calculated as PM<sub>10</sub> \*\*) no data

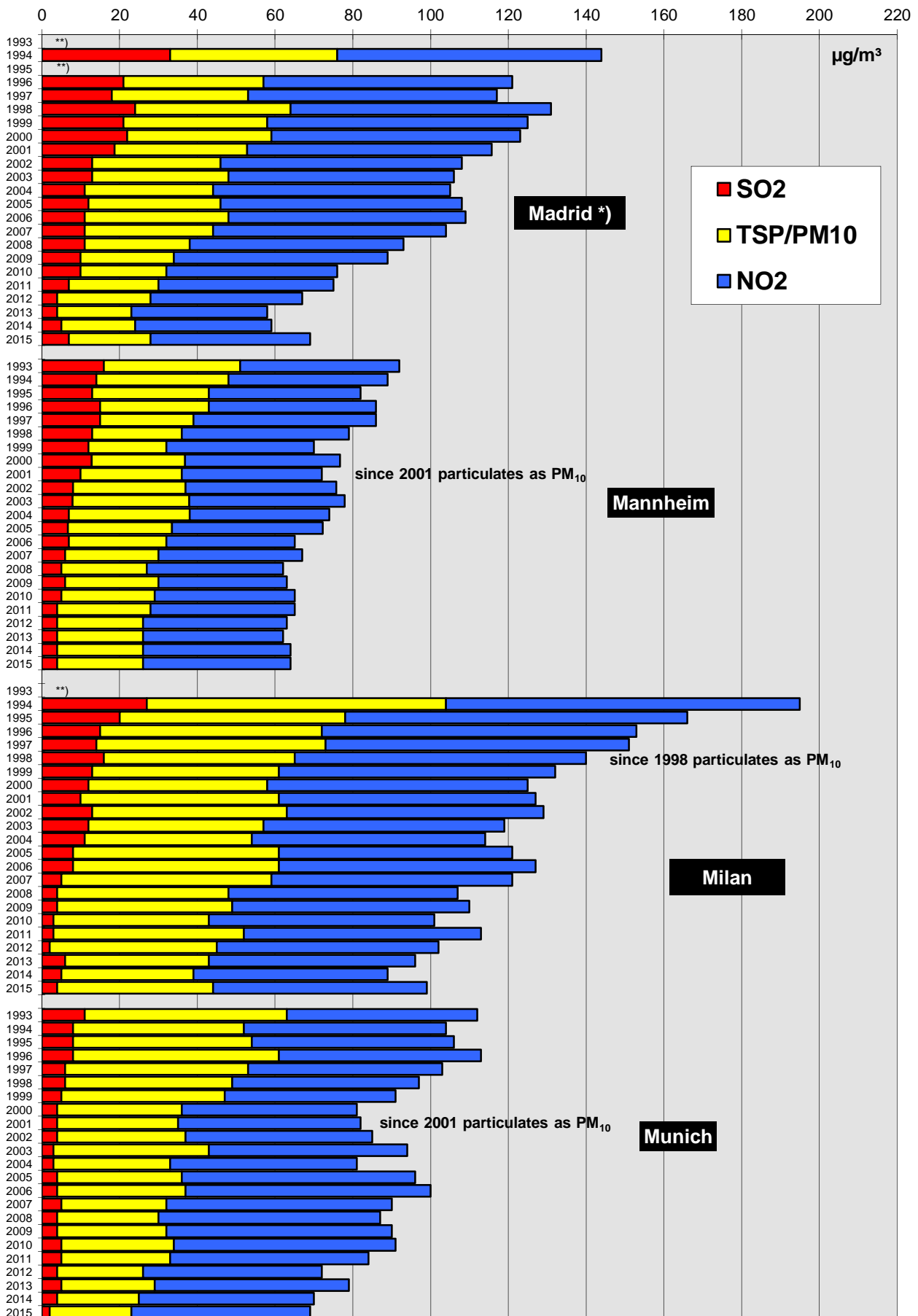
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\*) particulates calculated as PM<sub>10</sub> \*\*) no data

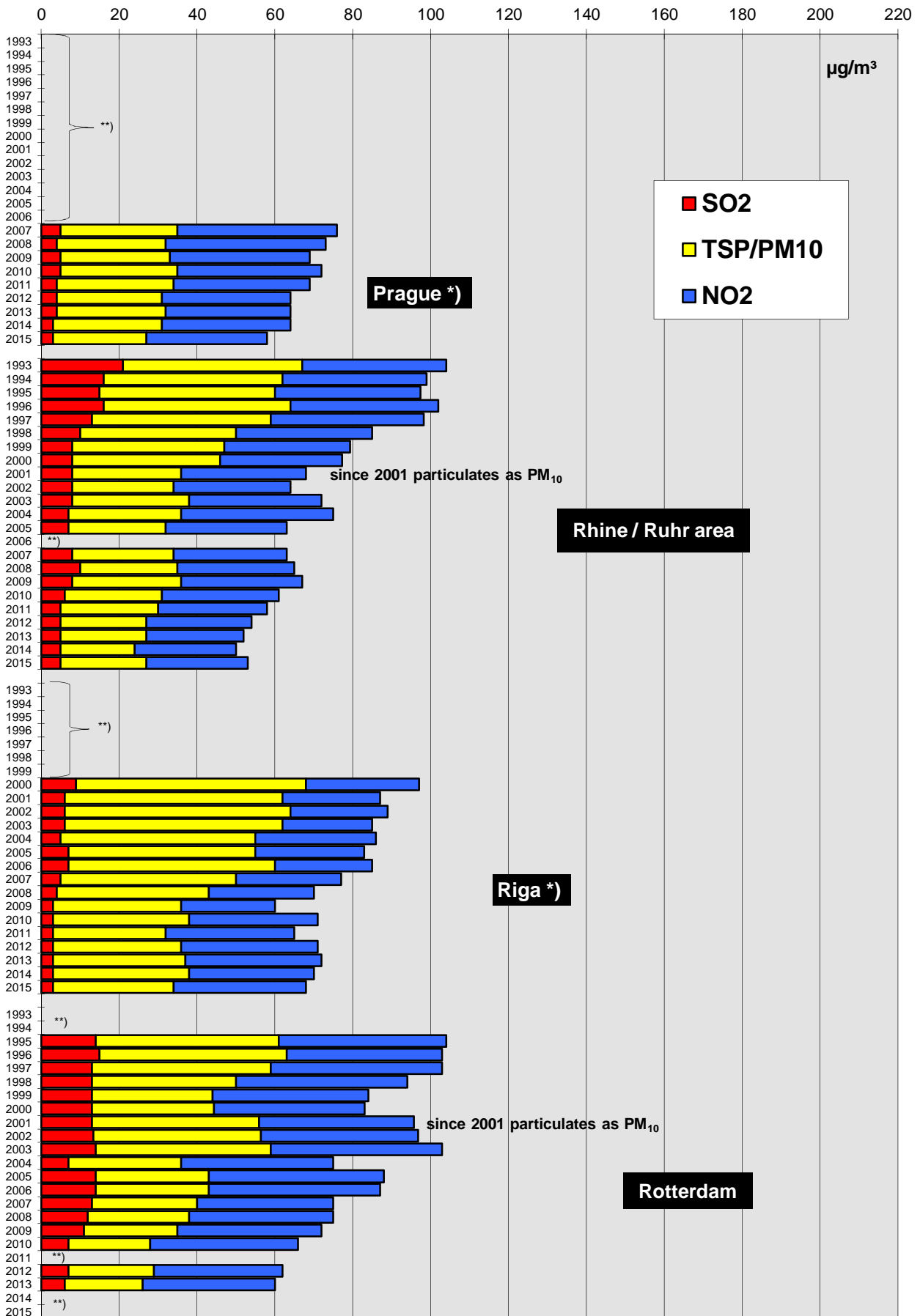
# Comparison Of The Air Quality 1993-2015

## Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



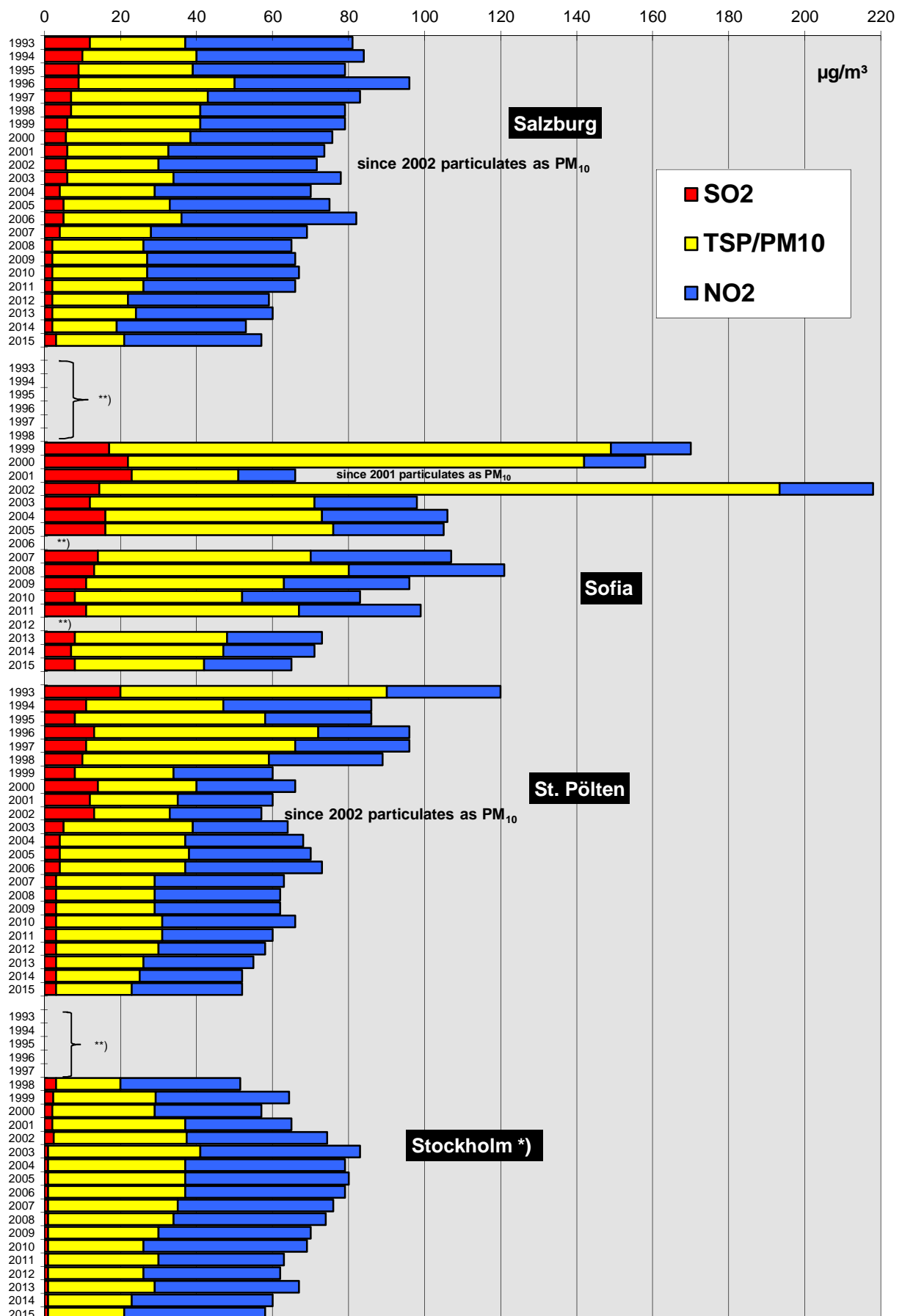
\*) particulates calculated as PM<sub>10</sub> \*\*) no data

### Comparison Of The Air Quality 1993-2015 Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



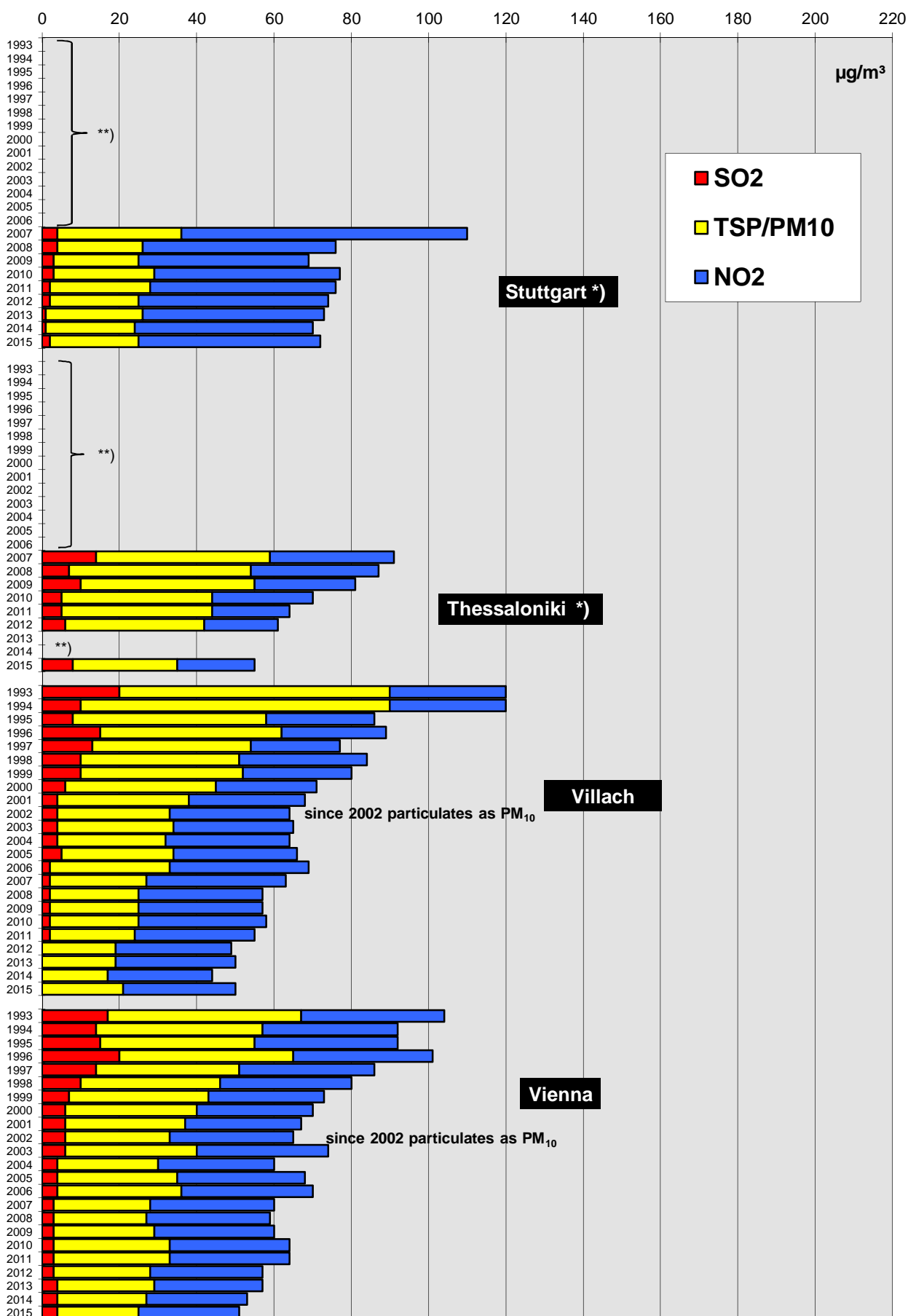
\*) particulates calculated as PM<sub>10</sub> \*\*) no data

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\*) particulates calculated as PM10 \*\*) no data

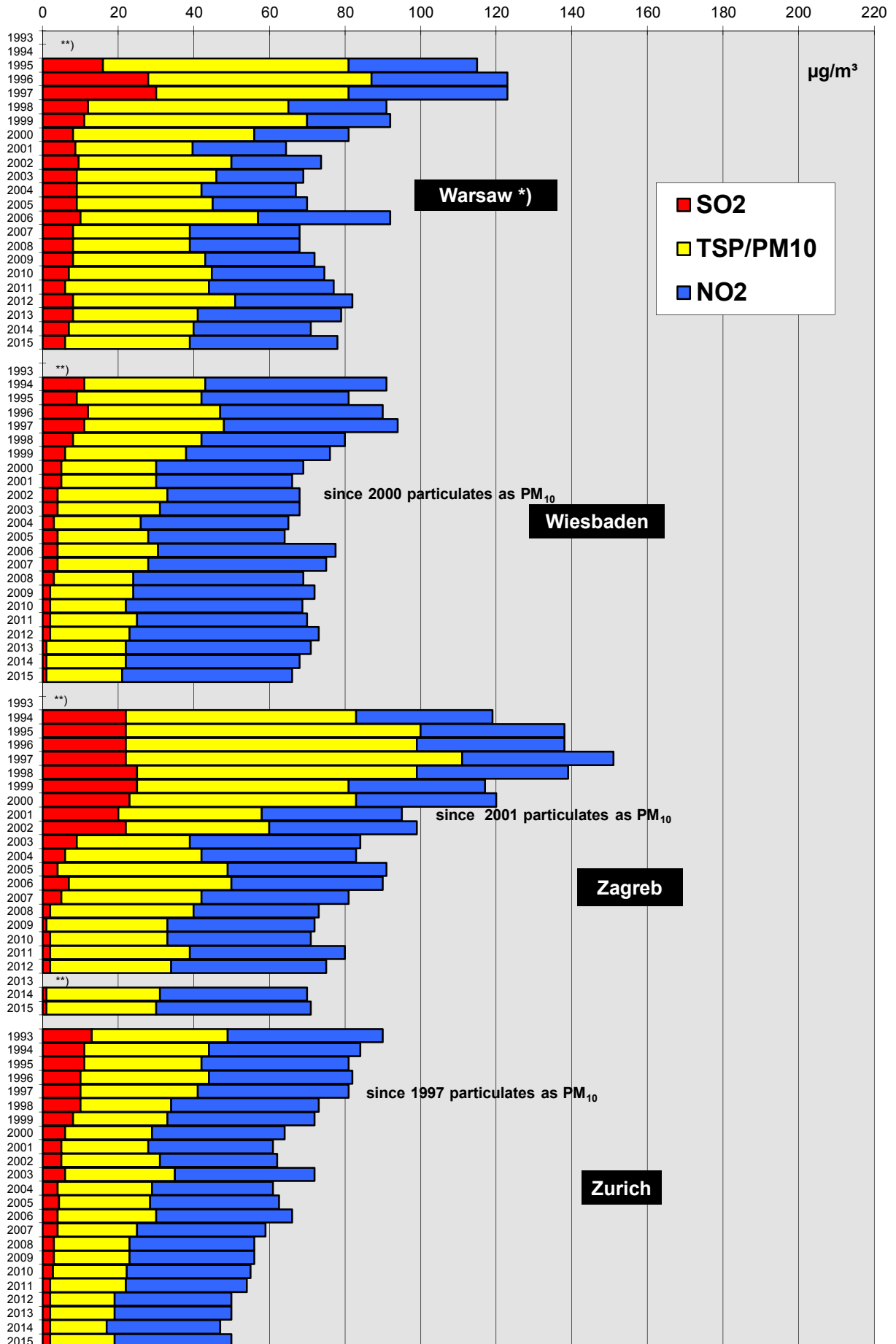
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\*) particulates calculated as PM<sub>10</sub> \*\*) no data

# Comparison Of The Air Quality 1993-2015

## Development of the annual mean values, $\Sigma$ SO<sub>2</sub>, TSP/PM<sub>10</sub>, NO<sub>2</sub> (mean of all monitoring stations)



) particulates calculated as PM<sub>10</sub> \*\*) no data





**Luftgütekennzahlen 2015**

**der einzelnen**

**Vergleichsregionen**

**Immission Reference Values 2015**

**Of All Compared Regions**



**Athens**immission area: 1 948 km<sup>2</sup>

population: 3 551 370

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	6	7	20	35	-	372	-	40
PM <sub>10</sub>	11	32	66	646	-	-	-	102
PM <sub>2,5</sub>	6	16	43	199	-	-	-	74
NO	14	27	189	-	-	840	-	364
NO <sub>2</sub>	14	31	89	-	-	201	-	136
CO	6	817	2700	-	-	11100	-	5100
O <sub>3</sub>	13	59	122	-	-	263	-	153

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	89
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

**Barcelona**immission area: 101 km<sup>2</sup>

population: 1 604 555

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]**
SO <sub>2</sub>	4	2	4	13	47	92	-	10
PM <sub>10</sub> *	10	28	51	83	-	-	-	64
PM <sub>2,5</sub> *	7	17	34	60	-	-	-	44
NO	7	21	82	245	463	550	-	226
NO <sub>2</sub>	7	43	71	129	193	217	-	121
CO	4	500	1300	3500	5400	5700	-	2100
O <sub>3</sub>	5	46	83	109	167	206	-	115

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	22 ***
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	2 ****

Comments:

- \* Gravimetric method, daily resolution
  - \*\* Maximum 98 percentile of hourly values, except PM<sub>10</sub> and PM<sub>2,5</sub> daily mean values
  - \*\*\* Station: Pl. de la Universitat (ES0559A, 8019028), P90.4 = 45.2 µg/m<sup>3</sup>
  - \*\*\*\* Station: Palau Reial (ES1992A, 8019057), P99.8 = 141 µg/m<sup>3</sup>
- Area and population of the municipalities of Barcelona (not metropolitan area)  
Minimum data capture of 75%, except for gravimetric PM<sub>10</sub> and PM<sub>2,5</sub> with a minimum data capture of 45%

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Basel**immission area: 557 km<sup>2</sup>

population: 501 285

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	3	7	20	27	37	7
PM <sub>10</sub>	1	15	25	65	106	196	299	48
PM <sub>2,5</sub>	1	12	24	53	-	-	-	-
NO	1	6	21	74	164	178	189	49
NO <sub>2</sub>	1	21	35	62	74	82	85	60
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	50	90	122	192	194	194	139

PM <sub>10</sub>	Monitoring method(s) used:	β-Meter-measurements, calibrated with gravimetric measurements every 4 days
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	4
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Belfast**immission area: 115 km<sup>2</sup>

population: 336.830

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	1	2	10	23	30	-	5
PM <sub>10</sub>	2	18	28	61	89	114	-	45
PM <sub>2,5</sub>	1	10	14	51	109	121	-	31
NO	2	34	85	250	772	1033	-	163
NO <sub>2</sub>	2	40	61	114	211	246	-	88
CO	1	151	188	600	1455	1601	-	400
O <sub>3</sub>	1	43	58	74	108	111	-	66

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	4
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	7

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Berlin (outskirt stations)** immission area: 892 km<sup>2</sup> population: 3 520 031\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	3	19	31	70	-	200	-	49
PM <sub>2,5</sub>	1	14	-	-	-	-	-	42
NO	5	2	10	75	-	148	-	26
NO <sub>2</sub>	5	13	19	40	-	79	-	40
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	5	51	80	131	-	216	-	131

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	20
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Berlin (traffic stations)**

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	3	25	-	447	-	7
PM <sub>10</sub> **	5	27	40	142	-	1594	-	65
PM <sub>2,5</sub> ***	1	19	-	-	-	-	-	53
NO	6	45	73	214	-	501	-	180
NO <sub>2</sub>	6	49	57	111	-	204	-	108
CO	2	387	-	-	-	2350	-	935
O <sub>3</sub>	-	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	36
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

Comments:

- \* source: annual book 2015; Amt für Statistik Berlin-Brandenburg
- \*\* Max. 1h mean caused by New Year's Eve fireworks
- \*\*\* PM<sub>2,5</sub>: mean or max. values from daily values (gravimetric measurement)

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Berlin (urban stations)**

	Number of monitoring stations	Annual mean value <sup>1</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. monthly mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. daily mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 3h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 1h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. ½ h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	Max. 98-Percentile per year [ $\mu\text{g}/\text{m}^3$ ]
SO <sub>2</sub>	1	1	2	8	-	22	-	9
PM <sub>10</sub> **	3	22	36	91	-	882	-	60
PM <sub>2,5</sub> ***	3	16	-	69	-	-	-	47
NO	5	8	17	136	-	464	-	61
NO <sub>2</sub>	5	26	32	73	-	148	-	68
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	2	46	78	129	-	203	-	128

PM <sub>10</sub>	Monitoring method(s) used:	$\beta$ -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 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applic.):	23
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015:	0

Comments: \* source: annual book 2015; Amt für Statistik Berlin-Brandenburg  
 \*\* Max. 1h mean caused by New Year's Eve fireworks  
 \*\*\* PM<sub>2,5</sub>: mean or max. values from daily values (gravimetric measurement)

**Birmingham**immission area: 268 km<sup>2</sup>

population: 1.101.360

	Number of monitoring stations	Annual mean value <sup>1</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. monthly mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. daily mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 3h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 1h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. ½ h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	Max. 98-Percentile per year [ $\mu\text{g}/\text{m}^3$ ]
SO <sub>2</sub>	1	1	2	4	11	13	-	3
PM <sub>10</sub>	2	18	25	63	114	68	-	49
PM <sub>2,5</sub>	3	12	21	58	91	146	-	43
NO	3	17	58	147	455	593	-	107
NO <sub>2</sub>	3	30	59	88	159	203	-	79
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	3	42	61	117	159	169	-	76

PM <sub>10</sub>	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 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	6
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015:	1

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Bludenz**immission area: 30 km<sup>2</sup>

population: 14 005

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	1	16	31	60	129	144	211	64
PM <sub>2,5</sub>	-	-	-	-	-	-	-	-
NO	1	18	81	163	276	328	333	152
NO <sub>2</sub>	1	24	47	81	123	124	142	73
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	46	83	117	165	170	173	133

PM <sub>10</sub>	Monitoring method(s) used:	gravimetrically
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	1
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Bratislava**immission area: 368 km<sup>2</sup>

population: 422 932

	Number of monitoring stations*	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	7	8	36	92	261	-	13
PM <sub>10</sub>	4	26	45	115	130	302	-	86
PM <sub>2,5</sub>	-	-	-	-	-	-	-	-
NO	3	17	64	209	293	653	-	171
NO <sub>2</sub>	3	31	55	100	133	193	-	116
CO	1	1089	1292	1871	2155	2465	-	151
O <sub>3</sub>	2	62	104	148	185	242	-	151

PM <sub>10</sub>	Monitoring method(s) used:	TEOM
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	40
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comments: Renewing of the monitoring network was performed from September to December 2015. The renewing consisted of exchange of monitoring stations (35), communication and reporting system, monitoring instruments - NO<sub>x</sub> analyzers (30), SO<sub>2</sub> analyzers (17), CO analyzers (16), ozone analyzers (19), benzene analyzers (11), dust monitors (12), autosamplers (18) as well as mobile monitoring stations (3). During the mentioned time period, monitoring of pollutants was stopped or markedly reduced. The monitoring network was also extended on NO<sub>x</sub> analyzers located on all stations monitoring ozone, and monitoring of PM<sub>2,5</sub>. Results of extended programme will be provided in the next year.

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Bristol**immission area: 110 km<sup>2</sup>

population: 442.500

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	1	15	23	63	83	101	-	42
PM <sub>2,5</sub>	1	11	18	60	75	92	-	37
NO	1	9	17	146	322	431	-	37
NO <sub>2</sub>	1	26	40	72	120	155	-	49
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	45	58	86	129	133	-	75

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	3
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Brussels**immission area: 161 km<sup>2</sup>

population: 1 180 531

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per day, hour [µg/m <sup>3</sup> ]
SO <sub>2</sub>	7	4	6	10	-	19	25	9
PM <sub>10</sub>	6	22	39	107	-	260	266	81
PM <sub>2,5</sub>	5	15	28	109	-	144	145	55
NO	10	19	85	265	-	698	856	208
NO <sub>2</sub>	10	35	69	164	-	372	396	125
CO	6	253	566	1551	-	3035	3450	1145
O <sub>3</sub>	7	40	69	129	-	193	193	113

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	19
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	9

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area



**Budapest**immission area: 525 km<sup>2</sup>

population: 1 757 618

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year <sup>2,3,4</sup> [µg/m <sup>3</sup> ]*
SO <sub>2</sub>	8	4	13	23	35	53	-	16
PM <sub>10</sub>	12	31	55	132	250	289	-	105
PM <sub>2,5</sub>	-	-	-	-	-	-	-	-
NO	9	18	60	173	462	519	-	155
NO <sub>2</sub>	9	33	63	106	160	226	-	115
CO	9	575	1115	1964	3469	4023	-	1747
O <sub>3</sub>	10	40	87	126	211	223	-	147

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	106**
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	2

Comments: \* Max. 98 percentile per year is calculated from hourly mean values.  
 \*\* The high number of PM<sub>10</sub> exceedances was caused by building operations.

**Chemnitz**immission area: 221 km<sup>2</sup>

population: 243.521

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	0	-	-	-	-	-	-	-
PM <sub>10</sub>	2	21	36	74	-	684	-	75
PM <sub>2,5</sub>	1	13	21	47	-	-	-	-
NO	2	9	54	172	172	500	-	164
NO <sub>2</sub>	2	22	50	82	82	199	-	99
CO	0	-	-	-	-	-	-	-
O <sub>3</sub>	1	50	79	135	135	193	-	136

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	11
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comments: \* Equivalent factors for the PM<sub>10</sub> – monitoring method:

station	PM <sub>10</sub> -HVS	PM <sub>10</sub> -TEOM
Chemnitz-Leipziger Straße	1.10	1.20 + f (temperature, humidity)
Chemnitz-Mitte	1.05	

Due to a car accident, all measurements at station "Chemnitz-Leipziger Straße" were discontinued from 20/09/2015 to 01/04/2016.

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Copenhagen**immission area: 88 km<sup>2</sup>

population: 591.481

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	-	-	-	17	-	7
PM <sub>10</sub>	3	25	-	83	-	-	-	60
PM <sub>2,5</sub>	3	15	-	65	-	-	-	48
NO	3	25	-	-	-	531	-	179
NO <sub>2</sub>	3	33	-	-	-	181	-	108
CO	2	265	-	1274	-	-	-	766
O <sub>3</sub>	2	48	-	112	-	153	-	102

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	22
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

**Dornbirn**immission area: 121 km<sup>2</sup>

population: 47 420

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	1	-	-	-	-	-	-
PM <sub>10</sub>	1	17	29	52	173	189	249	56
PM <sub>2,5</sub>	1	11	24	48	147	164	186	44
NO	1	27	77	137	280	337	354	139
NO <sub>2</sub>	1	34	55	81	114	129	185	83
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	45	86	128	184	187	190	134

PM <sub>10</sub>	Monitoring method(s) used:	gravimetrically
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	2
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Dresden**immission area: 328 km<sup>2</sup>

population: 536.308

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	4	5	29	41	55	-	13
PM <sub>10</sub>	4	21	37	173	740	934	-	63
PM <sub>2,5</sub>	3	14	23	132	-	-	-	-
NO	4	24	105	240	240	542	-	260
NO <sub>2</sub>	4	28	61	102	102	236	-	124
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	3	50	86	135	135	189	-	136

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	21
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	5

Comments:

\* Equivalent factors for the PM<sub>10</sub> – monitoring method:

station	PM <sub>10</sub> -HVS	PM <sub>10</sub> -TEOM
Dresden-Bergstr.	1.10	1.20 + f (temperature, humidity)
Dresden-Nord.	1.10	1.00 + f (temperature, humidity)
Dresden-Winckelmannstr.	1.00	1.00 + f (temperature, humidity)
Dresden-Wahnsdorf	1.05	1.00 + f (temperature, humidity)

**Edinburgh (St. Leonhards)**immission area: 262 km<sup>2</sup>

population: 492.680

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	2	7	6	7	-	5
PM <sub>10</sub> *	1	11	18	41	76	89	-	31
PM <sub>2,5</sub>	1	6	10	45	71	85	-	24
NO	1	13	25	68	-	-	-	50
NO <sub>2</sub>	1	26	34	65	-	-	-	55
CO	1	175	249	550	877	1125	-	371
O <sub>3</sub>	1	45	56	98	122	123	-	69

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	0*
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

Comments: \* 45 % data capture of the PM<sub>10</sub><sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Frankfurt (urban stations)** immission area: 248 km<sup>2</sup>

population: 724 486

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	3	7	16	35	51*	8
PM <sub>10</sub>	2	21	29	182	413*	523*	656*	58
PM <sub>2,5</sub>	1	13**	21**	79**	-	-	-	-
NO	2	21	53	204	339	387	460	137
NO <sub>2</sub>	2	35	46	74	109	133	136	81
CO	0	-	-	-	-	-	-	-
O <sub>3</sub>	2	40	75	139	265	277	280	131

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	10
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comments: \* value is from 1.1.2015 (New Year's Eve fire works)  
 \*\* monitoring method: gravitmetrically

**Frankfurt (traffic station)** immission area: 248 km<sup>2</sup>

population: 724 486

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	0	-	-	-	-	-	-	-
PM <sub>10</sub>	1	25	35	156	458*	984*	1195*	68
PM <sub>2,5</sub>	1	16	24	130	399	904	1219	50
NO	1	39	74	315	539	575	617	186
NO <sub>2</sub>	1	53	58	122	216	261	280	121
CO	1	410	550	1550	2640	2700	3250	1060
O <sub>3</sub>	0	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	18
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	12

Comments: \* value is from 1.1.2015 (New Year's Eve fire works)

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Glasgow (incl. traffic station)**immission area: 176 km<sup>2</sup>

population: 599.855

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub> *	1	12	20	45	94	128	-	33
PM <sub>2,5</sub>	1	6	10	35	85	115	-	22
NO	3	40	137	344	536	617	-	272
NO <sub>2</sub>	3	39	76	133	211	289	-	106
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	42	58	93	123	126	-	67

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	0
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	4

Comments: \* data capture of 44 % for PM<sub>10</sub>.**Gothenburg (traffic stations)**immission area: 1 031 km<sup>2</sup>

population: 543 005

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	4	21	41	112	-	336	-	75
PM <sub>2,5</sub>	2	9	11	32	-	71	-	25
NO	3	30	57	224	-	797	-	154
NO <sub>2</sub>	4	36	46	107	-	223	-	102
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	-	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	15
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	2

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Gothenburg (urban stations)**immission area: 1 031 km<sup>2</sup>

population: 543 005

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	2	2	4	10	-	19	-	8
PM <sub>10</sub>	1	14	17	45	-	86	-	36
PM <sub>2,5</sub>	1	8	11	36	-	69	-	25
NO	1	8	11	145	-	392	-	52
NO <sub>2</sub>	2	18	25	80	-	191	-	71
CO	1	269	337	454	-	892	-	433*
O <sub>3</sub>	2	58	76	98	-	150	-	101

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	0
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comments: \* 98% percentile of 8h-means

**Graz (urban stations)**immission area: 128 km<sup>2</sup>

population: 280.200

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ***]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ****]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	3	2	5	11	27	63	115	9
PM <sub>10</sub> *	2	24	46	112	-	-	-	67**
PM <sub>2,5</sub> *	2	18	36	99	-	-	-	67**
NO	5	23	109	212	495	527	528	231
NO <sub>2</sub>	5	29	50	76	120	154	160	82
CO	2	400	1100	1600	2600	2700	2700	1500
O <sub>3</sub>	4	48	89	138	166	169	172	129

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	35*
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

Comments: \* PM<sub>10</sub> and PM<sub>2,5</sub>: 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

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Graz (traffically influenced Don Bosco)**immission area: 128 km<sup>2</sup>

population: 280.200

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ] <sup>***</sup>	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ] <sup>****</sup>	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	4	7	29	58	64	7
PM <sub>10</sub> <sup>*</sup>	1	30	47	102	-	-	-	66 <sup>**</sup>
PM <sub>2,5</sub> <sup>*</sup>	1	22	37	90	-	-	-	55 <sup>**</sup>
NO	1	55	145	273	531	619	664	296
NO <sub>2</sub>	1	43	55	83	119	140	160	94
CO	1	500	1000	1700	2400	2500	140	1400
O <sub>3</sub>	-	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	39*
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

Comments: \* PM<sub>10</sub> and PM<sub>2.5</sub>: 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 km<sup>2</sup>

population: 20 769

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	2	3	5	18	85	138	243	9
PM <sub>10</sub>	1	18	31	51	-	-	-	-
PM <sub>2,5</sub>	1	13	23	47	-	-	-	-
NO	2	27	85	156	423	494	573	207
NO <sub>2</sub>	2	28	62	76	109	124	141	90
CO	1	350	560	900	1540	1750	2110	890
O <sub>3</sub>	1	67	98	131	185	185	187	142

PM <sub>10</sub>	Monitoring method(s) used:	Digitel and Sharp
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	1
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Hamburg (area monitoring stations)**immission area: 755 km<sup>2</sup>

population: 1 787 408

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	5	4	7	82	140	200	286	38
PM <sub>10</sub>	8	19	34	75	-	-	-	65
PM <sub>2,5</sub>	3	13	24	63	-	-	-	48
NO	13	8	37	124	421	459	476	103
NO <sub>2</sub>	13	23	41	80	121	126	145	77
CO	1	170	270	490	1610	1770	1980	500
O <sub>3</sub>	6	45	66	132	196	203	205	104

PM <sub>10</sub>	Monitoring method(s) used:	TEOM (7 stations), light scattering and β-absorption (Sharp, 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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	18
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Hamburg (traffic stations)**

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	3	24	37	99	-	-	-	70
PM <sub>2,5</sub>	1	17	26	66	-	-	-	52
NO	4	62	111	251	486	575	682	338
NO <sub>2</sub>	4	56	70	126	208	237	247	145
CO	2	500	620	1040	2160	3280	5130	1210
O <sub>3</sub>	-	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	16
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	7

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area



**Innsbruck**immission area: 105 km<sup>2</sup>

population: 130 894

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	6	9	13	15	16	8
PM <sub>10</sub>	2	20	50	76	-	-	-	59
PM <sub>2,5</sub>	1	13	24	47	-	-	-	31
NO	3	28	189	271	494	631	660	287
NO <sub>2</sub>	3	33	70	92	135	145	163	116
CO	1	450	841	1179	1661	1766	2076	1382
O <sub>3</sub>	3	59	112	153	177	178	179	141

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	18
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Karlsruhe (urban station)**immission area: 173 km<sup>2</sup>

population: 300 051\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	-	9	-	70	-	-
PM <sub>10</sub>	1	17	-	109	-	-	-	-
PM <sub>2,5</sub>	1	12	-	-	-	-	-	-
NO	1	10	-	114	-	301	-	-
NO <sub>2</sub>	1	24	-	62	-	113	-	-
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	49	-	145	-	224	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	3
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comment: \* metropolitan area (year 2014); source: Statistisches Landesamt Baden-Württemberg

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Karlsruhe (traffic station)** immission area: 173 km<sup>2</sup>

population: 300 051\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	1	22	-	152	-	-	-	-
PM <sub>2,5</sub>	1	14	-	-	-	-	-	-
NO	1	38	-	208	-	535	-	-
NO <sub>2</sub>	1	45	-	90	-	201	-	-
CO	1	300	-	1100	-	2600	-	-
O <sub>3</sub>	-	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	7
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

Comment: \* metropolitan area (year 2014); source: Statistisches Landesamt Baden-Württemberg

**Klagenfurt**immission area: 120 km<sup>2</sup>

population: 99 110

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	1	2	4	15	21	30	4
PM <sub>10</sub>	2	22	38	68	-	-	-	-
PM <sub>2,5</sub>	2	16	29	54	-	-	-	-
NO	2	27	98	179	421	507	511	202
NO <sub>2</sub>	2	28	51	72	123	134	138	83
CO	1	436	816	1259	1969	2074	2134	1264
O <sub>3</sub>	2	46	85	119	166	172	173	134

PM <sub>10</sub>	Monitoring method(s) used:	continuously (Sharp 5030)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,102y – 2,531 already applied to data
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	17
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

## Leeds

immission area: 552 km<sup>2</sup>

population: 766.400

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	2	7	27	36	-	5
PM <sub>10</sub>	2	17	30	74	127	171	-	57
PM <sub>2,5</sub>	2	12	21	55	130	185	-	44
NO	2	26	67	146	383	472	-	106
NO <sub>2</sub>	2	36	55	91	126	145	-	75
CO	1	254	331	570	987	1189	-	500
O <sub>3</sub>	1	39	55	98	132	148	-	70

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	13
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

## Leipzig

immission area: 298 km<sup>2</sup>

population: 544.473

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	3	5	9	19	27	-	9
PM <sub>10</sub> *	3	24	42	95	620	1349	-	71
PM <sub>2,5</sub>	2	14	26	66	-	-	-	-
NO	3	30	77	232	232	761	-	190
NO <sub>2</sub>	3	33	48	94	94	213	-	92
CO**	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	51	78	135	135	219	-	136

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	26
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

Comments:

\*

Equivalent factors for the PM<sub>10</sub> – monitoring method:

station	PM <sub>10</sub> -HVS	PM <sub>10</sub> -TEOM
Leipzig-Lützner Str.	1.10	1.20 + f (temperature, humidity)
Leipzig-Mitte	1.10	1.00+ f (temperature, humidity)
Leipzig-West	1.05	1.00+ f (temperature, humidity)

\*\*

No measurements of CO since 2008.

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Leoben (Leoben, Donawitz, Göß)**immission area: 108 km<sup>2</sup>

population: 25 341

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ] <sup>***</sup>	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ] <sup>****</sup>	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	4	5	37	89	111	123	19
PM <sub>10</sub> <sup>*</sup>	1	19	26	64	-	-	-	39 <sup>**</sup>
PM <sub>2,5</sub> <sup>*</sup>	0	-	-	-	-	-	-	-
NO	3	9	42	79	149	170	380	68
NO <sub>2</sub>	3	20	34	51	73	85	90	54
CO	1	600	1300	4500	10700	12400	14100	2700
O <sub>3</sub>	1	40	65	100	164	170	171	126

PM <sub>10</sub>	Monitoring method(s) used:	continuously, gravimetrically <sup>*</sup>
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	1 <sup>*</sup>
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

Comments: <sup>\*</sup> PM<sub>10</sub>: gravimetric monitoring method  
<sup>\*\*</sup> Max. 98-Percentile per year is calculated from daily mean values.  
<sup>\*\*\*</sup> Max 3h-mean value = static average,  
<sup>\*\*\*\*</sup> Max 1h-mean value = static average

**Linz**immission area: 96 km<sup>2</sup>

population: 201 595

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	5	3	11	39	62	77	90	34
PM <sub>10</sub>	6	23	44	115	266	284	294	75
PM <sub>2,5</sub>	4	16	31	69	-	216	217	50
NO	7	22	97	201	416	476	615	208
NO <sub>2</sub>	7	31	56	102	202	283	306	121
CO	5	340	660	2000	3000	3700	5500	1473
O <sub>3</sub>	3	41	80	125	182	185	188	139

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	23
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	4

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Lisbon**immission area: 85 km<sup>2</sup>

population: 545 245

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	2	1	2	6	16	19	-	6
PM <sub>10</sub>	5	27	53	118	211	219	-	94
PM <sub>2,5</sub>	2	13	23	49	98	101	-	42
NO	6	22	96	267	652	816	-	273
NO <sub>2</sub>	6	34	71	127	222	247	-	147
CO	4	339	556	1305	3581	3753	-	1112
O <sub>3</sub>	4	52	77	104	162	163	-	109

PM <sub>10</sub> :	Monitoring method(s) used:	Beta-absorption
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.18 (traffic stations) 1.11 (background)
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	66
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	22

**Liverpool**immission area: 112 km<sup>2</sup>

population: 473.073

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	3	17	63	128	-	7
PM <sub>10</sub>	1	14	21	57	115	129	-	39
PM <sub>2,5</sub>	1	9	14	52	62	70	-	31
NO	2	12	25	80	187	257	-	50
NO <sub>2</sub>	2	28	46	85	144	175	-	68
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	49	63	96	116	127	-	77

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	1
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**London**immission area: 1.572 km<sup>2</sup>

population: 8 538 689

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	3	4	11	18	30	33	-	14
PM <sub>10</sub>	5	21	30	76	112	196	-	55
PM <sub>2,5</sub>	7	13	21	71	84	89	-	43
NO	12	29	190	370	699	800	-	275
NO <sub>2</sub>	12	41	102	170	262	345	-	133
CO	2	411	614	1000	1756	1978	-	799
O <sub>3</sub>	8	37	66	132	180	185	-	80

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	10
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	58

**Lyon (urban site)**immission area: 47,9 km<sup>2</sup>

population: 500 715

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	1	-	7	-	32	-	7
PM <sub>10</sub>	2	26	-	116	-	192	-	78
PM <sub>2,5</sub>	1	17	-	98	-	108	-	52
NO	3	18	-	173	-	549	-	190
NO <sub>2</sub>	3	32	-	94	-	211	-	93
CO	0	-	-	-	-	-	-	-
O <sub>3</sub>	3	48	-	115	-	243	-	125

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	30
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Lyon (traffic site)**

	Number of monitoring stations	Annual mean value <sup>1</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. monthly mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. daily mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 3h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 1h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. ½ h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	Max. 98-Percentile per year [ $\mu\text{g}/\text{m}^3$ ]
SO <sub>2</sub>	0	-	-	-	-	-	-	-
PM <sub>10</sub>	3	29	-	124	-	163	-	89
PM <sub>2,5</sub>	1	22	-	115	-	130	-	61
NO	3	66	-	315	-	667	-	348
NO <sub>2</sub>	3	64	-	150	-	259	-	170
CO	1	349	-	983	-	1893	-	1013
O <sub>3</sub>	0	-	-	-	-	-	-	-

PM <sub>10</sub>	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 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	39
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015:	34

**Madrid**immission area: 604 km<sup>2</sup>

population: 3 237 937

	Number of monitoring stations	Annual mean value <sup>1</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. monthly mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. daily mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 3h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. 1h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	max. ½ h mean value <sup>2</sup> [ $\mu\text{g}/\text{m}^3$ ]	Max. 98-Percentile per year* [ $\mu\text{g}/\text{m}^3$ ]
SO <sub>2</sub>	10	7	19	38	74	94	-	37
PM <sub>10</sub>	12	21	42	108	213	250	-	72
PM <sub>2,5</sub>	6	12	25	41	75	88	-	40
NO	24	27	174	335	932	1146	-	405
NO <sub>2</sub>	24	41	90	166	350	424	-	168
CO	10	400	800	1600	3700	4500	-	1800
O <sub>3</sub>	14	51	90	136	232	236	-	143

PM <sub>10</sub>	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 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	16**
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 $\mu\text{g}/\text{m}^3$ at the highest stressed station in 2015:	95***

Comments:

\* Maximum 98 percentile of hourly values

\*\* Station: Farolillo (ES0126A, 28079039), P90.4=39

\*\*\* Station: Barrio del Pilar (ES1521A, 28079039), P99.8=295

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.

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Mannheim (urban station)**immission area: 145 km<sup>2</sup>

population: 299 844\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	4	-	24	-	381	-	-
PM <sub>10</sub>	1	19	-	127	-	-	-	-
PM <sub>2,5</sub>	1	13	-	-	-	-	-	-
NO	1	10	-	103	-	209	-	-
NO <sub>2</sub>	1	28	-	59	-	105	-	-
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	44	-	120	-	202	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	7
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comment: \* metropolitan area (year 2014); source: Statistisches Landesamt Baden-Württemberg

**Mannheim (traffic station)**immission area: 145 km<sup>2</sup>

population: 299 844\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	1	25	-	143	-	-	-	-
PM <sub>2,5</sub>	1	15	-	-	-	-	-	-
NO	1	37	-	186	-	498	-	-
NO <sub>2</sub>	1	47	-	107	-	227	-	-
CO	1	300	-	1000	-	3100	-	-
O <sub>3</sub>	-	-	-	-	-	-	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	15
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	3

Comment: \* metropolitan area (year 2014); source: Statistisches Landesamt Baden-Württemberg

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area



## Milan

immission area: 182 km<sup>2</sup>

population: 1 345 851

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year* [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	4	-	10	-	25	-	9
PM <sub>10</sub>	3	40	-	152	-	-	-	101
PM <sub>2,5</sub>	2	30	-	156	-	-	-	81
NO	8	40	-	285	-	650	-	236
NO <sub>2</sub>	8	55	-	150	-	320	-	129
CO	4	1217	-	3283	-	5824	-	2731
O <sub>3</sub>	3	44	-	130	-	198	-	147

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	101
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	57

Comments: \* SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2,5</sub>: Max 98-percentile per year of daily mean value  
NO, NO<sub>2</sub>, CO, O<sub>3</sub>: Max 98-percentile per year of 1 h mean value

## Munich

immission area: 310 km<sup>2</sup>

population: 1 530 000

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year** [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	3	5	-	21	25	4
PM <sub>10</sub>	4	21	42	61*	-	151*	180*	64
PM <sub>2,5</sub>	4	13	23	45*	-	84*	106*	39
NO	5	41	165	304	-	703	725	346
NO <sub>2</sub>	5	46	98	156	-	232	237	169
CO	3	400	700	1200	-	2100	2200	1100
O <sub>3</sub>	4	42	81	127	-	196	201	141

PM <sub>10</sub>	Monitoring method(s) used:	β-absorption / β-absorption+ nephelometer
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1.25 / 1.0
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	13 (9)***
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	

Comments: \* PM<sub>10</sub> / PM<sub>2,5</sub>: Values from Jan. 1st 2015 are not considered because of fireworks during the New Year's Eve. But these values are included when calculating the number of violations of the daily mean.  
\*\* Max. 98-percentile-value per year to be based of the 1h mean values.  
\*\*\* PM<sub>10</sub>-exceedances of limit values: 4 days due to winter services on the streets;  
§ 25 of the 39. BImSchV regulates the deduction of PM<sub>10</sub>-exceedances of limit values caused by winter services like road salt and grit

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Prague**immission area: 496 km<sup>2</sup>

population: 1 270 000

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile from daily mean per year [µg/m <sup>3</sup> ]**
SO <sub>2</sub>	3	3	5	9	-	50	-	7
PM <sub>10</sub>	18	24	49	162	-	317	-	69
PM <sub>2,5</sub>	6	17	35	103	-	166	-	56
NO	13	19	79	255	-	598	-	133
NO <sub>2</sub>	16	31	74	127	-	311	-	97
CO	2	486	809	1392	-	2508	-	990
O <sub>3</sub>	6	49	87	149	-	213	-	119

PM <sub>10</sub>	Monitoring method(s) used:	3 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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	32
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	16

**Riga (urban station)**immission area: 307 km<sup>2</sup>

population: 641 007

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	2	3	4	6	14	23	27	5
PM <sub>10</sub>	1	20	26	70	-	-	-	44
PM <sub>2,5</sub>	1	16	23	69	-	-	-	42
NO	-	-	-	-	-	-	-	-
NO <sub>2</sub>	2	26	38	86	152	161	179	85
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	2	60	83	98	129	132	133	103

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	0
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comments:

\*

SO<sub>2</sub> - 98% - value of 1- hour's meansPM<sub>10</sub> - 98% - value of daily means (urban station)

CO - 98% - value of 1- hour's means

NO<sub>2</sub> - 98% - value of 1- hour's meansO<sub>3</sub> - 98% - value of 1- hour's means<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Riga (traffic station)**immission area: 307 km<sup>2</sup>

population: 641 007

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]*
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	2	36	52	103	-	230	-	105
PM <sub>2,5</sub>	-	-	-	-	-	-	-	-
NO	1	74	116	247	501	608	640	254
NO <sub>2</sub>	1	51	67	126	176	222	240	130
CO	1	317	364	592	800	1801	2900	446
O <sub>3</sub>	1	32	72	103	132	119	165	101

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	27
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	2

Comments: \* SO<sub>2</sub> - 98% - value of 1- hour's means  
 PM<sub>10</sub> - 98% - value of 1- hour's means (traffic station)  
 CO - 98% - value of 1- hour's means  
 NO<sub>2</sub> - 98% - value of 1- hour's means  
 O<sub>3</sub> - 98% - value of 1- hour's means

**Rhine/Ruhr area**immission area: 5 770 km<sup>2</sup>

population: 9 963 000

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	7	5	21	-	-	242	-	34
PM <sub>10</sub>	8	22	37	136	-	-	-	-
PM <sub>2,5</sub>	6	14	-	-	-	-	-	-
NO	21	9	31	-	-	595	-	83
NO <sub>2</sub>	21	26	41	-	-	166	-	64
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	16	41	68	-	-	254	-	122

PM <sub>10</sub>	Monitoring method(s) used:	gravimetric methods
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	31
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Rotterdam**immission area: 803 km<sup>2</sup>

population: 631 155

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>								
PM <sub>10</sub>								
PM <sub>2,5</sub>								
NO								
NO <sub>2</sub>								
CO								
O <sub>3</sub>								

No data for 2015!

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	

**Salzburg**immission area: 66 km<sup>2</sup>

population: 150 887

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	2	3	5	8	40	63	115	7
PM <sub>10</sub>	3	18	33	81	-	-	-	-
PM <sub>2,5</sub>	2	12	22	62	-	-	-	-
NO	3	26	122	176	392	486	582	221
NO <sub>2</sub>	3	36	66	90	148	169	185	110
CO	2	330	590	910	1460	1560	1810	930
O <sub>3</sub>	2	43	75	116	165	171	172	130

PM <sub>10</sub>	Monitoring method(s) used:	Digitel and SHARP
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	6
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

**Sofia**immission area: 1 344 km<sup>2</sup>

population: 1 256 667

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	6	8	19	64	-	156	-	41
PM <sub>10</sub>	7	34	89	279	-	-	-	180
PM <sub>2,5</sub>	2	17	60	232	-	-	-	-
NO	6	14	68	263	-	707	-	284
NO <sub>2</sub>	6	23	73	127	-	240	-	129
CO	4	652	1912	-	-	-	-	-
O <sub>3</sub>	5	66	112	138	-	195	-	130

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	74
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	2

**St. Pölten, urban station**immission area: 108 km<sup>2</sup>

population: 53 619

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	1	21	32	57	113	141	149	52
PM <sub>2,5</sub>	-	-	-	-	-	-	-	-
NO	1	23	39	184	544	709	712	121
NO <sub>2</sub>	1	35	41	83	179	219	223	80
CO	1	310	450	840	1820	2240	2290	700
O <sub>3</sub>	1	41	73	116	181	182	184	128

PM <sub>10</sub>	Monitoring method(s) used:	Grimm
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	*0,899 + 0,000138
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	4
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area

## St. Pölten, traffically influenced

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	3	4	9	14	17	18	6
PM <sub>10</sub>	1	19	30	59	108	140	200	52
PM <sub>2,5</sub>	1	14	25	46	60	62	64	40
NO	1	7	16	78	249	288	359	48
NO <sub>2</sub>	1	22	29	54	95	106	118	57
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	48	84	125	191	193	195	139

PM <sub>10</sub>	Monitoring method(s) used:	TEOM - FDMS
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	0,871
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	6
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

## Stockholm

immission area (inner city): 48 km<sup>2</sup>  
area (Stockholm): 220 km<sup>2</sup>

population (Stockholm): 923 516

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per hour/daily [µg/m <sup>3</sup> ]
SO <sub>2</sub> <sup>*</sup>	1	1	1	-	-	-	-	-
PM <sub>10</sub> <sup>**</sup>	4	20	-	96	-	448	-	-
PM <sub>2,5</sub> <sup>**</sup>	3	5	-	27	-	57	-	-
NO	0	-	-	-	-	-	-	-
NO <sub>2</sub> <sup>**</sup>	4	37	-	95	-	207	-	103/79
CO <sup>**</sup>	2	300	-	-	-	14000	-	-
O <sub>3</sub> <sup>***</sup>	1	51	-	88	-	116	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	19
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

Comments:

All stations are situated in the inner city of Stockholm

\* SO<sub>2</sub>: roof level, diffusive samplers -only per month

\*\* PM<sub>10</sub>, PM<sub>2,5</sub>, NO<sub>2</sub>, CO: street level. PM<sub>10</sub>: During 2015 intensified dust-binding and street-cleaning efforts during winter and spring result in record low levels in the inner city of Stockholm (see summary in report [http://slb.nu/slb/rapporter/pdf8/slb2016\\_002.pdf](http://slb.nu/slb/rapporter/pdf8/slb2016_002.pdf))

\*\*\* O<sub>3</sub>: roof level

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Stuttgart (urban station)**immission area: 207 km<sup>2</sup>

population: 612 441\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	-	5	-	14	-	-
PM <sub>10</sub>	1	19	-	104	-	-	-	-
PM <sub>2,5</sub>	1	12	-	-	-	-	-	-
NO	1	16	-	119	-	251	-	-
NO <sub>2</sub>	1	32	-	62	-	109	-	-
CO	-	-	-	-	-	-	-	-
O <sub>3</sub>	1	42	-	118	-	215	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	3
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comment: \* in the metropolitan area in the year 2014; source: Statistisches Landesamt Baden-Württemberg

**Stuttgart (traffic station)**immission area: 207 km<sup>2</sup>

population: 612 441\*

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	-	-	-	-	-	-	-	-
PM <sub>10</sub>	1	27	-	112	-	-	-	-
PM <sub>2,5</sub>	1	15	-	-	-	-	-	-
NO	1	70	-	220	-	557	-	-
NO <sub>2</sub>	1	62	-	99	-	165	-	-
CO	1	300	-	800	-	1400	-	-
O <sub>3</sub>	-	-	-	94	-	206	-	-

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	17
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

Comments: \* metropolitan area (year 2014); source: Statistisches Landesamt Baden-Württemberg

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Thessaloniki**immission area: 129 km<sup>2</sup>

population: 794 330

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per hour [µg/m <sup>3</sup> ]
SO <sub>2</sub>	3	8	-	-	-	364	-	38
PM <sub>10</sub>	4	27	-	201	-	-	-	101
PM <sub>2,5</sub>	-	-	-	-	-	-	-	-
NO	6	16	-	-	-	795	-	326
NO <sub>2</sub>	6	20	-	-	-	190	-	112
CO	3	433	-	-	-	16700	-	5100
O <sub>3</sub>	6	63	-	-	-	174	-	142

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	22
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

**Vienna**immission area: 415 km<sup>2</sup>

population: 1 797 337

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 99,9 Percentile 3h-mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 99,9 Percentile 1h-mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 99,9 Percentile 1/2h-mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	6	4	7	16	24	28	29	12
PM <sub>10</sub> *	13	21	35	88	167	178	190	69
PM <sub>2,5</sub> **	6	15	27	63	71	71	71	44
NO	16	12	104	249	346	370	385	223
NO <sub>2</sub>	16	26	60	119	158	161	170	121
CO	4	315	639	1231	1343	1371	1429	923
O <sub>3</sub>	4	58	105	152	190	190	190	150

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	14
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	3

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area



Comments for Vienna:

A defect exhaust at the monitoring station „Stephansplatz“ causes invalid values for the annual statistic.

\* PM<sub>10</sub> equivalent factor 2015 for the continuous measurement method:

PM <sub>10</sub> monitoring station	period	measurement system	calibration
<b>Taborstraße</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
<b>AKH</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
<b>Belgradplatz</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
Laaer Berg	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
Kaiser-Ebersdorf	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
<b>A23-Wehlistraße</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
<b>Gaudenzdorf</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
<b>Kendlerstraße</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
Schafberg	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
Gerichtsgasse	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
Lobau	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
Stadlau	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.827 \cdot y_{\text{roh}} + 0.10$
<b>Liesing-Gewerbegebiet</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.905 \cdot y_{\text{roh}} + 0.191$

Bold printed monitoring stations: additionally gravimetric method used

\*\* PM<sub>2,5</sub> - equivalent faktor 2015 for the continuous measurement method:

PM <sub>2,5</sub> monitoring station	period	measurement system	calibration
<b>Taborstraße</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.778 \cdot y_{\text{roh}} - 0.25$
<b>AKH</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.778 \cdot y_{\text{roh}} - 0.25$
<b>A23-Wehlistraße</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.778 \cdot y_{\text{roh}} - 0.25$
Kendlerstraße	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.778 \cdot y_{\text{roh}} - 0.25$
<b>Lobau</b>	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.778 \cdot y_{\text{roh}} - 0.25$
Stadlau	from 1.1.	Grimm EDM-180	$y_{\text{äquivalent}} = 0.778 \cdot y_{\text{roh}} - 0.25$

Bold printed monitoring stations: additionally gravimetric method used

99.9-Percentile values (HMW, MW1 and MW3) of PM<sub>10</sub> and PM<sub>2,5</sub> are from continuous measurements (including station factor). This applies also for stations with continuous and gravimetric 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.

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Villach**immission area: 135 km<sup>2</sup>

population: 61 221

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	0	-	-	-	-	-	-	-
PM <sub>10</sub>	1	21	35	59	-	-	-	-
PM <sub>2,5</sub>	0	-	-	-	-	-	-	-
NO	1	26	83	178	287	337	353	151
NO <sub>2</sub>	1	29	47	68	103	112	119	73
CO	0	-	-	-	-	-	-	-
O <sub>3</sub>	0	-	-	-	-	-	-	-

PM <sub>10</sub>	Monitoring method(s) used:	continuously (Sharp 5030)
	Equivalent factor for monitoring method(s) according to EU-directive 2008/50/EG:	1,102y – 2,531 already applied to data
	Number of limit violations of the daily mean standard of 50 µg/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	5
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	-

**Warsaw**immission area: 517 km<sup>2</sup>

population: 1.744.351

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per day [µg/m <sup>3</sup> ]
SO <sub>2</sub>	2	6	9	55	179	223	-	24
PM <sub>10</sub>	5	33	64	139	323	467	-	101
PM <sub>2,5</sub>	3	25	47	94	188	215	-	71
NO	4	30	88	219	497	610	-	163
NO <sub>2</sub>	4	39	70	148	220	247	-	104
CO	3	541	800	1499	634	4403	-	1129
O <sub>3</sub>	3	39	76	108	174	180	-	92

PM <sub>10</sub>	Monitoring method(s) used:	automatic: TEOM+FDMS, nephelometry 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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	80
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	6

Comments: \* TEOM and FDMS for PM<sub>10</sub> and PM<sub>2,5</sub>: 1.25\*x-0.798  
 Nephelometry for PM<sub>10</sub>: 0.877\*x+2.587  
 Nephelometry for PM<sub>2,5</sub>: 0.818\*

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Wiesbaden (urban stations)**immission area: 204 km<sup>2</sup> population: 284 620

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	1	1	4	10	21	39	4
PM <sub>10</sub>	1	19	29	112	221**	317**	341**	54
PM <sub>2,5</sub>	1	12*	21*	86*	-	-	-	-
NO	1	14	44	130	233	322	325	110
NO <sub>2</sub>	1	29	37	57	94	118	129	72
CO	0	-	-	-	-	-	-	-
O <sub>3</sub>	1	42	77	155	276	283	286	136

1

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2005 (measured values <b>including</b> equivalent factor, if applicable):	5
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2005:	0

Comments: \* monitoring method: gravimetrically  
 \*\* value from Jan. 1 2015 (New Year's Eve fire works)

**Wiesbaden (traffic station)**

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	0	-	-	-	-	-	-	-
PM <sub>10</sub>	2	21	30	191	673*	937*	1033*	56
PM <sub>2,5</sub>	1	15	24	78	102	120	941*	47
NO	2	56	116	222	432	581	609	230
NO <sub>2</sub>	2	53	67	98	165	263	277	117
CO	1	450	660	1170	2030	3210	3250	1230
O <sub>3</sub>	0	-	-	-	-	-	-	-

1

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2005 (measured values <b>including</b> equivalent factor, if applicable):	8
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2005:	2

Comments: \* value from Jan. 1 2015 (New Year's Eve fire works)

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area

<sup>2</sup> max. value of all monitoring stations of the affected area

**Zagreb**immission area: 641 km<sup>2</sup>

population: 790 017

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	6	1	10	22	-	52	-	15
PM <sub>10</sub>	6	29	56	186	-	-	-	102
PM <sub>2,5</sub>	3	24	54	181	-	-	-	85
NO	-	-	-	-	-	-	-	-
NO <sub>2</sub>	5	41	69	122	-	215	-	95
CO	1	480	980	1870	-	3780	-	1420
O <sub>3</sub>	5	37	89	148	-	218	-	114

PM <sub>10</sub>	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	64
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	1

**Zurich**immission area: 1 086 km<sup>2</sup>

population: 1 185 214

	Number of monitoring stations	Annual mean value <sup>1</sup> [µg/m <sup>3</sup> ]	max. monthly mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. daily mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 3h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. 1h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	max. ½ h mean value <sup>2</sup> [µg/m <sup>3</sup> ]	Max. 98-Percentile per year [µg/m <sup>3</sup> ]
SO <sub>2</sub>	1	2	3	5	12	16	24	5
PM <sub>10</sub>	1	17	27	57	141	200	236	48
PM <sub>2,5</sub>	1	12	22	49	-	-	-	-
NO	1	11	48	126	164	193	249	101
NO <sub>2</sub>	1	31	48	85	106	112	117	79
CO	1	295	478	880	1847	2182	2250	699
O <sub>3</sub>	1	48	88	119	194	199	201	139

PM <sub>10</sub> :	Monitoring method(s) used:	β-meter-measurement, calibrated with gravimetric measurements every 4 days
	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/m <sup>3</sup> at the highest stressed station in 2015 (measured values <b>including</b> equivalent factor, if applicable):	5
NO <sub>2</sub>	Number of limit violations of the 1h mean standard of 200 µg/m <sup>3</sup> at the highest stressed station in 2015:	0

<sup>1</sup> arithmetic mean value of all monitoring stations of the affected area<sup>2</sup> max. value of all monitoring stations of the affected area