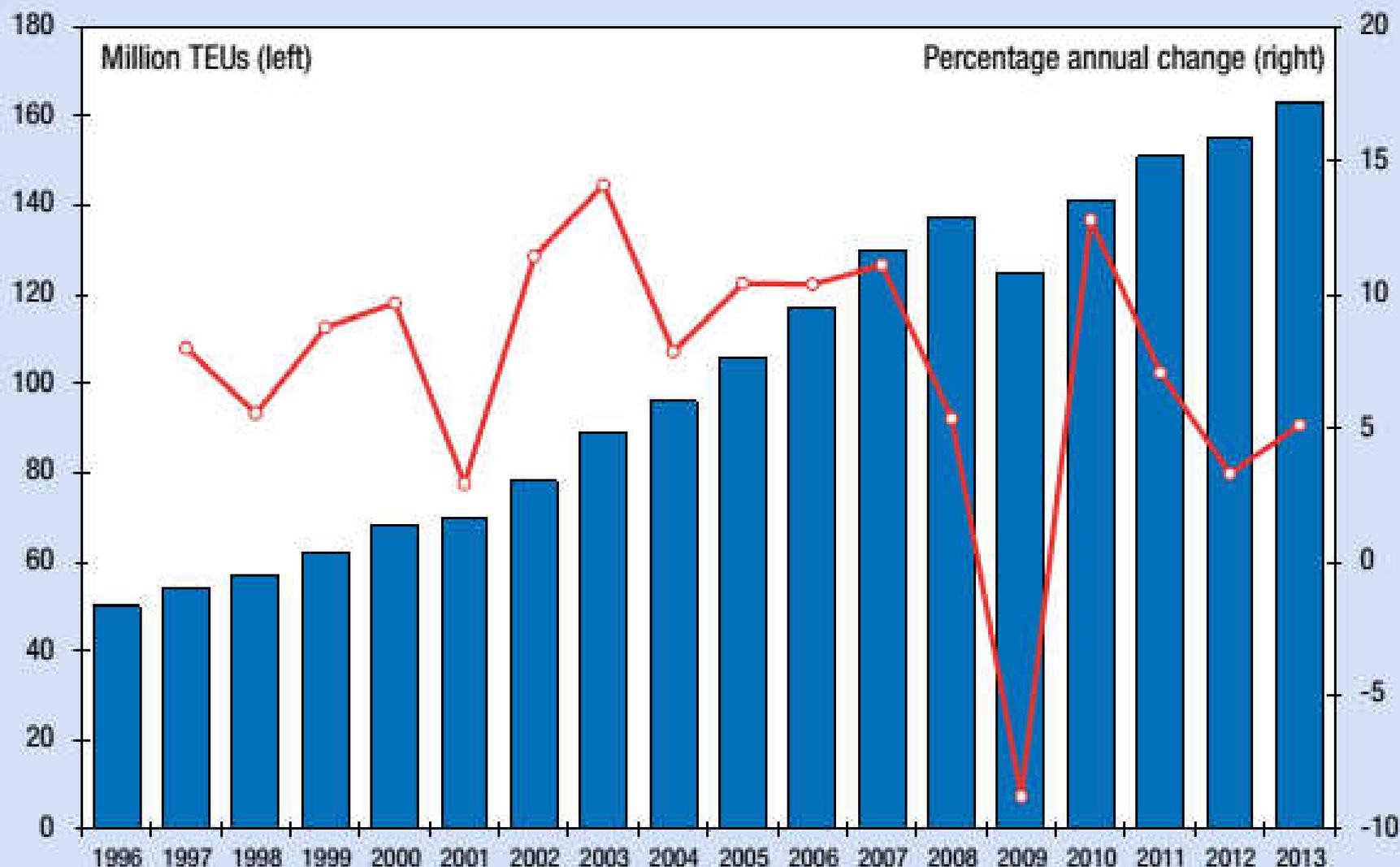


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# Luftschadstoffe und ihre Folgewirkungen

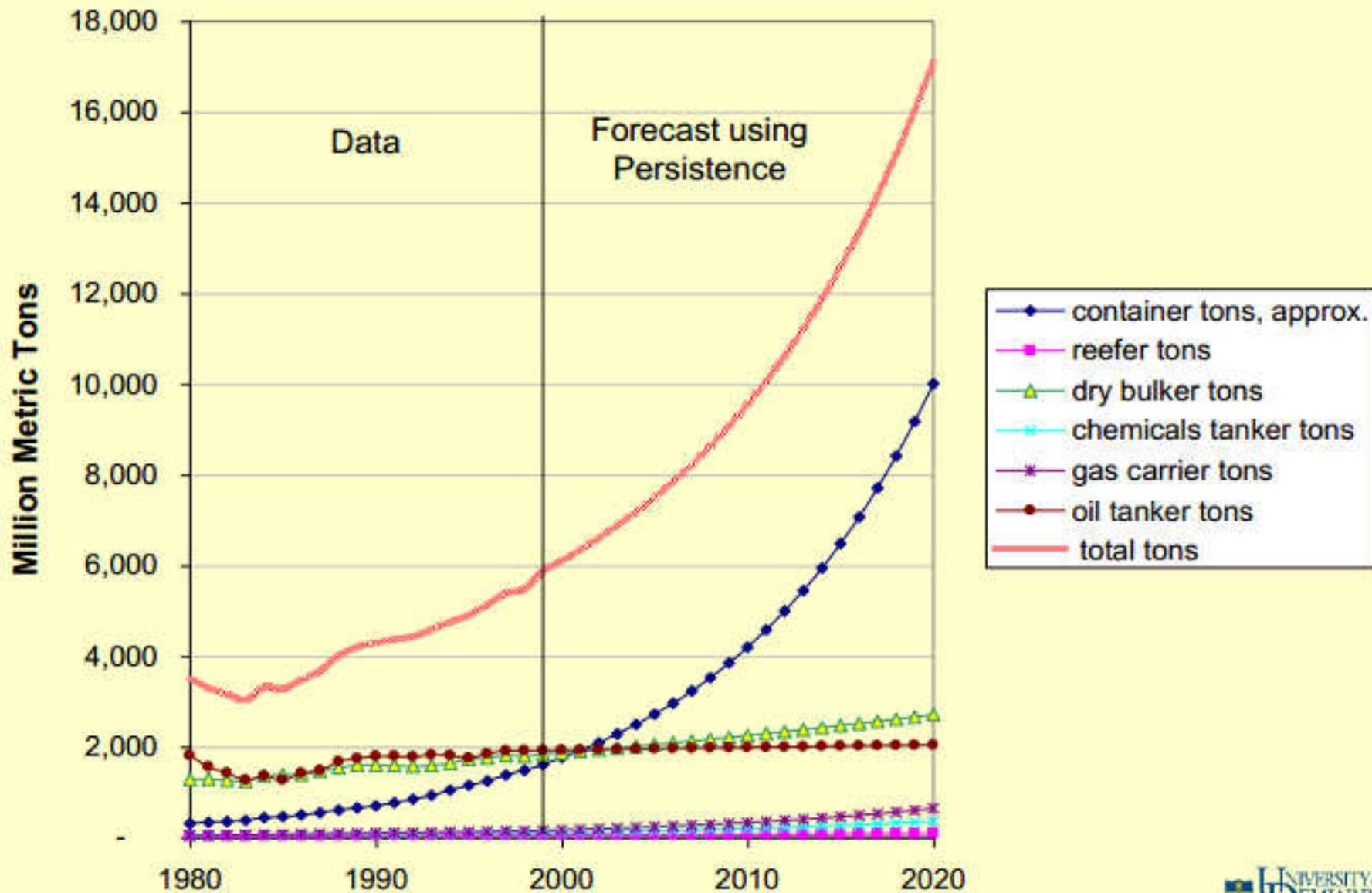
Dr. Axel Friedrich  
Berlin

Figure 1.5 (a). Global container trade, 1996–2013 (Millions of TEUs and percentage annual change)

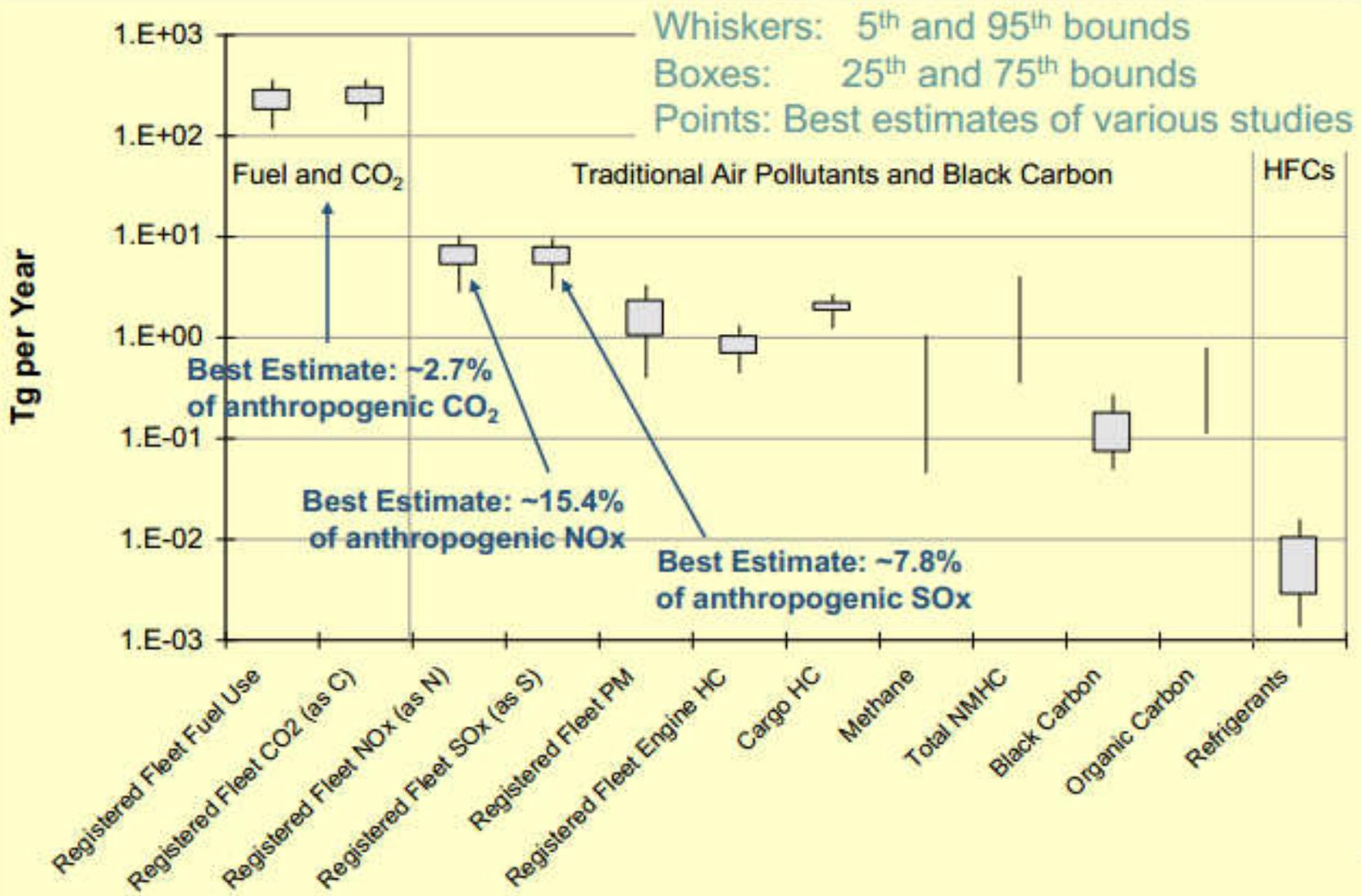


Source: Based on Drewry Shipping Consultants, *Container Market Review and Forecast 2008/2009*, and Clarkson Research Services, *Container Intelligence Monthly*, various issues.

# Fast-growing sectors can dominate forecast



# Ship emissions estimates bounded





EUROPEAN COMMISSION

PRESS RELEASE

Brussels, 31 January 2013

## **Environment: Newly found health effects of air pollution call for stronger EU air policies**

Long-term exposure to fine particles (PM<sub>2.5</sub>) can trigger atherosclerosis, adverse birth outcomes and childhood respiratory diseases, according to a World Health Organisation (WHO) review released today. REVIHAAP – the “Review of evidence on health aspects of air pollution” – also suggests a possible link with neurodevelopment, cognitive function and diabetes, and strengthens the causal link between PM<sub>2.5</sub> and cardiovascular and respiratory deaths. The research was carried out at the request of the European Commission in the framework of the 2013 review of the European Union’s air policy.

Over 80 % of Europeans are exposed to particulate matter (PM) levels above the 2005 WHO Air Quality Guidelines (AQGs). This on average deprives each citizen of 8.6 months of life.

# Comprehensive Four-Year Study Finds Black Carbon Second Biggest Climate Pollutant Behind Carbon Dioxide

The four-year, 232-page study of black carbon, published in the *Journal of Geophysical Research: Atmospheres*, shows that short-lived pollution known as soot, such as emissions from diesel engines and wood-fired stoves, has about two-thirds the climate impact of carbon dioxide. The analysis has pushed methane, which comes from landfills and other forces, into third place as a human contributor to global warming.

Source: Bounding the role of black carbon in the climate system: A scientific assessment, T. C. Bond et al., *Journal of Geophysical Research: Atmospheres* 2013

# Chair's conclusions from the Arctic Environment Ministers Meeting

## *Arctic change – Global effects*

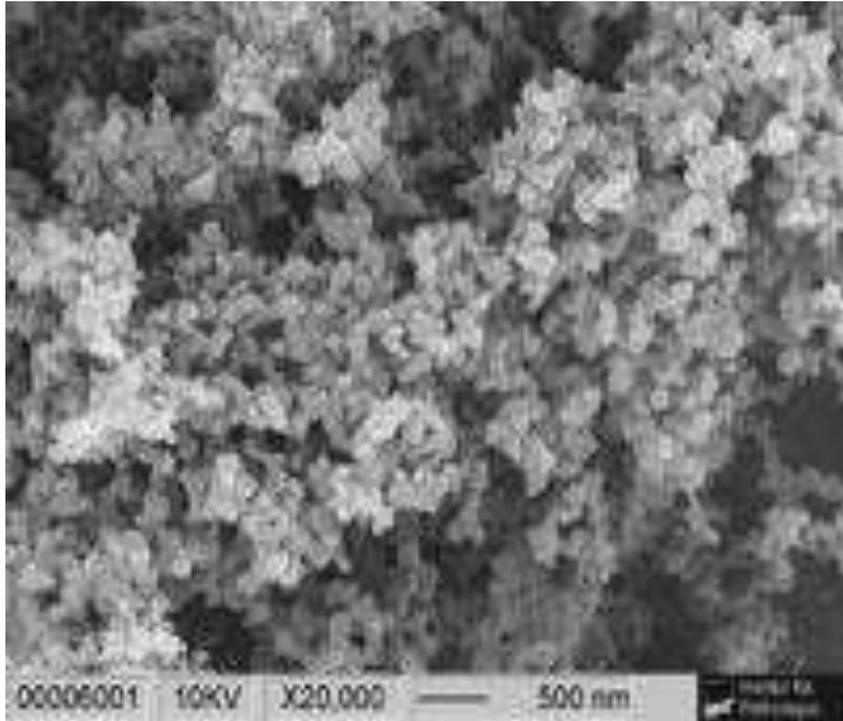
Jukkasjärvi, Sweden, 5-6 February, 2013

Ministers stressed the need for urgent action to reduce SLCP emissions to contribute to Arctic climate change mitigation and to the preservation of the unique culture and ecosystems of the Arctic which are under threat from rapid climate changes. They also underscored the continued role of the Arctic Council and Arctic States in spearheading greater international action on SLCPs and the importance of continuously improving the scientific knowledge of SLCPs and how they impact the climate.

Ministers concluded that decisive action on black carbon and other SLCPs is needed, and encouraged coordination and support for international and global efforts to address emissions.

# Relative Albedo

Measured from 0.00 (dark) to 1.00 (bright)

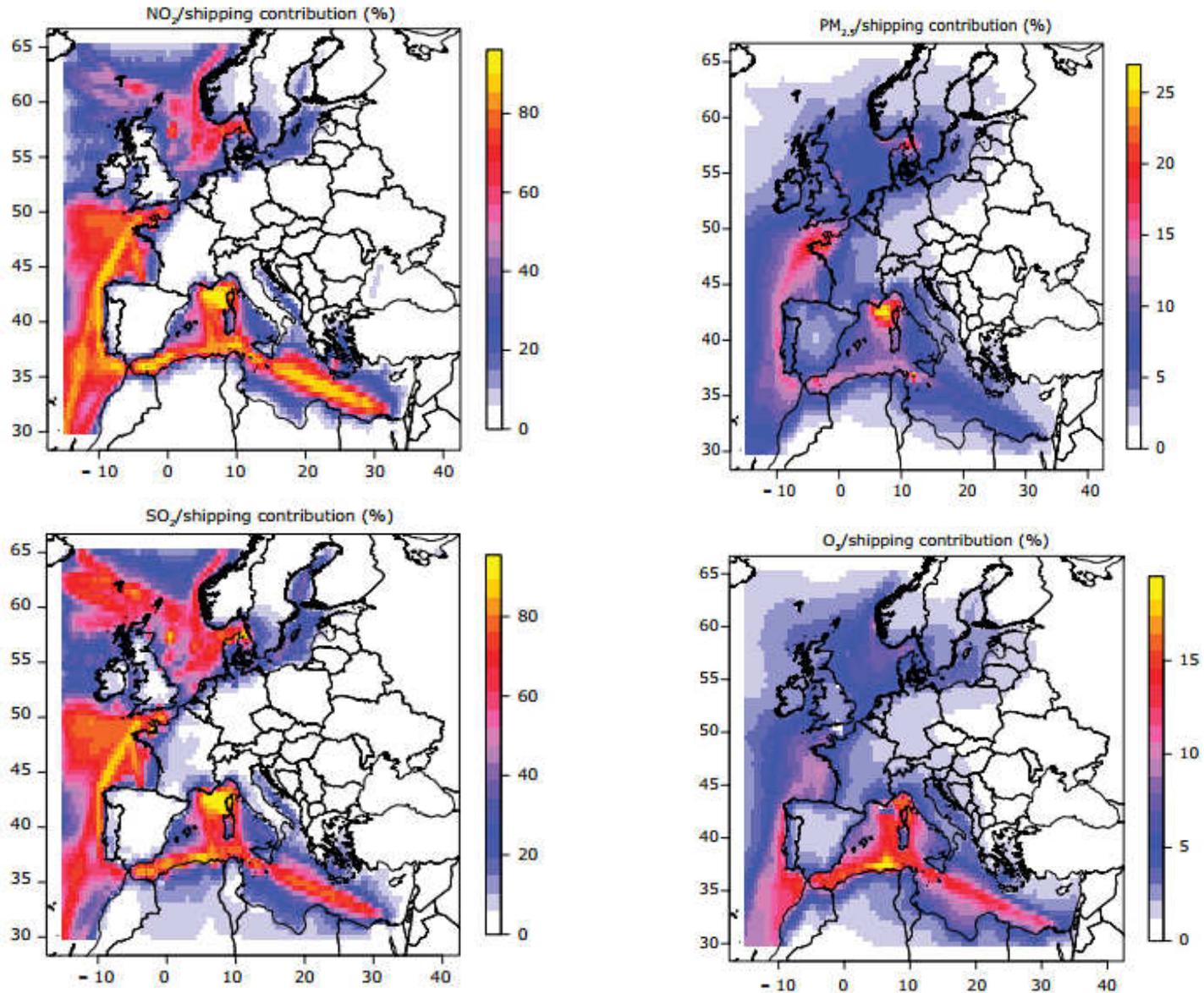


Black Carbon = 0.04



Fresh Snow = 0.9

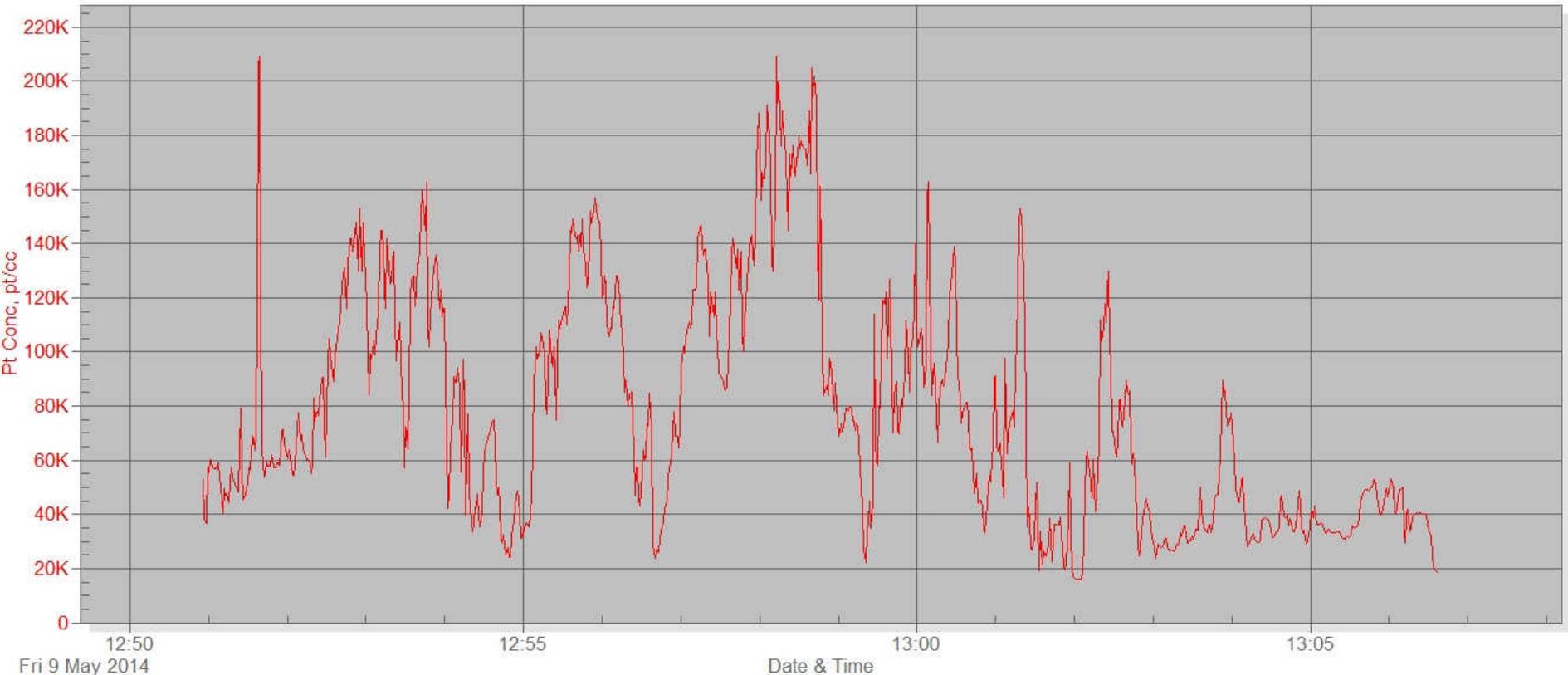
# Maps of Contribution of Shipping Emissions in % to the Annual mean of NO<sub>2</sub>, SO<sub>2</sub>, PM<sub>2.5</sub> and Av. of the Summer daily max O<sub>3</sub>



Source: EEA 2013

# Ultra fine Particle Measurement in the Harbor of Hamburg

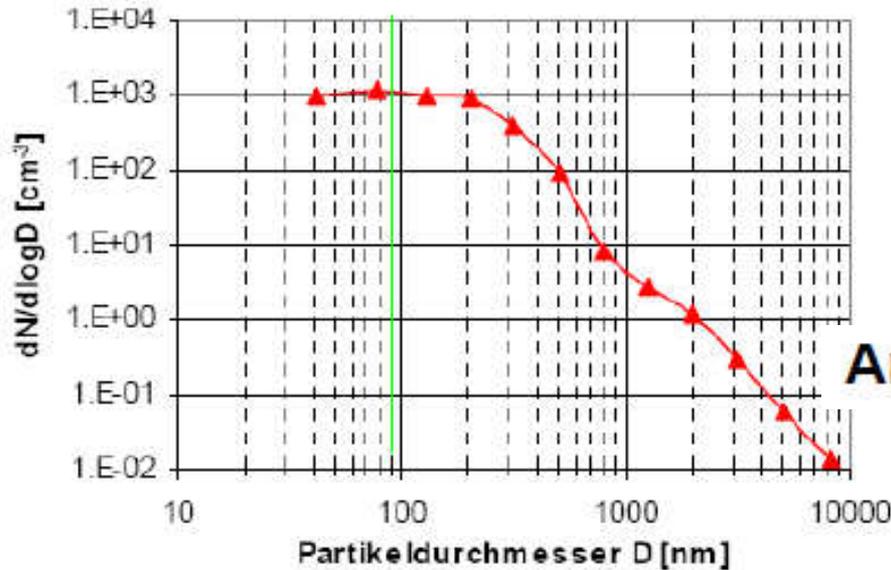
Harfengeburtstag  
12:59



Number concentrations of ultra fine particles in clean urban environment about 2000-3000 particles/ccm. Per 1000/ ccm PN increase heart attacks increase by about 7%.

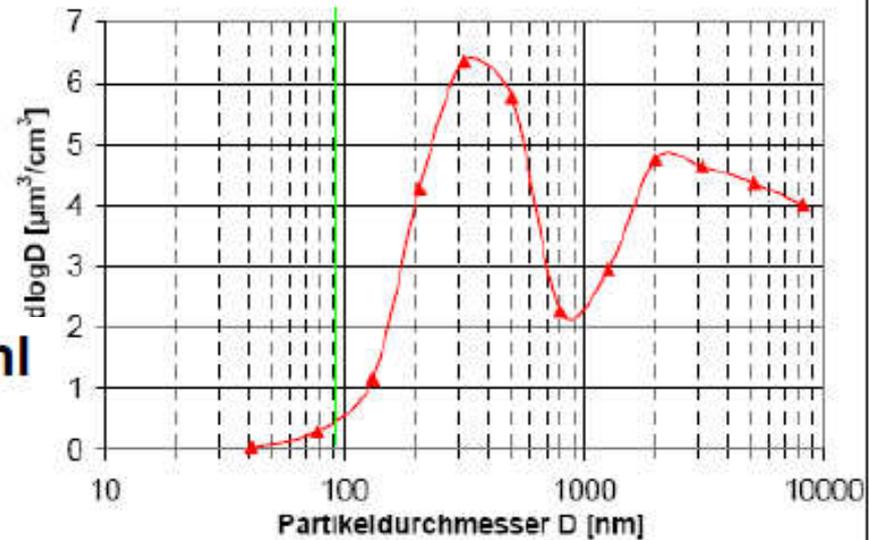
# Number- and Mass-Distribution

25.10.01 04:30



Anzahl

25.10.01 04:30



Number

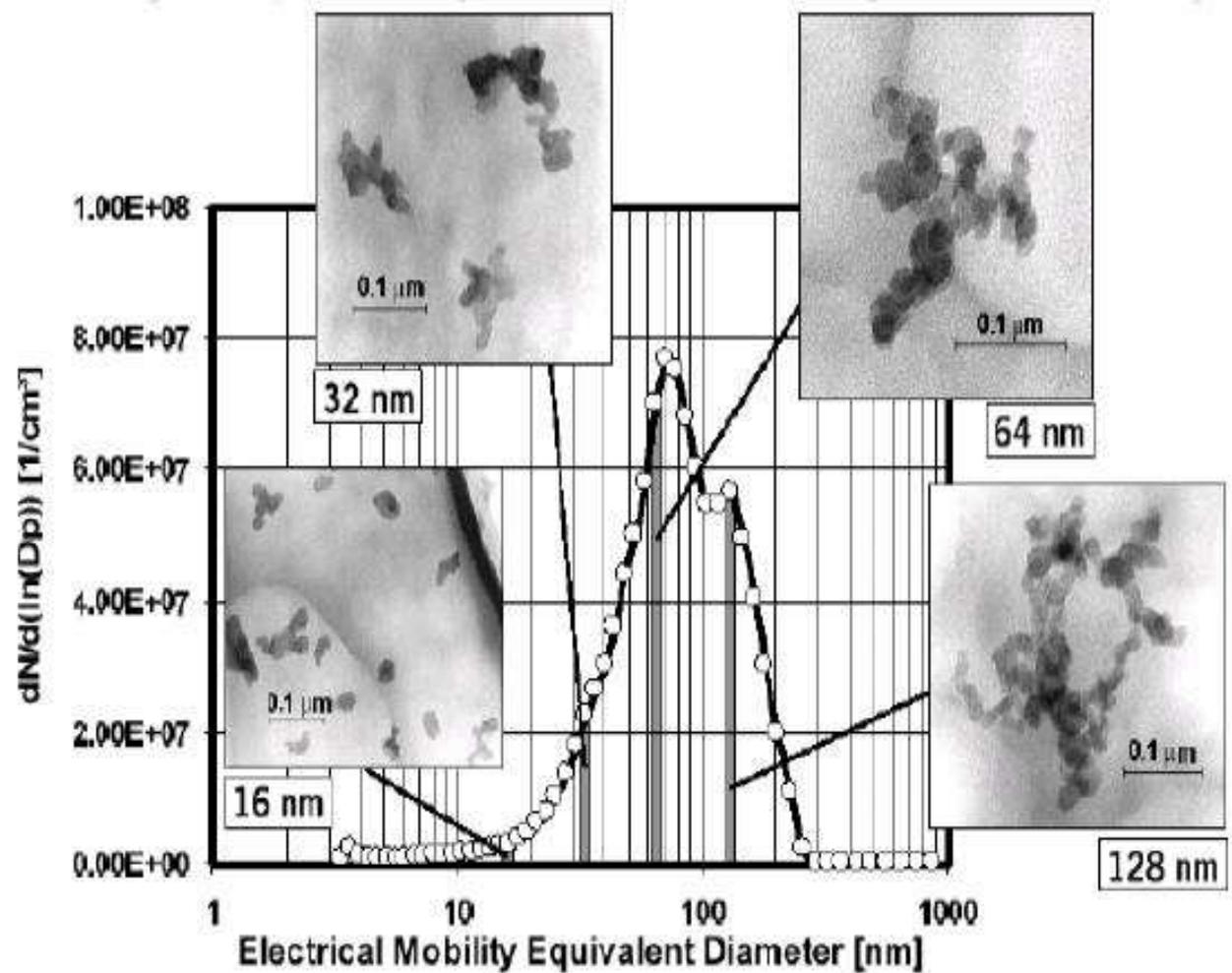
Volume  
Mass

PSI UVFK 2003

Particle mass are dominated by particles greater than 200nm, particle number by ultrafine particles

# **Health (Ultrafine Particles)**

# Diesel Particles

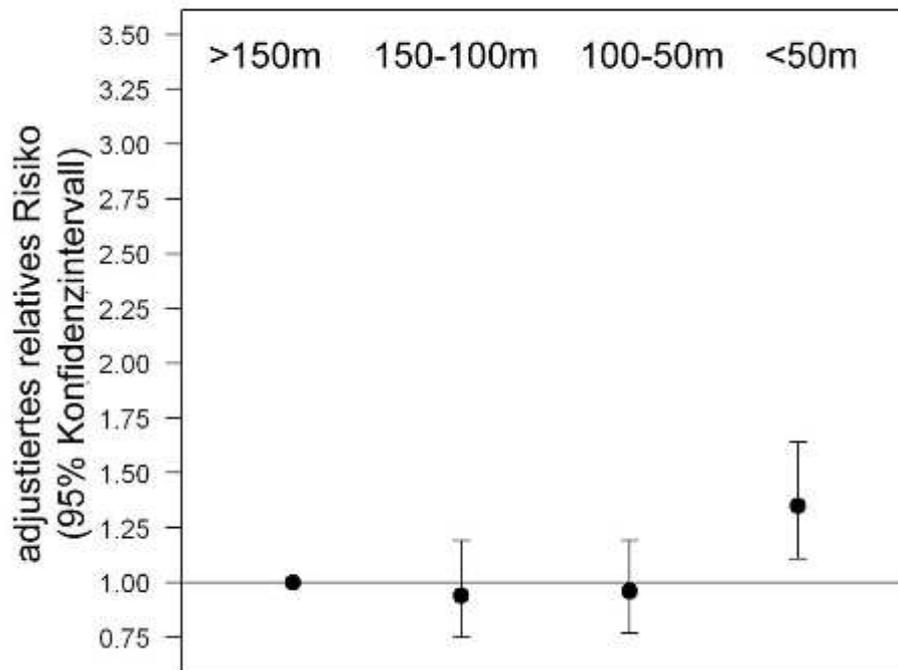


Living near on traffic intensive roads

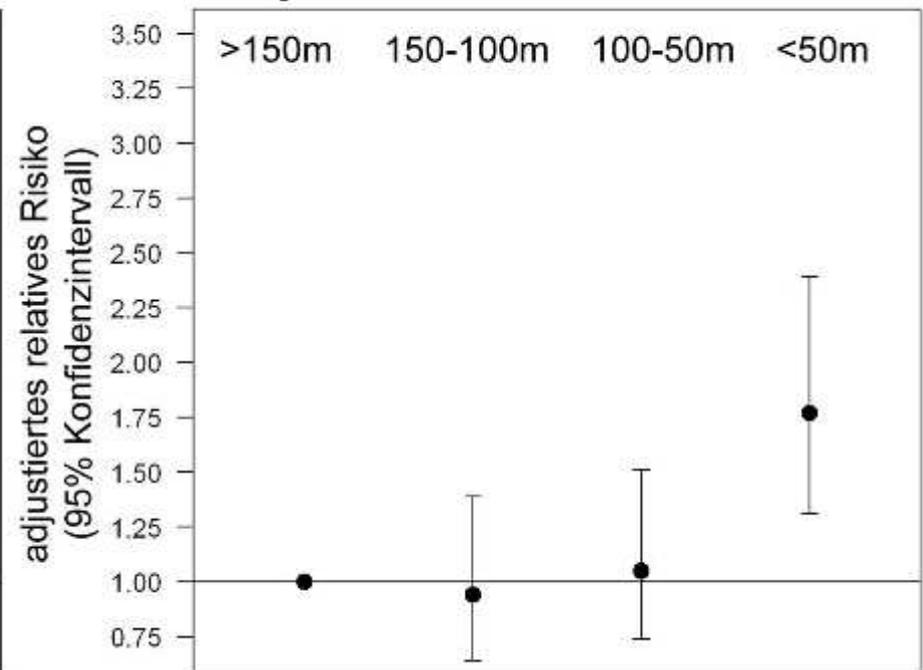
# Distance less than 50 m

**Increase of total mortality by 38% and of cardiopulmonary death cases by 77%**

**A Gesamtmortalität**



**B Kardiopulmonal**



Verkehrsreiche Straßen: 5000 Fahrzeuge pro Tag; aRR: adjustiert für Sozialstatus und Rauchen

# The effect of particle size on cardiovascular disorders – The smaller the worse

Ulrich Franck<sup>a</sup>, Siad Odeh<sup>c</sup>, Alfred Wiedensohler<sup>b</sup>, Birgit Wehner<sup>b</sup>, Olf Herbarth<sup>c,\*</sup>

<sup>a</sup> Helmholtz Centre for Environmental Research GmbH – UFZ, Leipzig, Germany

<sup>b</sup> Institute for Tropospheric Research, Leipzig, Germany

<sup>c</sup> Environmental Medicine and Hygiene, Faculty of Medicine, University of Leipzig, Germany

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Health effects

Time series analysis

Environmental medicine

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## ABSTRACT

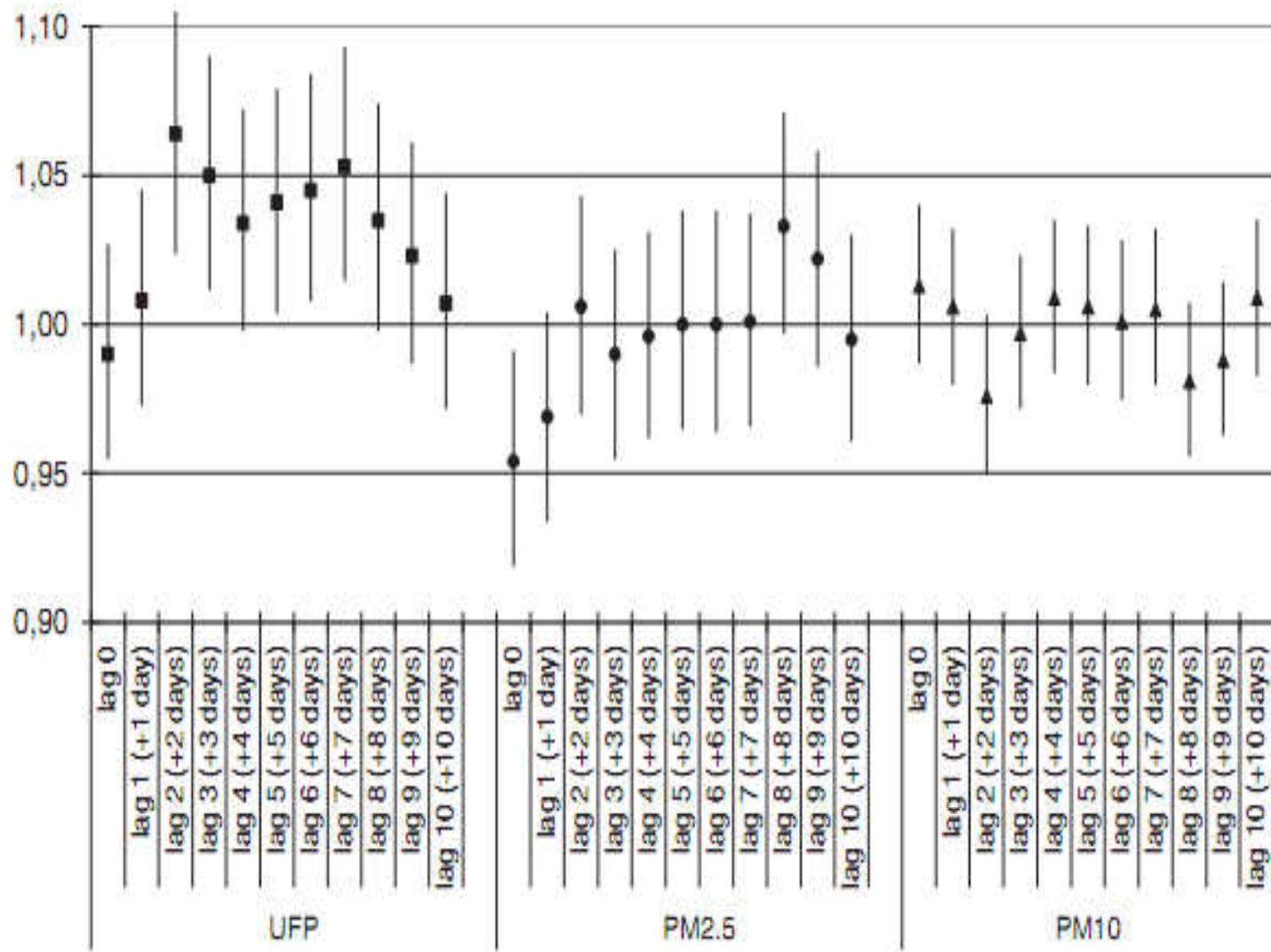
*Background:* Previous studies observed associations between airborne particles and cardio-vascular disease. Questions, however, remain as to which size of the inhalable particles (coarse, fine, or ultrafine) exerts the most significant impact on health.

*Methods:* For this retrospective study, data of the total number of 23,741 emergency service calls, registered between February 2002 and January 2003 in the City of Leipzig, were analysed, identifying 5326 as being related to cardiovascular incidences. Simultaneous particle exposure was determined for the particle sizes classes <100 nm (UFP), <2.5 µm (PM<sub>2.5</sub>) and <10 µm (PM<sub>10</sub>). We used a time resolution of 1 day for both parameters, emergency calls and exposure.

*Results:* Within the group of cardiovascular diseases, the diagnostic category of hypertensive crisis showed a significant association with particle exposure. The significant effect on hypertensive crisis was found for particles with a size of <100 nm in diameter and starting with a lag of 2 days after exposure. No consistent influence could be observed for PM<sub>2.5</sub> and PM<sub>10</sub>. The Odds Ratios on hypertensive crisis were significant for the particle size <100 nm in diameter from day 2 post exposure OR = 1.06 (95%CI: 1.02–1.10, p = 0.002) up to day 7 OR = 1.05 (95%CI 1.02–1.09, p = 0.005).

*Conclusion:* Ultrafine particles affect cardiovascular disease adversely, particularly hypertensive crises. Their effect is significant compared with PM<sub>2.5</sub> and PM<sub>10</sub>. It appears necessary, from a public health point of view, to consider regulating this type of particles using appropriate measurands as particle number.

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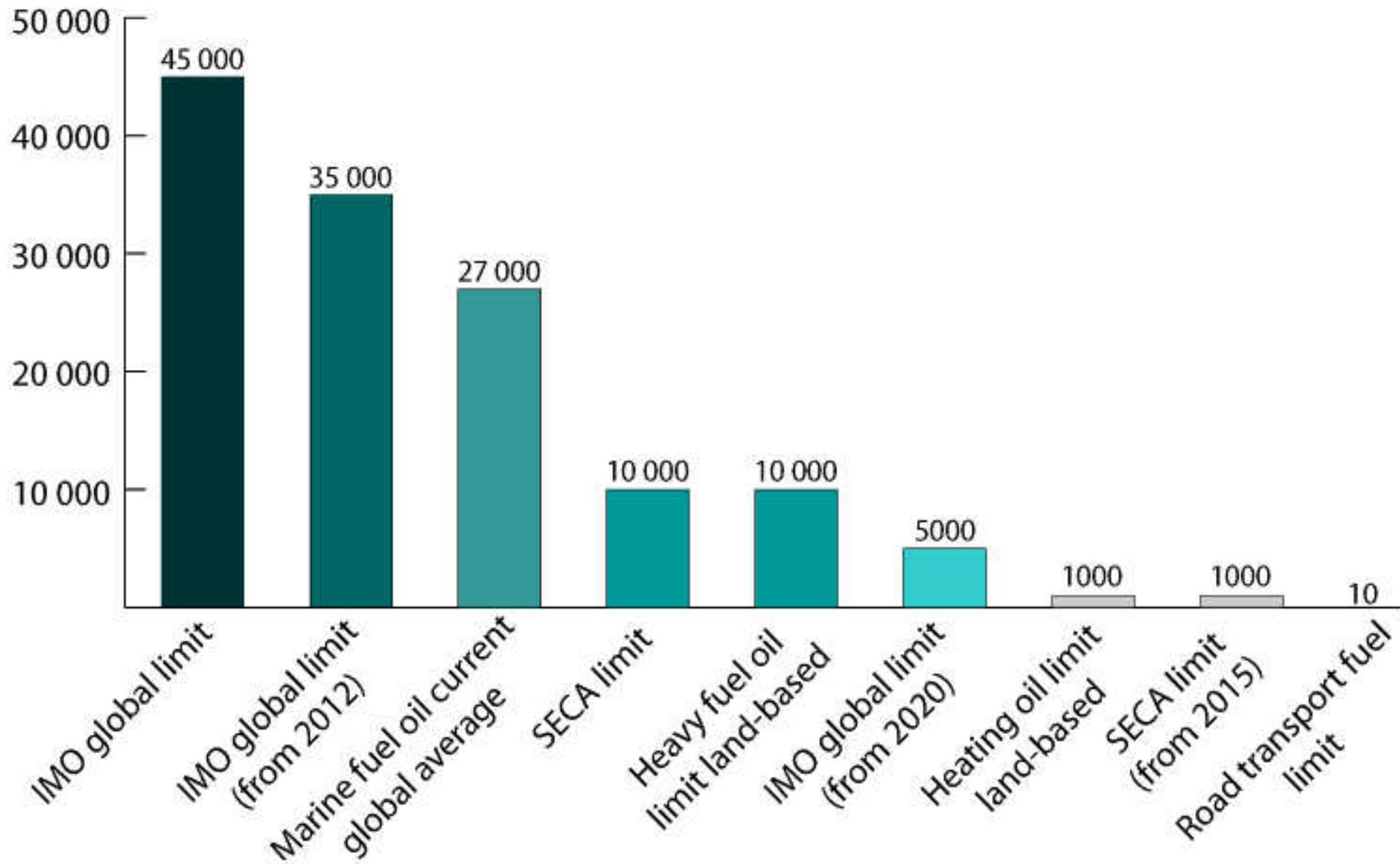


OR and 95% confidence interval in emergency calls related to hypertensive crises depending on time of exposure to airborne particles and size of particles (ultrafine[UFP]–fine [PM2.5]–coarse [PM10])

## Sulphur Limit in Fuel (% m/m)

	SECA	Global
2000	1.5%	4.5%
2010	1.0%	
2012	0.1%	3.5%
2015		
2020 <sup>a</sup>		0.5%

a - alternative date is 2025, to be decided by a review in 2018



Comparison of various fuel sulphur limits in parts per million (ppm). Please note that the upper figure of 45 000 ppm corresponds to 4.5% sulphur content, whereas the lower figure of 10 ppm for road transport fuels corresponds to a 0.00001% sulphur content.

# Justification for an improved Fuel Quality for Marine Vessels

1. Fast reduction of air pollution ( $\text{SO}_x$  and Particles)
2. Eliminate toxic residues
3. Eliminates fuel processing on board
3. Precondition for the use of particle filter and SCR
4. Improve the health of the crew and of passengers

# HFO Accidents

By the increasing use of heavy oils as ship fuels, it comes for about three decades also to a growing share of the heavy oils in the accident-related oil pollution on sea.

Only during the last years heavy fuel oil is also transported as a load by tank ships. The accidents such as **BALTIC CARRIER, Erika HEATHER, PRESTIGE EVOIKOS, NAKHODKA, VOLGONEFT** show that there are since then also oil disasters which are caused by heavy oils.



**INTERTANKO**

# MDO - ADDITIONAL BENEFITS

- **ENVIRONMENTAL:**

- Lower fuel consumption from ALL ships
- Reduces CO<sub>2</sub>emissions from ALL ships
- No heating and pre-treatment of bunkers= further reduction of CO<sub>2</sub>emissions from ALL ships
- Eliminates fuel generated waste = further reduction of CO<sub>2</sub>emissions from ALL ships
- No heavy metals and PAH in MDO – no need to clean up and dispose hazardous PMs
- Use of in-engine solutions for further exhaust gas cleaning = no further additional waste & no need of further waste disposal
- Potential bunker spills significantly less harmful



**INTERTANKO**

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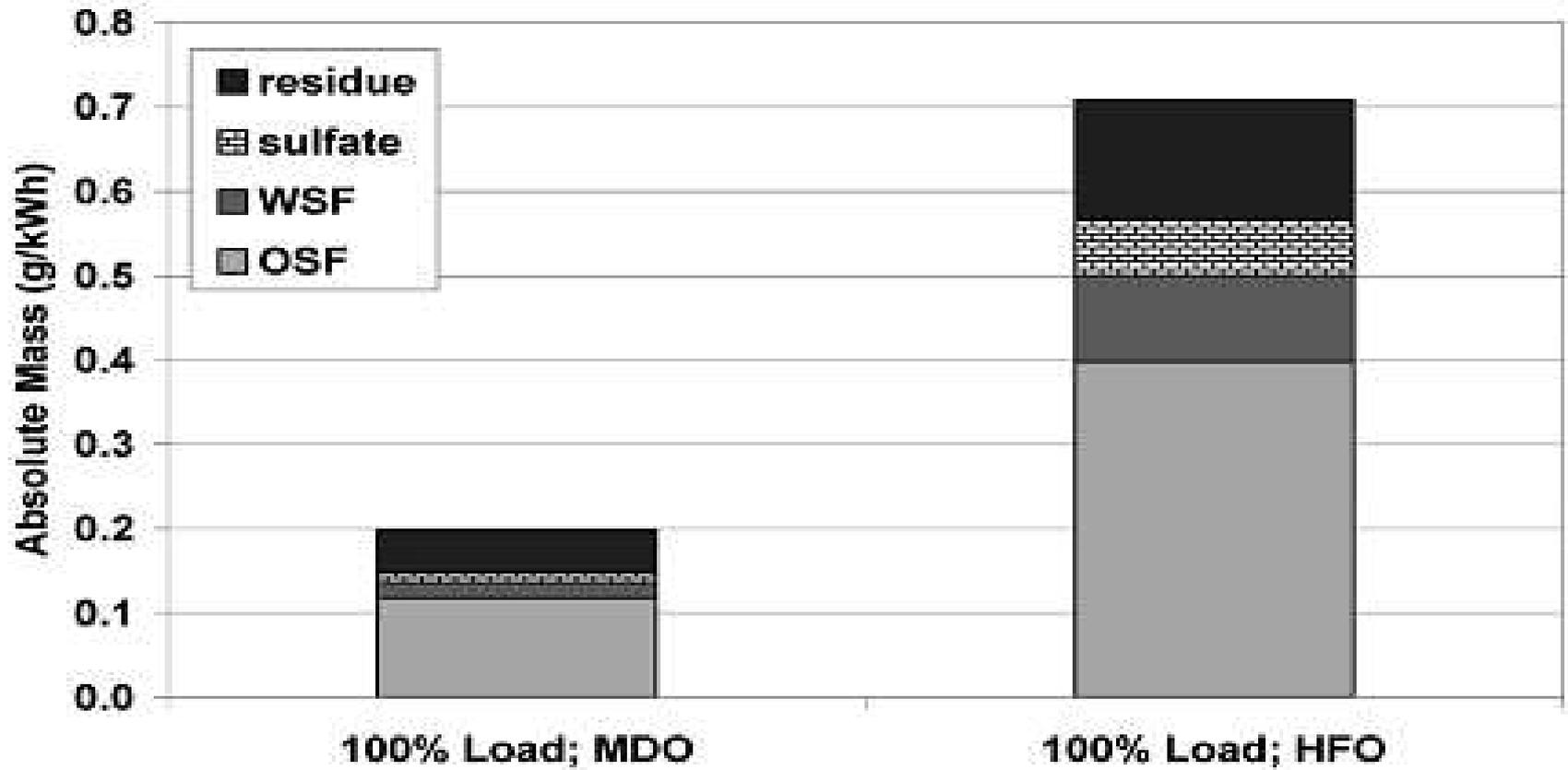


FIG. 15. Absolute masses as extracted from filters sampled at 100% load with both fuels.

# LSMGO prices 33% down year-on-year in European hub

5th December 2014 15:31 GMT

Be the first to rate this story.

Your Rating: ☆☆☆☆☆

Fears of a spike in low sulphur marine gas oil (LSMGO) prices ahead of the new emission control area (ECA) regulations have almost vanished on the back of tumbling crude oil markets.

Bunkerworld price data showed LSMGO averaging around \$606 per metric tonne (pmt) in early deals in **Rotterdam** on Friday, the lowest it has been since daily averages began to be recorded in May 2011.

It was also 33% lower than price indications at the start of the year.

There was a similar pattern of falling prices in other European ports inside the ECA zones, although the price slide in **St. Petersburg** was less steep.



**Rotterdam: LSMGO falling despite advent of tough new ECA rules**

**LSMGO in Rotterdam**

vs.

Date Range: **12m** 9m 6m 3m 1m 2w



December 9 - December 8 High: \$919.00 Low: \$604.00 Spread: \$315.00 Change: \$-300.00

Rotterdam Trend is a linear regression of Rotterdam price indications for LSMGO in the specified time period, quickly showing you the overall direction that the market is moving.

WTI prices are converted from USD/bbl to USD per metric tonne at a rate of 7.62 barrels per metric tonne.

Brent prices are converted from USD/bbl to USD per metric tonne at a rate of 7.53 barrels per metric tonne.

	Price \$/mt	Change	High	Low	Spread
M Dec 8	604.00 ▼	-13.50	605.00	603.00	2.00
F Dec 5	617.50 ▼	-20.00	620.00	615.00	5.00

# Barges FOB Rotterdam

October Price \$/ mmt

Diesel 10 ppm	774.000
Gasoil 50 ppm	770.500
Gasoil 0.1%	746.750
1% fuel oil	457.250
3.5% fuel oil	446.000

Oilgram Price Report [www.platts.com](http://www.platts.com)

Bunker Prices, Monday December 8, 2014

Grade	IFO380	IFO180	MDO	MGO
<u>Fujairah</u>	394.50	437.50		863.00
<u>Houston</u>	370.00	504.50		748.50
<u>Rotterdam</u>	350.50	374.00		596.00

Source: Bunker World

# Swedish port cuts fees for less polluting ships

5th December 2014 16:51 GMT

Be the first to rate this story.

Your Rating: ☆☆☆☆☆

In Sweden, the **Ports of Stockholm** are to apply a new set of 'environmentally differentiated' port fees to encourage shipping companies to go beyond their legal obligations in cutting pollution.

"To motivate and encourage our customers to reduce their environmental impact we are introducing new environmental discounts for onshore power supply in port, for liquefied natural gas (LNG) vessels and for reduced nitrogen oxide emissions," said Ports of Stockholm Deputy Managing Director Henrik Widerstahl.



**Stockholm: Port authority wants owners to do more than the legal minimum**

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[axel.friedrich.berlin@gmail.com](mailto:axel.friedrich.berlin@gmail.com)