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City of Helsinki
Preparedness Plan for serious air pollution episodes and Air Quality Action Plan 2008-2016

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City of Helsinki Environmental Centre

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Background information

- In Europe the air quality objectives for different pollutants to protect human health have been set in EU directives on Air Quality
- Those directives have been implemented in Finland's national legislation (ordinance 711/2001)
- According to ordinance the city is obligated to make plans and programmes if the limiting values given in ordinance have exceeded
- In Helsinki the daily limit values for PM_{10} and the yearly limit values for nitrogen dioxide have exceeded
- The main reason for exceeding is sanding during the winter time. The other reason is traffic. Sometimes exceeding is caused by long-range transport of airborne pollutants

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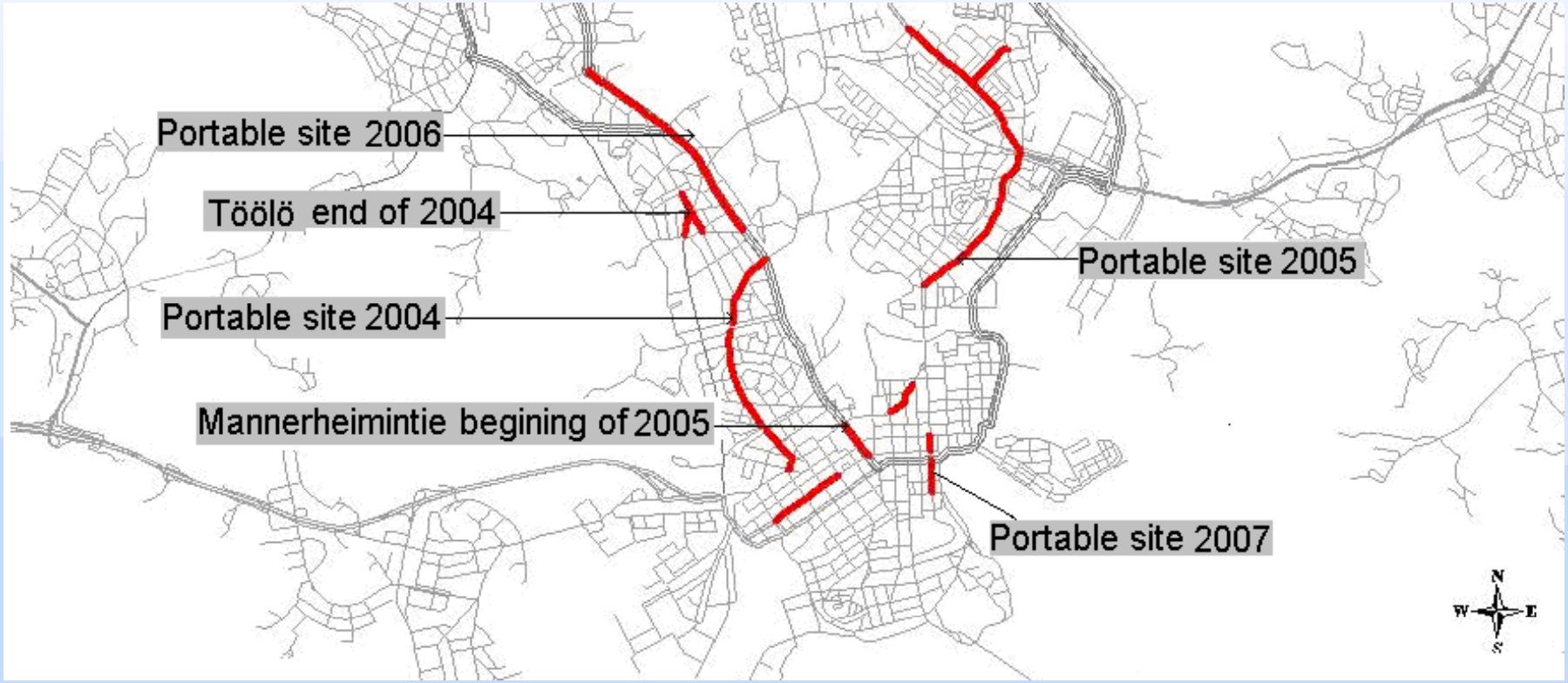
Background information

- The optimal places for exceeding are narrow streets lined by buildings. Helsinki environmental centre and YTV have surveyed this kind of streets in Helsinki
- Next Picture shows the streets where the limiting values of PM_{10} and NO_2 will most likely to exceed. In same picture are shown the monitoring sites situated in narrow streets



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The places where PM_{10} limiting values have exceeded

- PM_{10} (Daily limit value 50 µg/m^3 may exceed 35 times per year before counts that limit value has really exceeded)
  - Runeberginkatu 2003, 41 times
  - Mannerheimintie 2005, 49 times
  - Hämeentie 2005, 41 times
  - Mannerheimintie 2006, 37 times
  - Töölöntulli 2006, 59 times

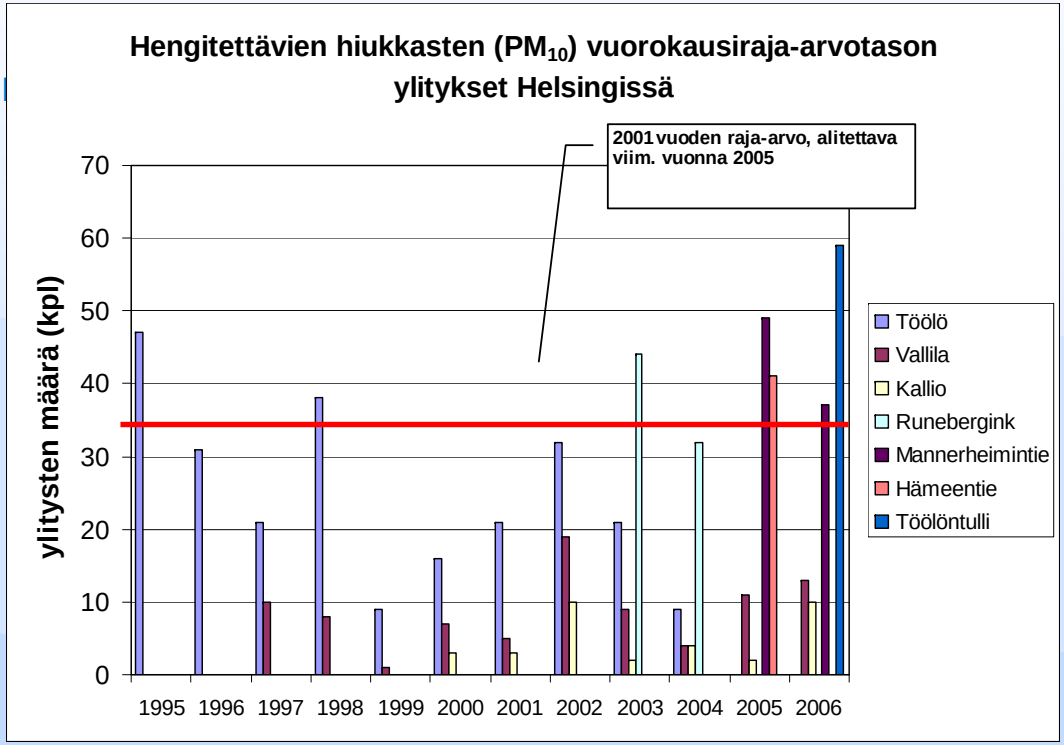

Figure. Inhalable particles (PM_{10}) compared to 24 h limit value (50 µg/m^3) (number of exceedings) (Ref: YTV).

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The places where NO_2 limiting values have exceeded

NO_2 (Yearly limit value 40 µg/m³)

- Mannerheimintie 2005, 43 µg/m³
- Hämeentie 2005, 46 µg/m³
- Mannerheimintie 2006, 42 µg/m³
- Töölöntulli 2006, 54 µg/m³

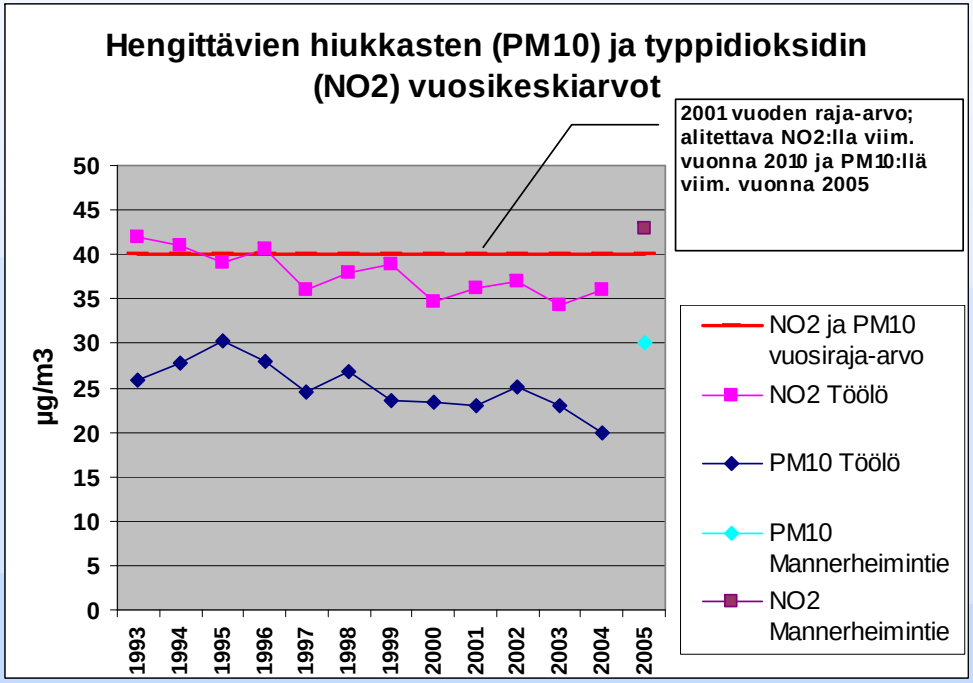

Figure. nitrogen dioxide (NO_2) (red points) and PM_{10} (blue points) compared to yearly limit value (40 µg/m³) (Ref: YTV).

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What has Helsinki done to reach the limit values for PM_{10} and NO_2?

- There is two different action plans
  1. Preparedness Plan for serious air pollution episodes
     - Contains short term measures
  2. Air Quality Action Plan for Helsinki 2008-2016
     - Contains long and medium term measures
- Together these two plans form the total air quality action plan for Helsinki city

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HELSINKI'S PREPAREDNESS PLAN FOR SERIOUS AIR POLLUTION EPISODES

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Contains three episode situations

1. High nitrogen dioxide concentration caused by traffic

Jari Viinanen

Jari Viinanen

2. High PM_{10} concentration caused by winter sanding

3. High $PM_{2,5}$ concentration caused by local forest fires or long-range transport

CHRISTIAN WESTERBACK HS 21.8.2006 HS.fi.jpg

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1. Nitrogen dioxide episode

- Three different levels of preparedness according to NO_2 concentrations
  1. Initiating preparedness (>150 µg/m^3, 3h)
  2. Effective preparedness (>200 µg/m^3, 18h)
  3. Full preparedness (>200 µg/m^3, ≥ 3d)
- Measures for preparedness levels:
  - Recommendations for driving with private cars
  - Free public transport
  - Restrictions for driving with private cars

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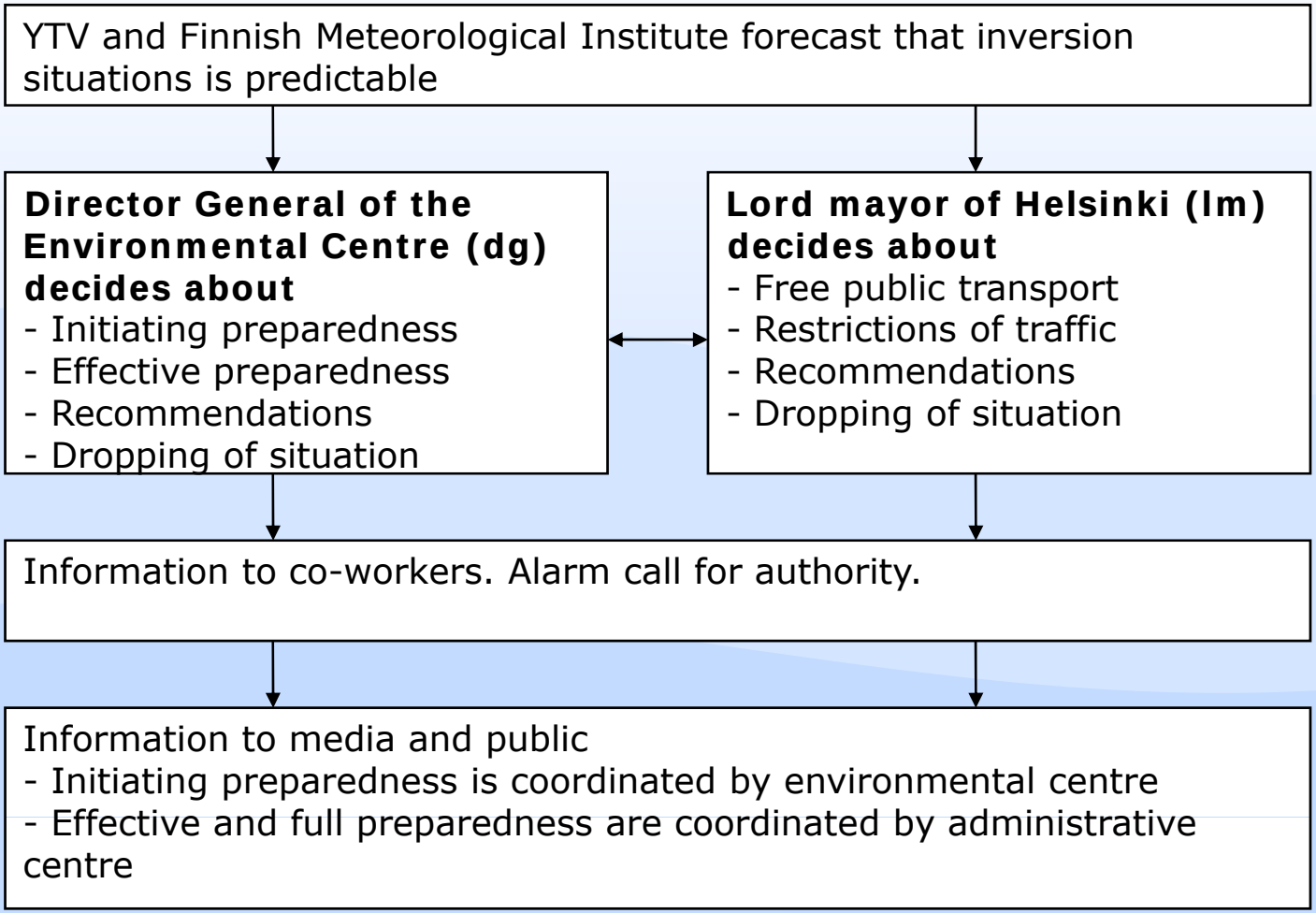
1. Nitrogen dioxide episode



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2. PM_{10} episode

- Episode situation occurs usually during spring (from march to may)
- PM_{10} episode includes two measures
  1. Advance warning
  2. Action request
     - The streets are watered by calcium chloride solution
     - Watering is done by HKR (construction office) and road district of Uusimaa

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3. $PM_{2,5}$ episode

- Episode situation occurs usually during spring and summer when a lot of forest fires exists
- $PM_{2,5}$ episode is
    1. "Normal" long-range transport
    2. Forest fires, other large fires and strong smell of smoke on wide area

- The measures are:
    - information for public and
    - warn people about situation

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AIR QUALITY ACTION PLAN 2008-2016

-Long and medium term measures-

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Framing

- Action plan is made to decrease the concentration of NO_2, PM_{10} and $PM_{2,5}$. Those are the impurities that are most likely to exceed limit values in Helsinki area

- There is several programs that partly has same goals with Helsinki's air quality action plan
  1. Preparedness plan for Helsinki
  2. Air quality program for the Metropolitan area
  3. Climate strategy 2030
  4. Sustainable development action plan for Helsinki 2002-2010
  5. Plan for Helsinki's ecological stability

- Earlier City of Helsinki has had air quality plans in 1980s

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Air Quality in Helsinki

- EMISSION SOURCES
  - Traffic: car traffic, port of Helsinki, working machines
  - Point sources: power production, surface sources, small point sources

Making the plan

- Guided by work group for air protection
- Planned and prepared by project group
- Approved by city council

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Making the plan

- Measures are estimated in five classes
  1. Environmental effects
     - air quality
     - other environmental effect
  2. Costs
  3. Health effects
  4. Timetable
  5. Feasibility

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Goals and measures

- Nine desire lines for measures
  1. General
  2. Land use and traffic planning
  3. Traffic
  4. Street dust
  5. Energy production
  6. Long-range transport
  7. Burning of wood in fireplaces
  8. Researches and planning
  9. Communication, enlightenment and education

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Indicators and Monitoring

- Examples from indicators
  - Amount of exposures
  - Mode of transport
  - Exceeds in Mannerheimintie, main source sanding
  - Exceeds in Mannerheimintie, main sources sanding and traffic
  - Relation between buildings in district cooling and “other” cooling

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Timetable

- 10/2007 Project group has made an outline for air quality action plan 2008-2016. Control group and administrations give their comments.
- 12/2007 Outline ready for statements
- 1-3/2008 Circulation for comment. Publication of outline
- 6/2008 City executive board approve an outline (at the latest)
- 6/2008 Reporting of the Action plan: Regional Environment Centre → Ministry of the Environment → European Union

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AIR QUALITY ACTION PLANS IN EUROPE

CITY	GLASCOW	ROTTERDAM	BERLIINI	BRISTOL	EDINBURGH	PRAHA	VENETSIA	OXFORD	BIRMINGHAM	TUKHOLMA	SHEFFIELD	ROOMA	OSLO	LONTOO	BRYSSEL
MEASURE O = in use X = coming Δ = not relevant															
TRAFFIC MANAGEMENT															
Local traffic control (for example: new roads, ring roads, bypassing roads, traffic sings, timing of traffic lights)	O	O	X	O	O	Δ	Δ	X	O	X	Δ			X	O
Environmental zone (heavy and light vehicles)	Δ	X	X	X	X		Δ	X		O		Δ		X	
Freight charges from heavy vehicles that come in inner city									O						
Congestion charge	Δ			Δ	O	Δ			O	O			X	O	
Car sharing		O		O			Δ	X		O		O			
Dynamic speed limits		X	X	X											
Clear Zone				O		Δ								O	
Improved goods delivery				X						X	X				

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PARKING POLICY															
Examination of parking policy (price, amount of parking places, parking time)			Δ	X	O	O		X	Δ	X					X
Parking charges at working place	Δ									X					
LIIKKUMISSTRATEGIAT															
Promotion of biking and walking	O			O		Δ	Δ	X	O		X		X		O
Travel plans (workplace, school, city, public transport)	O	Δ	O	O	O				O	O	O	Δ		O	X
PUBLIC TRANSPORT															
Improved timetable information for public transport	O							X	X						
Wider public transport	X		Δ		O	Δ	O		O	X		X			
Cleaner vehicles in public transport (Euro-class, particle filter)		O	O	X	O	O		O		O				O	
Better reputation for public transport (safety, fastness, environmental friendliness)						Δ	O		Δ			Δ			X
Cleaner locomotives (particle filters, electric locomotives)		Δ												Δ	
Provision of additional park & ride facilities	O	O				Δ	Δ	X	O	X	Δ				X

	GLASCOW	ROTTERDAM	BERLIINI	BRISTOL	EDINBURGH	PRAHA	VENETSIA	OXFORD	BIRMINGHAM	TUKHOLMA	SHEFFIELD	ROOMA	OSLO	LONTOO	BRYSSEL
TECHINCAL MEASUREMENTS															
Control of idling	O				Δ				X					X	
Improved air quality monitoring	O								O					O	Δ
Retrofit				Δ				X						O	
Promotion of air quality measurements	O			Δ	X	O	Δ	X	Δ						
VEHICLES															
- Technical demands for heavy goods vehicles and taxis								X	O	X				O	X
Tightening of the European emission standards for motor vehicles			Δ												
Extending of fuel duty														O	
Facilitating meetings between vehicle operators, cleaner fuel and vehicle providers and grant agencies														O	
Acquisition demands for power tools										O					
Tax relief for cleaner vehicles			Δ				Δ			O					Δ
Alternative fuels	O	O	O	Δ		X	X	O	X		Δ	X	X	O	Δ
Denying of studded tires										O			O		
Increased amount of cleaner vehicles			X	Δ		O				O				X	X

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EDUCATION															
Raised public awareness of air quality issues	O	X	O	O	O	O			X		Δ	X		X	O
Special subject days (car-free days, to school by bike-day)	O	X				O									O
The city acts as an example	O	O	O						X		Δ			O	X
Research activity		Δ												Δ	
Courses for eco efficiency driving													X		X
HOUSEHOLDS															
Energy efficiency at households					O	Δ	Δ		O				X	Δ	X
Regulation of fireplaces		O					X		O				X		
INDUSTRY															
Tightened environmental demands		X													X
Financial support for companies that reduce NO_x –emissions		X													X
Control of industrial emissions		X							O						
Encourage operators to adopt accredited environmental management systems											X				
Tightened EU-demands for harbours		Δ													
Local operation for trains (fixing, refuelling, cleaning)		X													
Shore-connected electricity supply to vessels in the ports		X													
Reduction of dust on construction sites			X											X	

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Increased amount of buildings in district heat											Δ		X	Δ	
Replace fossil fuels by biofuels													X		Δ
Encourage neighbouring Eastern European countries to more rapidly reduce particulate matter-related emissions from industry and power-plants			Δ												
OTHER															
Regional planning - general principles and directions - integrate land use and traffic planning					O	Δ	Δ				X		X	X	
Reduction of dust by planting						O									
Preparedness plans							O					Δ			X
Cleaning of streets							O								O
Reregulation of boiler plant and chimney heights									O						
Better ventilation in tunnels										O					X
Airport´s emission reductions														Δ	