Session 2.4 “Clean Air on the spot: Regional Challenges and Solutions”

Assumpta Farran i Poca
Director-General for Environmental Quality. Autonomous Government of Catalonia

Green Week 2013
Air Quality Plan in the Metropolitan Area of Barcelona

Main Challenges

- **Road Transport** (47% NOx Emissions; 45% PM10 Emissions)
- **Port** (16% NOx Emissions; 21% PM10 Emissions)
- **Industry** (24% NOx Emissions; 20% PM10 Emissions)

Solutions:

- Clean Fuels and Vehicles promotion
- Fleet vehicles “ecolabel” (green purchase guide)
- Street vehicles pacification
- LNG Promotion at harbour
- Rail transport of goods promotion
Sources of Emissions in the Metropolitan Area of Barcelona

**NOx Sources of Emissions:**
- Maritime Transport: 16.4%
- Urban Road Transport: 23.4%
- Aerial Transport: 4.7%
- Interurban Road Transport: 23.9%
- Industry, combustion & cogeneration < 50 MWt: 25.0%
- Energy > 50 MWt: 1.6%

47% of NOx Emissions due to Road Transport

**PM10 Sources of Emissions:**
- Maritime Transport: 22.5%
- Aerial Transport: 7.5%
- Interurban Road Transport: 27.2%
- Domestic: 1.5%
- Mineral Activities: 0.4%
- Energy > 50 MWt: 21.5%

45% of PM10 Emissions due to Road Transport

Generalitat de Catalunya
Government of Catalonia
High Road Urban Transport Emissions

Passenger cars (x 1000)

Passenger cars/km² (x 1000)

Very high density of vehicles (cars/km²)

> 100,000 vehicles/day

Dense framework: lots of streets among 7,000 and 87,000 vehicles/day + dense architecture

… besides about the 50% of circulating vehicles in Barcelona city comes from outside

Source: BCN town council and CSIC

Generalitat de Catalunya
Government of Catalonia

Source: BCN town council and CSIC

Generalitat de Catalunya
Government of Catalonia
Air Quality Plan in the Area of Barcelona

National Plan

Air Quality Plan (2011-2015)

7 AREAS
13 AIR QUALITY OBJECTIVES
34 LT MEASURES
4 MEASURES FOR EPISODES

1st AQ PLAN 2007-2010

Mayor’s commitment for a cleaner air
Air Quality Plan in the Metropolitan Area of Barcelona

Road Transport and Mobility related Plans:
- Barcelona Metropolitan Area Mobility Plan
- Bicycle Plan, Infrastructures Director Plan, Voyagers Transport Plan
- Urban Mobility Plans
- Workplaces Mobility Plans

- Vehicle Fleet “ecolabel” approved

• Green Purchase Guide approved.

• TMB bus fleet renewal:
  • 39% GNC.
  • 40% SCRT.
  • Hybridization of old diesel and GN buses
Air Quality Plan in the Metropolitan Area of Barcelona

Toll discounts in several access to Barcelona city

1. High Occupancy Vehicles (+ 3): 40% discount
2. Clean Vehicles: 30% discount if:
   - Diesel, biodiesel (& hybrids): ≤ 108 g CO2/km
   - Gasoline, bioethanol (& hybrids): ≤ 120 g CO2/km
   - GNP, GLP & Electric vehicles: all
C-58 High Occupancy Vehicles Lane:

**Only authorized vehicles:**

- Public transport vehicles (bus, taxi,..)
- Passenger cars with more than 3 passengers
- Low emission vehicles (ecolabel stick in windscreen)
- Motorcycles
- Reduced Mobility people’s vehicles
- New bus express services allowed
C-58 High Occupancy Vehicles Lane:

C-58 INTENSITATS 2013 fins dia 7 d'abril LABORAL

IMD C-58 EXIT: ~ 73.000
IMD C-58 ENTRANCE: ~ 78.000
IMD HOV +3: ~ 1.700
IMD HOV+2: ~ 3.500
Zones 30 in Barcelona

Zone 30

Generalitat de Catalunya
Government of Catalonia
Zones 30 in Barcelona
ENVIRONMENTAL COSTS FOR DIFFERENT FLEET TYPES (TAXIS, LDV, ETC.)

<table>
<thead>
<tr>
<th></th>
<th>Dièsel</th>
<th>VE</th>
<th>GLP</th>
<th>GNC</th>
<th>Híbrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contaminants locals</td>
<td>45,90</td>
<td>0</td>
<td>8,95</td>
<td>6,54</td>
<td>5,68</td>
</tr>
<tr>
<td>Emissions CO2</td>
<td>322,2</td>
<td>90,17</td>
<td>405,17</td>
<td>371,95</td>
<td>210,85</td>
</tr>
<tr>
<td>Total taxi</td>
<td>368,1</td>
<td>90,17</td>
<td>414,12</td>
<td>378,49</td>
<td>216,53</td>
</tr>
<tr>
<td>Contaminants locals</td>
<td>16,40</td>
<td>0</td>
<td>2,49</td>
<td>2,18</td>
<td>1,89</td>
</tr>
<tr>
<td>Emissions CO2</td>
<td>86,08</td>
<td>30,06</td>
<td>90,03</td>
<td>90,82</td>
<td>70,28</td>
</tr>
<tr>
<td>Total representació comercial</td>
<td>102,48</td>
<td>30,06</td>
<td>92,52</td>
<td>93</td>
<td>72,17</td>
</tr>
<tr>
<td>Contaminants locals</td>
<td>16,60</td>
<td>0</td>
<td>5,96</td>
<td>3,08</td>
<td>1,89</td>
</tr>
<tr>
<td>Emissions CO2</td>
<td>108,19</td>
<td>29,62</td>
<td>134,25</td>
<td>105,03</td>
<td>70,28</td>
</tr>
<tr>
<td>Total furgoneta petita</td>
<td>124,79</td>
<td>29,62</td>
<td>140,21</td>
<td>108,21</td>
<td>72,17</td>
</tr>
<tr>
<td>Contaminants locals</td>
<td>366,32</td>
<td>0</td>
<td>n.c.</td>
<td>74,97</td>
<td>n.c.</td>
</tr>
<tr>
<td>Emissions CO2</td>
<td>494,41</td>
<td>93,64</td>
<td>n.c.</td>
<td>337,01</td>
<td>n.c.</td>
</tr>
<tr>
<td>Total camió &lt; 3.500 Kg.</td>
<td>860,73</td>
<td>93,64</td>
<td>n.c.</td>
<td>411,98</td>
<td>n.c.</td>
</tr>
<tr>
<td>Contaminants locals</td>
<td>6,31</td>
<td>0</td>
<td>1,75</td>
<td>2,11</td>
<td>n.c.</td>
</tr>
<tr>
<td>Emissions CO2</td>
<td>50,94</td>
<td>20,07</td>
<td>54,88</td>
<td>51,33</td>
<td>n.c.</td>
</tr>
<tr>
<td>Total vehicle serveis</td>
<td>57,25</td>
<td>20,07</td>
<td>56,63</td>
<td>53,44</td>
<td>n.c.</td>
</tr>
</tbody>
</table>

Source: RACC

NOTA: n.c. alternativa no considerada
## COBERTURA DELS COSTOS AMBIENTALS PER LA FISCALITAT ESPECÍFICA

Percentatge dels impostos específics sobre costos ambientals

<table>
<thead>
<tr>
<th>VCI</th>
<th>Diesel</th>
<th>VE</th>
<th>GNC</th>
<th>GLP</th>
<th>Híbrid</th>
</tr>
</thead>
<tbody>
<tr>
<td>Taxi</td>
<td>385,6</td>
<td>96,9</td>
<td>127,2</td>
<td>151,6</td>
<td>502,2</td>
</tr>
<tr>
<td>Representació comercial</td>
<td>346,6</td>
<td>100,1</td>
<td>84,2</td>
<td>64,2</td>
<td>516,8</td>
</tr>
<tr>
<td>Furgoneta petita</td>
<td>426,9</td>
<td>169,9</td>
<td>199,1</td>
<td>219,0</td>
<td>n.c.</td>
</tr>
<tr>
<td>Camió &lt; 3.500 kg.</td>
<td>255,5</td>
<td>91,1</td>
<td>181,3</td>
<td>n.c.</td>
<td>n.c.</td>
</tr>
<tr>
<td>Serveis urbans</td>
<td>547,8</td>
<td>224,9</td>
<td>274,9</td>
<td>239,0</td>
<td>n.c.</td>
</tr>
</tbody>
</table>

Source: RACC
Distinctive of environmental quality for vehicle fleets

What is it?

- It is a voluntary eco-label that recognizes vehicle fleets with optimum environmental management beyond required by the regulations.
- It is awarded by the Government of Catalonia managed by the Ministry of Territory and Sustainability.
- It’s a measure of the Barcelona Area Air Quality Plan.

Objectives:

1) **Reduction** of air pollutants **emissions** (PM10, NO2,…).
2) **Improve eco-efficiency and sustainability** (especially in urban environments).
3) **Minimize impacts** and **greenhouse gas emissions** from transport.
There are 8 sub-categories of the vehicle fleet distinctive according to:

1) **Type of vehicle:** Passenger car, Light Duty Vehicle, Heavy Duty Vehicle, Collective Transport or Special Services.
2) **Type of applicant:** Freelancer, Company or Institution.

Environmental criteria to obtain the distinctive include mandatory standards and in some cases optional criteria related to:

1) Fleet Management (fuel monthly record,..)
2) Efficient driving (training, plans,..)
3) Maintenance of vehicles (eco-labeled workshop)
4) Euro standards (minimum)
5) Low emissions vehicles (renewal plans)
6) Other actions of environmental commitment (ISO, EMAS)
Air Pollution Episode
23 & 24 July 2012
Forest Fire

PM10 levels Evolution in the Metropolitan Area of Barcelona (µg/m3)

Generalitat de Catalunya
Government of Catalonia
Port of Barcelona

**APICE PROJECT** Common Mediterranean strategy and local practical Actions for the mitigation of Port, Industries and Cities Emissions.

(funded by the European Program for Territorial Cooperation MED 2007/2013)

**MAIN ACTIONS PROPOSED**

- LNG Promotion (ships, heavy duty vehicles)
- Goods distribution by train promotion
- Control of Ships Emissions
GASIFICATION

According to APICE GNL offers:

- 90% reduction of NOx emissions, almost zero sulfur oxides and particles emissions and 25% reduction in CO2 emissions.
- Significant reductions in fuel costs and maintenance.

But:

- There is still no regulations for ships that can operate with LNG.
- Implementation of infrastructure and logistics for LNG supply is needed.
Existing Emission Control Areas

North Sea (SOx, 2005/2006)
North American ECA, including most of US and Canadian coast (NOx & SOx, 2010/2012).
US Caribbean ECA, including Puerto Rico and the US Virgin Islands (NOx & SOx, 2011/2014).
The regulation of ship emissions is based on:

1. Annex VI of the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Amendment of 2008 (emission limits for NOx, SO2 and PM10, and emission control areas (ECA)).
2. Directive 2005/33/EC. (since January 1, 2010 max. 0,1% Sulfur content for ships at EU ports and inland)

The result obtained with the reduction to the 0,1% S fuel content in docked ships in European ports from January 1, 2010, is reflected in the following SO2 annual average immission values for Barcelona and Rotterdam ports.
2. GNL economic aspects

The cost of LNG thermal power unit is half that of MGO and 25% less than that of HFO. The cost of LNG is competitive when the price of Brent is high, as the HC are more indexed to oil prices.

The U.S. gas prices have decoupled from oil exploited new shale gas reserves. The price of LNG is not the same in EU, USA and Japan. In Japan the price is 2 or 3 times the EU.
Thanks for your attention
more info at:

www.airemes.net

Fem aire més net
There should be greater consistency among Energy, Climate Change and Air Quality policies to prevent any contradictory effects on air quality.

And try to revert the promotion of diesel vehicles due to the prioritization of CC over air quality policies and the important NO2 air pollution problem created in road traffic hot spots.

Sectorial emission standards (euro standards) should be introduced as soon as feasibly possible and the timescales linked to limit value compliance dates.

Where all reasonable and proportionate action has been taken this should be considered in the compliance process. The failure of the euro standards with regard to the NOx emissions reduction from road vehicles in real urban driving conditions should be taken into account for the NO2 compliance process.
High dieselization of the fleet

Pb levels evolution in the Metropolitan Area of Barcelona. (1991-2012)

Vehicle Park vs new Registrations: Gasoline & Diesel

2010 New registrations
Diesel: 70% ; Gasoline 30%

Passenger cars evolution 2004-2010
Diesel: + 49%
Gasoline: - 12%

NO2 anual mean Evolution in the Metropolitan Area of Barcelona. (2000-2012)

Evolution of % PM10 Daily Limit Value exceedances in the metropolitan area of Barcelona. (2005-2012)
Needs and requests to EU and National Authorities

Regional empowering

- Clear responsibilities among all public administration levels (UE, state, regional, local) should be clearly established.
  - Euro 6 standards for diesel vehicles should take into account real NO2 emissions or, if expectations are not achieved, a new more realistic test cycle should be established.
  - An updated euro standard for motorcycles and mopeds (current ones are euro 3 and euro 2 respectively) and European funding to promote electric motorcycles are needed in Mediterranean cities such as Barcelona.

- Agreements and collaboration among EU, National, Regional and local authorities is necessary to solve air pollution problems.
  - The “Eurovignette” directive application: necessary harmonization among Regional and National authorities.
The “Eurovignette” application

Catalan highways and high capacity roads network

El Govern aplicarà el 2013 el peatge per als camions que recorrin tot l’èix Transversal

<table>
<thead>
<tr>
<th>Xarxa transeuropea de la Generalitat</th>
<th>Xarxa transeuropea de l’Estat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Via</td>
<td>Tram</td>
</tr>
<tr>
<td>-----</td>
<td>------</td>
</tr>
<tr>
<td>C-25</td>
<td>Tot</td>
</tr>
<tr>
<td>C-16</td>
<td>Barcelona-Manresa</td>
</tr>
<tr>
<td>Manresa-Berga</td>
<td>Peatge ombra</td>
</tr>
<tr>
<td>Túnel del Cadí</td>
<td>Peatge explícit</td>
</tr>
<tr>
<td>Resta trams</td>
<td>No concessionats</td>
</tr>
</tbody>
</table>
The Eurovignette application

The C-25 project

Altres projectes actuals

Montblanc
Tarragona

Autopistes i autovies

Autopistes i autovies previstes

N-260
C-25
N-152
N-230
E-90
A-2
E-9
C-16
C-17
C-25
AP-2
A-22
EP-7
AP-7
AP-7
N-2
PK 778
9.775
A-2
PK 517,9
2.279
C-25
PK 96.5
AP-7
PK 0.1
9.819
N-2
PK 778
350

Nodes prioritaris “Plan Impulso Ferroviario”

Font: Mapa de Tráfico 2010 Ministerio de Fomento
The Bascara solution
Thanks for your attention

more info at:

www.airemes.net