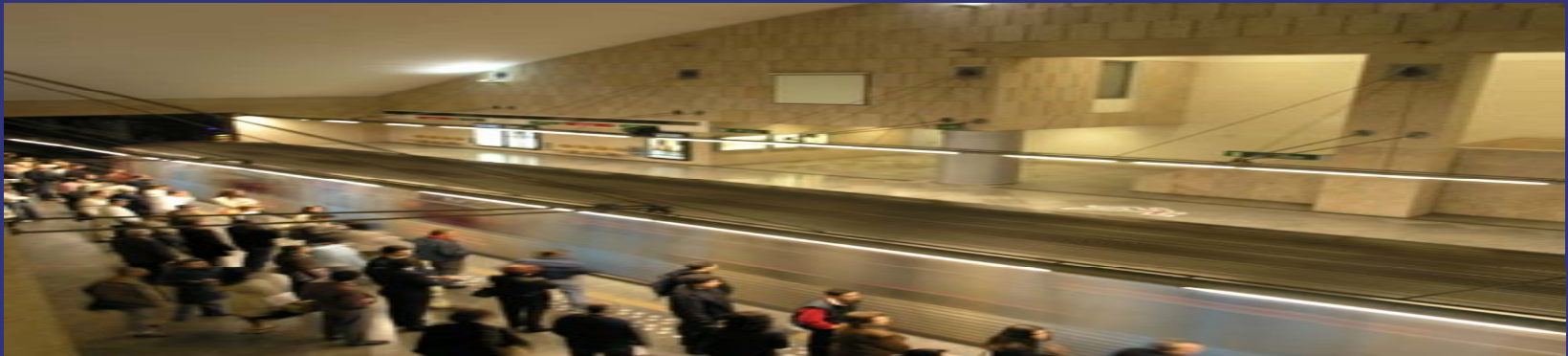




The Commitment of the Metro of Lisbon

1st UITP Sustainable Development Congress

Bilbao



Susana de Carvalho, Metro of Lisbon

18th to 20th October 2006



Metropolitano de Lisboa

1. What is Sustainability

2. Kyoto Protocol and the Role of the Transport Sector

3. Sustainable Development Vision for Metro of Lisbon

4. The Commitment of Metro of Lisbon

5. Social Performance to Accomplish Sustainability

6. Conclusions and Further Work

What is Sustainability



Station of Ameixoeira

- The most commonly cited definition first appeared in the Earth Summit in Rio in 1992. The conference was prompted by publication of *Our Common Future*, more commonly known as the Brundtland Report, which states that *sustainable development is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs"*.

And what is Sustainable Transportation?

- In Vienna, in October 2000, the Organisation for Economic Co-operation and Development (OECD), defined Environmentally Sustainable Transportation as:
- Transportation that does not endanger public health or ecosystems and meets mobility needs consistent with (a) use of renewable resources at below their rates of regeneration and use of non-renewable resources at below the rates of development of renewable substitutes.



Station of Rossio

Kyoto Protocol and the Role of the Transport Sector



Station of Picoas

- 177 States ratified the United Nations Framework Convention on Climate Change.
- On December 1997 – Governments signed the Kyoto Protocol committing themselves to reducing at least 5% of six Greenhouse Gas (GHG) emissions until 2008-2012.
- Bonn, Germany in October 2000 and Marrakech, Morocco in December 2000 – Accords between the sufficient number of States to accomplish the ratification of the Kyoto Protocol without the USA.

European Commission estimated:

- **Transportation Sector** - the carbon (CO₂) emission will represent 39% relative to the level of 1990 by the year 2010;

- **Energy Sector** – the carbon emissions are expected to stabilize;

- **Domestic and Tertiary Sector** – the carbon emissions levels will increase about 4%;

- **Industrial Sector** – the carbon emissions will diminish 15% between 1990 and 2010.



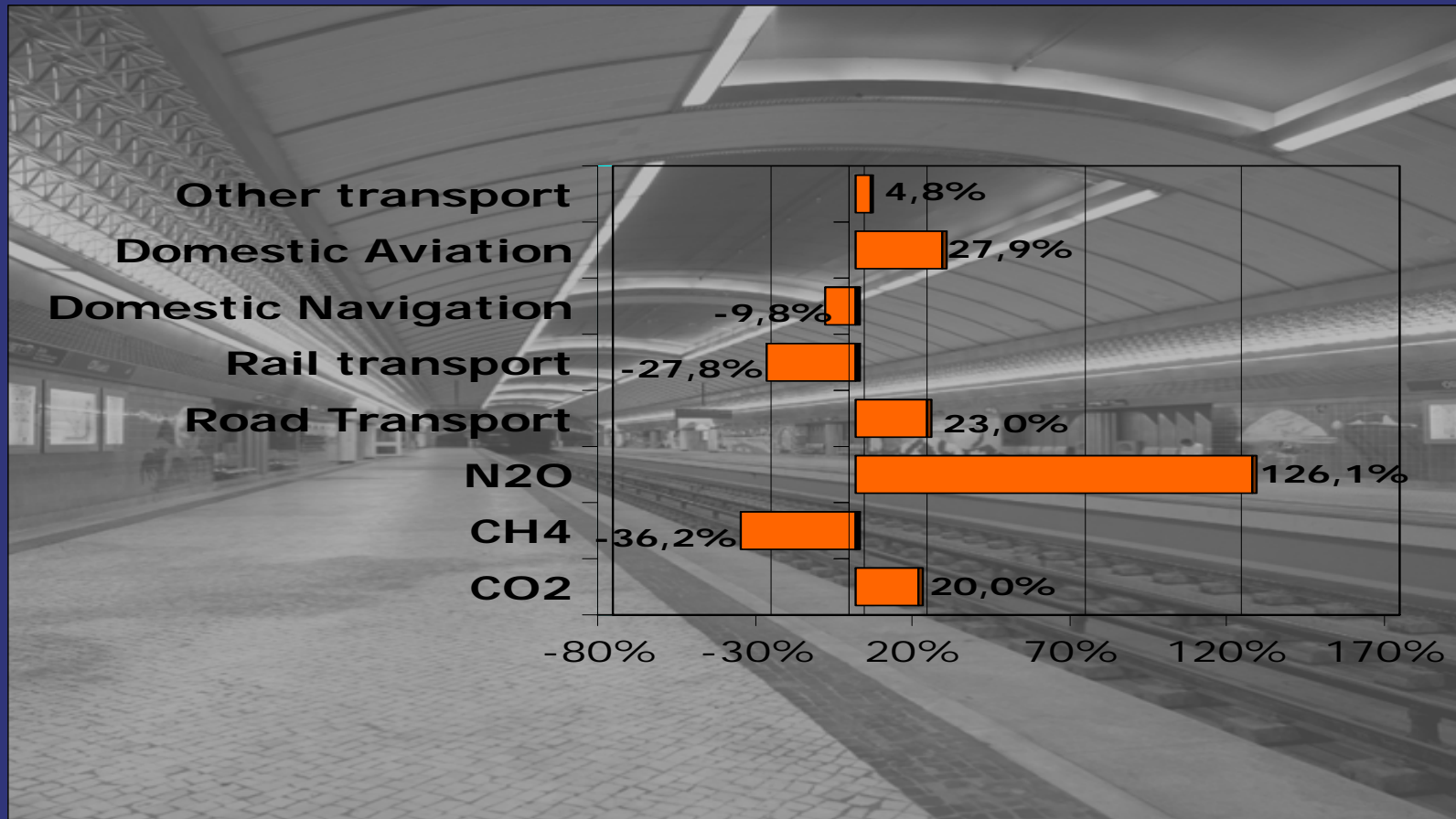
Station of Parque

Greenhouse Gas (GHG) Emissions by Sector (%)



Source: European Environment Agency

Contribution to change in total EU-15 transport emissions by mode and pollutant, 1990-2001



Source: European Environment Agency

Sustainable Development Vision for Metro of Lisbon



Station of Saldanha

- Strategic vision of operational excellence, service quality and economic efficiency.
- This must take environmental concerns into account.
- It should contribute positively to social responsibility in the city.
- It should aim to enhance Lisbon as a globally competitive city, safeguarding the quality of life of those who live and work there.

Environmental Plan

- Continue to develop Environmental Impact Studies (EIS) for new extensions and Environmental Impact Assessments (EIA) when legally required;
- Continue the environmental Follow-up of all civil construction contracts.



Project of Amadora-Este – Reboleira



Works in Alameda

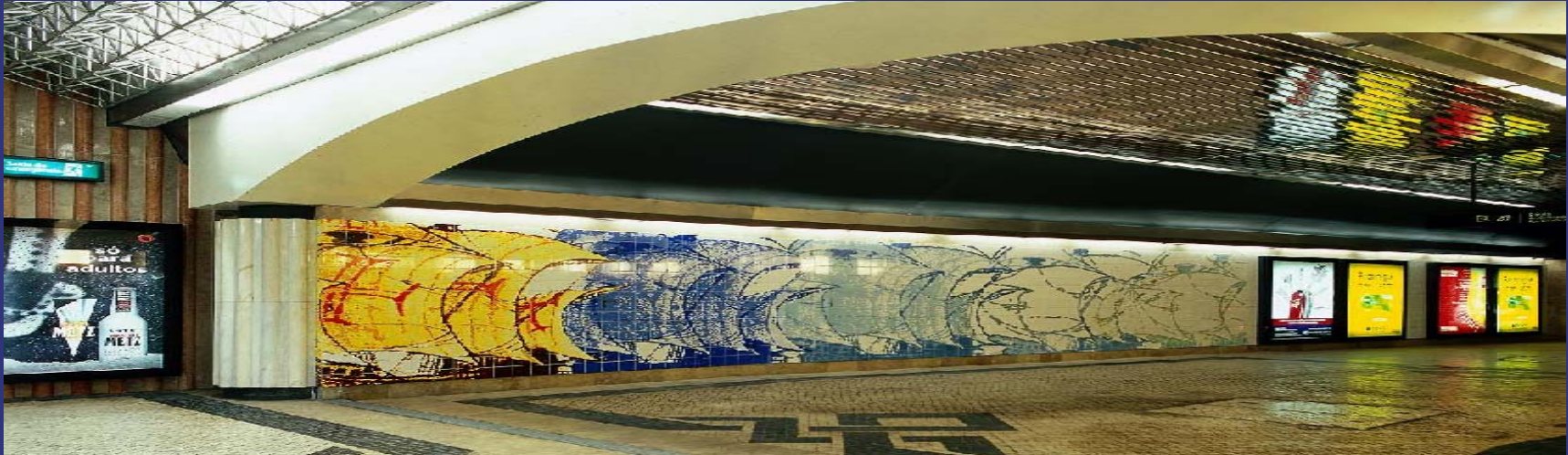
Environmental Plan

- Integration of the Kyoto Protocol targets into our own environmental targets;
- Plan and implement actions to reduce negative environmental impact from existing installations, particularly noise and vibration reduction as well as improving air-quality in our stations;



Station of Cabo Ruivo

Environmental Plan



Station of Olivais

- Fully implement the integrated waste management plan;
- Initiate the implementation of the Environmental Management System - based on the NP EN ISO 14001:2004 standard;
- Launch the Environmental accounting works.

The Commitment of Metro of Lisbon

Network Expansion

- The network expansion measures result from the Reference Scenario of the Portuguese National Program for Climate Change (PNAC 2004) and the Portuguese Government's orientations as shareholder.



Viaduct of Campo Grande

Measures in the Reference Scenario of PNAC 200	Target: Modal Transfers to ML in 2010 (pkm)	Distance to 2004 target (measured in 2006)	Environmental Efficiency Estimated in 2010
Expansion of Metro of Lisbon (ML) Blue Line (Pontinha-Falagueira)	94,538.447	-63% The extension became effective in 2004/05/15 - the estimated number of transported passengers is of- 5.212.623. For 2010 the previously estimated goal is expected to be reached.	0% - No deviation -5.60 kton.CO ₂ e/year
Expansion of Metro of Lisbon (ML) Yellow Line (Campo Grande - Odivelas)	181,032.000	-40% The extension became effective in 2004/03/27 - the estimated number of transported passengers is of 18.049.541. For 2010 the previously estimated goal is expected to be reached.	0% - No deviation -3.33 kton.CO ₂ e/year
Expansion of Metro of Lisbon (ML) Red Line (Alameda - Campolide - Campo de Ourique)	122,458.000	-100% The extension will become effective in 2007; 2008 will be the first complete year of exploitation. The goal for 2003, will be reached in 2008. The goal for 2006 will be reached only by 2010.	-5,5% -5.60 kton.CO ₂ e/year +0.31 kton.CO ₂ e/year
CO₂ reduction due to the ML network expansion as estimated in PNAC			-14.22 kton.CO₂e/year

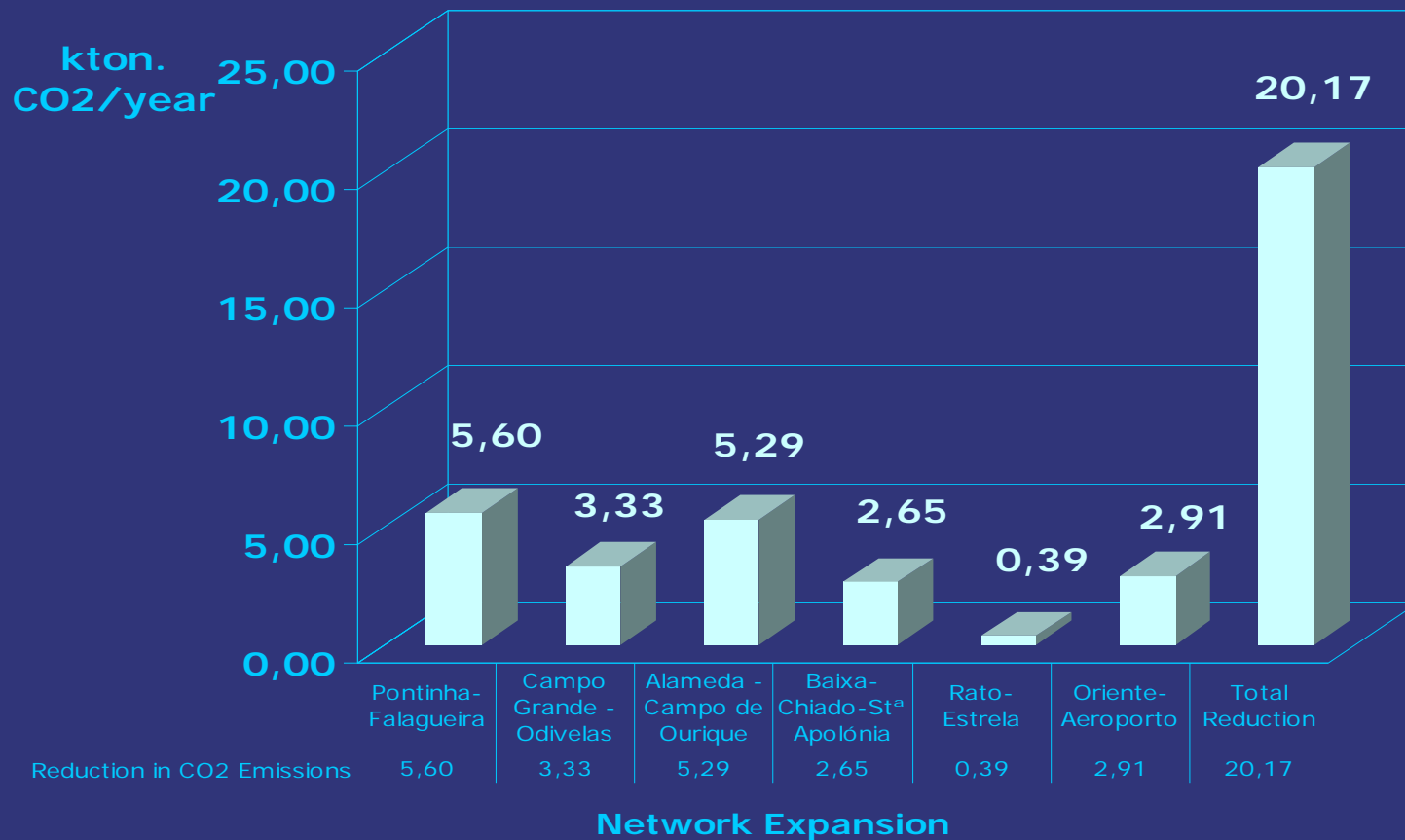
- Beyond the expansion considered in the National Program for the Climate Change, the Metro of Lisbon has other line prolongations in course or in the project phase.

Prolongation	Passenger transfer from Private Transport to ML (pass./year)[1]	Passenger transfer from Road Public Transport to ML (pass./year)[1]	Extension (km)	Reduction in CO ₂ Emissions (kton. CO ₂ /year)
Blue Line- Baixa-Chiado- St ^a Apolónia	2,500.000	10,000.000	2.154	- 2.65
Yellow Line – Rato-Estrela	942.000	2,747.000	0.994	- 0.39
Red Line – Oriente- Aeroporto	369.600	14,415.000	2.584	- 2.91
Total	3,811.600	27,162.000	5.732	- 5.95

[1] emission factor 200 gCO₂/pkm (source: Carbono Zero)

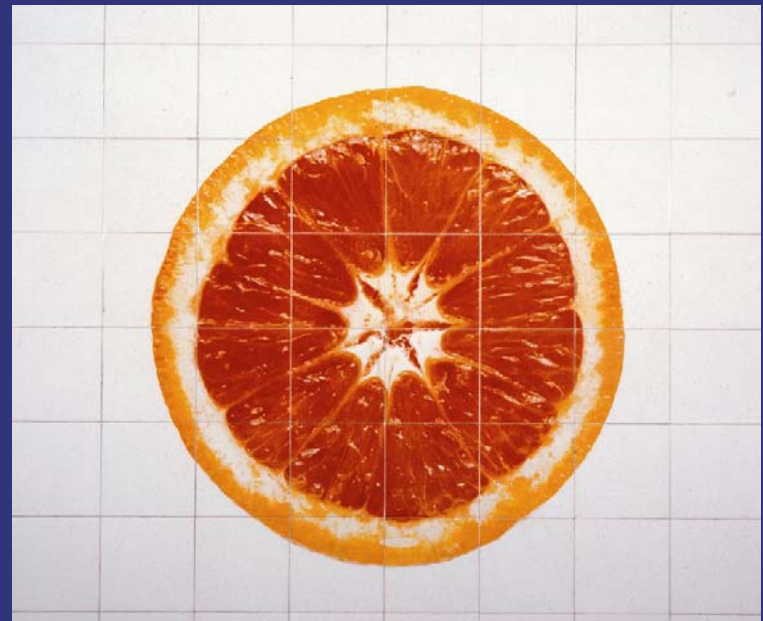
[2] emission factor 73 gCO₂/pkm (source: Carbono Zero)

- The total reduction on CO₂ emissions from the Network Expansion until 2010 is here presented:



Network Operation

- Gradual substitution, starting in 1993 and reaching 100% in 2000/01, of the carriages for lighter ones also with a higher capacity for energy recovery from the braking system.
- Capacity to yield a recovery of energy of the order of 35%. However, this rate of energy recovery is reached only in certain conditions of exploration.

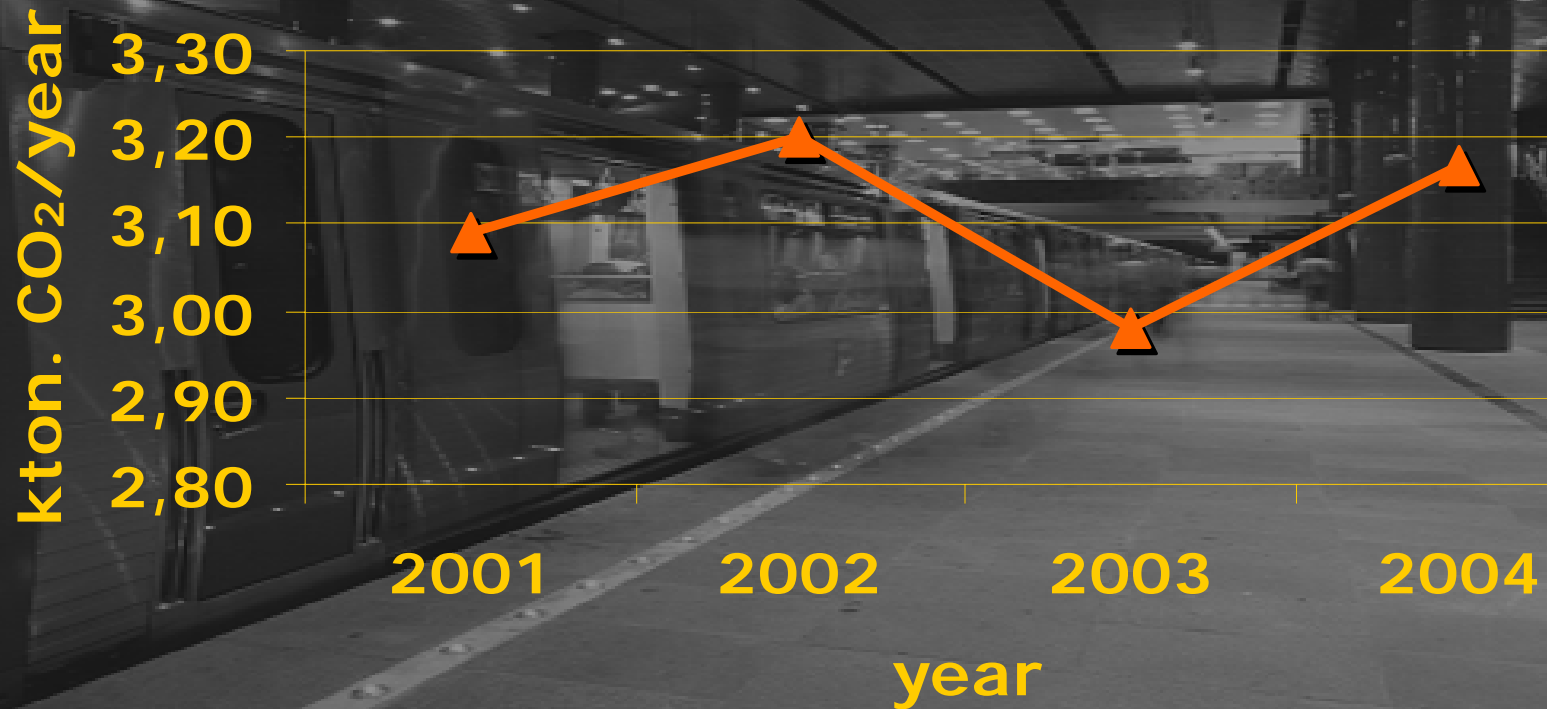


Station of Laranjeiras



- A conservative estimate for the global energy recovery rate of the network is of 14%.

Reduction in CO₂ Emissions from Energy Recovery

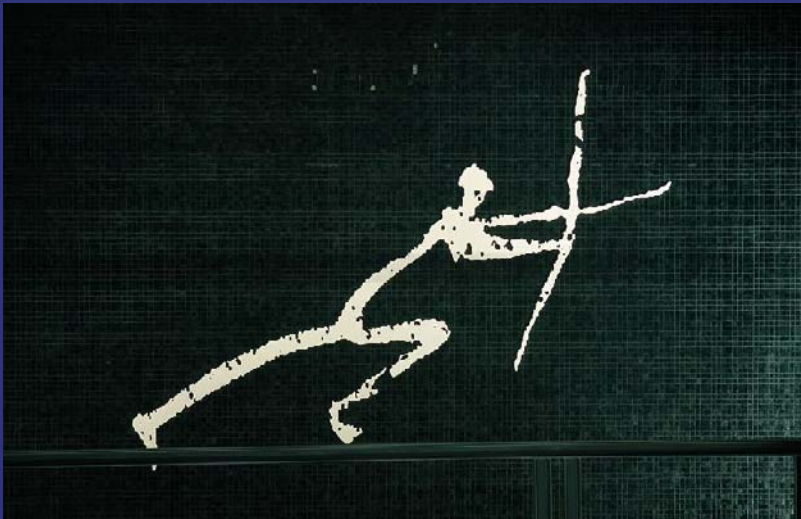


- Taking into account the expansion of Metro of Lisbon network and based only on measures already implemented or in implementation phase, the total reduction of CO₂ emissions amounts to 35.68 kton. CO₂/year.



Viaduct of Olaias

Social Performance to Accomplish Sustainability



Station of Cabo Ruivo

- Commemoration of the Day of the Ozone Layer (16 of September of 2005);
- Commemoration of the Day of Mobility (22 of September of 2005).

- Awareness among car users, frequent users of commuting highways in and out of Lisbon, for the role of the subway system in the preservation of the environment and for the advantages in its daily use to get around in the great city. In the context of the week of mobility, we implemented two measures:

- Gratuitous transportation of bicycles during all of the week (under an agreement with all the other public operators of transportation);
- Gratuitous transportation of all passengers in the ML on September 22, 2005.



In Station of Alto dos Moinhos



In Station of Jardim Zoológico

- On World Children's Day - 1st June 2005- ML provides free travel for children under 12, now an established tradition. This included organised groups of children in charitable organisations as well as children travelling with their family and other adults.

• A program has been developed in schools, starting a few years ago and in collaboration with several social and educational institutions, where visits to our installations are promoted, namely to stations, PMO' s and construction sites.

• At the beginning of each school year, at high schools and universities, we also develop a campaign for the promotion of Public Transportation and of its ticketing system, the card "Lisboa Viva" .



Campaigns at schools

- On 8th March 2005 ML associated itself with International Women's Day commemorations sharing a number of activities with Customers. At high traffic stations such as Campo Grande, Marquês de Pombal, Alameda and Jardim Zoológico we distributed flowers to female Customers and staged musical concerts.



At Station of Campo Grande



At Station of Marquês do Pombal

- *Our Company is pleased to provide facilities for access to art and our stations are often regarded as one enormous public art gallery.*
- **Since the late 1990's the artistic policy was maintained. Contemporary national artists were invited on an ongoing basis to contribute to this artistic heritage.**
- **This investment is now unequivocally a management decision to add value and contribute to the quality of the stations and public spaces used by our Customers.**



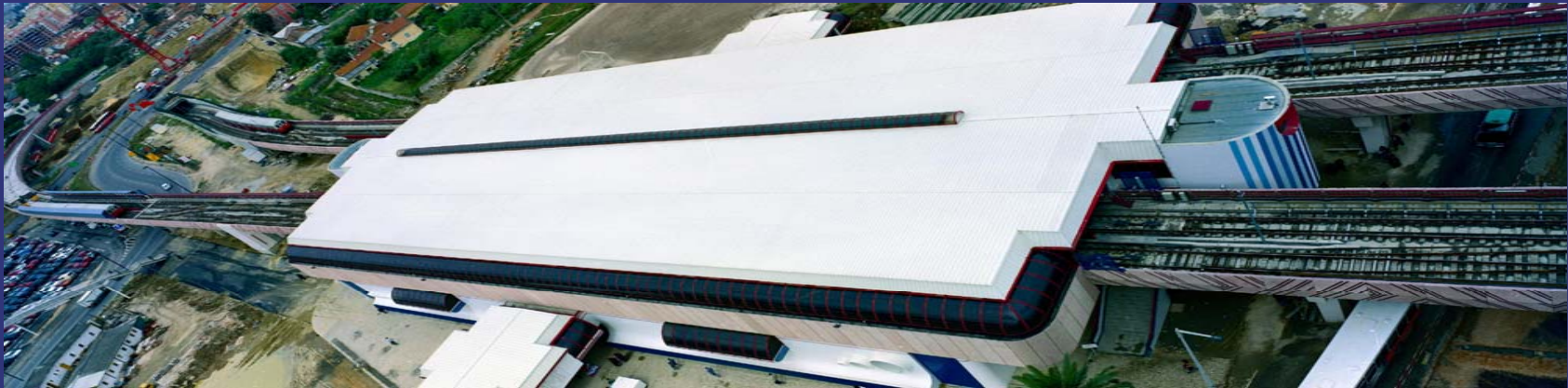
Photograph exhibition at the Station of Baixa-Chiado

- As is traditional we celebrate a number of different events annually, with a focus on Customer entertainment at various stations.
- In sharing the Christmas mood with our Customers, we provided holiday period entertainment including music at various stations.



Event at the Station of Alameda

Conclusions and Further Work



Station of Campo Grande

- We regularly develop several specific assessments in matters such as Air Quality, Noise and Vibration we are developing the first measurements of electromagnetic field levels.

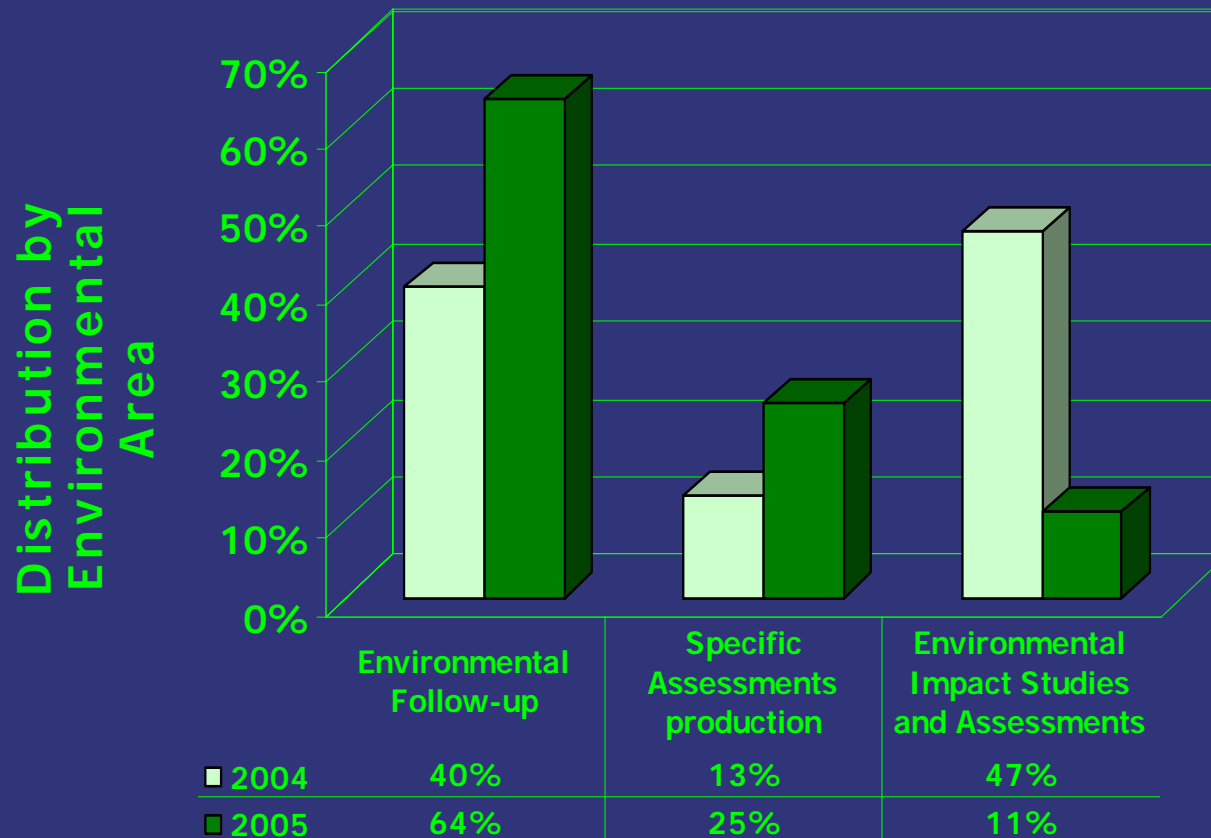
- We await the conclusions of a study launched in 2003: "Assessment of trends in quality of air and atmospheric emissions associated with ML expansion". The study, due for completion in 2007, seeks to evaluate how the introduction of these new forms of mobility will contribute to air quality improvement in the Lisbon area.



Station of Oriente

Environmental Investments

- This graph shows the evolution in the concern of Metro of Lisbon with specific environmental themes such as the application of the Kyoto Protocol, carbon emissions and air quality.



- We continue to analyse different solutions for the use of renewable energy sources such as implementing solar panels on the roof of our workshops with a wide area of application.



Workshops in Pontinha

• We will continue, besides contributing to social equity, environmental improvement and economic development, to promote Sustainable Mobility for Lisbon.

• The Sustainable Development Vision is our guiding path for the future.



Sight of Lisbon

- Do your part
- Contribute
- Give a hand
- Get involved
- Follow them, Save the Environment!
- I took the subway, the environment gives back!



Thank you for your attention.