



Sustainability Management in the Air Transport

Energy Efficiency and CO₂ Emissions

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TAP Group



2,682 M€

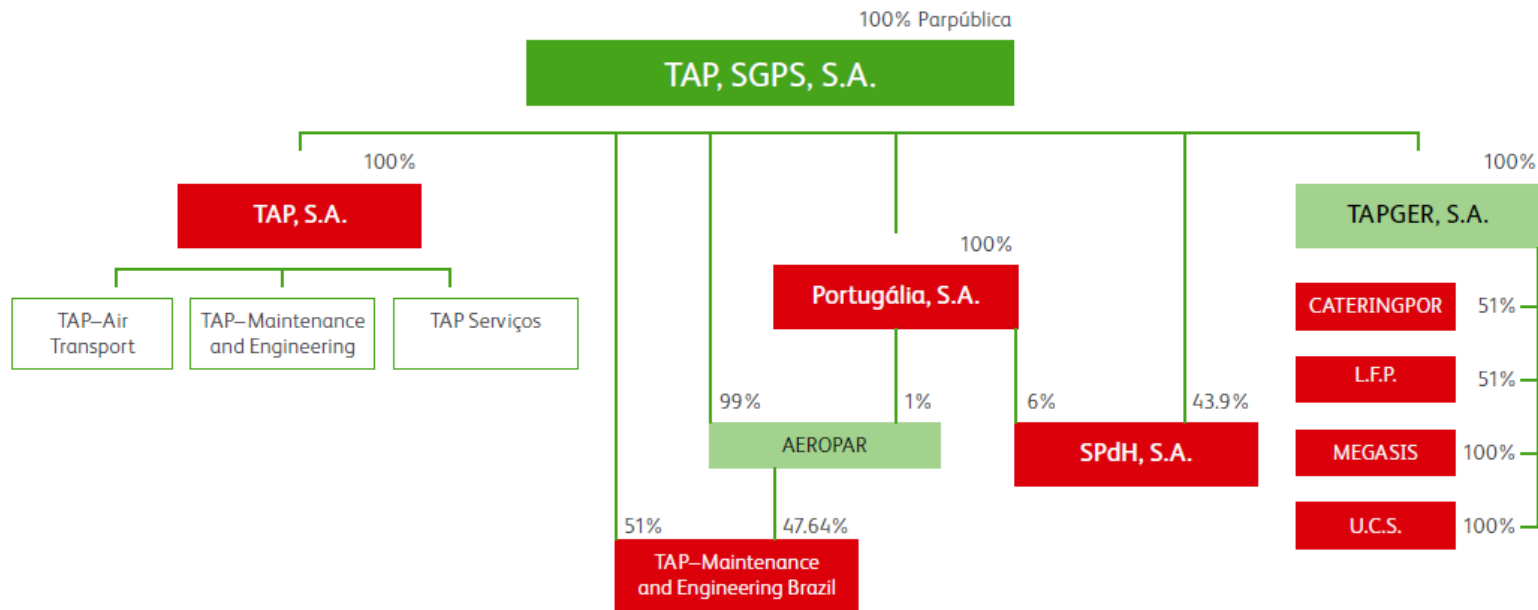
revenue in 2012

8

subsidiary companies

12,506

employees



TAP Portugal – some figures...



1945

foundation of TAP
PGA integrated in **2007**

71

aircraft

77

destinations in **34**
countries

252,900

flight hours *

10,2 million

passengers carried *

27,226 million

RPK (Revenue passenger-kilometers) *

76,8%

load factor *



World's Leading Airline to Africa – 2011 and 2012



World's Leading Airline to South America – 2009, 2010, 2011 and 2012



Best Airline in Europe – 2011 and 2012

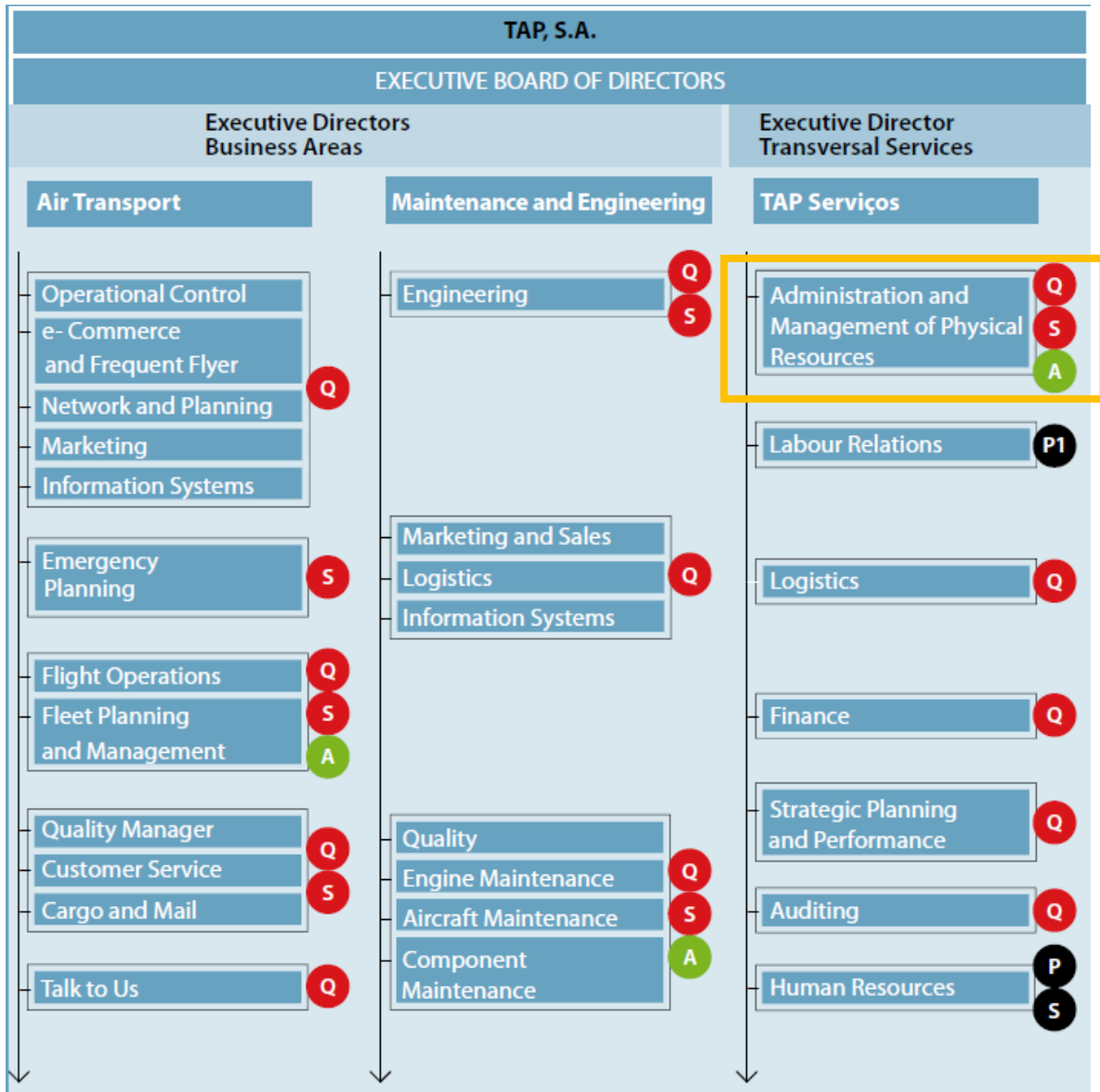
* in 2012

TAP Environmental guidelines



- Use of eco-efficient practices and technologies that manage growth while protecting the environment
- Promote the continuous improvement of energy efficiency in all activities – air transport and ground operations
- Promote employees and suppliers environmental awareness
- Star Alliance [Environmental Commitment Statement](#)
- UN Global Compact

Environmental structure



Environmental Issues	Customer Related Issues	Human Resources Issues
A Environmental	Q Quality	P Specific Human Resources Policies
	S Safety	P1 Specific Labour Relations Policies
		S Safety, Hygiene and Health

Main working areas



Corporate Environmental Initiatives

- *Environmental Management Programmes:*
 - waste, waste water, gaseous effluents;
- *Carbon Offset Programme*
- *Training*
- *Risk Assessment*

Represent

- *Vice-Chair of AEA Climate Change Working Group*
- *Observer at IATA's Environment Committee*
- *Lobby within official environmental actors/agencies*

Legal Requirements

- *Environmental regulation evaluation*
- *Prepare reports for legal authorities*

Communication

- *Environmental KPI calculation*
- *Internal and external communication*
- *Prepare environmental contents for Corporate Governance & Sustainability Report and Annual Report*

Environmental impact

■ TAP's environmental impact is due to flight operations (air transport) and ground operations (aircraft, engine and component maintenance, administrative activities)



Flight Operations

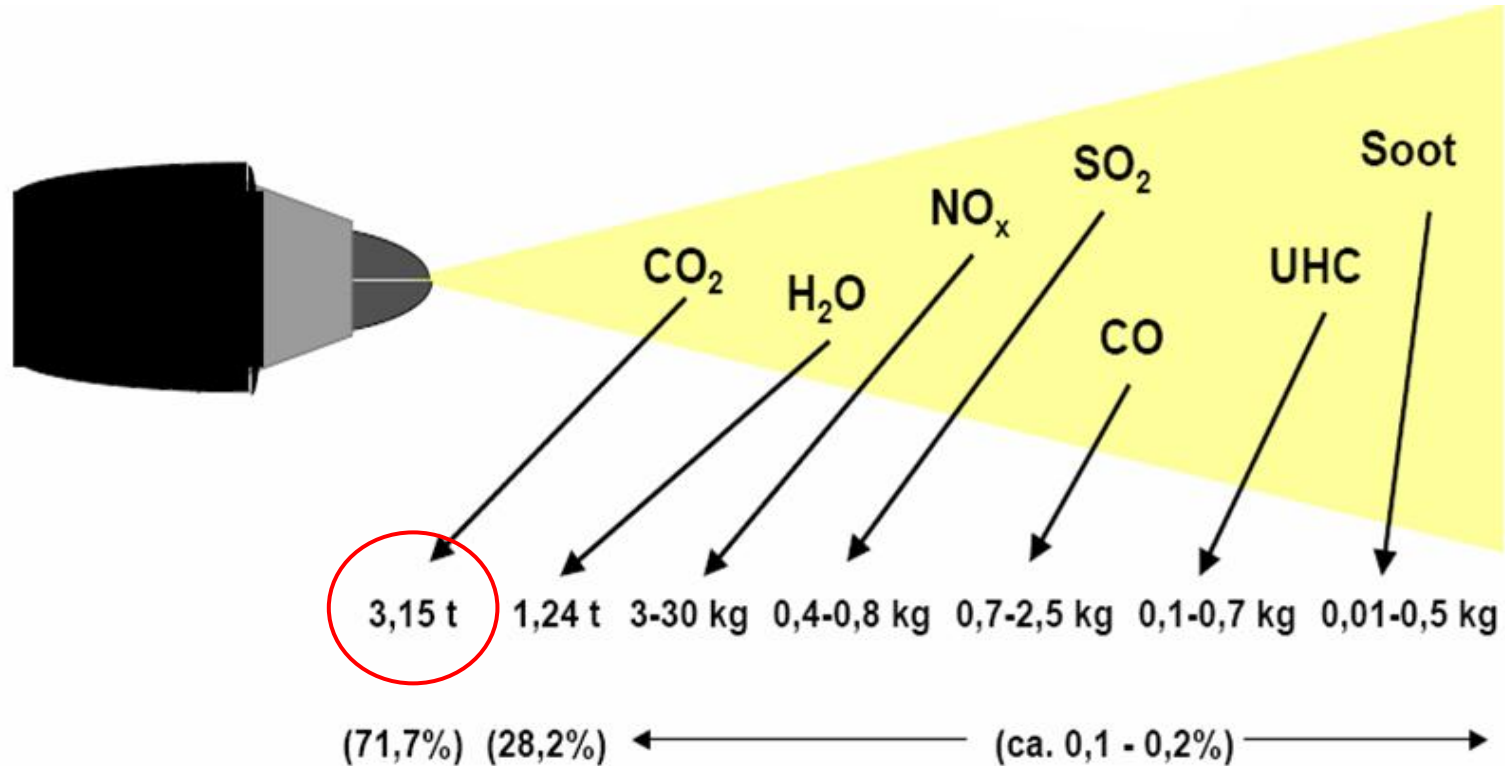


Ground Operations



Flight operations – Energy and CO₂ emissions

- The combustion of **1 tonne of fuel** (Jet A1) with 3,4 tonnes of oxygen forms:



CO₂ emissions are proportional to fuel consumption

Source: Deutsche Lufthansa

Flight operations – Environmental KPI

KPI	2001	2011	2012	2013	Variação (2012/2013)	Variação (2001/2013)	Variação média anual (2001/2013)
Fleet (aircraft number)	35	71	71	71	0	+ 103%	+ 8%
RPK (million)	10 449	25 965	27 226	28 152	+ 3,4%	+ 169%	+ 13%
Jet fuel consumption (million litres)	564,92	1 134,72	1 172,15	1 212,59	+ 3,45%	+ 115%	+ 9%
CO ₂ emissions (million tonnes)	1,424	2,859	2,954	3,056	+ 3,45%	+ 115%	+ 9%
Jet fuel consumption per passenger (litres/100 RPK)	5,41	4,37	4,31	4,31	0	- 20,3%	- 1,6%
CO₂ emissions per passenger (kg/100 RPK)	13,62	11,01	10,85	10,85	0	- 20,3%	-1,6%

RPK = Revenue passenger-kilometers

Aviation and Climate Change...

2%

Aviation accounts for two percent of man-made CO₂

689 million tonnes

Worldwide, flights produced 689 million tonnes of CO₂ in 2012. Globally, humans produced over 34 billion tonnes of CO₂.

Aviation is a key part



of the global village

CLIMATE TARGETS

1.5%

Aviation will improve its fleet fuel efficiency by 1.5% per annum between now and 2020.

STABILISE

From 2020, net carbon emissions from aviation will be capped through carbon-neutral growth.

50%

By 2050, net aviation carbon emissions will be half of what they were in 2005.

Source: IATA

Ground operations – *TAP Campus*



Total area = 217 816 m²

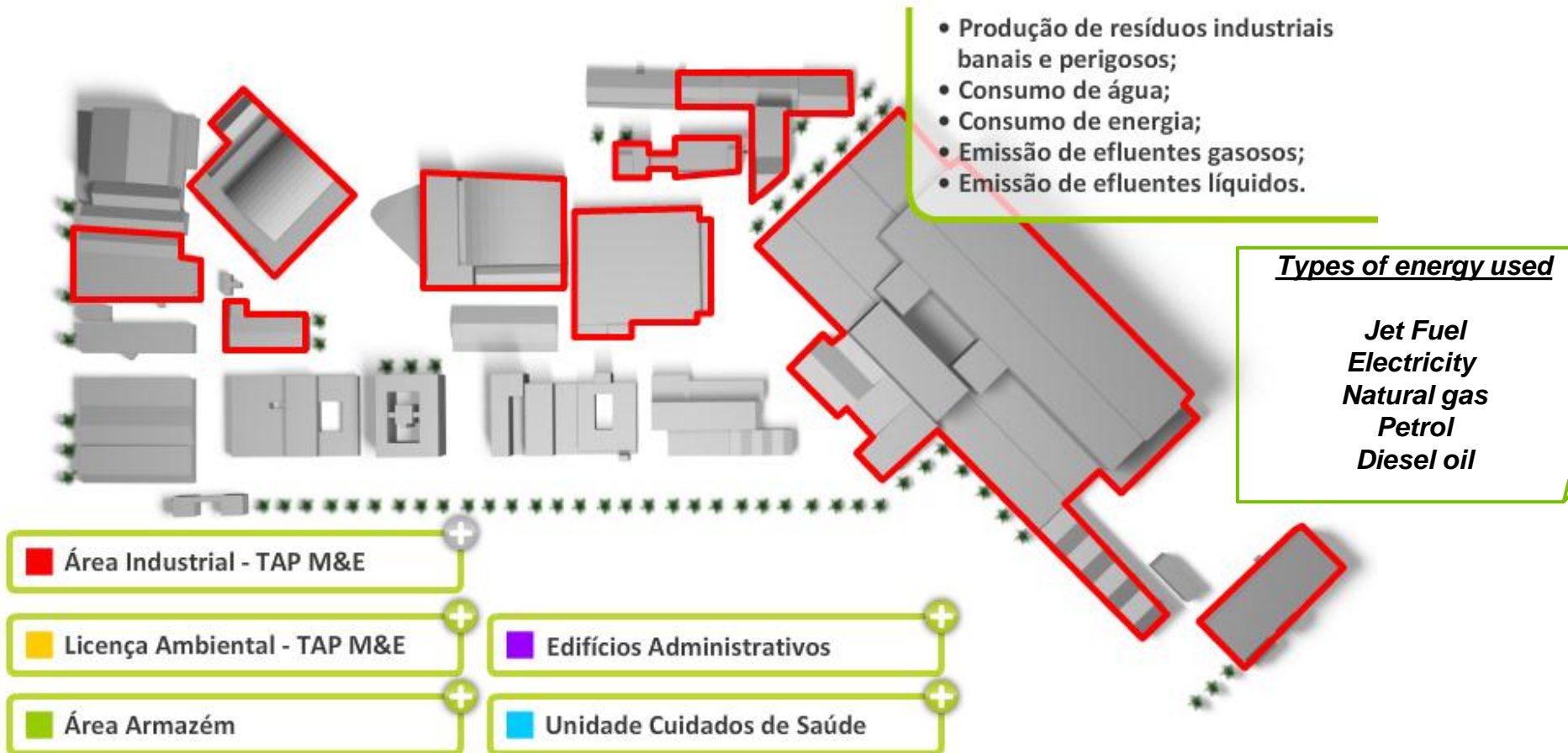
26 buildings

M&E area = 71 200 m²

Ground operations – TAP Campus

Ambiente

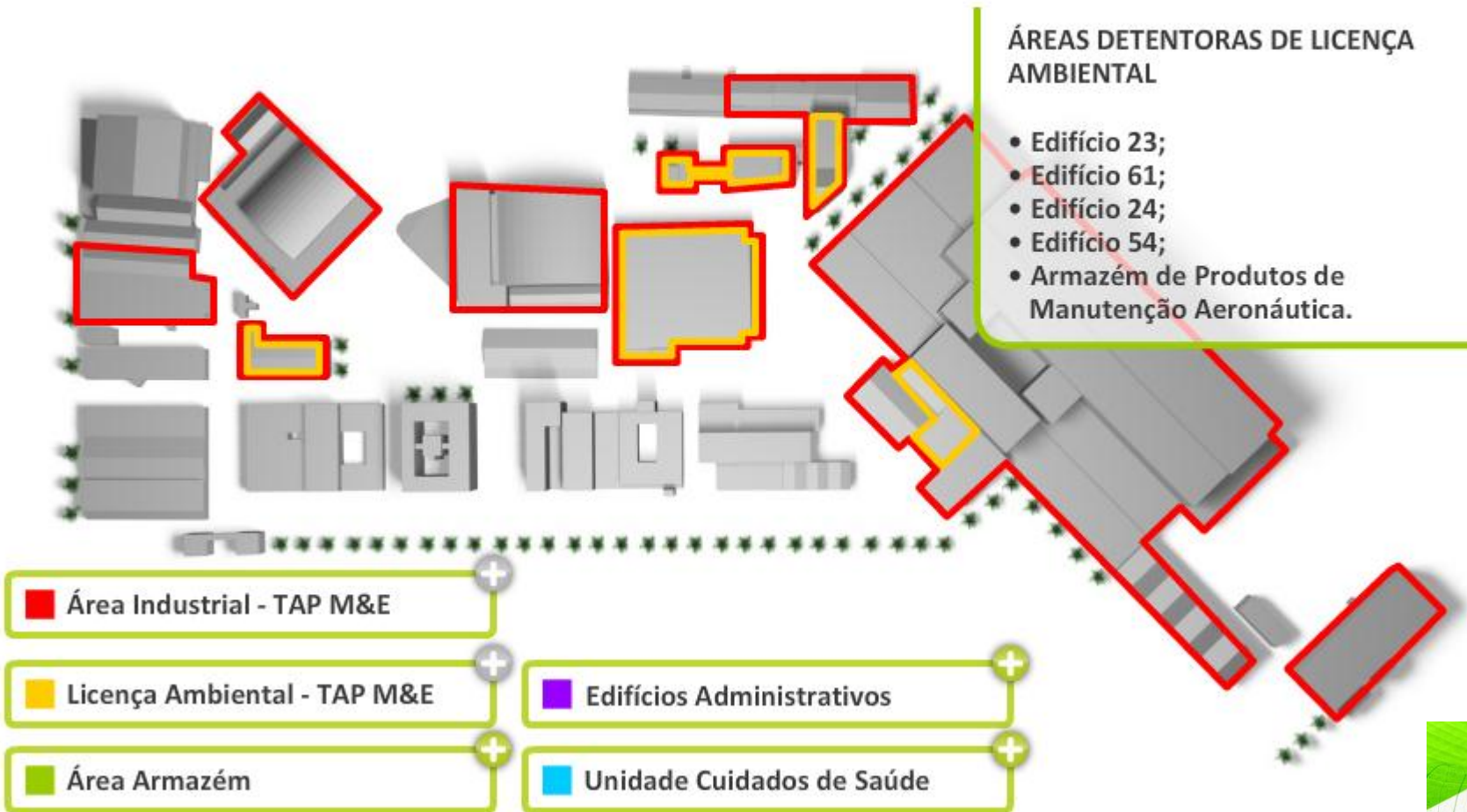
A TAP e o Ambiente



Ground operations – TAP Campus

Ambiente

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TAP Energy consumption and CO₂ emissions

TAP 2012	Consumption		CO ₂ Emissions (Million tonnes)	%
Jet fuel (flight operations)	M liters	1 172	2,95	99,71
	toe ¹	1 030 265		
Jet fuel (engine cell test)	toe	391	0,0011	0,04
Electricity Natural gas Petrol Diesel oil	toe	2 566	0,011	0,25
TOTAL	toe	1 033 222	2,966	100

(1) toe = tonne of oil equivalent

*Air transport activities account for **99,75%** of TAP's total energy consumption and CO₂ emissions*

TAP's Environmental Strategy

***Consumption
Reduction***

- Improving fuel and operational efficiency
- Fuel Conservation and Emissions Reduction Project
- Fleet renewal programme

***Offset CO₂
Emissions***

- *TAP Carbon Offset Programme*

Fuel Conservation and Emissions Reduction

- Improvements in some operational and maintenance procedures are leading to CO₂ emissions reduction:
 - *Less 60000 CO₂ tonnes in 2012*
 - *Less 360000 CO₂ tonnes since the beginning on the project (2005)*

Performance improvement due to aircraft weight reduction



Light-weight safety equipment
-800 ton. CO₂/year



Drag reduction
-7 700 ton. CO₂/year



Potable water
-750 ton. CO₂/year

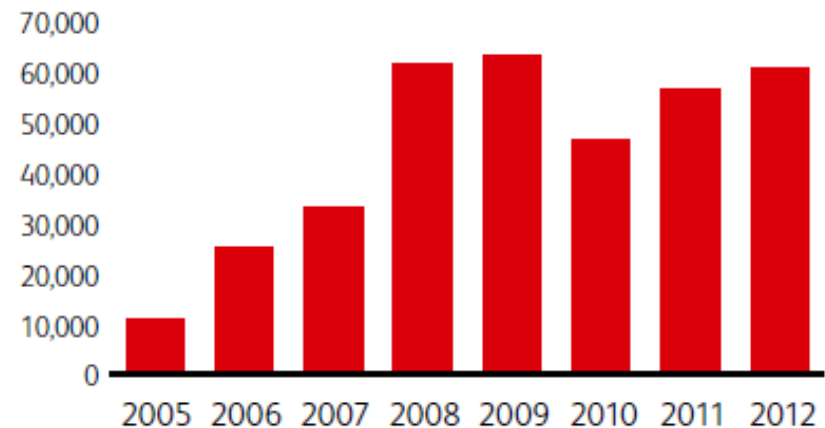


Optimized service
for reduced weight
-1 200 ton. CO₂/year



Engine water wash
-3 400 ton. CO₂/year

Reduced Annual CO₂ Emissions (ton)



TAP Carbon Offset Programme



- The first worldwide launched with IATA (June 2009)
- TAP was awarded a “Planet Earth Award 2010” by UNESCO and International Union of Geological Sciences
- It is available at www.flytap.com
- Allows passengers to **voluntarily** offset carbon dioxide (CO₂) emissions from their flights, contributing to emissions reduction projects in developing countries (CDM Projects)
- Included in the booking process in a user friendly way (simple, easy and safe)
- CO2 calculator according ICAO methodology



TAP Carbon Offset Programme

UNESCO granted TAP a “Planet Earth Award 2010”



planetearth[®]
Earth Sciences for Society
2007 – 2009

Partnership Award

The International Year of Planet Earth (IYPE), proclaimed by the United Nations, initiated by the International Union of Geological Sciences (IUGS) and the United Nations Educational, Scientific and Cultural Organization (UNESCO), supported by 11 Founding Partners, 25 Associate Partners and 30 International Partners, with active National Committees in 80 nations representing 81% of the world population, acknowledges

2009 International Partnership

of

TAP PORTUGAL

and congratulates TAP - PORTUGAL on its decision to support the aims and objectives of the International Year of Planet Earth so as to use Earth scientific knowledge more effectively to build safer, healthier and more prosperous societies on this Planet.



Prof. Larry Woodfork
Chair of the Board of Directors



Prof. Eduardo de Mulder
Executive Director IYPE Secretariat

TAP Carbon Offset Programme



OUTCOME SO FAR...

	Tonnes CO ₂ Offset	Target	Deviation
2009	2508	1500	+ 67%
2010	4278	3500	+ 22%
2011	4515	4000	+ 13%
2012	9579	4200	+ 128%
2013	15037	5000	+ 201%
Total	35920	--	--

TAP Carbon Offset Programme



CO2 Carbon Calculator – Emissions per citypairs

■ LONG HAUL

Aiport From/To 1	Airport To/From 2	Fuel/ PAX (Kg/PAX)	CO2 / PAX (Kg/PAX)
LIS	SSA	188	593
LAD	LIS	190	598
EWR	LIS	168	531

**CO2 Offset Cost
(€/PAX)**
LIS/SSA = 1,03

LIS – Lisboa

SSA – Salvador da Bahia

LAD – Luanda

EWR - Nova Iorque

■ MEDIUM HAUL

Aiport From/To 1	Airport To/From 2	Fuel/ PAX (Kg/PAX)	CO2 / PAX (Kg/PAX)
BRU	LIS	63	199
LIS	ORY	48	152
LIS	WAW	94	297

**CO2 Offset Cost
(€/PAX)**
BRU/LIS = 0,33

BRU – Bruxelas

ORY – Orly

WAW – Varsóvia

TAP Carbon Offset Programme

BENCHMARKING ANALYSIS

➤ TAP's Carbon Offset Programme got the 2nd place in a ranking included in a master's degree research from the University of London, which evaluated offset programmes of 32 airlines.

TOP 10 – Carbon Offset Programmes

Ranking	Airline
1º	Virgin Atlantic
2º	TAP Portugal
3º	British Airways
4º	Brussels Airlines
5.º	NatureAir
6.º (<i>ex aequo</i>)	Lufthansa, Swiss, Continental, United, Thomson Airways

Fonte: Cafferty, C. (2011), "Is the sky the limit for carbon offsetting", University of London

TAP Carbon Offset Programme

BENCHMARKING ANALYSIS - CRITERIA

Comparative analysis of airline websites				
Themes	Transparency	Education	Credibility	Accessibility
Key Performance Indicators (KPIs)	Review of carbon calculator	Explanation of carbon offsetting	Quality	User-friendliness
	Detail provided on projects	Impacts of aviation on climate change	CSR reporting	Payment experience
	Pricing transparency	How to reduce one's carbon footprint	Openness	Prominence
Key questions	Does the airline clearly explain how carbon emissions are calculated per passenger including any assumptions?	Does the airline allow the consumer to clearly understand carbon offsetting in a way that has meaning to them?	Does the airline make it easy to judge quality through high standards, quality assurance and verification reports?	Is the consumer encouraged to find out more about the airline's carbon offsetting through interactive content, animation etc?
	Are projects explained in detail including no. of offsets generated and links to supporting documentation?	Does the airline increase awareness of the broader issues of climate change and sustainable aviation?	Does the airline discuss their offsetting scheme as part of CSR reporting?	How easily can consumers book carbon offsets online to facilitate uptake?
	How transparent is pricing to the consumer and are all charges clearly explained?	Does the airline educate the consumer on alternative ways to reduce their carbon footprint?	Does the airline disclose uptake volumes and discuss achievements/challenges with its customers?	How prominent is the airline's carbon offsetting scheme and does it have a link or logo on their homepage?

Fonte: Cafferty, C. (2011), "Is the sky the limit for carbon offsetting", University of London



Be green
fly TAP!

www.flytap.com



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A STAR ALLIANCE MEMBER 



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