



A photograph of a modern glass building with a paved walkway and two people walking, overlaid with a blue gradient. The image is split vertically, with the left side showing the scene and the right side being a solid blue gradient with text.

10

**Commitment
to the
environment**

10. Commitment to the environment

HIGHLIGHTS 2011

- › Continuous environmental performance improvement at our Data Centre in Erding, Amadeus largest resource consumption site, with significant reduction in CO₂ emissions and increased efficiency.
- › Resource consumption inventory for top Amadeus locations worldwide, identification of best practices.
- › Launch of emissions reporting solution in Amadeus Corporate Booking Tool, using industry standard calculator from the International Civil Aviation Organisation (ICAO).
- › Publication of fuel and emissions savings results from Altéa Departure Control System Flight Management module.

OUTLOOK 2012

- › Development of Central Database for regular environmental reporting of top ten Amadeus sites worldwide.
- › Improve environmental performance of Amadeus operations, implementing common best practices identified.
- › Continue to join forces with other industry players to address industry environmental concerns of the travel and tourism industry.
- › Enhance cooperation with customers for deployment of industry standard environmental solutions.

Amadeus has enjoyed continuous growth and provided economic and social benefits to employees, shareholders, customers and partners for more than twenty years. On the other hand, compared with other industries, Amadeus has a relatively low direct environmental impact. Nonetheless, with more than 10,000 employees, presence in more than 190 markets and operating in a high energy intensity industry, we acknowledge our responsibility to minimise the company's environmental impact and at the same time help the travel industry in its efforts towards sustainability.

10.1 Amadeus environmental strategy

Our environmental strategy addresses the impact of our operations and the concerns of stakeholders in the travel industry, including customers, partners, regulatory bodies and the society in general.

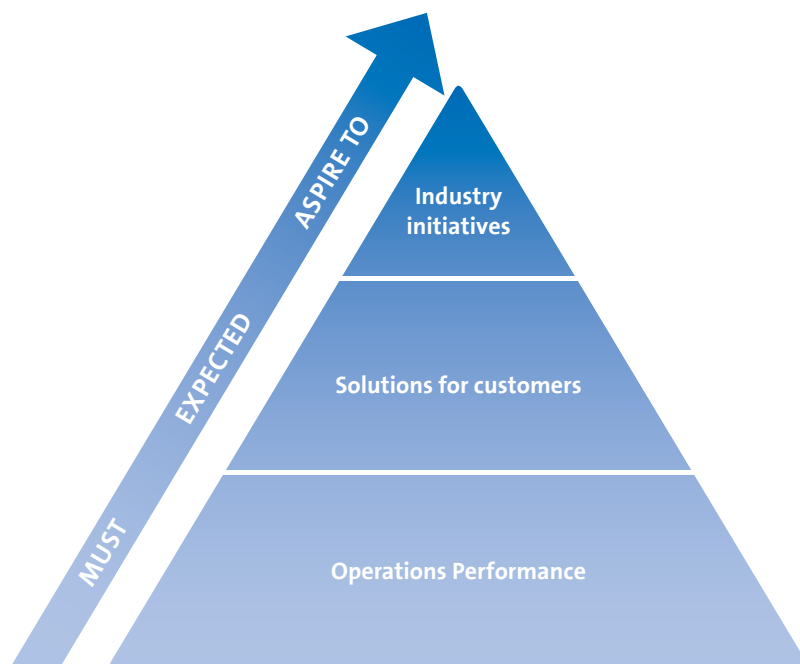
We believe our first and most important responsibility is to address the environmental impact of our operations. Fortunately, for most cases we find a common economic and environmental interest that facilitates action in reducing resource consumption and environmental impact. For example, by reducing the electricity consumption we also achieve significant cost savings. This is particularly relevant for our Data Centre in Erding (Germany) where the annual electricity costs exceed four million Euros and where we estimate current savings of more than one million Euros per year, as compared with industry standard performance¹⁹.

Secondly, our customers expect us to deliver technological solutions for a broad scope of challenges, including environmental issues. Although the economic downturn has surely taken priority over many other aspects of our industry, we believe that a standard environmental impact reporting methodology is needed for the travel industry, in order to offer travellers transparent information and improve performance.

Providing a standard solution for reporting environmental impact for travel is a challenge that the industry has probably underestimated. Our partnership with the International Civil Aviation Organisation and membership of the Global Sustainable Tourism Council are examples of our efforts to facilitate standard environmental reporting for the travel industry. Additionally, our state of the art technology for airlines is providing productivity improvements

in many aspects of the business. Amadeus Altéa Departure Control System contributes, through improved aircraft weight estimations, to reduce the amount of fuel, emissions and costs for airlines.

Finally, we need to work together with other industry stakeholders to address environmental challenges for the whole industry. For this reason we keep various initiatives in place, like our participation in various travel and tourism organisations and forums like the European Technology and Travel Services Association (ETTSA), or the Interactive Travel Services Association (ITSA). We also work with various external companies to help improve our environmental performance. As an example, some of our offices, like Amadeus Services in London, have entered into energy performance contracts with guarantees to bring our electricity consumption down.



¹⁹ This calculation was made based on the Power Usage Effectiveness of similar Data Centres in Europe.

10.2 Environmental key performance indicators

In 2011, we have broadened the scope of our environmental reporting to cover up to the top ten Amadeus sites by number of employees, which in 2011 represented 75% of all Amadeus employees. In 2009 these top ten sites included 71% of all employees, so the scope has also increased for this reason. The Amadeus sites included in the reporting are:

- 1 Amadeus S.A.S. Sophia, Antipolis** (France)
- 2 Amadeus Data Processing GmbH, Erding** (Germany)
- 3 Amadeus North America, Inc., Miami** (USA)
- 4 Amadeus IT Group, S.A. Madrid** (Spain)
- 5 Amadeus Germany GmbH, Bad Homburg** (Germany)
- 6 Amadeus Services Ltd., London** (UK)
- 7 Amadeus Asia Ltd., Bangkok** (Thailand)
- 8 Amadeus IT Pacific Pty Ltd., Sydney** (Australia)
- 9 Amadeus France, Paris** (France)
- 10 Amadeus Soluciones Tecnológicas, S.A., Madrid** (Spain)



Electricity consumption

The table below includes the aggregated electricity consumption of the ten Amadeus sites mentioned above for the last three years.

The total electricity consumption of the top ten sites increased basically because of the growth in number of employees in these sites; but taking into consideration the entire Amadeus Group worldwide and the increased efficiency, we estimate that the total consumption went down from 80 GWh in 2010 to 78 GWh in 2011.

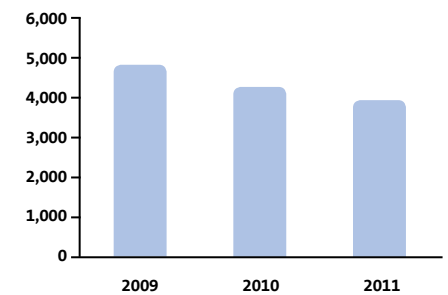
In 2011, several measures have been taken locally to optimise consumption. Below are examples of initiatives carried out in different sites:

Amadeus SAS, Sophia Antipolis (France)

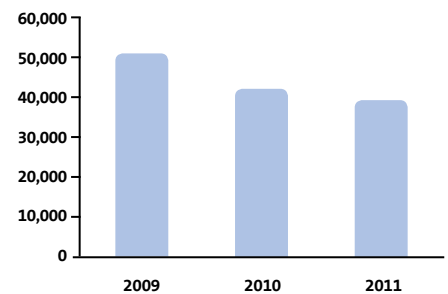
- › Installation of movement sensors in toilets so that lights are switched off when rooms are empty.
- › Change of standard lights for LEDs in the Executive Briefing Centre.
- › The current Building Management System (BMS) permits to control and manage the electricity consumption of specific high energy intense equipment like the air processing central during non-working hours and weekends.

For 2012 and 2013 we expect to change our BMS (Building Management System) and deploy an Energy Management module with improved reporting and analysis functionality. We aim at reducing by 15% the energy required for cooling, heating and lighting. In economic terms this will be in the range of 30,000 EUR/year. In addition, we are currently piloting new air conditioning units and will monitor energy savings to decide on potential expansion and also plan to substitute traditional bulbs for LEDs in specific areas like the car parking slots.

Electricity consumption per employee and year (kWh)



Energy required per one million transactions (kWh)



Electricity consumption and employees at top ten Amadeus sites²⁰

Electricity Consumption	2009	2010	2011
Number of employees top ten sites	6,452	7,265	7,728
Electricity Consumption Offices top ten sites (GJ)	111,166	113,275	110,276
Electricity Consumption per employee and year (GJ)	17	16	14
Electricity Consumption Data Centre (GJ)	125,438	131,057	135,044
Number of transactions processed by Data Centre (Millions)	676.7	849.9	947.6
Energy required per 1 Million transactions (GJ)	185	154	143
Total Electricity Consumption top ten sites (GJ)	236,604	244,332	245,320

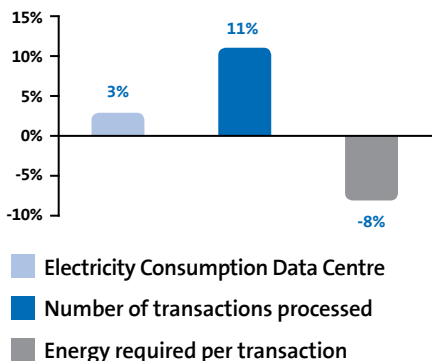
²⁰ Transactions include air and non air travel agency bookings, Passengers Boarded (PB) & e-Commerce passenger name records (PNR). The estimations for the entire Amadeus Group are calculated based on the average electricity consumption per employee.

Objectives of the energy efficiency policy at Amadeus Data Processing

- > Demonstrate environmental responsibility
- > Prove through energy efficiency certification
- > Increase general awareness
- > Save costs and extend lifecycle of the Data Centre
- > Police and document goals and achievements required for certification

Energy efficiency measured by transactions processed at the Amadeus Data Centre

2011 vs 2010



Amadeus Data Processing, Erding (Germany)

Approximately half of the total Amadeus electricity consumption worldwide comes from Amadeus Data Centre in Erding (Germany). For this reason we focus special attention to optimise performance in this particular site.

The Amadeus Data Centre is one of the world’s biggest data processing centres dedicated to the travel industry. The Data Centre operates and maintains the systems and network for all Amadeus products and provides data and transaction processing services.

The number of key billed travel transactions²¹ grew from 850 million in 2010 to 948 million in 2011. The Data Centre holds a storage capacity of five petabytes. 95% of the world’s scheduled network airline seats are bookable using the Amadeus Data Centre infrastructure.

Maintaining and improving energy efficiency of the Data Centre is an important Amadeus objective both from the environmental and economic point of view.

The official general energy efficiency policy of Amadeus Data Processing, introduced in 2009, focuses on the following aspects:

- > Building infrastructure.
- > Server infrastructure (main factor of overall energy usage).
- > Network infrastructure.
- > Processes.
- > Measurement and monitoring through KPIs.

The graph on the left illustrates energy efficiency improvements. Despite the significant increase in business activity, reflected in the key billed transactions growth, the energy required grew at a much slower pace, resulting in a 8% increased efficiency in terms of energy required per transaction, and despite the fact that in 2010 the energy efficiency per transaction was also increased by 14% compared to 2009, as reported in 2010 Amadeus Corporate Responsibility Report.

Amadeus Data Centre was awarded the “Energy-efficient Enterprise” certification by international organisation TÜV SÜD²² in March 2010. The certificate was granted following an energy audit of Amadeus Data Centre facilities.

The certification was the result of a year-long process, during which time Amadeus conducted a full review of its data centre’s energy efficiency. Of particular focus were the power supply, cooling and climate control processes and IT equipment used, as well as the facility’s procurement, installation and de-installation processes and procedures.

Following the audit, TÜV SÜD worked together with Amadeus’s facility management, storage management and capacity planning contacts to develop a plan for implementing energy saving measures in order to gain certification as an energy-efficient enterprise.

²¹ Transactions include air and non air travel agency bookings, Passengers Boarded and e-commerce passenger records.

²² TÜV SÜD provides independent consulting, testing, certification and training services.

As a result of certification, internal guidelines now exist that assess all data centre activities from a sustainability perspective, whilst Amadeus is making additional efforts to continue operating its data centre in a resource-efficient manner in order to achieve renewed certification in 2012. In parallel, Amadeus is maintaining the highest possible technical service levels for all customers at all times.

Hardware at the Data Centre is positioned in a strict hot and cold aisle concept, improving cooling capacity and enhancing energy efficiency. Additionally, during 2010, water registers of the sensitive cooler systems were replaced with new registers providing a greater surface to extract heat from the air flow in our computer rooms. This allows the sensitive coolers to run on a lower fan speed, which in turn means reduced electricity consumption.

In December 2011 all lights in the fire cells were changed to LEDs. Expected savings will be in the range of 250,000 kWh and more than 27,000 EUR per year.

Other Amadeus sites

Measures that are implemented or in way to being implemented generally for all sites include:

- › Replacement of broken light bulbs are replaced with low energy new ones.
- › Employees are systematically encouraged to switch off lights of rooms that are not in use.
- › When moving to new buildings, we generally achieve improvements in environmental performance since resource saving measures are more common in new buildings, like the introduction of movement sensors to automatically switch lights on and off, and the automatic switch off at specific hours.
- › Encourage the use of blinds or curtains to use maximum natural light and avoid heat, in order to reduce the use of electric light and air conditioning.
- › Maintaining room temperatures within reasonable terms, recommending no more than 21 degrees Celsius in the winter and no less than 25 in the summer.

Additionally, some of our offices like the one in London have entered into energy performance contracts with external providers in order to guarantee bringing the total electricity consumption down.

Paper consumption

The table below includes the aggregated paper consumption of the top ten Amadeus sites and the estimation for the total Amadeus group worldwide for the last three years.

In 2011, we have changed the methodology to estimate paper consumption to make it more accurate and comparable year to year. Paper consumption was reduced by 7.5% in 2011, mainly because of the implementation of the FollowMe - Uniflow printing system. In fact, in line with the plan established in 2010, some principal Amadeus premises like Amadeus SAS, Sophia Antipolis (France), Amadeus Data Processing, Erding (Germany) and Amadeus IT Group, Madrid (Spain) have implemented the FollowMe - Uniflow printing system.

Below is an analysis of the results obtained and measured after the first six months of implementation of the FollowMe - Uniflow printing system in our largest site in Sophia Antipolis (France).

FollowMe - Uniflow printing system results. Sophia Antipolis

In June 2011 we implemented FollowMe - Uniflow, a badge-based printing system, throughout the Amadeus Sophia campus. We can now compare printing statistics from July through December for the years 2010 and 2011.

Have we really reduced our environmental impact with FollowMe - Uniflow? The answer is yes!

With FollowMe - Uniflow, we save paper in two different ways. Firstly, we no longer print cover pages, and secondly, not every job sent to the system actually gets printed. Sometimes, users send several versions of the same document to FollowMe - Uniflow but only print the most recent one, and occasionally, a document is not output at all and is deleted from the print queue by the system after a time-out period. Before FollowMe - Uniflow, all these unnecessary jobs were actually printed, remained on the tables in the printer rooms for a while, and were eventually thrown out.

From July through December 2010, we registered 4,523,810 clicks (a click is one printed side of one sheet of paper) of which 811,729 were cover pages. For the same period in 2011, the click count had decreased to 3,186,493. In spite of a slight increase in the number of users as well as printers, this represents a drop of 29.6% in the number of clicks. Taking into account the number of double-sided pages, we show a net savings of 1,247,293 sheets of paper, or 32.1%, for the six-month period. The following table illustrates the savings achieved:

Paper consumption per employee at top ten Amadeus sites

Paper consumption	2009	2010	2011
Paper consumption top ten Amadeus sites (kg)	77,595	87,370	85,965
Paper consumption per employee (A4 sheets / working day)	10.93	10.93	10.11



86 boxes of paper is approximately the amount of paper saved per month thanks to FollowMe - Uniflow printing

This comes out to 2,495 packs, or 499 cartons, or 6,236 kilograms of paper. If stacked, the cartons would make a 130 meter tower. If the 1,247,293 pages were laid down next to each other, connected by their short side, they would span 370 kilometres, enough to go from Sophia to Marseille—and back! An estimated 150 pulp trees would be needed to manufacture this quantity of paper²³. The weight equals that of more than 80 people. Keep in mind that all these numbers are for half a year only. Indeed, before the end of March 2012, the weight of the saved paper will exceed that of the entire audience of our largest auditorium (Mistral) full of people... and we have not even mentioned the environmentally extremely positive impact of using less toner and the secure and confidential printing the FollowMe - Uniflow solution provides.

The effects of FollowMe - Uniflow were not totally unexpected, but what truly surprised us is the outstanding cooperation we received from our user community. Even though FollowMe - Uniflow represented a marked change in work habits, people were supportive, provided feedback, and helped us improve the system.

Other best practices implemented in some of our sites and recommended for all include:

- › Set printers to double side printing and remove cover pages by default.
- › Set colour printers with two printing options, one for black and white and one for colour printing, using colour only when necessary and hence reducing the amount of coloured toner required.
- › Recycle bins are generally located next to the printers. Although precise recycling figures are not available, we estimate that at least 50% of the paper used is sent for recycling.
- › Some offices like Bangkok changed the type of paper to increase the proportion of recycled paper used.
- › Other sites like Sydney or Paris use 100% carbon neutral paper (certified by Forest Stewardship).

	Jul-Dec 2010	Jul-Dec 2011	Delta	Savings
Total clicks incl. cover pages	4,523,810	3,186,493	1,337,317	29.6%
Of which double-sided	635,349	545,325		
Total sheets of paper	3,888,461	2,641,168	1,247,293	32.1%

²³ Source: <http://conservatree.org/learn/EnviroIssues/TreeStats.shtml>

Water

In 2011 we increased the scope of our reporting to the top ten Amadeus sites worldwide.

Beyond regular office water consumption, Amadeus uses water for cooling equipment in our Data Centre in Erding and for irrigation in our Sophia Antipolis (France) site. In both sites we use partially our own wells. The reduction in water consumption in 2011 is mainly due to our optimisation measures put in place in Sophia Antipolis, which include:

- Crushed wood is used to keep humidity and reduce watering duration.
- A centralised management system has been put in place to manage watering and be alerted in case of leaks. Quantity and duration of watering is programmed and adjusted by areas, by types of plants and by season.
- Rain gauges have been installed to maximise watering from rain and hence reduce water consumption.

In 2012 we plan to enhance our management system to be able to monitor water consumption to identify any area for improvement and fine tune settings in place.

In Amadeus Data Processing on the other hand the water use has increased due to additional cooling capacity but measures have been undertaken to guarantee supply from our own well.

Other best practices identified and recommended include:

- Some sites, like our office in Miami, are now equipped with infrared sensor faucets that reduce water use in toilets.
- Other sites where the number of employees justifies, have implemented kitchen equipment that reduces water consumption. Our office in Bad Homburg has installed a professional dishwasher which is estimated to provide savings of 500 litres of water per hour in use. This means yearly savings of approximately 480 cubic metres of water and around 2,000 EUR of costs.
- Our General Services teams report immediately any dripping taps or leaking toilets.
- Some of our landlords, like in our offices in Sydney, have obtained the highest level of sustainability rating in regards to building management and have initiated a Green Lease Guide to help tenants work towards a better and more sustainable work environment. Amadeus has committed to these guidelines. In fact, when Amadeus took additional office space our landlord included a sustainability incentive which will finance the installation of a Managed Lighting System to control the lighting in our office.

Water consumption and employees at top ten Amadeus sites

Water consumption	2009	2010	2011
Water consumption top ten Amadeus sites (m ³)	180,202	180,818	168,869
Number of employees top ten Amadeus sites	6,452	7,265	7,728
Evolution of water consumption per employee		-10.89%	-12.20%

Waste management

The amount of waste produced by Amadeus is limited to standard office use, since we don't manufacture any product subject to be disposed. Over the last years, several measures have been put in place to minimise the amount of waste, including:

- › In our largest sites, where we have canteens / restaurants for employees, like in Sophia Antipolis we have put in place containers to classify waste and facilitate recycling. Generally there are three different containers for plastic, paper and organic materials, and glass.
- › As indicated above, recycling bins are located next to the printers in largest sites and we are encouraging the broader implementation of this measure.
- › Some premises, like in our headquarters in Madrid, have located battery containers in each floor so employees can dispose batteries easily.
- › Some of our premises, like our new building in Miami forms part of a full recycling program run by the City authorities. The recycling is facilitated since all trash is collected in one container and duly classified at the recycling facility.
- › In other sites, like in Bangkok, we have taken a more active role by asking our landlord to facilitate the separation of glass and plastic. We have also encouraged staff to use the recycling bins.

Despite our attempts, reporting for waste is difficult since different sites use different concepts for measuring and total amounts are generally estimated rather than measured. In the future though we plan to pay special attentions to those materials that can be easier tracked for Amadeus, like paper; and manage through external providers the reporting of other materials that are not really linked to Amadeus operations, like rubble disposal after building works.

Fossil fuels and CO₂ emissions

In 2011 we have broadened the scope of our CO₂ reporting to include emissions from natural gas and diesel, and generally included our top ten largest sites as opposed to only two reported last year. For this reason the figures of the report this year don't match the report of 2010.

With regards to fossil fuels combustion, our offices in Erding, Frankfurt and London use diesel and natural gas for heating and guaranteeing uninterrupted power supply. Their consumption is included in the table below:

Following the Green House Gas protocol standards, CO₂ emissions are reported in the table below:

A critical success factor for our improvement in 2011 in scope 2 emissions was our agreement with our electricity provider for the Amadeus Data Centre in Erding that managed to reduce CO₂ emissions per kWh from 291 to 171, with the positive consequence regarding emissions. Also important was our continuous improvement in efficiency, as demonstrated in the figure above, by which we keep reducing the amount of power required per transaction. This is a fundamental effort since the number of transactions keeps growing year over year.

On the other hand, our geographical expansion and business growth are mainly the reasons for our rise in scope 3 emissions, mainly due to increased number of business trips²⁴.

Fossil fuels consumption and trends

Fossil fuels	2009	2010	2011
Natural gas (GJ)	22,553	23,517	19,959
Trend Natural gas		4%	-15%
Diesel (GJ)	1,713	1,802	1,743
Trend Diesel		5%	-3%

Greenhouse gas emissions

CO ₂ emissions (t)	2009	2010	2011
Scope 1. Direct emissions (fossil fuels)	1,310	1,367	1,175
Scope 2. Indirect emissions from purchased electricity	18,493	19,470	17,161
Scope 3. Indirect emissions from other sources	3,548	3,946	5,084
Total emissions	23,351	24,783	23,419
Trend		6.1%	-5.5%

²⁴ Emissions from business trips include CO₂ emissions from air transport for trips managed in our top seven sites worldwide. We have used the International Civil Aviation Organisation carbon calculator to estimate emissions per passenger.

10.3 Improving environmental performance in our industry

Every day, Amadeus processes air bookings for more than one million passengers. The amount of information managed by our systems is immense. We provide the technology that supports a world “on the move”. We acknowledge the enormous economic and social benefit of that movement, and also its environmental impact.

The travel industry in general and aviation in particular are under increasing pressure to better keep track, measure, manage and reduce environmental impact, especially greenhouse gas emissions. Similarly, travellers, whether as individuals or corporations are becoming increasingly concerned about the undesired environmental consequences of travelling and need tools and advice to better understand these consequences and neutralise them to the greatest extent possible.

Carbon calculation standards for aviation

The International Civil Aviation Organisation (ICAO) and Amadeus have contributed with a significant step towards reaching wide consensus on an aviation industry standard calculation methodology for CO₂ emissions per passenger.

Calculating CO₂ emissions per passenger is complicated by a number of factors related to data availability, scientific uncertainty regarding global warming effects of certain aircraft emissions, and the unavoidable subjectivity of allocating aircraft emissions to individual passengers. This has led to a situation in which different calculators offer significantly different results for the same itinerary.

In October 2009 Amadeus and the ICAO executed an agreement by which Amadeus would use and promote the ICAO CO₂ calculator. The information obtained from the ICAO calculator is used to provide CO₂ emissions information to passengers and corporate customers willing to build emissions inventories and offset emissions.

ICAO CO₂ calculator can be considered the closest to an international standard, given the use of publicly available information and the legitimacy of the ICAO as the global forum for civil aviation, formed by 190 contracting states. Through the Amadeus - ICAO agreement, the ICAO provides calculated emissions data per city pair using their calculation methodology; and Amadeus on the other hand facilitates the usage of the calculator through our technology and global reach.

The current version of the Amadeus corporate booking tool (Amadeus eTravel Manager) includes a CO₂ display functionality that uses CO₂ estimations from the ICAO carbon calculator.

We look forward to continuing to work with the ICAO and other industry players towards the achievement of further environmental goals.



Amadeus eTravel Manager v15 with CO₂ display functionality.

Fuel savings achieved through technology

Amadeus has developed technologies to help airlines and other industry players reduce emissions, therefore reducing also the cost of new environmental regulations.

Through optimum weight allocation and optimisation tools, Amadeus Altéa Departure Control System (DCS) Flight Management module saves significant amounts of fuel, and therefore greenhouse gas emissions, as compared with less sophisticated technologies currently on the market.

In 2011, Amadeus and Finnair carried out and presented a study which analysed 40,000 Finnair flights. Approximately two thirds of the sample included flights where Altéa DCS FM was already implemented, and one third of the sample referred to flights where Finnair was using the previous system to calculate the EZFW (Estimated Zero Fuel Weight of an aircraft).

The study demonstrates Altéa FM is more accurate than the previous system estimating the ZFW of the aircraft. This permits a more accurate calculation of the fuel needed, and therefore fuel savings.

The savings estimations, based on the most prudent assumptions, were in the range of 300t of CO₂ emissions savings per year for Finnair; which is an airline with approximately seven million passengers per year. At the time of writing this report, Amadeus has implemented the Altéa Departure Control System, Flight Management module in airlines that carry 138 Million passengers, and 380 million additional passengers fly with airlines that will implement the same technological solution within the next months. The total estimated emissions savings will be coincidentally very similar to the total Amadeus emissions reported in the table on page 100 including the three scopes.

Amadeus aims at continually bringing benefits to our customers and the industry through the continuous innovation of our technology, and this is our strongest tool for contributing to the sustainability of the travel industry.

