

COP15
carbon footprint
Approach and
methodology



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1. Introduction

“A carbon footprint is a measure of the impact of human activities on the environment in terms of the amount of greenhouse gases produced, measured in units of carbon dioxide equivalents (CO₂e)”¹.

Carbon footprint measurements are recommended as part of the climate strategies for organizations, projects or events to control and reduce emissions of greenhouse gasses (GHG). The measurement can act as a tool to determine the most significant sources of GHG emissions, to prioritize reduction initiatives, and finally to offset the emissions in order to achieve carbon neutrality.

This report describes the methodology and results of carbon footprint measurement of the COP15 climate summit in Copenhagen, December 2009. The approach and measurement is commissioned by Deloitte to the Danish Ministry of Foreign Affairs.

The aim of this report is to explain the considerations, measurement and calculations used to determine the COP15 carbon footprint, and to provide insight into carbon footprint measurements and inspiration for emission reducing activities at future meetings of the Conference of the Parties (COP).

Context of carbon footprint measurement

Measuring carbon footprints is an international, rapidly evolving discipline, and for events such as the COP, there are no detailed standards or accepted methods for defining scope, calculating, making assumptions and presenting results. Consequently, compilation of a carbon footprint can have many quantitative results, and the differences between the results can be very significant depending on the choice of scope, method and assumptions. The COP15 carbon footprint is therefore not necessarily directly comparable with other carbon footprint statements and must be read in conjunction with COP15 carbon footprint approach and methodology. With the initiative of measuring the COP15 carbon footprint, the conference organizers contribute to the development of good practice for the management and estimation of event-based carbon footprint.

¹ Source: Wikipedia.org

Applications of the carbon footprint

The COP15 carbon footprint approach and methodology, with the above general considerations in mind, should provide adequately robust results to support the purpose of the carbon footprint. The methodology is not suitable for measuring and reproducing specific mitigation actions and operational improvements.

The COP15 carbon footprint is considered a good basis for communicating the impact of the different areas and sub areas of a COP meeting, and to identify and prioritize areas of improvement. External communication of the results should be accompanied by "cautionary language" due to the above general considerations, and should be presented so that it does not appear to show a high degree of accuracy.

2. Measuring the carbon footprint

Purpose

The defined purpose of the carbon footprint measurement drives the choice of process and methodology. The three main purposes are to:

- provide the basis for visualization and communication of individual GHG emissions during the conference
- provide the basis for initiatives to make the conference carbon neutral
- prepare comparable calculations of GHG emissions at future COP meetings

In addition the measurement may provide further insight and overview of the impact of activities and decisions; assist to prioritize mitigation actions² and measure progress; and help to set the standard, inspire and benchmark with other similar events.

Scope

The COP15 carbon footprint calculation uses a control based approach. This means that the scope primarily includes activities whose GHG emissions to a certain degree can be controlled by either the organizers or the participants of COP15.

The scope of the measurement includes only emissions from activities in or near the location of the conference (local emissions), while emissions from participants' travel to and from Copenhagen is not included in the scope as those are separately calculated by the UNFCCC.

This approach has been reviewed in consultation with an international panel of practitioners in Deloitte with extensive experience in the application of GHG accounting and reporting methodologies.

The scope and methodology have also been reviewed externally by Professor Henrik Wenzel, a Professor in Life Cycle Assessment (LCA) and Environmental Engineering of products, services and systems at the University of Southern Denmark. Professor Wenzel's comments and suggestions have

² The measurement process presented in this report has been initiated posterior to the organizers' decisions of "greening" activities for COP15. In spite of this, it is Deloitte's view that the Danish Ministry of Foreign Affairs have based their emission reducing initiatives on a fair state-of-the-art understanding of the main contributors to the GHG emissions of the event and on sound considerations of the likely results. In order to fully utilize the carbon footprint measurement, however, Deloitte recommends the initial estimate to be done at a much earlier stage during organization of future COP meetings (see chapter 5).

been considered and some changes in the scope inventory have been implemented (eg carbon footprint from food and paper consumption).

The measurement includes the following main areas and sub areas as agreed at preliminary and subsequent discussions with Professor Wenzel and the Danish Ministry of Foreign Affairs.

Area	Sub area	GHG sources	Data sources
Accommodation	<ul style="list-style-type: none"> - Hotel - Outsourcing of laundry - Outsourcing of catering - Outsourcing of IT servers - Private accommodation 	<ul style="list-style-type: none"> - Energy consumption for operations (fuel, electricity and heating) 	<ul style="list-style-type: none"> - Hotels - Participant information - Hotel service providers - Normative databases³
Transport	<ul style="list-style-type: none"> - Private cars - Taxis - Buses - Trains - Metro - Police vehicles - Transport of goods 	<ul style="list-style-type: none"> - Energy consumption for operations (fuel and electricity) 	<ul style="list-style-type: none"> - Service providers (train, metro, taxis) - Participant information - Data from participants survey (participant behavior) - Normative databases - Police - Emergency
Conference center	<ul style="list-style-type: none"> - Operation of conference center - Food - Paper 	<ul style="list-style-type: none"> - Energy consumption for operations (fuel, electricity and heating) - Energy consumption for production of food and paper 	<ul style="list-style-type: none"> - Conference Center - Bella Center service providers - Normative databases

An overview of the scope in relation to the Greenhouse Gas Protocol⁴ scope definitions can be found in Appendix I.

Process

The process for determining the carbon footprint builds on an 8-step model as described below:

Step 1 – Definition of scope and identification of preliminary data

The scope is defined on the basis of existing and emerging guidelines and standards (GHG Protocol, ISO 14064 and BS 8901), using a control-based approach as described in the previous section. The preliminary data are mainly retrieved from normative databases, assumptions and adjusted results from measurement of similar events.

Step 2 – First estimate of GHG emissions and preliminary conclusions

The first estimate is a rough calculation that gives an overview of the most significant sources of GHG emissions. With this knowledge, the subsequent calculations can focus on refining those areas that have the most significant impact on the total carbon footprint, while areas with insignificant contributions need less attention.

³ Normative databases are public databases containing acknowledged generic data such as emission factors

⁴ For information about the Greenhouse Gas Protocol and scopes, please visit ghgprotocol.org.

Step 3 – Identification of data requirements

With focus on the most significant sources of GHG emissions, the requirements for data are determined. It is also outlined how and when the data can be retrieved.

Step 4 – Pre-conference data collection

Reasonable accessible actual data as defined in step 3 are collected. Some data, however, may only be available after the conference and in those cases preliminary data and estimates are used.

Step 5 – Second estimate of GHG emissions

Data for the three areas in the scope and the different sub areas within each area are consolidated in the pre-conference estimate. The results and conclusions are used for communication and awareness building during the conference.

Step 6 – Post-conference data collection

After the conference, the remaining data such as actual energy consumption at the conference center, number of participants and their behavior are collected.

Step 7 – Final calculation of GHG emissions

The final data and the result are reviewed and the differences to the pre-conference estimate are analysed.

Step 8 – Report

The report describes the methodology, results and guidance for carbon footprint measurements at COP meetings.

Example: Step 5 – Second estimate of GHG emissions

Results and key messages

Total carbon footprint is estimated to 5,700 tonnes.

Main contributor to the carbon footprint is the conference center with 70% of total emissions, while the accommodation contributes with 23%, and local transport represents the smallest emission of 7%.

Compared to the GHG emissions of participants' travel to and from Copenhagen (estimated by UNFCCC), the local emissions are small. Thus the local emissions amount to only 12% of total emissions from COP15 and associated transport.

Confidence and use

The GHG emissions remain highly dependent on unknown factors such as the number of participants and their behavior during the conference (see appendix II: Level of confidence pre-COP15)

However the numbers can be used in communication during the conference – with appropriate reservations – to give a picture of the main sources of emissions, to demonstrate the methodology, and to raise awareness of the COP15 emissions.

Data sources and assumptions

Key assumptions

Data based on models and generic data (normative factors) have been applied in the calculations. If more than one source of data or methods of calculation are available, the most confident is chosen, while alternative sources of data or methods are used for controlling the calculations. The assumptions and data are described in more detail under each area in the sections 3.1 – 3.3.

Level of confidence (uncertainty calculations)

The confidence of the data is assessed and further described in Appendix I, "Level of confidence". The assessment is based on a qualitative judgment of the assumptions and the quality of information and data used in the calculation. To compensate for the uncertainty of the pre-conference assessment, a buffer of 20% was added to the total estimate. The final calculation includes no such general buffer.

Global warming potentials

Global warming potentials (GWP) from IPCC in their Fourth Assessment Report from 17 November 2007 have been used to convert to CO₂ equivalences (CO₂e). They are based on GWPs from pulse emissions over a 100-year time frame, as per the Kyoto Protocol.

3. Calculations

Scope

The carbon footprint measurement considers the GHG emissions arising from the local activities at the COP15 conference.

Conference boundaries

The conference boundaries are determined using a control approach accounting for local activities related to the conference, over which the following groups of people have operational control:

- Local organizers of the conference
- Accredited participants.

The calculations cover the period of occupying the conference center (1 November to 20 December 2009).

Operational boundaries of the measurement

The carbon footprint measurement includes the following areas:

- Accommodation
- Local transport
- Conference center

A detailed description of the scope within each area is further described in section 3.1 – 3.3.

General data

Number of participants and participant days

The participants' numbers and length of stay are key factors in the carbon footprint calculations. The number of participants is defined by the number of activated badges for COP15, while the number of participant days is defined by the number of days one registered participant has been checking in at COP15 (or has had the intention of checking in, but not been able to, due to logistical conditions or UN restrictions). The numbers are used to estimate the number of nights of accommodation and the number of local transportation trips.

The Danish Ministry of Foreign Affairs has provided number of activated badges, statistics from COP14 in Poznan and records of entrances from COP15 for the first 7 days of the conference. As regards the last 5 days of the conference, the entrances were not recorded, and the numbers are therefore estimated by extrapolations of COP14 numbers.

3.1 Accommodation

Scope

Accommodation activities and their inclusion in the GHG calculation are shown in the table below.

GHG Protocol ⁵ scope	Accommodation
Scope 1 (included)	Gas and oil for hotel heating
Scope 2 (included)	Electricity and district heating in hotels
Scope 3 (included)	Energy for extraction of fuels and production of electricity and heat Outsourcing of linen service at hotels
Scope 3 (not included)	Construction of hotels Food/beverages for hotels and restaurants Accommodation for parallel events Waste and waste handling

Data sources

Accommodation data is retrieved from following sources:

- Hotels
- Danish Ministry of Foreign Affairs
- Information to delegates
- Service providers for hotels
- Normative databases and reliable websites

Person nights

The number of person nights is defined by the total number of times one COP15 participant spends one night of accommodation in connection with the conference. The number is estimated from the number of participant days and the assumption that each participant spends one extra night on average at the conference compared to conference days.

Choice of accommodation

Accommodation is divided in hotels and other/private accommodation. Choice of accommodation has been identified in the participants survey by interviewing 411 participants. Based on recognized statistical sampling methodology it is assumed that the survey sample is representative for the whole conference.

⁵ For further details on GHG Protocol, please refer to Appendix I

Hotels

All 56 hotels that according to the Danish Ministry of Foreign Affairs have guests related to the COP15 have been contacted. 30 hotels have presented all of the requested information; 19 hotels have responded with some relevant information; and 7 hotels have not presented any of the requested data.

For each hotel, primarily the Chief Executive Officer or senior leadership of the hotels has been contacted and has delivered the information. In some cases others, such as technical management, environmental management, and guest service have been involved in retrieving and delivering the information. The hotels have been asked to state their usages of electricity, heating, laundry (if outsourced), laundry supplier (if such is used) and number of guest nights, for the period of a full year. The data is based on hotel activity mainly in 2008 but some hotels have stated 2007 or 2008-2009. To adjust for seasonal deviation, information from the energy provider SEAS NVE has been used.

Additional data for hotel emissions have been retrieved from normative data bases. This data includes:

- Emission factors from energy suppliers in Denmark and Sweden
- Emission factors from laundry suppliers

Example – emissions from hotels

Input data

Hotels: Resource consumption and guest nights per year (latest year available). Outsourced laundry.

Energy providers: Emission factors for electricity and heat.

Laundry service providers: Emission factors for linen wash.

Normative databases: Emission factors for fuel, formula for seasonal deviation.

Danish Ministry of Foreign Affairs: Number of participants* and participant days*.

Participants survey: Choice of accommodation⁶.

Calculations

Emission per standard guest night from each hotel, adjusted for seasonal deviations (base data from hotels is validated individually, and invalid data are eliminated).

Average emission per guest night, weighted in accordance with number of COP15 reservations on each hotel.

Total nights in hotels in accordance with number of person nights (one night per participant day + one extra night per participant) and choice of accommodation.

Result

Total emissions from hotels

⁶ for pre-COP 15 calculations, the data are estimated based on information from the Danish Ministry of Foreign Affairs: Allocation of hotel reservations

Other/private accommodation

Other/private accommodation is accommodation in private homes, hostels and other places prepared to accommodate a larger number of persons (gyms etc.). It is assumed that emissions for other/private accommodation correspond to average Danish household emissions per person.

Data on emissions from Danish households has been retrieved from normative data bases, and adjusted for seasonal deviations.

3.2 Local transport

Scope

Local transport activities and their inclusion in the GHG calculation are shown in the table below.

GHG Protocol scope	Local Transport
Scope 1 (included)	Fuel for taxis, cars, limos, diesel trains and trucks
Scope 2 (included)	Electricity for electric trains
Scope 3 (included)	Energy for extraction of fuels and production of electricity
Scope 3 (not included)	Construction of infrastructure Maintenance of infrastructure Transport for parallel events

Data sources

Local transport data is retrieved from following sources:

- Service providers (Trains, Metro, taxi companies)
- Danish Ministry of Foreign Affairs
- Information to delegates
- Normative databases and appropriate websites

Number of trips

Number of trips is defined by the number of times one delegate is transported between accommodation and the conference center. It is assumed that two trips are travelled per participant day.

Distances travelled

Distance travelled between accommodation and the conference center is measured from locations of the 56 hotels that according to the Danish Ministry of Foreign Affairs have guests related to COP15.

Choice of personal transport

Delegates' choice of personal transport has been identified at the participants survey.

A scenario has been set for each of the hotels that according to the Danish Ministry of Foreign Affairs have guests related to COP15, so that their behavior is estimated from price, accessibility and capacity of the different means of transport. It is assumed that:

- high accessibility to public transport is when hotel is located less than 400 m from a station. Such location results in more people using public transport
- longer distance between hotel and Bella Center results in more persons using public transport because of price and convenience.

By combining choice of transport with accessibility and distance from Bella Center, the average distance traveled by each means of transportation has been obtained.

Limousines, security and transport of goods

An estimate of the extent of limousines, security (police cars and motorcycles) and transport of goods has been obtained from the Danish Ministry of Foreign Affairs.

Emission factors

Emission factors for the different means of transport have been retrieved from generic data bases. This data includes:

- Emission per km from taxis, cars, Metro, trains in Denmark, trains in Sweden, buses, limousines (bio-fueled), trucks and police vehicles.

Example – emissions from Metro

Input data

Copenhagen Metro: Emission factors in kg CO₂e per person-km (one person transported one km).

Danish Ministry of Foreign Affairs: Number of participant days* and allocation of hotel nights.

Google Maps: Location of hotels and Metro stations.

Participants survey: Choice of transport*.

Website “Rejseplanen.dk” for control calculations.

*for pre-COP 15 calculations, the data are estimated.

Calculations

Share of distance travelled by Metro from each hotel, based on satisfaction measurement (choice of Metro) and accessibility to Metro.

Distance travelled from each hotel, estimated from Google Maps.

Number of Metro trips based on number of participant days (two trips per participant day) and share of participants using Metro.

Control calculations done on the website “Rejseplanen”, which calculates total emissions of a person travelling between two stations.

Result

Total emissions from Metro.

3.3 Conference center

Scope

Conference center activities and their inclusion in the GHG calculation are shown in the table below.

GHG Protocol scope	Conference center
Scope 1 (included)	Oil for heating temporary buildings Diesel for electricity generators in temporary buildings
Scope 2 (included)	Electricity and district heating in permanent buildings
Scope 3 (included)	Energy for extraction of fuels and production of electricity and heat Production of paper for Bella Center Production of food/beverages for Bella Center
Scope 3 (not included)	Construction of permanent buildings Construction of temporary buildings Planning and organisation of COP15 Paper/materials brought by participants Activities/venues for parallel events Waste and waste handling

Data sources

Conference center data is retrieved from the following sources:

- Danish Ministry of Foreign Affairs
- Bella Center
- Service providers of Bella Center
- Normative databases and reliable websites

Energy, heat and fuel

Consumption of electricity, district heating, fuel for heaters and generators (temporary buildings) is logged by Bella Center on a daily basis. The exact consumption can therefore be observed.

Paper, food and beverages

The consumption of paper is retrieved from the paper supplier. An estimate of the consumption of food and beverage is made with information and assistance from the catering provider. For each type of meal/beverage, a scenario for the ingredients is set up, and emissions are calculated from average emission factors from the different types of ingredients (meat, vegetables, bread etc.). Normative databases and information from manufacturers are used for this purpose.

4. Results

Final results: GHG emissions

The total calculated GHG emissions amount to **6,000 tonnes CO₂e**. The figure below illustrates the contribution from each area within the scope (tonnes CO₂e)

Accommodation	2,300	Local transport	270	Conference center	3,430
Sub areas:		Sub areas:		Sub areas:	
Private accommodation	700	Limoservice	10	Conference center - perm. build.	2,200
Hotels	1,600	Train and metro	70	Conference center - temp. build.	1,130
		Taxi	110	Conference center - Forum	5
		Bus	50	Paper consumption	15
		Police	25	Food consumption	80
		Transport of goods and services	5		

5. Recommendations for future COP meetings

With lessons learned from the carbon footprint measurement of COP15, Deloitte is providing a list of recommendations for successful carbon footprint measurements for future COP meetings.

1. Establish an effective governance structure

Understanding the most significant GHG sources should be included in the decision-making process for the logistics of the COP meeting in order to achieve the best results and to demonstrate commitment. The governance structure may include a body of representatives from the national government hosting the COP and the UNFCCC to ensure effective planning, coordination and communication.

2. Adopt a step model

The 8-step model described in chapter 2 may apply for measuring the carbon footprint of events. First of all the model makes it possible to focus on the most significant as well as the most uncertain factors; secondly it ensures an effective process; and lastly it provides key messages to communicating in a timely manner during the process. The steps, however, should not necessarily be seen as a sequential process, as they may overlap.

3. Engage with organizers and suppliers on interchange and collection of data

The access to valid data is essential for achieving a credible and applicable result, and most data are collected in collaboration with direct or indirect suppliers to the COP meeting. In order to ensure sufficient and timely data collection, the requirement for data should be agreed at an early stage, preferably by the engagement of suppliers.

4. Use acknowledged standards and units of measurement

Standards for organisations (eg. GHG Protocol and ISO 14064) and events (eg. BS 8901 and ISO 20120) may be deployed at COP meetings, however the standards designed for organisations must be adjusted to suit the purpose.

5. Keep track of documentation

All data and information sources as well as preliminary results should be traceable. Focus on the ability to revise and compare estimates as they evolve before and after the conference – including the possibility to estimate and document GHG emission reductions from specific initiatives.

6. Make control calculations by alternative methods

Whenever an alternative source of data or method of calculation is available, it can be used to control the validity of the method applied in the methodology. If large deviations occur, the causes for those deviations may be found and explained, and potential errors may be corrected.

7. Get third party viewpoint

Involve a third party such as an independent research institution, NGO or similar in decisions regarding scope, methodology and data sources. Such involvement may help increase credibility in the results, ensure that special public interests are considered, and – to some extent – prevent criticism from observers. The involvement may be established on an official or ad hoc basis. In addition, the reporting entity may engage an independent auditor to express an opinion on the carbon footprint.

8. Compare and benchmark to similar events

When possible, similar events whose carbon footprint has been measured may be studied to compare and benchmark, and to control the validity of applied calculations. As described in the introduction, some factors may vary greatly and make it challenging to compare. Those factors include the nature of the events' activities and local conditions such as infrastructure and weather conditions⁷.

9. Estimate the level of confidence

Quantitative measurements of the level of confidence is a time consuming and costly discipline. Therefore a more simple qualitative consideration of level of confidence may be used to evaluate whether the overall results have a high, medium or low level of confidence, and whether initiatives should be taken to raise confidence levels. If the level of confidence of key data is relatively low due to factors yet unknown, it is recommended to add a buffer to the total estimate. As an example, please see Appendix II – levels of confidence.

10. Utilize results for communication and awareness raising

The results of the pre-conference estimate are suitable for communication and awareness raising during the conference. Using sufficiently plausible numbers for quantifying the effect of participants' behavior may encourage more people to behavioral changes.

⁷ In connection with the COP15 carbon footprint measurement, no specific benchmark was made, however suggestions for benchmarking were given to the Danish Ministry of Foreign Affairs.

Appendix I: Issues included in scope of measurement according to GHG Protocol scopes

The Greenhouse Gas Protocol⁸ (GHG Protocol) is the most widely used international accounting tool for government and business organisations to understand, quantify, and manage greenhouse gas emissions. The GHG Protocol distinguishes between 3 scopes of measurement, defined by direct emissions (scope 1), indirect emissions caused by energy consumption (scope 2) and other indirect emissions. For more information, please visit ghgprotocol.org.

	Accommodation	Transport	Conference center
Scope 1 (included)	Gas and oil for hotel heating	Fuel for taxis, cars, limos, diesel trains and trucks	Oil for heating temporary buildings Diesel for electricity generators in temporary buildings
Scope 2 (included)	Electricity and district heating in hotels	Electricity for electric trains	Electricity and district heating in permanent buildings
Scope 3 (included)	Energy for extraction of fuels and production of electricity and heat Outsourcing of linen service at hotels	Energy for extraction of fuels and production of electricity	Energy for extraction of fuels and production of electricity and heat Production of paper for Bella Center Production of food/beverages for Bella Center
Scope 3 (not included)	Construction of hotels Food/beverages for hotels and restaurants Accommodation for parallel events Waste and waste handling	Construction of infrastructure Maintenance of infrastructure Transport for parallel events	Construction of permanent buildings Construction of temporary buildings Planning and organisation of COP15 activities Paper/materials brought by participants Activities/venues for parallel events Waste and waste handling

⁸ The Greenhouse Gas Protocol – A Corporate Accounting and Reporting Standard was published April 2004 by World Business Council for Sustainable Development and World Resource Institute. For further information, see ghgprotocol.org

Appendix II: Levels of confidence

Levels of confidence have been estimated qualitatively for all data sources. The most influential data sources and their level of confidence are described in the table below. For the pre-COP15 estimate, the relatively low levels of confidence have resulted in a buffer of 20% being added to the total result.

Approximate order of influence	Data source	Level of confidence (pre-COP15)	Level of confidence (post-COP15)
1	Emission factor for electricity	High (best practice measurement)	High (best practice measurement)
2	Electricity consumption in Bella Center	Medium (extrapolated historic data)	High (log)
3	Heat consumption in Bella Center	Medium (extrapolated historic data)	High (log)
4	Number of person days	Low (based on COP14 data)	Medium (log + assumptions)
5	Fuel consumption in temporary buildings	Medium (fair estimate)	High (registered purchase)
6	Allocation to hotels and other/private accommodation	Low (unsupported estimate)	Medium (based on sample – 411)
7	Electricity consumption at hotels	Medium (info from hotels)	Medium (info from hotels)
8	Heat consumption at hotels	Medium (info from hotels)	Medium (info from hotels)
9	Emission factor on heat	High (best practice measurement)	High (best practice measurement)
10	Allocation to means of transportation	Low (unsupported estimate)	Medium (based on sample 411)

Appendix III: Comparison of pre- and post-conference measurements

Key messages

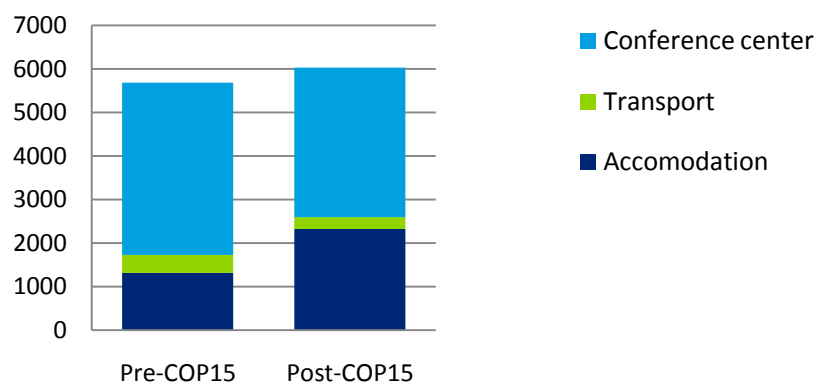
Hotel activities have more GHG emissions than estimated in the pre-conference estimate, mainly due to a larger number of participants and accounted extra heating.

GHG emissions from transport and conference center are lower than in the pre-conference estimate due to:

- a better than expected use of public transport
- an error in pre-conference estimate of emissions from paper
- elimination of a buffer of 20% in the pre-COP15 estimate.

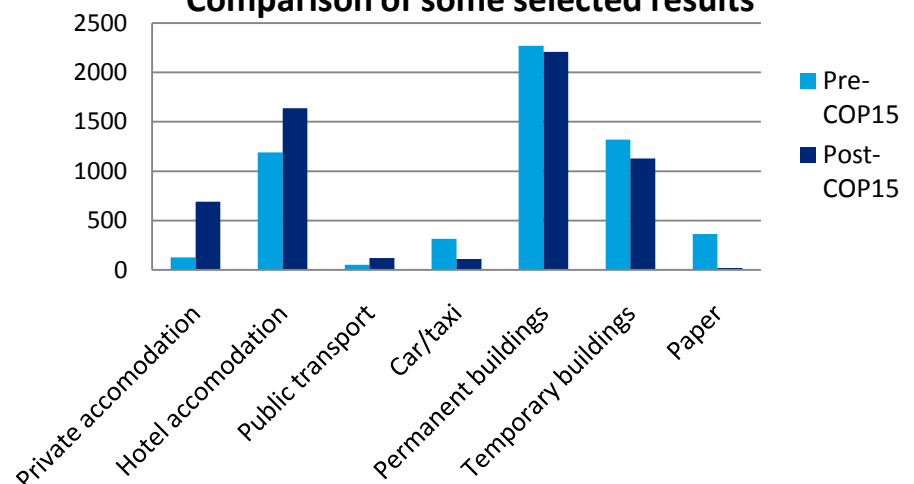
Changes in results of the carbon footprint from pre- to post-conference calculation are mainly due to a higher than estimated number of participants and participant days. The total changes can be viewed on the graph below.

Total GHG emissions, tons CO2e



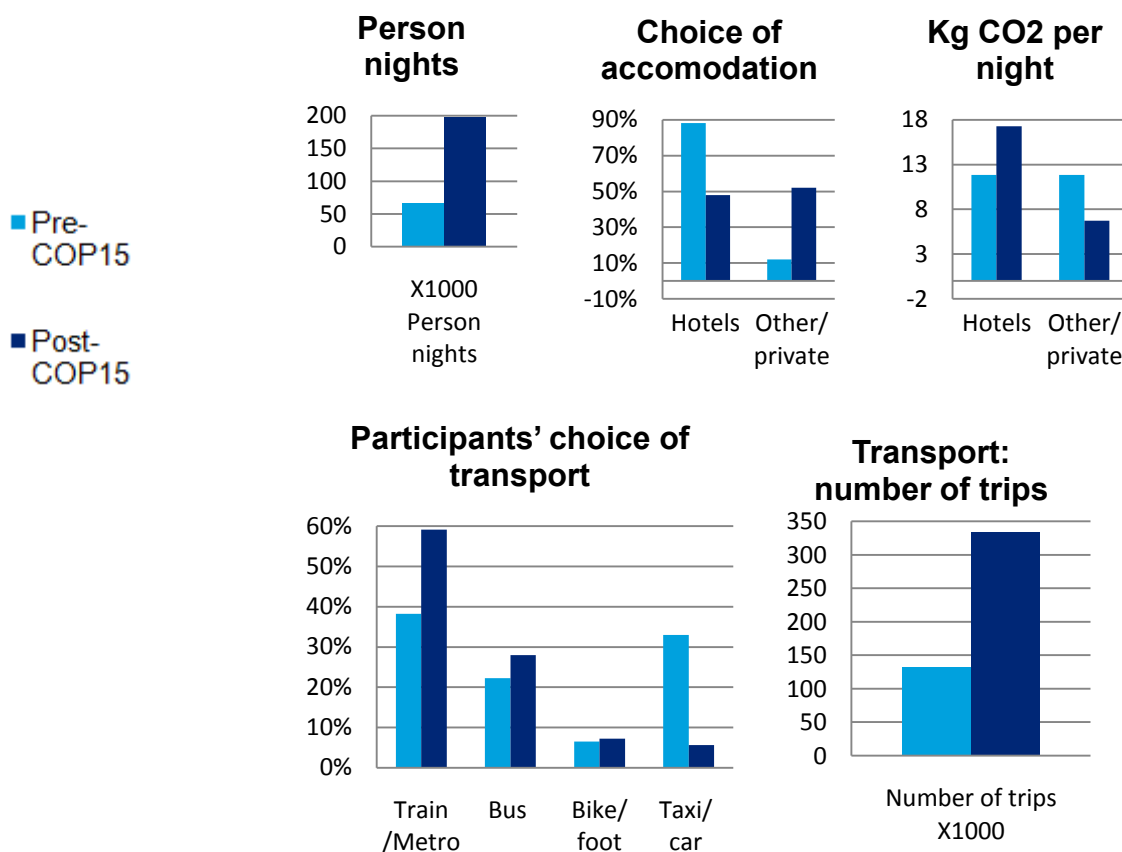
Comparison of the most significantly changed results is shown on the graph below.

Comparison of some selected results



Changes in base data from pre- to post-COP15 calculations

The most significant changes in base data are shown in the graphs below.



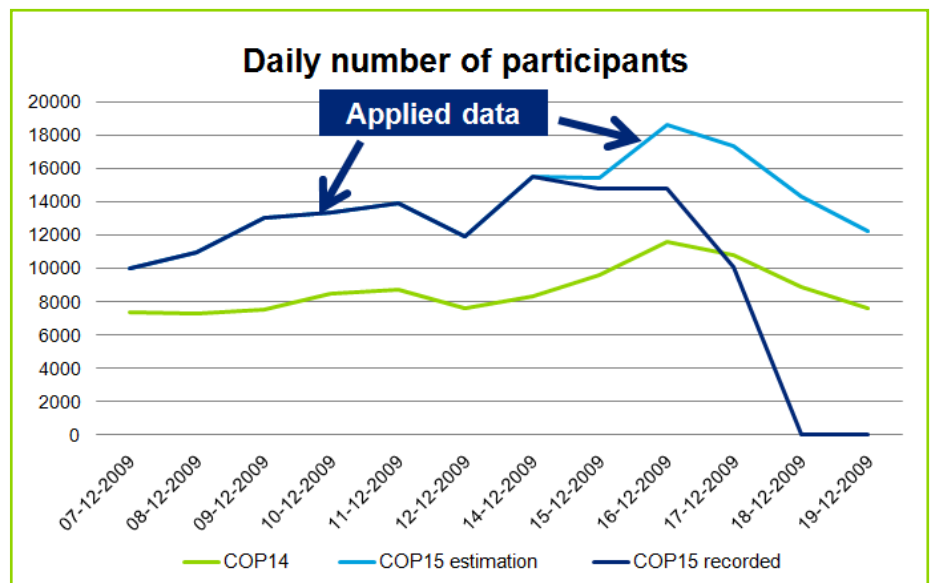
Changes in practice from pre- to post-COP15 calculations

The changes in practice of measurement from pre- to post-conference calculations are shown in the table below.

Accommodation	Transport	Conference center
<p>Number of person nights (total nights of accommodation) has been changed from pre-COP15 expected number of guest nights (provided by the Danish Ministry of Foreign Affairs) to the finally estimated number of participant days plus one extra night per participant (see appendix IV).</p> <p>Variations in energy consumption due to winter temperatures have been accounted for.</p> <p>Choice of accommodation and difference in GHG emissions from hotel vs. other/private accommodation have been accounted for.</p>	<p>Choice of transport has been adjusted to reflect tendency in participants survey.</p> <p>Number of trips has been changed from two trips per pre-COP15 expected guest night (provided by the Danish Ministry of Foreign Affairs) to two trips per participant day, as finally estimated (see appendix IV).</p>	<p>Food and beverages have been included in post-COP15 calculations.</p> <p>Forum activities have been added (Forum = extra conference center rented for NGO participants on the last two days of the conference)</p> <p>An error in the pre-COP15 calculations on paper has been corrected.</p> <p>Estimated numbers have been replaced by actual numbers (energy log and fuel consumption).</p>

Appendix IV : Estimated number of participant days

Recorded data for the last 5 conference days is not valid, as the recording system was (fully or partially) put out of operation those days. Therefore the numbers for the last 5 days were estimated based on total numbers during the first 7 days compared to COP14 numbers, and extrapolated COP14 numbers for the last 5 days (see graph below). The method is based on the assumption that the pattern of the number of participants over the days of a COP meeting is comparable from one year to another, even though the total number of participants may vary. This is confirmed by the fact that both COP14 and COP15 were intensified and had more participants during the second conference week. The assumption however may not be fully correct, but it is considered the best applicable method for estimating the number of participant days, given the available data (see also Appendix II Levels of Confidence).



Appendix V: Overview of data sources

Overall data

Emission factors for Denmark: Energinet: Miljødeklarationer 2008 for el leveret i Øst- og Vest-danmark (only scope 2 emissions).

Emission factors for Sweden: 2009 Guidelines to Defra / DECC's GHG Conversion Factors for Company Reporting.

Other emission factors: Website: "Klimakompasset.dk" by the Danish Ministry of Economic and Business Affairs (scope 2 and 3 emissions from energy production).

Number of participants, participant days and person nights: Information obtained from Danish Ministry of Foreign Affairs: Hotel allotments and records of participant days at COP14 and COP15.

Accommodation

Choice of accommodation: Participants survey conducted by Deloitte. For pre-conference estimate, information from the Danish Ministry of Foreign Affairs provides assumed numbers of participants in hotels and private accommodation.

Energy and heat consumption and outsourcing from hotels: Information obtained from 56 hotels including non-disclosure agreements.

Outsourcing: Information obtained from laundry service provider.

Adjustment for seasonal changes: Website of SEAS NVE (energy supplier).

Emissions from private / other accommodation: Statistical information from Energistyrelsen (Danish Energy Agency under Ministry of Energy and Climate) on emissions in 2008 from Danish households and population in 2008.

Transport

Choice of transport: Participants survey conducted by Deloitte.

Emission factors from fuel in cars and trucks: Website: "Klimakompasset.dk" by the Danish Ministry of Economic and Business Affairs. For control calculations, websites from different car manufacturers have been consulted.

Emission factors from Metro, trains and buses: Websites of service providers: Copenhagen Metro, DSB and Arriva. For control calculations, the web service called "Rejseplanen" is used. It provides an estimate of total GHG emissions from pre-defined journeys.

Hotel locations and distances: Information obtained from Danish Ministry of Foreign Affairs: Hotel allotments and Google Maps.

Police: Article in web magazine "Bilmagasinet" about police car types. Volkswagen website about emission factors from Volkswagen Passat.

Limousine emission factors: Article in Berlingske newspaper "130 limousiner lines op til klimatopmødet i København" about limousines on 2G biofuel and their emission factors.

Emission factors for other vehicles: "Model til beregning af vej- og bane-transportens CO₂-ævivalent emissioner" (Technical note from the Danish Ministry of Transport).

Assumptions of distances driven for police, security and transport of goods: Information obtained from Danish Ministry of Foreign Affairs.

Conference center

Pre-conference estimate of energy and heat consumption in Bella Center permanent buildings: Energy logs from previous years provided by the Bella Center technical department.

Consumption of energy and heat in Bella Center permanent buildings: Daily energy log for November and December 2009 provided by the Bella Center technical department.

Pre-conference estimate of fuel consumption for energy and heat in Bella Center temporary buildings: Estimates provided by the Bella Center technical department.

Consumption of fuel for energy and heat in Bella Center temporary buildings: Log of fuel provided by the Bella Center technical department.

Consumption of energy and heat in Forum: Daily log provided by the Bella Center technical department.

Consumption of paper at COP15: Information obtained from paper supplier.

Assumption of recycled percentage of paper: Information obtained from Danish Ministry of Foreign Affairs.

Emission factor for paper: Report: "Environmental Assessment of Products, volume 1: Methodology, tools and case studies in product development". Wenzel H, Hauschild M & Alting L. Kluwer Academic Publishers, ISBN 0-412-80800-5 (hardbound), ISBN 0-7923-7859-8 (paperback).

Ingredients and sourcing of food: Mail Information obtained from Bella Center catering: Types of meat used in catering, share of locally sourced foods.

Consumption of food and beverages in Bella center: Information obtained from Bella Center catering: People flow estimate and estimate of average participant food and beverage consumption.

Emission factors for food: website: lcafood.dk (website under 6 different Danish research institutions): emission factors for meat (chicken, lamb), vegetables (field and greenhouse crops), bread and sugar.

Emission factors for coffee: Report: "LCA of Packed Food Products" by ESU Services.

Emission factors for soft drinks: Report: "2007/2008 Sustainability Review" by Coca-cola Company.

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