FROM COP20/CMP10 TO THE WORLD:
HANDBOOK ON GHG ACCOUNTING AND OFFSETTING FOR COP/CMP PROCESSES
# INDEX

PREFACE .................................................................................................................................................. 5
INTRODUCTION ...................................................................................................................................... 7

1. METHODOLOGY .................................................................................................................................... 9
   1.1. How?: Process of measurement of GHG emissions of a COP/CMP .......................................... 9
   1.2. Where?: Definition of limits and scopes .................................................................................. 11
   1.3. Who?: Responsibilities of information and characteristics of the event ................................ 14
   1.4. How much?: Information and emission factors ........................................................................ 14
      1.4.1. Greenhouse Gases (GHG) counted in a COP/CMP ............................................................ 14
      1.4.2. GHG emission sources ....................................................................................................... 15
      1.4.3. Collect required information (Activity levels) .................................................................... 17
      1.4.4. Selection of emission factors ............................................................................................. 12
      1.4.5. Estimation of GHG emissions ............................................................................................. 20
      1.4.6. Quality control ................................................................................................................... 21

2. GHG EMISSIONS REPORT – COP 20/CMP 10 LIMA ........................................................................ 22
   2.1. Methodology, limits and sources of GHG emissions ................................................................. 22
   2.2. GHG emissions by source .......................................................................................................... 23

3. VERIFICATION OF THE CALCULATION OF GHG EMISSIONS OF A COP/CMP ......................... 29

4. MEASURES TO REDUCE GHG EMISSIONS OF A COP/CMP .......................................................... 30
   4.1. Venue Location ......................................................................................................................... 30
   4.2. Air Transportation of participants .......................................................................................... 30
   4.3. Local Transport ....................................................................................................................... 30
   4.4. Electric Power Consumption .................................................................................................. 30
   4.5. Catering (food service) ........................................................................................................... 31
   4.6. Water Consumption ............................................................................................................... 31
   4.7. Paper and other materials consumption .................................................................................. 31
   4.8. Solid Waste ............................................................................................................................. 31
   4.9. Services provided by third parties ........................................................................................... 31

5. OFFSETTING THE GHG EMISSIONS OF A COP/CMP .................................................................... 33

ANNEXES ................................................................................................................................................ 35
Annex 1: Survey Template applied in the COP20/CMP10 ................................................................... 35
Annex 2: Results of the applied survey in the COP20/CMP10 ............................................................ 36
Annex 3: Quality Carbon Footprint Certificate of the COP20/CMP10 ................................................. 37
Annex 4: Carbon Offsetting Certificate of the COP20/CMP10 ............................................................ 38
ACRONYMS

UNFCCC United Nations Framework Convention for Climate Change
CMP Conference of the Parties of the Kyoto Protocol
COP Conference of the Parties
IPCC Intergovernmental Panel on Climate Change
GHG Greenhouse Gases
SIEN National Interconnected Electric System
ISO International Standard Organization
MINAM Ministry of Environment of Peru
PREFACE

Aware of the impact of their GHG emissions, the practice of calculating and offsetting them is spreading across more and more periodic international meetings. However, it is not common to find different approaches for similar meetings or even the same meeting in different years. To cope with that, this handbook seeks to share with the global audience and future COP/CMP stakeholders, practices gained through the calculation, auditing and offsetting of GHG emissions associated with the COP 20/CMP 10, the first Carbon Neutral COP/CMP of history.

Considering that the COP20/CMP10 experience is totally replicable, this document aims to contribute to the sustainability of future COP/CMP processes and international meetings in general by promoting a common ground for event organizers to benchmark their GHG performance.

This handbook presents the methodologies and instruments used internationally to calculate GHG emissions associated to large international events. In order to help event organizers to fast track the learning curve of GHG emissions calculations, this handbook focuses on identifying, within the main features of a COP/CMP, the key sources of emissions and showcasing respective experiences from the COP 20/CMP 10 process of Lima.
The objective of all stakeholders involved in the organization of the COP/CMP must be to minimize the impact by conducting an efficient and sustainable management. This was understood by COP20/CMP10 organizers who in December 2015 conducted a complete greenhouse gases (GHG) inventory of the event, as a sample of the host country commitment against climate change.

Considering that COP20/CMP10 was the first experience calculating, auditing and offsetting GHG emissions of a COP/CMP, this document aims to document the referred experience to potential organizers of future COPs/CMPs. This will enable the comparison between COPs/CMPs and will promote the gradual improvement in GHG efficiency.

This handbook is organized in five chapters. The first chapter refers to the recommended methodology to carry out GHG emissions calculation of a COP/CMP, describing the main standards and principles that should be considered, as well as how to develop the different stages that must be present in the process such as setting the limits of the carbon footprint and classify GHG emission sources per scope. The first chapter shows examples from the COP20/CMP10 to better understand the methodological aspects.

The second chapter describes the process of the calculation of GHG emissions associated to COP20/CMP10 and presents the respective results. This section helps the reader to understand how the report was prepared and the key aspects that enable its auditing.

The third chapter develops the auditing process of the calculation, explaining the importance of counting with an external review for the quality control and assurance of the results.

The fourth chapter identifies the main measures to reduce the carbon footprint of a COP/CMP, recommending actions to optimize transportation, use of energy, catering, solid waste, water usage, among others.

Last but not least, the fifth chapter describes the offsetting process of GHG emissions and its importance in the framework of climate responsibility describing the steps to achieve a carbon neutral COP/CMP.
1. METHODOLOGY

In this section we will describe the methodology to calculate the GHG emissions of a COP/CMP. The following paragraphs explain the suggested steps to carry out the calculation and report GHG emissions of a COP/CMP and illustrate them with examples from COP20/CMP10.

In essence, the methodology helps us to organize our answers to three questions:

• How do we calculate emissions of a COP/CMP?
• What are the boundaries of the calculation?
• Who are the key people on the GHG calculation of a COP/CMP?

1.1. How do we calculate emissions of a COP/CMP?

The calculation of GHG emissions in the COP/CMP should be done in accordance to standards and procedures. This will enable a proper documentation of the process and will ease auditing work.

Step 1: Selection of standards
There are several guidelines and rules to measure GHG emissions of companies, products and services, however there is no universally accepted method to calculate GHG emissions of events. Given its proven effectiveness and world recognition, it is recommended that the calculation and report are based in the main instruments of orientation such as: the Greenhouse Gas Protocol (GHG Protocol), the standard ISO 14064 and the guidelines of the IPCC for Greenhouse Gases Inventories.


The Greenhouse Gas Protocol (GHG Protocol) is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. This tool is used for the calculation of GHG emissions of companies, cities, products. It is compatible with emissions trading schemes, registries and other instruments of the existing climate change policy in different countries.
b) IPCC Guidelines for national GHG inventories

The guidelines of the Intergovernmental Panel on Climate Change (IPCC) for the development of national GHG inventories are addressed to national governments. However, they are an excellent source of GHG emission factors and general calculation guidelines, including formulas and tips.

The ISO 14064 standard has three parts, of which only part 1 must be used as reference for the calculation and report of GHG emissions of a COP/CMP. This standard is fully compatible with the GHG Protocol.

It is important to consider the following principles mentioned in the GHG Protocol, the IPCC Guidelines-2006 and the ISO 14064:

c) ISO 14064

The ISO 14064 standard has three parts, of which only part 1 must be used as reference for the calculation and report of GHG emissions of a COP/CMP. This standard is fully compatible with the GHG Protocol.

Relevance: Define the boundaries of your GHG emissions calculation taking into account relevant GHG sources for a COP/CMP.

Completeness: Account for and report on all GHG emission sources and included activities within the chosen boundaries of the COP/CMP's carbon footprint.

Consistency: Use consistent methodologies to allow for meaningful comparisons of emissions over time in the reports of future COP/CMP.

Transparency: Promote transparency of sufficient and appropriate information related with GHG emissions associated with a COP/CMP. This will allow your organization to take decisions with reasonable trust.

Accuracy: Ensure that GHG emissions are not systematically over or under estimated, as far as can be judged, and that uncertainties are reduced as far as practicable.
Step 2:

1.2. What are the boundaries of the calculation?

Once a standard has been selected, the boundaries of the calculations have to be established. These boundaries are known as limits and can be either organizational (referred to the activities that are under control of the organization) or operational (referred to the scopes and the direct and indirect GHG emissions of the identified sources by the organization). This important step frames the calculation of GHG emissions.

Considering the GHG Protocol, the organizational limits are established through a control approach. Under this focus, the entity that has the control, either directly or through one of its subsidiaries, and is accountable for 100% of the emissions of the operation.

From the organizational point of view of a COP/CMP, the organizers as part of their responsibilities must conduct certain activities, under their control, that generate GHG emissions. These emissions should be counted:

- Coordination of transportation of the participants internationally such as locally
- Organization for the accommodation and catering of the participants
- Definition and preparation of venue of the COP/CMP and other places
- Organization of local transportation or in the city
- Disposal of waste generated in the headquarters and other places of the COP/CMP
- Organization of logistics and general security of the event
- Others

In the case of the COP/CMP, the UNFCCC Secretariat, through its Office of Logistics and Organization, and the host country are responsible for the organization of the event. Although they may transfer part of the organization and operation of the venue to a third party, they keep overall responsibility of COP/CMP emissions.

We must take into account that the events held outside the venue of the COP/CMP, in which the organizers have no organizational control, should not be taken in account in the quantification of GHG emissions.

The calculation of GHG emissions of a COP/CMP must also take into account the operational limits, namely defining the period of report, the scopes and the direct and indirect emissions to consider.

a) Reporting period

It is necessary to limit the reporting period considering the time lapse in which the COP/CMP takes place and if applicable, the times in which the emissions are generated by previous and subsequent activities to the dates of the event (mission trips, transportation of materials, organization, logistics, Infrastructure construction, dismantling, among others).
The reporting period should be defined taking into account the limits and GHG emission sources included in the calculation.

Keep in mind that: In case the country assigned as host of a COP/CMP does not count with the required facilities for an event of this magnitude, it is recommended to include in the calculation of GHG emissions those activities associated with the construction, conditioning and/or dismantling of the facilities, also including the generated emissions by the trips of the technicians and civil servants for the monitoring of the work.

In the COP20/CMP10, the host country (Peru) had to implement a temporary convention center from scratch. This included planning, structure design, assembling, equipment installation and dismantling. This way all the associated emissions related to the transport of materials for the construction of the venue, the trips of the technical service, fuel and water consumption were included in COP/CMP GHG emissions.

b) **Scopes**

The GHG Protocol classifies emissions into direct and indirect emissions. Direct emissions come from GHG emissions sources that are property of the organizers of the event and/or are controlled by them. The indirect emissions correspond to those who come from the use of purchased electricity, heat or steam and the sources that are not owned nor controlled by the organization.

Direct and indirect emissions are reported through scopes. In a COP/CMP the potential GHG emission sources according to these scopes are:
Scope 1: GHG emissions directly generated by sources that are controlled by the organization of the COP/CMP. Examples include:
- Fuel consumption (private vehicles, generators of electricity, heat or steam, etc.)
- Leaks of air conditioning equipment

Scope 2: Indirect GHG emissions originated by the consumption of energy of the activities of the COP/CMP provided by a third party. Examples include:
- Consumption of energy (electricity, heat, steam) obtained of the network or purchased from a third party.

Scope 3: GHG emissions indirectly generated as a consequence of activities of the COP/CMP, but that occur in sources that are not controlled by the organization of the COP/CMP. Examples include:
- Air travel
- Local transportation
- Food consumption
- Paper consumption
- Water consumption
- Generation and decomposition of solid waste

The carbon footprint report of a COP/CMP must inform over the totality of GHG emissions generated by the activities linked to the event, such as those produced in direct form, as those generated in indirect form, considering the sources and defined limits for the calculation.
1.3. Who are the key people on the GHG calculation of a COP/CMP?

Once the limits of the carbon footprint have been set and the GHG emission sources identified, it is critical to identify the staff that will deliver the necessary information to calculate GHG emissions. The following table suggests the responsible area for each one of the identified sources:

<table>
<thead>
<tr>
<th>SCOPE</th>
<th>POTENTIAL GHG EMISSION SOURCES</th>
<th>POSSIBLY RESPONSIBLE OF DELIVERING INFORMATION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope 1</strong>: GHG emissions directly generated by sources that are controlled by the organization of the COP/CMP.</td>
<td>- Fuel consumption (private vehicles, generators of energy, etc.)</td>
<td>- Logistics or provider of the service</td>
</tr>
<tr>
<td></td>
<td>- Leaks of the air conditioning equipment's.</td>
<td></td>
</tr>
<tr>
<td><strong>Scope 2</strong>: Indirect GHG emissions, originated by the energy consumption of the activities of the COP/CMP and that is provided from a third party.</td>
<td>- Energy consumption of the network.</td>
<td>- Logistics or administration</td>
</tr>
<tr>
<td><strong>Scope 3</strong>: GHG emissions indirectly generated as a consequence of activities of the COP/CMP, but that occur in sources that are not controlled by the organization of the COP/CMP.</td>
<td>- Air Travel</td>
<td>- Office of logistics and organization of the COP/CMP of the UNFCCC Secretariat</td>
</tr>
<tr>
<td></td>
<td>- Local transportation</td>
<td>- Logistics, administration or provider of the service</td>
</tr>
<tr>
<td></td>
<td>- Food consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Paper consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Water consumption</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Generation and decomposition of solid waste</td>
<td>- Logistics, administration or provider of the service of cleaning.</td>
</tr>
</tbody>
</table>

The key people in charge of organizing, contracting and managing suppliers and services for the event, can also provide answers to important questions that may arise such as: will the COP/CMP involve construction/refurbishing of new facilities for the event?, if yes: has material and personal been moved? Is assembling and dismantling of facilities planned?

Information and emission factors: For the quantification of the GHG emissions, the list of greenhouse gases and their emission sources will be identified and included.

1.4. How much?: Information and emission factors

For the quantification of the GHG emissions, it should be identified the greenhouse gases and have a final list of the emission sources that will be included.

1.4.1. Greenhouse Gases (GHG) included in a COP/CMP footprint

The GHG Protocol determines that the calculation of the emissions must include, if feasible, all GHGs listed in the Kyoto Protocol. However applying the principle of relevance and considering the nature of the activities that are developed in a COP/CMP, we recommend including the GHG listed in the following table.
1.4.2. GHG emission sources

Once the potential sources have been identified, a fundamental step, within the calculation of GHG emissions of an event, is the final definition of which GHG emission sources to consider. This step applies the relevance principle and establishes a set of criteria to determine those sources that should be included (e.g. identifying planned activities that could generate emissions, existence of emission factors corresponding to these activities, define the degree of importance of these emissions, and define relevance for groups of interest, among others).

With some minor differences, COP/CMP emissions generally come from the same type of sources.

Among the main GHG emission sources to be found in each COP we have the following:
- International Travel
- National travel
- Local Transportation
- Transportation of materials
- Energy consumption
- Accommodation
- Catering
- Generation of waste
- Paper consumption
- Water consumption

The following flowchart is proposed for defining the inclusion of the emission sources in the carbon footprint:
For the development of the calculation of GHG emissions of the COP20/CMP10, only those emission sources that were considered relevant, with easy access to the information and with emission factors, were included in the calculation:

- Air travel (national and international)
- Accommodation and catering
- Energy consumption
- Local transportation
- Generation of waste
- Paper consumption
1.4.3. Compile required information (Activity levels)

Once all the GHG emission sources that will be included in the footprint, the next step is to gather the required information.

Among the main sources of information for the calculation of emissions of a COP/CMP are:

- Committee of organization/coordination of the COP/CMP.
- Office of Logistics and Organization of the COP and CMP of the Secretary of the UNFCC.
- Interviews and surveys. The surveys should consider a minimal interval of confidence of 90% and 10% of sampling error.
- Official information sources.
- Data of service providers.

1.4.4. Selection of emission factors

The emission factors are essential in the processes of calculating GHG emissions. While different sources of information may exist, use host country emission factors if they are available.

If no national emission factors are available, then it is recommended to use those of countries with similar characteristics or use the default emission factors listed by IPCC or GHG Protocol.

For the calculation of GHG emissions of a COP/CMP we should identify available emission factors per type of source and finally define which will be used. All the used emission factors should be properly registered and referenced for each source in the report. The following table lists the main emission factors used by COP20/CMP10.
## GHG Emission Sources

### Fuel Consumption (Vehicles and Power Generators)

<table>
<thead>
<tr>
<th>Fuel</th>
<th>Emission Factor by Default:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\text{CO}_2$ (kgCO$_2$/t)</td>
</tr>
<tr>
<td>Diesel Oil (Fixed Sources)</td>
<td>74.100</td>
</tr>
<tr>
<td>Diesel Oil (Mobile Sources)</td>
<td>74.100</td>
</tr>
<tr>
<td>Biofuel</td>
<td>70.800</td>
</tr>
</tbody>
</table>

*Source: 2006 IPCC Guidelines Volume 2, Chapter 2*

### Air Travel

#### Emission Factors for Air Transport of Passengers

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Distance Intervals:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≤1000 KM</td>
</tr>
<tr>
<td>For, kg of CO$_2$ per capita/km</td>
<td>0.15</td>
</tr>
<tr>
<td>Radiative Forcing Index (RFI)</td>
<td>1.00</td>
</tr>
<tr>
<td>RFI + PC</td>
<td>0.15</td>
</tr>
</tbody>
</table>

*Source: GHG Protocol (CO$_2$ emissions from business travel version 2.0. Developed by World Resources Institute (WRI) - Distance-Based Emission Factors for Air, Rail, Bus and Car Travel)*

*Given that in the IPCC doesn’t exist a clear consensus over the values and their use, you can use 1*

### Water Consumption

| Suggested Emission Factor, by Water Consumption of the Public Network | $0.5$ kgCO$_2$/m$^3$ |

*Source: A2O Climate Partners*
**GHG EMISSION SOURCES**

**GHG EMISSION**

Transportation of materials:

| Cargo vessel of small containers | 0.0480 Kg CO2e/tmile |
| Cargo vessel of big containers   | 0.0480 Kg CO2e/tmile  |

Source: GHG Protocol (Mobile Guide v1.3 - Table 8)

**Local mobility**

<table>
<thead>
<tr>
<th>Emission source</th>
<th>CLASSIFICATION</th>
<th>Emission factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground transportation</td>
<td>DIESEL BUS</td>
<td>1.03 kg CO2e/km</td>
</tr>
</tbody>
</table>

Source: GHG Protocol

**Generation of waste**

Emission factors for the generation of methane:

<table>
<thead>
<tr>
<th>Type of material</th>
<th>SDGH (kg CO2e / t waste)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food waste</td>
<td>0.15</td>
</tr>
<tr>
<td>Gardens and Parks waste</td>
<td>0.20</td>
</tr>
<tr>
<td>Paper/Cardboard</td>
<td>0.40</td>
</tr>
<tr>
<td>Textiles</td>
<td>0.24</td>
</tr>
<tr>
<td>Wood</td>
<td>0.43</td>
</tr>
<tr>
<td>Others</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Source: 2006 IPCC Guidelines

**GHG EMISSION SOURCES**

**GHG EMISSION FACTOR**

Electricity consumption of a network:

Emission factor of the SDH 0.2611 tCO2e/MWh

\[
FE_{\text{elec}} = \frac{\sum (Q_i \times FE_i)}{G \times (1-p)}
\]

where:
- \( FE_{\text{elec}} \): emission factor for the network in kgCO2e/kWh
- \( Q_i \): fossil fuel consumption in kgCO2e/unit
- \( G \): total generation in the network in kWh
- \( p \): losses by transmission and distribution in the network in Latin American countries ranges between 11% - 12%

Source: GHG Protocol

**GHG emissions of foods**

| Value per caloria | 4.4017 kg CO2e/diner |

Source: A2O Climate Partners
For the calculation of GHG emissions for electric power consumption in the COP20/CMP10 a national factor was used:

Electricity consumption-Accommodation

### 1.4.5. Estimating GHG emissions

Based on the defined GHG emission sources and using the methodologies and emission factors for the calculation, an excel spreadsheet should be prepared with the respective equations for each GHG source.

The COP 20/CMP 10, after determining the GHG emission sources, obtaining the activity levels and having identified its respective emission factors, the calculation of the GHG emissions showed the following results:

<table>
<thead>
<tr>
<th>STAGE</th>
<th>SOURCE</th>
<th>GHG EMISSIONS (tCO₂e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the event</td>
<td>Fuel in the generation of electricity</td>
<td>432.70</td>
</tr>
<tr>
<td></td>
<td>Fuel in vehicles</td>
<td>269.59</td>
</tr>
<tr>
<td></td>
<td>Air travel infrastructure</td>
<td>216.47</td>
</tr>
<tr>
<td></td>
<td>Water consumption</td>
<td>1.24</td>
</tr>
<tr>
<td></td>
<td>Transportation of material</td>
<td>725.01</td>
</tr>
<tr>
<td>During the event</td>
<td>Fuel in the generation of electricity</td>
<td>1,149.62</td>
</tr>
<tr>
<td></td>
<td>Air travel participants</td>
<td>30,114.59</td>
</tr>
<tr>
<td></td>
<td>Local mobility</td>
<td>43.33</td>
</tr>
<tr>
<td></td>
<td>Generation of water</td>
<td>33.33</td>
</tr>
<tr>
<td></td>
<td>Electricity consumption-Accommodation</td>
<td>1,180.14</td>
</tr>
<tr>
<td></td>
<td>GHG emissions as food</td>
<td>2,642.53</td>
</tr>
<tr>
<td></td>
<td>Water consumption</td>
<td>363.88</td>
</tr>
<tr>
<td>After the event</td>
<td>Air travel infrastructure</td>
<td>215.47</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>39,664</td>
</tr>
</tbody>
</table>

---

1 National Grid of Peru
1.4.6. Quality Control

Given the complexity of this type of calculation and the quantity of data and formulas used to obtain the results, it is necessary to implement quality control measures during the process.

During the process of calculation of GHG emissions, the following actions are recommended:

- Check the transcription of the entry data through a double revision done by a second professional to avoid mistakes.
  - Check that all units are duly noted and consistent among each other.
  - Check that the emission factors are duly noted and are the correct ones.
- Revision of the results through a second calculation by sampling.
  - Review the equations, units required and formulas in the calculation process
  - Validate the calculations using an alternative method
- Keep referenced all the activity levels (information) and used documents.
- Keep all the reference documents.

In the process of calculation and report of the COP20/CMP10 the following quality control measures were implemented:

- Verification of the delivered data of activity levels
- Verification of the assumptions and calculations for the activity levels
- Verification of the emission factors
- Verification of the calculations of GHG emissions
- Control of used units and correction factors
- Consistency cross-check of the data
2. GHG EMISSIONS REPORT– COP 20/ CMP 10 LIMA

From 1 to 12 of December of 2014, Lima hosted the Twentieth Conference of the Parties in the United Nations Framework Convention for Climate Change COP20 and the Tenth Meeting of the Conference of the Parties of the Kyoto Protocol CMP10. This event took place in the Army headquarters in San Borja, Lima- Peru and was the first COP/CMP that calculated, verified, neutralized and reported its GHG emissions, becoming certified as carbon neutral.

2.1. Methodology, limits and GHG emission sources

The present is a summary of the report about the main results of the calculation of GHG emissions of the COP20/CMP10.

The GHG Protocol (corporative standard of accounting and report) and the IPCC guidelines for the GHG national inventories were used to calculate GHG emissions of the COP20/CMP10.

The limits for the calculation of the COP20/CMP10 were established considering the physical aspects of the venue, the time in which the developments and execution of the event was carried out (before, during and after) and the activities on which the organization of the COP/CMP had control.

Additionally, GHG sources were classified in accordance to scopes and stages.
2.2. **GHG emissions by source**

a) **Fuel in the generation of electricity**

The GHG emissions from this source were produced by the fuel consumption of the power generators that had to be used in the assembly/construction of the infrastructure of the venue and during the development of the COP20/CMP10.

<table>
<thead>
<tr>
<th>Source of Emissions</th>
<th>Scope</th>
<th>Stage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel consumption of vehicles</td>
<td>3</td>
<td>Before the COP</td>
</tr>
<tr>
<td>Transportation of materials</td>
<td>3</td>
<td>Before the COP</td>
</tr>
<tr>
<td>Fuel consumption in the generation of electricity</td>
<td>3</td>
<td>Before and during the COP</td>
</tr>
<tr>
<td>Water consumption</td>
<td>3</td>
<td>Before and during the COP</td>
</tr>
<tr>
<td>Electricity consumption of the National Interconnected Electric System (SEIN)</td>
<td>2</td>
<td>During the COP</td>
</tr>
<tr>
<td>Air travel participants</td>
<td>3</td>
<td>During the COP</td>
</tr>
<tr>
<td>Local mobility</td>
<td>3</td>
<td>During the COP</td>
</tr>
<tr>
<td>Generation of waste</td>
<td>3</td>
<td>During the COP</td>
</tr>
<tr>
<td>Food preparation</td>
<td>3</td>
<td>During the COP</td>
</tr>
<tr>
<td>Air travel</td>
<td>3</td>
<td>Before and after the COP</td>
</tr>
</tbody>
</table>

### Table 5: GHG emissions by power generators

<table>
<thead>
<tr>
<th>Stage</th>
<th>Fuel Consumption (Liters)</th>
<th>GHG Emissions (t CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the COP20/CMP10</td>
<td>172,294</td>
<td>433</td>
</tr>
<tr>
<td>During the COP20/CMP10</td>
<td>695,086</td>
<td>1,746</td>
</tr>
<tr>
<td>Total</td>
<td>867,380</td>
<td>2,178</td>
</tr>
</tbody>
</table>

### Graphic 1: GHG emissions by power generators

- **Before the COP20/CMP10**: 433 t CO2e (20%)
- **After the COP20/CMP10**: 1,746 t CO2e (80%)
b) Fuel in the vehicles

For the assembly/construction of the infrastructure of the venue of the COP20/CMP10 vehicles were used for the transport of materials and structures. The calculation included the GHG emissions generated by the fuel consumption of these vehicles.

Table 6: GHG emissions by fuel consumption of vehicles

<table>
<thead>
<tr>
<th>STAGE</th>
<th>FUEL CONSUMPTION (LITERS)</th>
<th>GHG EMISSIONS [ t CO₂.e ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the COP20/CMP10</td>
<td>80 000,00</td>
<td>205,09</td>
</tr>
<tr>
<td>Total</td>
<td>80 000,00</td>
<td>205,09</td>
</tr>
</tbody>
</table>

c) Air travel

The calculation included the GHG emissions generated by the trips of the participants and the technical staff in charge of the assembly/construction of the infrastructure of the venue of the COP20/CMP10.

To estimate the generated GHG emissions by the trips of the participants, the official list of participants was provided by the UNFCCC Secretariat along with the application of the surveys (see annex 1). These surveys were developed in the venue during the event requesting information related to the place of origin of the participant. The survey was applied to a sample of 630 foreign participants and 20 national participants. With the list of participants and with the survey results, the final calculation was done.

The COP/CMP Lima received 14,632 participants from 194 countries.

Table 7: GHG emissions by the transportation of participants of the COP20/CMP10

<table>
<thead>
<tr>
<th>STAGE</th>
<th>CONTINENT FROM</th>
<th>SAMPLING GHG EMISSIONS [2011 FLIGHTS] [ t CO₂.e ]</th>
<th>PARTICIPATION (CONTINENT/ TOTAL) [%]</th>
<th>TOTAL GHG EMISSIONS [ t CO₂.e ]</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the COP/CMP</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Europe</td>
<td></td>
<td>1 291,43</td>
<td>17,49%</td>
<td>5 618,22</td>
</tr>
<tr>
<td>Asia</td>
<td></td>
<td>2 281,15</td>
<td>30,90%</td>
<td>9 824,04</td>
</tr>
<tr>
<td>Africa</td>
<td></td>
<td>2 863,25</td>
<td>36,75%</td>
<td>12 447,09</td>
</tr>
<tr>
<td>Central America</td>
<td></td>
<td>61,76</td>
<td>0,84%</td>
<td>268,66</td>
</tr>
<tr>
<td>South America</td>
<td></td>
<td>99,76</td>
<td>1,35%</td>
<td>433,99</td>
</tr>
<tr>
<td>North America</td>
<td></td>
<td>361,26</td>
<td>4,80%</td>
<td>1 571,64</td>
</tr>
<tr>
<td>Croatia</td>
<td></td>
<td>425,36</td>
<td>5,78%</td>
<td>1 850,25</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>7 381,91</td>
<td>100,00%</td>
<td>32 114,59</td>
</tr>
</tbody>
</table>

Furthermore, the trips of the technical staff in charge of the assembly and construction of the venue were included. This includes round trips from France, Brazil, Croatia, Poland and England to Lima from.

The following table presents the air transport emissions of the 211 people for the preparation of the COP20/CMP10 venue:
d) Water consumption

This source considered the consumption of energy in the pumping equipment, carrying water from the storage pits to the final water per capita consumption at COP20/CMP10. This estimate is based on reference information obtained from the district municipality of Miraflores, where each citizen consumes a daily average of 16 liters of water in the use of toilets and 30 liters in the hand washers.

**Tabla 9: Emisiones de GEI por consumo de agua**

<table>
<thead>
<tr>
<th>STAGE</th>
<th>WATER CONSUMPTION (m³)</th>
<th>GHG EMISSIONS [t CO₂]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before the COP</td>
<td>2,475.49</td>
<td>1.24</td>
</tr>
<tr>
<td>During the COP</td>
<td>607,757.22</td>
<td>303.88</td>
</tr>
<tr>
<td>Total</td>
<td>610,232.71</td>
<td>305.12</td>
</tr>
</tbody>
</table>
e) Transportation of material

For the assembly/construction of the venue materials were shipped by sea from Brazil, United Arab Emirates, England and Belgium. Table 10 shows the emissions related to this item.

<table>
<thead>
<tr>
<th>Table 10: GHG emissions by the transport of materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STAGE</strong></td>
</tr>
<tr>
<td>Before the event</td>
</tr>
</tbody>
</table>

f) Local transport

The organization of the COP/CMP provided the service of local transportation throughout shuttle buses that mobilized the participants through 7 routes and following pre-established schedules. The calculation of GHG emissions of the COP20/CMP10 included the GHG emissions generated by the transportation of the participants from their accommodation to the venue and vice versa.

<table>
<thead>
<tr>
<th>Table 11: GHG emissions by local mobility</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Stage</strong></td>
</tr>
<tr>
<td>During the COP20/CMP10</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
</tr>
</tbody>
</table>

g) Solid waste

Based on local per capita waste generation factors and the total quantity of participants of the COP20/CMP10, the total amount of generated solid waste was estimated. GHG emissions were estimated applying a organic waste factor.

<table>
<thead>
<tr>
<th>Table 12: GHG emissions by solid waste</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SOURCE</strong></td>
</tr>
<tr>
<td>Solid waste</td>
</tr>
</tbody>
</table>
h) Electricity consumption in accommodation

This source includes GHG emissions produced by the electricity consumption of foreign participants at their hotels. This calculation was based on the list of participants, a per capita consumption of electricity of 36.4 kWh/night\textsuperscript{2} and surveys (see annex 1) applied to 630 participants requesting information of days of stay in hotels.

\begin{table}[h]
\centering
\caption{GHG emissions by electricity consumption in accommodation}
\begin{tabular}{|c|c|c|}
\hline
SAMPLE CONSUMPTION (kWh) & TOTAL CONSUMPTION (kWh) & TOTAL GHG EMISSIONS [ t CO\textsubscript{2}e ] \\
\hline
252,751.60 & 4,539,038.69 & 1,169.26 \\
\hline
\end{tabular}
\end{table}

i) Food preparation

To carry out this calculation it has been taken as reference an average of GHG emissions generated per person obtained from a study on restaurants emissions in Lima. The referred study considers the GHG emissions factor associated to the preparation of the food (electricity consumption, water and paper, generation of solid waste and employee commuting).

The above emission factor per dinner and the surveys (see annex 1) applied to 630 participants the GHG calculation was done.

\begin{table}[h]
\centering
\caption{GHG emissions for the preparation of food}
\begin{tabular}{|c|c|}
\hline
SAMPLE GHG EMISSIONS (tCO\textsubscript{2}e) & TOTAL GHG EMISSIONS [ t CO\textsubscript{2}e ] \\
\hline
108.69 & 2,442.53 \\
\hline
\end{tabular}
\end{table}

Total GHG emissions of the COP 20/CMP10

The COP20/CMP10, developed in Lima, had the attendance of 11,185 foreign participants and 14,632 persons in total. The different activities developed before, during and after the COP20/CMP10 reported a total of 39,664 tons of carbon dioxide equivalent.
The sources with the highest reported GHG emissions were: “Air travel of participants”, “Fuel in the generation of electricity” and “GHG emissions in food”, that accumulated a 91.53% of the total of GHG emissions of the COP20/CMP10, as shown by the following figure:

Table 15: GHG emissions of the COP20/CMP10

<table>
<thead>
<tr>
<th>SOURCE</th>
<th>GHG EMISSIONS (t CO₂e)</th>
<th>PARTICIPATION (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel in the generation of electricity</td>
<td>2,176.32</td>
<td>5.49%</td>
</tr>
<tr>
<td>Fuel in the vehicles</td>
<td>205.09</td>
<td>0.52%</td>
</tr>
<tr>
<td>Air travel infrastructure</td>
<td>430.93</td>
<td>1.09%</td>
</tr>
<tr>
<td>Water consumption</td>
<td>305.12</td>
<td>0.77%</td>
</tr>
<tr>
<td>Transport of material</td>
<td>725.01</td>
<td>1.83%</td>
</tr>
<tr>
<td>Air travel participants</td>
<td>32,114.59</td>
<td>80.97%</td>
</tr>
<tr>
<td>Local mobility</td>
<td>43.33</td>
<td>0.11%</td>
</tr>
<tr>
<td>Generation of waste</td>
<td>33.37</td>
<td>0.08%</td>
</tr>
<tr>
<td>Electricity consumption-Accommodation</td>
<td>1,165.14</td>
<td>2.99%</td>
</tr>
<tr>
<td>GHG emissions on food</td>
<td>2,442.93</td>
<td>6.16%</td>
</tr>
<tr>
<td><strong>TOTAL GHG EMISSIONS COP20/CMP10</strong></td>
<td><strong>39,664</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

The sources with the highest reported GHG emissions were: “Air travel of participants”, “Fuel in the generation of electricity” and “GHG emissions in food”, that accumulated a 91.53% of the total of GHG emissions of the COP20/CMP10, as shown by the following figure:
3. Verification of the calculation of GHG emissions of a COP

The verification of the calculation is a key element in the quantification of GHG emissions, and provides transparency to the calculation process.

This process consists of an audit of the reported information in the calculation of GHG emissions, used methodology, criteria and principles. The verification, verifies that the supplied data is complete, does not have inconsistencies or errors that can affect the calculated emissions, formulas used and other components of the calculation. Although there is no specific rule for the verification and validation of the calculation of GHG emissions of an event. It is recommended to use the standard ISO 14064 and the GHG Protocol.

The standard ISO 14064 in its part 1, details the principles and requirements of an organization for the design, management and publication of a GHG inventory. This includes the requirements for the determination of the limits, quantification of the emissions and identification of actions or specific activities of an organization, aimed to improve its GHG management. It also includes the requirements and guidelines about the management of the quality of the GHG inventory, presentation of reports, internal audits and responsibility of the organization in the verification.

Furthermore, the standard ISO 14064 in its part 3 in turn, establishes the principles, requirements and guidelines for those institutions that do the validation and verification of GHG information. Only the companies that are validated under this standard can grant certifications of verification and validation of calculations.

Based on the above, the verification and validation of the calculation of GHG emissions of a COP/CMP, should be realized by an auditing company registered as a certified entity in accordance to the standard 14064-3.

The verification of the COP20/CMP10

In the case of the verification and validation of the calculation of GHG emissions in the COP20/CMP10, since no specific methodology for the calculations of events was available, the international auditor used essentially the standard ISO-14064, but also used the GHG Protocol as a complement.

Since part of the COP/CMP organization and logistics was outsourced, this third party answered all the observations raised by the auditing company. Once the observations were absolved, the certification of verification and GHG emissions offsetting was completed, on behalf of the COP20/CMP10 organizers in a public ceremony attended by the media.
4. Measures to reduce GHG emissions of a COP/CMP

Reducing GHG emissions associated with a COP/CMP is a goal to consider in future meetings, even more when the aim of these events is that the countries agree actions to stop climate change and its effects.

This chapter describes a sample of actions that could be considered in the planning of future COPs/CMPs so as to reduce the negative impacts and maximize the positive impacts.

The development of efforts previous to the event will bring along important positive impacts such as: less pressure over the sources (energy, water and paper), less generation of waste and maximize social benefits, among others.

The following paragraphs list options that could be considered, if feasible, during the planning phase of a COP/CMP.

4.1. Main Venue Location
- Identify convention centers that implement energy efficiency measures and if feasible crosscheck if they hold any environmental certification.
- Take into account the distance from venue to the main hotels and accommodations.

4.2. Air transport of participants
- The organization of the COP/CMP should advise previously to the attendees to consider the most efficient airlines or with policies of sustainability in its flights.
- If possible suggest to participants the purchase of offsetting services provided by the airline.

4.3. Local transportation
- Encourage the transfer of not motorized transportation throughout the use of bicycles and even walking if weather and safety allows it.
- Organize the transfer of the participants to the main venue in efficient buses and through optimized routes.
- Provide information to the participants about how the COP/CMP attendees can use public transport. Facilitate maps and routes of the buses and/or metro.

4.4. Electricity consumption
- Provide to the main venue of the COP/CMP, whenever possible, energy (electricity, heat, steam) that is produced through renewable sources.
- Apply practices of energy saving during the organization and development of the COP/CMP.
4.5. Catering (food service)
- Use reusable dishes of clay or glass instead of polystyrene and plastic.
- Consider the local food and those that generate the least amount of solid waste.
- If feasible, adapt containers that allow the gathering of organic matter that facilitates the preparation of compost.

4.6. Water consumption
- Select a venue with water saving or efficient devices.
- Avoid bottled water proposing policies of self service (re-fill) through dispensers.

4.7. Consumption of paper and other materials
- If possible use recycled paper or with certification of sustainable management.
- Print all papers double-sided.
- Provide formats of electronic presentation instead of printed brochures.
- If bags or other gifts are provided, use biodegradable or recyclable products.

4.8. Solid waste
- Secure the disposal of containers for the recycling of solid waste in visible places.
- Give priority to the purchase of recycled products and recycled post-consumption.

4.9. Services provided by third parties
- Secure that the provider possesses a policy of sustainability in the provided services.
As example in the case of the COP20, the actions addressed to reduce GHG emissions were the following:
Local mobility - fuel efficiency

- The average velocity of the buses that transported the participants every 15 minutes, was defined in 60 km/h which is considered an optimal speed for the efficient use of fuel.

- The drivers of the fleet of buses received training about good driving practices. This optimized the service and reduced fuel consumption.

- A bicycle loan programme was implemented and made them available to COP participants.

- All the buses received preventive maintenance in the period of service

Efficient use of materials

- For communications it was used apps such as Whatsapp. Also the reports were developed in Google Drive. This allowed to avoid the use of paper and printing.

- In the dining and café areas, all materials (dishes, cups, spoons, etc.) were made of organic fiber. Once this material was used, 100% recyclable black PET was used.

- In carbonated beverages PET was used PET plastic, also fully recyclable.

- All dining and refreshment areas had mobile chargers powered by solar energy
5. Offsetting the GHG emissions of a COP/CMP

Worldwide, more and more events are organized as carbon neutral events. The offsetting of GHG emissions. This way, emissions generated by an event A, can be compensated in a project B in other part of the planet through the exchange/purchase/retirement of verified carbon credits.

To achieve offsetting the following steps are recommended:

- Identify the project issuing carbon credits, national or international, that is aligned with the defined criteria from the organizers of the COP/CMP for its selection. Among the selection criteria for carbon credits and projects are: prices and certification standards of the carbon credits, social aspects of the project, communication and media potential, scale, location and type of project (e.g. energy efficiency, REDD or others).

- Acquisition (via purchase or grants) of the necessary quantity, quality and type of carbon credits for the offsetting of GHG emissions of the COP/CMP.

- Withdrawal of carbon credits. Once the project has been chosen the purchase contract should specify their retirement from the carbon market so they cannot be used again. Carbon credits will be deducted from the seller registration account and sometimes transferred to a trust.

- Issuance of offsetting certificate. Once the process has been audited, the offsetting certificate is issued and delivered to the COP/CMP organizers.
The COP20/CMP10 neutralized its emissions through carbon credits from REDD+ projects with the highest international standards like the Verified Carbon Standard (VCS) and the Climate Community and Biodiversity Standards (CCBS Standards); these projects are located in four areas:

- **Alto Mayo Protection Forest (BPAM)**

  It is located in the San Martin region, with an area of 182,000 hectares. The BPAM houses a REDD+ project implemented by Conservation International (CI). Its aim is to counter the threat of deforestation due to continuous migration, lands, traffic, and unsustainable activities undertaken by the population in the area. The project supports local communities to improve and secure their livelihoods and achieve a participatory manner for the conservation of forests, a vital ecosystem for their development.

- **Cordillera Azul National Park (PNCAZ)**

  It has an area of 1,353,190 hectares at the confluence of four departments: San Martin, Huanuco, Loreto and Ucayali. The REDD+ project in this NPA is run by the Center for Conservation, Research, and Management of Natural Areas Cordillera Azul (CIMA). Its main goal is to prevent deforestation in the PNCAZ. Thus, they promote the strengthening of the protection by involving local people in land use and the development of activities that are compatible with conservation, that help to improve life quality for residents that live near the National Park.

- **Tambopata National Reserve and Bahuaja Sonene National Park**

  Both are located in Madre de Dios and cover an area of around 1.3 million hectares. These areas have the highest levels of biodiversity in the country, as part of the Tropical Andes Hotspot. The REDD+ project, implemented by the Association for Research and Integral Development (AIDER) on 500,000 hectares, aims to prevent deforestation through monitoring and surveillance of parks, conservation agreements, existing biodiversity research, and development of sustainable activities in the buffer zone.

A total of 39,634 TM CO2e in carbon credits were retired from the market to compensate GHG emissions from the COP20/CMP10. These projects are aimed to avoid deforestation of the Peruvian rainforest, contribute to conserve important biological diversity, and promote sustainable economic activities with the participation of the local communities.
Annex 1: Applied survey model in the COP20/CMP10

**Calculating GHG emissions at COP20**

This sampling will help us to calculate the GHG emissions by transport and accommodation at COP20 Lima-Peru.

(Este muestreo nos ayudará a calcular las emisiones GEI por la COP 20 Lima-Peru)

**Email**

Correo electrónico

**Air transport (Transporte aéreo)**

International flights (Vuelos internacionales)
Country where you come from to the COP 20:
(País desde donde viene a la COP 20).

☐ Flight offset? ¿Vuelo neutralizado?

**National flights (Vuelos nacionales)**

Peruvian city where you come from to the COP 20
(Ciudad peruana de donde viene a la COP 20).

☐ Flight offset? ¿Vuelo neutralizado?

**In Lima: Local transport (Transporte local en Lima)**

☐ COP20’s transport?

If not use COP20’s transport, please complete:
(Si no usa el transporte de la COP20, complete)
Mode of transport to arrive at the COP20’s event
(Modo de transporte que usa para llegar el evento de la COP 20):

Mode of transport to arrive at the COP20’s event
(Modo de transporte que usa para llegar el evento de la COP 20):

How much time do you spend for arriving to the COP20?
(¿Cuánto tiempo le toma para llegar el evento de la COP 20?)

Minutes (minutes):

---

**How many days will you attend to the COP 20’s events?**

(¿Cuántos días asistirá a los eventos de la COP 20?):

Accommodation (Hospedaje)

How many days will you be lodged in Lima to attend events at COP20?
(¿Cuántos días estará hospedado en Lima para asistir a la COP20?):

Where do you usually take breakfast? (¿Dónde suele tomar el desayuno?):

Hotel's Service: ☐ COP 20’s Service: ☐

Restaurant: ☐ Others: ☐

Where do you usually take lunch? (¿Dónde suele comer el almuerzo?):

Hotel’s Service: ☐ COP 20’s Service: ☐

Restaurant: ☐ Others: ☐

Where do you usually take dinner? (¿Dónde suele comer la cena?):

Hotel’s Service: ☐ COP 20’s Service: ☐

Restaurant: ☐ Others: ☐

☐ Do you want to receive your GHG emissions by email? (¿Desea recibir el resultado de sus emisiones por correo electrónico?):

Thanks a lot for your contribution! All COP20’s GHG emissions will be offset.

Muchas gracias por su contribución. Todas las emisiones de la COP20 serán neutralizadas.

AG Climate Partners
Annex 2: Results from the applied survey in the COP20/CMP10

Table 16: Number of surveys by origin of surveyed

<table>
<thead>
<tr>
<th>CONTINENT FROM</th>
<th>NUMBER OF ANSWERS</th>
<th>AVERAGE DAYS OF ASSISTANCE</th>
<th>AVERAGE DAYS OF ACCOMMODATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asia</td>
<td>128</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Europe</td>
<td>128</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>Africa</td>
<td>106</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>North America</td>
<td>84</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>South America</td>
<td>121</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Central America</td>
<td>57</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Oceania</td>
<td>6</td>
<td>11</td>
<td>10</td>
</tr>
<tr>
<td>Total foreigners</td>
<td>630</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Total national</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total surveyed</td>
<td>650</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The number of foreigners surveyed overcame the size of the estimated sample. In the following table is presented the information of the development of the survey:

Table 17: Data of the Survey in the Venue

<table>
<thead>
<tr>
<th>Quantity of surveyed</th>
<th>4 – 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Days that was surveyed</td>
<td>2 – 9 December 2014</td>
</tr>
<tr>
<td>Schedule in which was carried out the survey</td>
<td>9:00h – 16:00h</td>
</tr>
<tr>
<td>Place</td>
<td>Headquarters of the Army in San Borja, Lima - Peru</td>
</tr>
</tbody>
</table>

Parameters for the survey:

<table>
<thead>
<tr>
<th>Population size (N)</th>
<th>14000 people (foreigners + national)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variance (σ²)</td>
<td>0.5</td>
</tr>
<tr>
<td>Error percentage (ε)</td>
<td>6%</td>
</tr>
<tr>
<td>Alpha (1 - Alpha – level of confidence) (α)</td>
<td>5%</td>
</tr>
<tr>
<td>Sample size (n')</td>
<td>514 people</td>
</tr>
</tbody>
</table>

Source: A2G Climate Partners

\[ n' = \frac{Z^2 \sigma^2 N}{e^2(N-1)+Z^2\sigma^2} \]

The sample size was estimated with the following equation:

The surveys were tabulated in a workbook (Microsoft Excel), considering the values of central tendency (averages and model values), as the values for quality control.
Anexo 3: Quality Carbon Footprint Certificate of the COP20/CMP10

Certificate

We are pleased to award this certificate of calculation of carbon footprint to:

LIMA COP20 - CMP10
CONFERENCE OF THE PARTIES
LIMA CARIBBEAN CLIMATE 2014

This certificate assures that the calculation of the generated GHG emissions in the development of the activities of the Twentieth Conference of the Parties in the United Nations Framework Convention for Climate Change COP20 and the Tenth Meeting of the Conference of the Parties of the Kyoto Protocol CMP10 in the year 2014 amount to 39,664 metric tons, were calculated in base of the international lineaments of the Greenhouse Gas Protocol and the Guidelines of the Intergovernmental Panel on Climate Change.

March, 2015 Lima

A2G-Reg- Cert-Nº: 2012-02-HC
www.atwog.com
Certificate AENOR Environment
CO$_2$ Neutral

EC-015/2015

AENOR, Spanish Association for Standardization and Certification, certifies that the event:

TWENTIETH SESSION OF THE CONFERENCE OF THE PARTIES (COP20)
TENTH SESSION OF THE CONFERENCE OF THE PARTIES SERVING AS
THE MEETING OF THE PARTIES (CMP10)

organized by:

MINISTRY OF THE ENVIRONMENT OF THE REPUBLIC OF PERU

is Carbon Neutral, having offset 39,664 tCO$_2$e calculated according to the methodology stated in GHG PROTOCOL through the commitment of removing 39,664 Verified Carbon Units (VCUs) issued by the Verified Carbon Standard (VCS).

For the event held at: Guarel General del Ejército (Pentagonito), San Borja, Lima (Peru)
from 01 to 12 December 2014.

Date of Issue: 2015-05-27

[Signature]

Avelino PINTO MARQUINA
CEO AENOR

AENOR
Asociación Española de Normalización y Certificación
Gihueta, s/n 28004 Madrid, España
Tel.: 912 102 201 – www.aenor.es