WHAT’S HAPPENING

Climate change is a significant issue of the 21st century and is recognized as a leading threat to global security. The Intergovernmental Panel on Climate Change (IPCC) recognizes the consequences of increased levels of greenhouse gases (GHG) within our atmosphere as a result of man’s activities.

Since then, international institutions have launched numerous initiatives regarding climate change, in particular to encourage the reduction of fossil fuel-based energy consumption and to promote the use of renewable energy sources. Legislative frameworks are evolving in several countries to drive further governmental and corporate action to reduce GHG emissions. These factors lead to increasing obligations for companies, and to an increased burden and substantial costs for the aerospace value chain, due to the complexity and variability of the information and requirements needed.

In 1997, 37 countries committed to reduce their GHG emissions under the Kyoto Protocol.

WHAT ARE GREENHOUSE GASES?

Greenhouse gases are gases in the atmosphere such as water vapor, carbon dioxide, methane and nitrous oxide that can absorb infrared radiation, trapping heat in the atmosphere. The greenhouse effect means that emissions of greenhouse gases due to human activity attributes to global warming.
GLOBAL WARMING? Global warming is the long-term heating of Earth’s surface observed since the pre-industrial period (between 1850 and 1900) due to human activities, primarily fossil fuel burning, which increases heat-trapping greenhouse gas levels in Earth’s atmosphere.

VS

CLIMATE CHANGE? Climate change is the long-term change in the average weather patterns that have come to define Earth’s local, regional and global climates. These changes have a broad range of observed effects that are synonymous with the term.
The Greenhouse Gas Protocol (GHG Protocol) is a multi-stakeholder partnership of businesses, non-governmental organizations (NGOs), governments, and others convened by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). Launched in 1998, the mission of the GHG Protocol is to develop internationally accepted greenhouse gas (GHG) accounting and reporting standards and tools, and to promote their adoption in order to achieve a low emissions economy worldwide.

IAEG’s GHG Reporting Guidance for the Aerospace Industry has the acknowledgement of the GHG Protocol, and we are currently seeking the same for the Purchased Goods and Services guidance.

**THE GREENHOUSE GAS PROTOCOL**

**SCOPE 1**
- Direct emissions from owned or controlled sources
  - Company facilities
  - Company vehicles

**SCOPE 2**
- Indirect emissions from the generation of purchased energy
  - Purchased electricity
  - Steam
  - Heating & cooling for own use

**SCOPE 3**
- All indirect emissions (not included in scope 2) that occur in the value chain of the reporting company, including both upstream and downstream emissions
  - Purchased goods/services
  - Capital goods
  - Fuel/energy related activities
  - Transportation/distribution
  - Waste generated in operations
  - Business travel
  - Employee commuting
  - Leased assets
  - Processing of sold products
  - Use of sold products
  - End-of-life treatment of sold products
  - Franchises
  - Investments
PURCHASED GOODS/SERVICES

- ELECTRICITY (STEAM, H&AC FOR OWN USE)

CAPITAL GOODS
- FUEL/ENERGY RELATED ACTIVITIES
- TRANSPORTATION/DISTRIBUTION

TRANSPORTATION/DISTRIBUTION
- PROCESSING SOLID PRODUCTS
- END-OF-LIFE TREATMENT (SOLD PRODUCTS)

REPORTING COMPANY
- USE OF SOLD PRODUCTS
- FRANCHISES
- INVESTMENTS

DOWNSTREAM ACTIVITIES

SCOPE 1
- DIRECT

SCOPE 2
- INDIRECT

SCOPE 3
- INDIRECT

POSSIBLY RELEVANT SCOPE 3 EMISSIONS FOR THE A&D INDUSTRY

GREENHOUSE GAS PROTOCOL

GHG PROTOCOL OVERVIEW

SCOPES AND EMISSIONS ACROSS THE VALUE CHAIN

CO2
- CH4
- N2O
- HFCs
- PFCs
- SF6
- NF3

POTENTIALLY RELEVANT SCOPE 3 EMISSIONS FOR THE A&D INDUSTRY

POTENTIALLY RELEVANT SCOPE 3 EMISSIONS FOR THE A&D INDUSTRY
Within the Aerospace and Defence industry, Scope 3 GHG emissions represent the significant majority of our footprint, particularly when considering use of sold products.
WHAT DOES GHG PROTOCOL MEAN TO A&D COMPANIES?

WHY YOU SHOULD CARE (RISKS):

- Access to credit
- Employee retention
- General market (stakeholder) interest
- Legal obligations in certain regions
- Financial market requests
- Loss of credibility and reputation
AEROSPACE INDUSTRY TOOL FOR CALCULATING SCOPE 3 GREENHOUSE GAS EMISSIONS OF PURCHASED GOODS & SERVICES AND CAPITAL GOODS

These emission groups were determined as being the most relevant and the larger of the scope 3 categories for the Aerospace industry.

Purchased Goods and Services examples:
• System assemblies
• Standard parts
• Structure parts
• Office consumables
• Raw materials
• IT and financial services

Capital goods examples:
• Production equipment
• Vehicles
• Buildings
• Furniture and IT equipment

Spend Vs Mass Methodology:
• The tool requires procurement data inputs in Mass (Kg) and/or Spend ($ or Euro) dependent on the input
• Mass based data is more accurate, but a hybrid approach—utilising both data types can be used
• Some data points will only have a financial input, for example, $ spent on consultancy services
• A decision tree is included in the tool to help users select the method most appropriate for them (see next page for detail)
EMISSION FACTORS SELECTION

- Where possible, the tool aims to use public sources of information for the emission factors.
- Cradle-to-gate emission factors are used where available.
- Geographic scope is the US, Europe, Japan, Brazil or China.
- Example of databases include those such as DOD, BASE impacts, EIO-LCA.
- The factors and tools are updated frequently to ensure accuracy; the first version was published in 2020 and is being updated in 2022 with revised factors and new categories.
TOOL INPUTS
• Users select product or service types from pre-populated drop down lists
• Up to three levels of categorisation so conversion factors used can be specific to the product or service
• Users then simply add the quantity of the mass or spend, based on the method they have selected or what is available
• Tool then auto calculates the emissions with the specific purchases

TOOL OUTPUTS
• Exports visually engaging charts and graphs to support business interpretation of the results
• Provides detail on tonnage of CO2 and percentage split between categories
• Highlights distribution of GHG emissions by decreasing significance
• Provides actionable outputs to track performance/trends, enabling targeted action within supply chain
• Supports users in responding to increasing stakeholder requirements—such as CDP, DJSI and SBTI

FUTURE DEVELOPMENTS
• Updates to the conversion factor and addition of new product types are being developed
• The group is seeking WRI GHG Protocol accreditation as previously done with other guidance documents

SCOPE 3 PURCHASED GOODS & SERVICES AND CAPITAL GOODS CALCULATION TOOL
**SCOPE 3 CATEGORY 11**

**USE OF SOLD PRODUCTS**
Scope 3, Category 11, “Use of Sold Products” is one of the most relevant Scope 3 emissions categories for many aerospace companies. It represents the projection of the future lifetime emissions from the use of goods and services sold by the reporting company in the reporting year.

IAEG developed an industry-specific methodology and guidance materials to promote consistency of reporting approaches within the industry.

The first issue of the guidance focuses on civil aviation applications (commercial aviation and business jets) and is meant to complement the GHG Protocol: Corporate Value Chain (Scope 3) Accounting and Reporting Standard, and the GHG Protocol’s Technical Guidance for Calculating Scope 3 Emissions—Category 11 Use of Sold Products, as well as the relevant sections of the ISO 14064-1 standard and ISO/TR 14069 guidance, where appropriate.

**EMISSION TYPES**

**DIRECT USE PHASE EMISSIONS**
- Emissions from products that directly consume energy (fuels or electricity) during use.
- **Examples:** emissions associated with fuel or electricity consumed by aircraft & engines, and emissions associated with energy (via engine offtakes) directly consumed by systems on board of the aircraft.

**INDIRECT USE PHASE EMISSIONS**
- Emissions from products that indirectly consume energy (fuels or electricity) during use.
- **Examples:** emissions associated with the use of aircraft interiors, landing gear and other systems. Their weight contributes to the overall fuel burn of the aircraft, and therefore results in indirect emissions for those systems (aircraft interiors, landing gears etc).

**OVERALL PROCESS**
- Determine organizational boundaries
- For products or integrated systems at least partially attributable to activities within the organizational boundaries
- Calculate whole aircraft lifetime emissions
- Allocate whole aircraft lifetime emissions to relevant products in question based on product lifetime and an allocation method
- Report the portion of emissions defined by organizational boundaries

The guidance also provides equations to calculate an intensity metric expressed in gCO2e per Revenue Passenger Kilometer (RPK) or Revenue Tonne Kilometer (RTK) in order to show improvements in product performance over time.
SCAPE 3
CATEGORY 11

GUIDELINE INCLUDES

- Formula for the computation of GHG emissions and intensity metric
- Allocation methodology for sold intermediate products
- Fossil jet-A/A1, Jet-B, fossil Aviation Gasoline (AvGas) emission factors
- Generic aircraft utilisation data per aircraft category (excluding business jets)
- Incorporation of Sustainable Aviation Fuel (SAF) or alternative energy (hydrogen, ammonia, electricity)
- Practical examples to illustrate the application of the guidance

PILOT PHASE
EARLY 2023

IAEG launches a pilot phase to gather further feedback from aerospace companies before public release of the guidance. Examples of applications of the guidance:

- Aircraft
- Engine
- Component with direct energy use (Environmental Control System, Electrical systems, Hydraulic systems, Auxiliary Power Units)
- Component without direct energy use (systems, aerostructures, cabin)
- Specific parts (mechanical parts)
- Standard parts (mechanical and electrical parts)

PLEASE CONTACT claire.boitenner-constans@airbus.com if you are interested in participating in this pilot phase.
A WAY FORWARD

The Paris agreement signed on 12 December 2015 by 196 parties, and the subsequent Conference of the Parties (COP) summits on Climate change call for action plans that must limit Global Warming below 2, preferably 1.5 degrees C above pre-industrial levels. For our sector, the International Civil Aviation Organization (ICAO) General Assembly of 7 October 2022 has adopted a collective worldwide Long Term Aspirational Goal (LTAG) to reduce to zero the net carbon emissions of Aviation in 2050. The States, the Air transport sector, and the Aerospace Industry are all committed to succeed ... and take actions! Governments have started to take legal steps towards a mandatory reporting of greenhouse gas emissions by the industrial sectors, and towards mandatory commitments to reduce them.

Aerospace & Defence (A&D) companies, as part of their own ESG journey or stimulated by the financial markets, are on the move: for reporting their emissions and for setting up reduction plans. Some A&D companies are pursuing their zero-carbon transformation by setting emissions reduction targets grounded in climate science through the Science Based Targets initiative (SBTi).

IAEG is willing to support Aerospace companies of all size with tools and guidance documents on a voluntary basis to help our industry move towards our Net-Zero future!
RESOURCES

GHG Reporting Guidance for the Aerospace Industry—
A Supplement to the GHG Protocol Corporate Accounting and Reporting Standard
https://www.iaeg.com/binaries/content/assets/iaeg/iaeg-ghg-reporting-guidance-v3.pdf

Calculation tool for purchased goods and services and capital goods
https://www.iaeg.com/binaries/content/assets/iaeg/pgs-and-cg-ghg-calculations-tool.xlsx

Methodology for calculating emissions from purchased goods and services and capital goods
https://www.iaeg.com/binaries/content/assets/iaeg/pgs-cg-userguide.docx

User guide for supporting calculation tool for purchased goods and services and capital goods
https://www.iaeg.com/binaries/content/assets/iaeg/pgs-cg-methodology.docx

Webinar on use of the calculation tool
https://www.iaeg.com/binaries/content/assets/iaeg/wg3-s3-pgs-cg-webinar.pptx
A RECOGNIZED GLOBAL BODY FOR AEROSPACE & DEFENSE

LEADING EDGE SOLUTIONS ACROSS THE VALUE CHAIN

TACKLE CLIMATE CHANGE
CHAMPION CHEMICAL STEWARDSHIP
FOSTER SUSTAINABILITY
ENGAGE SUPPLY CHAIN

RESPONSIBLE & SUSTAINABLE AEROSPACE INDUSTRY

IAEG Full Members
Airbus SAS
ATR
BAE Systems
Boeing
Bombardier
Dassault Aviation
De Havilland Aircraft of Canada Limited
Embraer
GE Aviation
GKN Aerospace
Gulfstream
Honda Aircraft Company, LLC
Honeywell
Howmet Aerospace
Huntsman Advanced Materials
Israel Aerospace Industry
L3Harris Technologies, Inc.
Leonardo Company
Lockheed Martin
Meggitt PLC
Northrop Grumman
Raytheon Technologies
Rolls-Royce
SAAB AB
SAFRAN
Spirit AeroSystems
Textron Inc.
Thales
3M Deutschland GmbH

IAEG Liaison Members
Airbus Canada
Airbus Defence and Space GmbH
Airbus Helicopters (Salamander)
Assent Compliance Inc.
Dassault Systemes Enovia
DXC Technology
Granta Design Ltd
Haley & Aldrich
Hangsterfer’s Laboratories, Inc.
National Quality Assurance
Noblus
Ramboll Environment & Health Risk & Policy Analysts Ltd
SAFECHEM Europe GmbH
Souriau SAS
Tetra Tech
Yordas Group

46 MEMBER COMPANIES
70% OF GLOBAL AEROSPACE & DEFENSE INDUSTRY ARE IAEG MEMBERS
$488B COMBINED ANNUAL 2020 REVENUES FOR IAEG (FULL) MEMBERS
$697B TOTAL GLOBAL AEROSPACE INDUSTRY 2020 REVENUES

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