The Consumer Goods FORUM

sustainability

activation toolkit

Supporting CGF members in implementing the resolutions and recommendations from the sustainability working groups

The Consumer Goods Forum Sustainability Activation Toolkit

"Supporting CGF members in implementing the resolutions and recommendations from the sustainability working groups"

Acknowledgements

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- Walmart

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ATKearney

toolkit

Activation toolkit for sustainability

Over the last three years the sustainability pillar of The Consumer Goods Forum has engaged a wide range of companies and organisations in a series of projects that have covered a broad spectrum of topics.

These projects have resulted in two CGF Board resolutions, a series of recommendations for CGF members and in the publication of several documents, such as this.

This activation toolkit brings together a summary of both the work that has been completed as well as the work that is currently in progress. As such, it serves as a handy reference manual for the work in the sustainability pillar.

More importantly, the toolkit provides guidance for CGF members that have not been active in these projects on how to implement the recommendations made by the project teams. This is through simple "how-to" guidelines that contain information on the rationale for addressing each topic, what steps to follow, reference documents, useful contacts and how to measure progress in the activation.

So, for example, this document lays out the rationale behind the CGF resolution on deforestation, explains how we, as an industry, can deliver on that resolution and gives clear guidance on how individual companies can buy sustainable commodities such as palm oil that protect our rainforests.

We recommend that this document is shared widely with both business leaders and CSR managers within your organisation.

The online version of this document will continue to be updated as the work of the sustainability pillar progresses: **http://sustainability.mycgforum.com**

The Consumer Goods FORUM

Contents

Working Collaboratively
Introduction

The sustainability pillar of The Consumer Goods Forum was started on the basis of a shared belief that our industry would be better served if we worked collectively on tackling the challenges of making our businesses and our industry sustainable.

This basis is expressed in the underlying principles of the pillar:

1. We will seek to decouple business growth from our environmental and social impacts. Our objective will be to achieve our respective companies' growth ambitions whilst at the same time improving our environmental impact.

2. We will continue to compete as businesses to bring products to our consumers. But, in accordance with the CGF antitrust guideline, we will work together and share learning to address the challenge of improving the environmental and social impact of our industry (including climate change).

3. Our work will be guided by the objective of helping our customers reduce their environmental and social impact through their product choice (what they buy, where they buy it and how they use it).

4. We will take a 'life cycle view' and cooperate within and across industry sectors, encompassing every step of the value chain from the sourcing of raw materials to consumer use and disposal of finished products.

Sustainability is an area where CGF member companies can be effective and make a significant difference by acting collaboratively, in accordance with antitrust/competition laws. Working groups have addressed or are currently addressing the following issues:

deforestation. With sub teams focused on each commodity crop: palm oil; soy; beef; paper & pulp.

refrigeration.

impact measurement.

solid waste.

packaging.

consumer glossary.

1: Defores

tation

"Tackling the issue of tropical deforestation will be essential if the world is to limit global warming."

1.1. Principles & resolutions on deforestation

Deforestation and greenhouse gas emissions

"Deforestation is the removal of a forest or stand of trees where the land is thereafter converted for non-forest use. Examples of deforestation include conversion of original woodland to other uses.[1]"

The IPCC estimate that deforestation could account for around 17% of all annual greenhouse gas emissions[2] as a result of a number of factors:

- Tropical rain forests are an important store of carbon. They draw down atmospheric CO2 through photosynthesis and store it in bio-mass.
- As trees are cut down and peat lands disturbed huge volumes of greenhouse gases are released back into the atmosphere.
- Once the trees are gone there is less future capacity to sequester carbon from the atmosphere.
- Finally, the clouds which cover the tropical rainforests provide an insulating belt around the planet reflecting sunlight. This can reduce the ground temperature by as much as 5 degrees Celsius. Once the forests are cleared the insulating effect is lost.

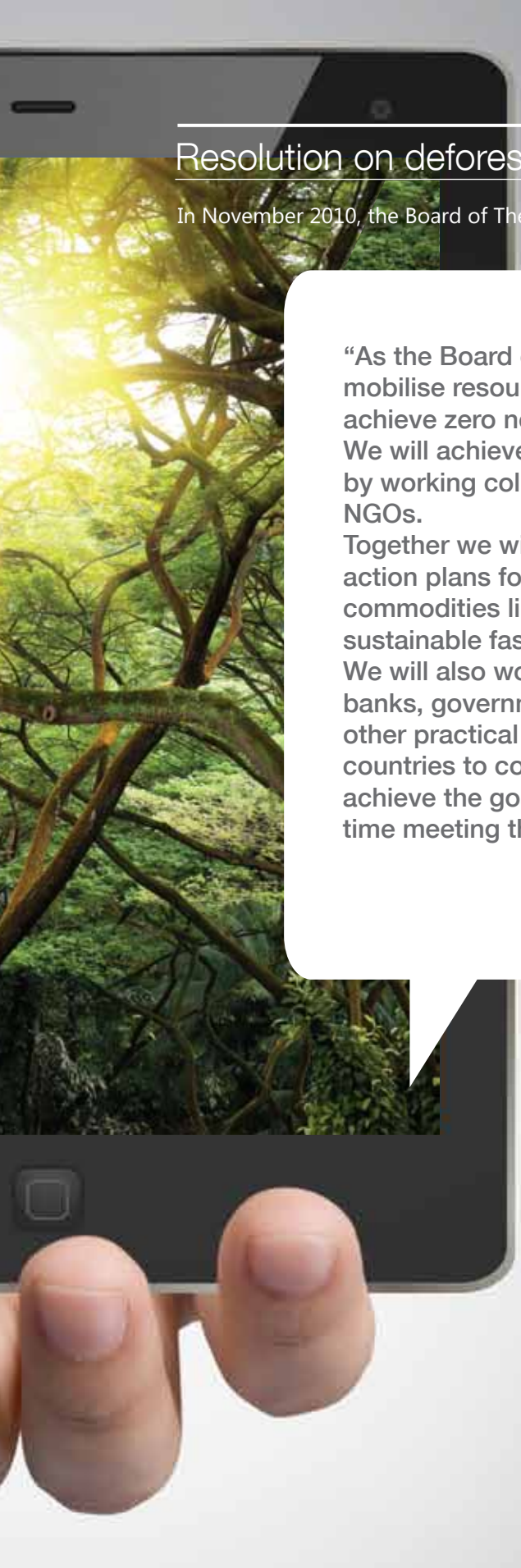
There is a broad scientific consensus that tackling the issue of tropical deforestation will be essential if the world is to limit global warming to less than two degrees.

Whilst the causes of deforestation are complex, c.50% is the result of the cultivation of soy and oil palm, logging for the production of paper and pulp and the rearing of cattle.[3]

Rationale for the CGF to address deforestation

All of these commodities are major ingredients in the supply chains of most consumer goods companies.
The CGF member companies drive the demand for these commodities and have an opportunity to ensure that the sourcing of these ingredients does not contribute to deforestation.
Shifting to sustainable agriculture is a win-win opportunity as it generates lower farmers' input costs, higher yields and it increases the benefits that can be passed onto the CGF member companies and the end consumer.

1 SAFnetDictionary|DefinitionFor [deforestation]. **http://dictionaryofforestry.org/dict/term/deforestation**
2 **http://www.ipcc.ch/index.htm**
3 **http://www.beefissuesquarterly.com/aninterviewwithdrjasonclay.aspx**



Resolution on deforestation

In November 2010, the Board of The Consumer Goods Forum agreed the following resolution:

"As the Board of The Consumer Goods Forum, we pledge to mobilise resources within our respective businesses to help achieve zero net deforestation by 2020.
We will achieve this both by individual company initiatives and by working collectively in partnership with governments and NGOs.
Together we will develop specific, time bound and cost effective action plans for the different challenges in sourcing commodities like palm oil, soya, beef, paper and pulp in a sustainable fashion.
We will also work with other stakeholders – NGOs, development banks, governments etc – to create funding mechanisms and other practical schemes that will incentivise and assist forested countries to conserve their natural assets and enable them to achieve the goal of zero net deforestation, whilst at the same time meeting their goals for economic development."

We recommend...

The CGF recommends its members to source sustainable palm oil certified by the Roundtable on Sustainable Palm Oil (RSPO) or an equivalent standard. The CGF is welcoming other standards if they are proven equivalent to the RSPO. However, since there is currently not an equivalent standard, only RSPO principles and criteria for certification are detailed in this toolkit.

1.2. Sourcing sustainable palm oil

Rationale for addressing palm oil sourcing

Palm oil is a driver of deforestation

Palm oil is the most produced vegetable oil in the world. Malaysia and Indonesia are leading producers, together accounting for 86% of global production. Palm oil has higher yields than other vegetable trees but the growing demand has led to expansion into forested areas and the destruction of peat lands.

Palm oil is heavily used by CGF members

Palm oil is extensively used in many consumer goods products. The oil palm fruit produces two oils: palm oil, which is used primarily in food products (e.g. cooking oil, shortening, margarine, milk fat replacer and cocoa butter substitute) and palm kernel oil which is mostly used in the oleo chemical industry for making soap, detergent, toiletries and cosmetics.

Roundtable on Sustainable Palm Oil (RSPO)

RSPO principles and criteria

Sustainable palm oil production is comprised of legal, economically viable, environmentally appropriate and socially beneficial management and operations.
This is delivered through the application of the following set of principles:

- Commitment to transparency.
- Compliance with applicable laws and regulations.
- Commitment to long-term economic and financial viability.
- Use of appropriate best practices by growers and millers.
- Environmental responsibility and conservation of natural resources and biodiversity.
- Responsible consideration of employees and of individuals and communities.
- Responsible development of new plantings.
- Commitment to continuous improvement in key areas of activity.

Each principle has associated criteria and a set of indicators.
Indicators are specific pieces of objective evidence that must be in place to demonstrate or verify that the criterion is being met. For example, having an annual replanting program projected for a minimum of 5 years with yearly reviews; or ensuring subsidence of peat soils is minimised under an effective and documented water management program; or monitoring pesticide toxicity units.

An exhaustive list of indicators and guidance for each criterion can be found in the RSPO principles and criteria for sustainable palm oil production, a document published in 2007 and currently being revised. An updated version will be published in 2013.
http://goo.gl/7b4fX

Supply chain mechanisms

Certified Sustainable Palm Oil (CSPO) can be purchased through three supply chain systems. They all have the same starting point – a plantation is successfully audited against the RSPO principles and criteria and the total volume of Certified Sustainable Palm Oil (CSPO) that it can produce a year is established.

Traceable CSPO
This is certified palm oil that is physically separated from non-certified palm oil all the way from the certified plantation to the end user. This option allows the purchaser to trace the consignment of palm oil that he buys back to the plantation on which it was grown. However, the approach can be expensive because the two streams of certified and non-certified oil or derivatives need to be kept apart throughout the entire supply chain.

Mass balance CSPO
This option allows companies along the supply chain, such as traders or refiners, to mix the certified palm oil with non-certified to avoid the costs of keeping the two entirely separate (as in Traceable). Each company handling Mass balance CSPO is only allowed to sell the same amount of certified palm oil drawn from the "mixed" oils as they originally bought as certified.

Book and Claim CSPO
This option is also known as GreenPalm after the name of the company managing the system for the RSPO. It is a certificate trading system separate from the physical trade in palm oil. The retailer or manufacturer purchases palm oil from an established supplier, along with a certificate for each ton of palm oil being used. A payment from each certificate goes directly to the producer of CSPO. Companies choosing the book and claim supply chain option to cover all or part of their palm oil supply are not, technically, "using" certified sustainable palm oil, but rather purchasing certificates to support responsible palm oil production.

Measuring progress

Key Performance Indicators (KPIs)

The objective is for the CGF to measure the following KPIs on palm oil:
- number of relevant CGF members with public commitments on palm oil
- percentage of certified palm oil purchases (RSPO or equivalent standard when available)

Recommended reporting

To support the tracking of the above KPIs and beyond, CGF member companies are encouraged to report:
- if they are sourcing products containing palm (kernel) oil
- if they have made a public commitment on certified palm oil sourcing (RSPO or equivalent)
- if they have joined RSPO
- their best estimate of volume of purchased palm oil (including what is used by suppliers)
- % of certified palm oil (with a split between traceable, mass balance, book and claim)
- their total revenues

All tracking will be reported within the CGF in an anonymised and aggregated format, in compliance with the CGF Antitrust Guideline.

Steps

Palm Oil

1

Become a member of the RSPO
Register at **http://www.rspo.org/register.php**

2

Set a timeline to reach 100% certified sustainable palm oil sourcing.
Companies should set milestones along the way, starting with understanding how much palm oil they use, and where it is coming from. Since breaking down palm oil volumes can be challenging, companies should use best estimates.

3

Source CSPO from any of the RSPO supply chains
Guidance can be found at
http://www.rspo.info/market/howtobegin
for companies to make RSPO-certified sustainable palm oil part of their operations.

4

Be transparent on current status and publicly report on progress.
Transparency is essential at this early stage in the evolution of a sustainable palm oil market – growers need to know what the likely demand for certified sustainable palm oil is.

Additional reference documents

2011 RSPO CSPO Growth Interpretation Narrative (GIN)

http://goo.gl/aPIoG
This is the first report on certified sustainable palm oil, aimed at analysing, shaping and facilitating commitment and discussions towards sustainable palm oil.
It includes trends in annual production capacity of CSPO, trends in annual supply, supply chain developments, market uptake, Greenpalm, RSPO trademark, RSPO membership and producing countries overview.
A summary of quick facts is also available on:
http://goo.gl/q38bB

RSPO supply chain systems

For more information on the three supply chain mechanisms, companies can refer to:
http://goo.gl/yZ1vn
More details on GreenPalm certificate trading programme can also be found on:
http://greenpalm.org
Requirements for RSPO certification of supply chain certification systems are explained in:
http://goo.gl/x0BoE

A number of NGOs are strong supporters of the RSPO

Several NGOs (e.g. WWF, Rainforest Alliance, Solidaridad, UTZ Certified, and others) recognises the positive effect that the RSPO can have on plantations and mills with improved staff morale and reduced turnover, better yields, more consistency, improved community and government relations. WWF for example published in April 2012 "profitably and sustainability in palm oil production", a first-time study that comprehensively examines the financial costs and benefits of producing sustainable palm oil under the guidelines set out by the RSPO. The report finds that economic benefits outweigh the financial costs of pursuing sustainable palm oil operations.
http://goo.gl/Nj7wn

WWF Palm Oil Buyers' Scorecard

http://goo.gl/A2JBD
WWF palm oil buyers' scorecard measures the performance of 132 consumer goods industry players in 4 areas with regards to their palm oil use:
- membership of the RSPO and reporting compliance
- commitment to source 100% RSPO-certified palm oil by 2015.
- disclosure of palm oil volumes and use of certified sustainable palm oil or buying book and claim certificates.

1.3. Sourcing sustainable soy

We recommend…

The CGF fully supports the Round Table on Responsible Soy Association (RTRS), an international multi-stakeholder initiative that promotes the use and growth of responsible production of soy, through a global standard for responsible production.
The CGF welcomes other standards if they are proven equivalent to RTRS and therefore encourages its members to source RTRS (or equivalent) certified soy.
Since there is currently not an equivalent standard, only RTRS principles and criteria for certification are detailed in this toolkit.

Rationale for addressing soy sourcing

Soy is a driver of deforestation

The global demand for soy beans is expected to dramatically increase in the coming years, as the soy bean consumption by emerging economies such as China mounts. This might result in expansion which could lead to deforestation if not managed in a sustainable manner, losing valuable natural resources and having negative impact on local communities.

Soy is heavily used by CGF members

Soy is an important commodity for human foods (used in 60% of processed food products like margarines, dressings, cakes, noodles, pastries) as well as animal feed (80% of soy production is used to feed pigs, poultry and cattle) contributing to the production of meat, eggs and dairy products. Soy beans are also used as feedstock for biofuels.

Round Table on Responsible Soy Association (RTRS)

RTRS principles and criteria

The RTRS Production Standard is the reference that defines what responsible soy is. It includes 98 indicators built around 5 key areas that producers must comply with to be certified:

- Legal compliance & good business practice
- Responsible labour conditions
- Responsible community relations
- Environmental responsibility
- Good agricultural practices

A certification scheme for production and one for chain of custody have been implemented. Early June 2011, the first farm was certified RTRS and the certificate trading platform already facilitated several transactions between certified producers and market stakeholders.
CGF member companies are recommended to encourage their soy suppliers to commit to increased soy supply chain transparency and traceability.

Supply chain mechanisms

Traceable
In the traceable supply chain model, soy from one or more RTRS certified farms is physically kept apart ('segregated' and therefore traceable) from other soy sources throughout the entire supply chain. All links in the supply chain need to be monitored by independent certification bodies to ensure that no mixing takes place.

Mass balance
In the mass balance supply chain model, soy from RTRS certified farms can be mixed with non-certified soy, as long as such mixing is administratively monitored. After mixing, equivalent percentages of certified soy and non-certified soy can be sold to the market.

Trading platform
To enable any soy grower or buyer to support responsible soy, a trading platform for 'responsible soy production credits' has been set up. It is a certificate trading system separate from the physical trade in soy.

Measuring progress

Key Performance Indicators (KPIs)

The objective is for the CGF to measure the following KPIs on soy:
- Number of relevant CGF members with public commitments on soy.
- Percentage of certified soy purchases (RTRS or equivalent standard when available).

Recommended reporting

To support the tracking of the above KPIs and beyond, CGF member companies are encouraged to report:
- if they are sourcing soy
- if they have made a public commitment on certified soy (RTRS or equivalent).
- if they have joined RTRS.
- best estimate of volume of purchased soy (including what is used by suppliers).
- % of certified soy (with a split between Traceable, Mass balance, Trading).
- their total revenues.

All tracking will be reported within the CGF in an anonymised and aggregated format, in compliance with the CGF antitrust guideline.

Recommended steps for CGF member companies

Steps

Soy

1 **Become a member of the RTRS**
Register at **www.responsiblesoy.org**

2 **Set a timeline to reach 100% certified sustainable soy sourcing.**
Companies should set milestones along the way, starting with understanding how much soy they use, and where it is coming from. Since breaking down soy volumes can be challenging, companies should use best estimates.

3 **Be transparent on current status and publicly report on progress.**

1.4. Sourcing sustainable paper & pulp

Rationale for addressing paper & pulp sourcing

Paper & pulp are drivers of deforestation

The high demand for paper and pulp has created a market for illegal loggers that simply cut down the trees they need, destroying the surrounding ecosystems: the forests are home to wildlife and nature and its indiscriminate deforestation prevents the natural regeneration of forests.

Paper & pulp are heavily used by CGF members

Almost all of the CGF companies are major users of forest products (pulp fibers), either as raw materials for their own finished goods or for their use in packaging. The consumer goods industry is a crucial part of the logging supply chain and many of its environmental impacts occur at this level. The CGF recognises the importance of sourcing forest products sustainably to minimise its environmental and societal impact.

We are developing…

The CFG supports FSC and PEFC as internationally recognised responsible forest management schemes.

A set of sourcing guidelines is under development and expected to be approved by the 2013 June Board meeting

More information can be found on the working group portal: http://goo.gl/uqLgC

Forestry Stewardship Council (FSC)

The Forestry Stewardship Council (FSC) is one of the forest management schemes supported by the CGF. **www.fsc.org**

FSC principles and criteria

The FSC principles and criteria document (**www.fsc.org/pc.html**) describes how forests can be managed to meet the social, economic, ecological, cultural and spiritual needs of present and future generations. Developed through a strong, multi-stakeholder process, they include managerial aspects as well as environmental and social requirements.

FSC certificates

The FSC does not issue certificates itself but by independent organisations called certification bodies. These have to gain FSC accreditation in order to issue certificates to applicants. **www.accreditation-services.com/archives/standards/fsc**

FSC certified forest products are verified from the origin through the supply chain. There are three different FSC certificates:

Forest management
It proves that forest operations are managed sustainably.

Chain of custody
It demonstrates the use of responsibly produced raw materials, ensures sourcing policies and compliance with public or private procurement policies where FSC is the preferred option.

Controlled wood
This standard avoids unacceptable products by rejecting illegally harvested wood, harvested in violation of traditional and civil rights or in high conservation values areas, from conversion of natural forests or from areas where genetically modified trees are planted.

Programme for the Endorsement of Forest Certification (PEFC)

The Programme for the Endorsement of Forest Certification (PEFC) is one of the forest management schemes supported by the CGF (**www.pefc.org**).

PEFC principles and criteria[4]

Obtaining PEFC sustainable forest management certification demonstrates that management practices meet requirements for best practice in sustainable forest management, including:

- Biodiversity of forest ecosystems is maintained or enhanced
- The range of ecosystem services that forests provide is sustained:
  - They provide food, fibre, biomass and wood.
  - They are a key part of the water cycle, act as sinks capturing and storing carbon and prevent soil erosion.
  - They provide habitats and shelter for people and wildlife.
  - They offer spiritual and recreational benefits.
- Chemicals are substituted by natural alternatives or their use is minimised.
- Workers' rights and welfare are protected.
- Local employment is encouraged.
- Indigenous peoples' rights are respected.
- Operations are undertaken within the legal framework and following best practices.

Detailed PEFC requirements can be found on **http://goo.gl/THRg2**

4 **http://www.pefc.org/standards/sustainable-forest-management/requirements-criteria**

We recommend...

CGF member companies are encouraged to input and endorse the work done under the Global Roundtable for Sustainable Beef (GRSB).

1.5. Sourcing sustainable beef

Rationale for addressing beef sourcing

Forest land is deforested to be used to grow grains, which will be used to feed the cattle, as well as for pastures and grazing. Overgrazing can lead to land degradation, soil loss, water wastage and chemical pollution (due to fertilizers, pesticides and herbicides).
Beef cattle is the leading driver of deforestation in the Brazilian Amazon and Cerrado biomes (62 percent of deforested Amazonian land is pasture and an additional 20 percent is pasture being reclaimed by secondary forest[5]), but not a major driver of deforestation in the other deforestation focus countries like, Indonesia, Malaysia and Russia.[6]

The Mato Grosso is the area of the Amazon with the highest rates of deforestation and also where the cattle industry is largest - there are well over 25 million cows in the region, and 7 of the 10 biggest cities in the Amazon producing cattle and cattle products are found there,

Global Roundtable for Sustainable Beef (GRSB)

The Global Roundtable for Sustainable Beef (GRSB) is an action-oriented non-profit association of beef supply chain stakeholders committed to continuous improvements in the sustainable global beef system.

GRSB **www.grsbeef.org**

Contacts

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5 Brazilian Agricultural Research Corporation (Empresa Brasileira de Pesquisa Agropecuária – EMBRAPA); and National Institute for Space Research (Instituto Nacional de Pesquisas Espaciais -- INPE), TerraClass, September 2011
6 California Environmental Associates (C.E.A.), Demand Side Campaigns in LULUCF, April 2010
7 Source **www.greenpeace.org/usa/en/news-and-blogs/news/cattle-ranching-biggest-driver**

2: Refriger

ation

"Synthetic chemicals used in refrigerants destroy ozone molecules in the stratosphere – unless Industry action is being taken."

2. Refrigeration

2.1. Rationale for working on refrigeration

The industry uses refrigerants

Refrigerants are heavily used by CGF member companies for the following applications.[8]

Chillers used to cool industrial processes. They can be classified by compressor type, including centrifugal, reciprocating, scroll, screw, and rotary.

Cold storage warehouses are used to store meat, produce, dairy products and other perishable goods.

Refrigerated transport moves products from one place to another while maintaining necessary temperatures, and include refrigerated ship holds, truck trailers, railway freight cars, and other shipping containers.

Retail food refrigeration includes all cold storage cases designed to chill food for commercial sale. In addition to grocery cases, the end-use includes convenience store reach-in cases and restaurant walk-in refrigerators.

Vending machines are self-contained units which dispense goods that must be kept cold or frozen.

Light commercial air conditioning and heat pumps includes central air conditioners, window air conditioners.

Heat transfer includes all cooling systems that rely on convection to remove heat from an area, rather than relying on mechanical refrigeration.

GHG impact

Refrigerant gases create greenhouse gas (GHG) emissions because of both the energy used to operate the equipment and their inherent global warming potential (GWP).

Ozone layer depletion[9] effect

In the mid-1970s it was discovered that synthetic chemicals used in refrigerants destroy ozone molecules in the stratosphere. This destruction leads to higher ultraviolet (UV) radiation levels at the surface of the Earth and can cause damage to ecosystems and human health.

The CGF working group on refrigeration

The principle of the working group is about shifting to non-GHG and non-ozone impacting refrigerants.

8 **http://www.epa.gov/ozone/snap/refrigerants/index.html**
9 **http://www.ozone.unep.org**

2.2. Overview on chemical refrigerants

CFC

These are substances containing carbon, florine and chlorine chemicals (CFC). CFC refrigerants, such as the once popular R-12, have the highest ozone depleting potential (rating 1) and are a greenhouse gas (GHG). They are now banned from production within all countries covered by the Montreal Protocol.

HCFC

These are substances containing hydrogen, carbon, florine and chlorine (HCFC) chemicals. The HCFC refrigerant R-22 was the most widely used refrigerant for light commercial air conditioning, refrigerators and freezers until concerns over ozone depletion were raised.
The HCFCs have a rating of ozone depletion potential (rating 0.05) lower than CFCs (rating 1) and are therefore classified as "transitional substitutes" during the time it takes to commercialise new ozone-safe alternatives and replacements.

HFC

These are substances containing hydrogen, florine and carbon chemicals. The HFC gases are used extensively in every day refrigeration and air conditioning systems (RAC systems). HFCs have no ozone depletion potential, but these chemically based synthetic refrigerants are powerful greenhouse gases that contribute to global warming if released into the atmosphere. Depending on the exact type of HFC, they can be a 20,000 times more powerful greenhouse gas than carbon dioxide.[10]

10 **http://goo.gl/wv5Ms**

2.3. Overview on regulations

The Montreal Protocol on substances that deplete the ozone layer

The Protocol...
Nations of the world took action in 1985 with the Vienna convention for the protection of the ozone layer, followed in 1987 by the Montreal Protocol on substances that deplete the ozone layer. With 196 parties, they are the most widely ratified treaties in United Nations history, and have, to date, enabled reductions of over 97% of all global consumption of controlled ozone depleting substances.

List of controlled substances...
The Montreal Protocol includes an exhaustive list of controlled substances with the ultimate objective of their elimination on the basis of developments in scientific knowledge, taking into account technical and economic considerations.
http://goo.gl/VA3tz...

Progress...
This action has had a major positive impact as the stratospheric ozone is no longer decreasing and is predicted to return to pre-1980 values before 2050 at mid-latitudes and a few years later at high latitudes.

Recent Developments under the Montreal Protocol...
In May 2012, together with Canada and Mexico, the United States jointly submitted a proposal to phase-down consumption and production of hydrofluorocarbons (HFCs) under the Montreal Protocol on substances that deplete the ozone layer.
http://goo.gl/mXOhu...

The Kyoto Protocol

In 1997, an amendment to the United Nations framework convention on climate change (UNFCCC) treaty, known as the Kyoto Protocol, was adopted. The Kyoto Protocol does not call for the phase-out or banning of any HFCs. Its goal is the overall reduction of GHG emissions in developed countries and HFCs are part of the 'basket' of greenhouse gases regulated under this protocol.

The European Fluorinated Gases Regulation

EC No 842/2006 came into force on 4th July 2007. It aims at reducing F-gas emissions through measures including containment and recovery, training and certification of personnel as well as a few bans for specific applications and a number of products containing F-gases. On 26 September 2011, the commission completed a review of the application, effects and adequacy of the F-Gas Regulation and issued a report outlining possible future orientation of the F-gases regulation.
The European commission has presented a legislative proposal revising the current EU F-Gas regulation in November 2012.
http://ec.europa.eu/clima/consultations/0011/summary_en.pdf
http://ec.europa.eu/clima/policies/f-gas/legislation/docs/com_2012_643_en.pdf

The Significant New Alternatives Policy (SNAP)

In the United States, the Environmental Protection Agency (EPA) has created the Significant New Alternatives Policy (SNAP) program under section 612 of the Clean Air Act Amendments. SNAP evaluates alternatives to ozone-depleting substances. Substitutes are reviewed on the basis of ozone depletion potential, global warming potential, toxicity, flammability, and exposure potential as described in the 18th March , 1994, final SNAP rule: **http://goo.gl/OQeeo**
In May 2012, G8 countries joined the Clean Air Act Coalition.[11]

11 **http://fpc.state.gov/190390.htm**

2.4. The CGF resolution on refrigeration

In November 2010, the Board of The Consumer Goods Forum agreed a resolution on refrigeration:

"As the Board of The Consumer Goods Forum, we recognise the major and increasing contribution to total greenhouse gas emissions of HFCs and derivative chemical refrigerants.
We are therefore taking action to mobilise resources within our respective businesses to begin phasing-out HFC refrigerants as of 2015 and replace them with non-HFC refrigerants (natural refrigerant alternatives) where these are legally allowed and available for new purchases of point-of-sale units and large refrigeration installations.
We recognise that barriers exist to wide scale adoption of more climate-friendly refrigeration, namely legislative restrictions in some markets, availability, cost, safety, maintenance and servicing. We will work to overcome those barriers by strengthening existing collaborative platforms and initiatives.
We also will use our collective influence to encourage our supply base to develop natural refrigerant technologies that meet our business demand under commercially viable condition".

Natural refrigerant alternatives

Natural refrigerants are naturally occurring substances that can be used as cooling agents (heat transfer medium) in refrigerators and air conditioners. They don't harm the ozone layer and have no or negligible climate impact, but may pose operational safety risks if not properly managed.
Examples

- Ammonia (R-717), used in industrial refrigeration plants for more than 130 years, is deemed to be environment-friendly, economical, and energy-efficient
- The natural refrigerant carbon dioxide CO2 (R-744) has a similarly long tradition in refrigeration technology
- Non-halogenated hydrocarbons (HC) such as propane and iso-butane
- Helium
- Water
- Air

The challenges to adopt natural refrigerants

Three major challenges have been recognised by the CGF:

Driving scale

The CGF member companies have to collectively encourage the supply base to develop natural refrigerant technologies that meet business demand under commercially viable conditions. Collaboratively, CGF member companies can disseminate successful HFC free technologies overcoming the cost and availability barrier. Achieving scale will increase availability of training and service capabilities, which will in turn positively impact cost and safety.

Driving Scale is also essential to raise awareness of the progress made to eliminate HFCs and the CGF is working on assembling and publishing successful implementation case studies of non-HFC technologies. The CGF will organise the 3rd Refrigeration Summit in Spring 2013.

Public policy and regulatory

Regulatory barriers in some markets are considered one of the main obstacles for the switch towards HFC-free alternatives.
In the US, EPA SNAP approvals have been given to HC coolers in 2012, but progress is required in ASHRAE 15 standard which specifies safe design, construction, installation, and operation of refrigeration systems. In February 2012, the US Secretary of State launched the Climate and Clean Air Coalition, a new global initiative to realise concrete benefits on climate, health, food and energy resulting from reducing short-lived climate pollutants. The coalition will focus efforts on reducing black carbon, hydrofluorocarbons (HFCs) and methane.

Performance measurement and methodology

The CGF recognises the need to create a compendium to provide information about the HFC-free technologies, key performance indicators (KPI) and how to measure them.
The compendium should include information regarding Life Cycle Analysis (LCA) and third party verification.
The CGF supports a TEWI approach (Total Equivalent Warming Impact) when assessing the impact of alternative refrigerants on global warming. This ensures that not only the direct contribution of the alternatives as greenhouse gases is considered, but also the indirect contribution of the carbon dioxide emissions resulting from the energy required operating the system over its normal life.

2.5. Recommendations for CGF member companies

Resolution implementation

Retrofitting of existing installations is out of the scope of the resolution. The commitment to start using natural refrigerants covers the installation of new facilities.
CGF member companies are encouraged to implement the CGF resolution through the following steps.

Steps

Refrigeration

1 **Make a public commitment to phase out HFC refrigerants in new installations from 2015.**

2 **Start piloting solutions for new installations with natural refrigerants now.**

3 **Measure existing footprint and share best practices on natural refrigerant pilots.**

4 **Publicly communicate about progress (for example total charge of refrigeration,** % leakage per year, % of natural refrigerants, number of new installations using natural refrigerants).

5 **Contribute voluntarily to a set of case studies to raise awareness.**

Further recommendation

In addition to the resolution, CGF member companies are encouraged to minimise leaks in existing refrigeration systems through maintenance, effective detection and prompt repairs.

Collaboration with external stakeholders

CGF member companies can collaborate with NGOs or other organisation active on refrigeration, including:

Greenpeace
Greenpeace plays a critical role in raising awareness about the need for natural refrigeration.
www.greenpeace.org

Refrigerants, Naturally!
The CGF collaborates with Greenpeace and UNEP in the award-winning initiative "Refrigerants, Naturally!" to promote the switch to natural refrigerants with a focus on their point-of-sale cooling applications.
www.refrigerantsnaturally.com

ATMOsphere
Shecco organises ATMOsphere, regional conferences (Europe/America/Asia) bringing together decision makers from industries and governments to promote the switch from HFCs to natural refrigerants. An ATMOsphere conference typically covers policy issues, sharing of experience with consumer brands and retailers, technology case studies and a session on market trends presenting the latest developments and forecasts for natural refrigerants. **www.shecco.com**
ATMOsphere request submission of case studies to be presented at their conference.
A library of case studies can be found at **http://goo.gl/XRdj6**

EIA
The Environmental Investigation Agency (EIA) is an independent campaigning organisation committed to bringing about change that protects the natural world from environmental crime and abuse. Their work focuses on raising awareness and pushing for climate-friendly alternatives for harmful gases.
www.eia-international.org

Measuring progress

Key Performance Indicators (KPIs)

- number of public commitments from members
- percentage of new installations that use natural refrigerants

Recommended reporting

To support the tracking of the above KPIs and beyond, CGF member companies are encouraged to report:
- if they have made a commitment to start phasing out HFC refrigerants in 2015.
- number and percentage of installations being piloted with natural refrigerants (with best estimate of corresponding charge).
- percentage of total refrigerant charge which is from natural refrigerants.

All tracking will be reported within the CGF in an anonymised and aggregated format, in compliance with the CGF antitrust guideline.

Additional reference documents

Useful sources of information

About the science and effects of ozone depletion...
UNEP, United Nations Environment Programme, **http://www.ozone.unep.org...**
WMO, World Meteorological Organization, **http://www.wmo.ch...**
EPA,Environmental Protection Agency,
http://www.epa.gov/ozone/science/ods

The Montreal Protocol treaty on substances that deplete the ozone layer...
http://goo.gl/KmyTD...

North American Amendment Proposal to address HFCs under the Montreal Protocol...
http://goo.gl/gwo3m...

UNEP Environmental Effects Assessment Panel - questions and answers...
This document provides some answers to commonly asked questions about the environmental effects of ozone depletion....
http://goo.gl/kGG6u...

Kyoto Protocol...
http://goo.gl/Bi3OI...
...
R744...
R744.com aims to support the worldwide development of CO2 refrigeration and be the industry platform for CO2 cooling and heating experts worldwide. They share papers and case studies on their website.
http://www.r744.com...

Measuring GHG emissions of refrigeration installations...
Chemical refrigerants are greenhouse gases (GHGs) which impact varies with the type of refrigerant, leakage rate and recharge capacity. Guidance to measure the GHGs can be found on **http://goo.gl/aoZam...**

The Climate and Clean Air Coalition...
http://www.unep.org/ccac

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3: Measure

ment

“Greenhouse gases reduce the rate at which the Earth’s surface loses infrared radiation to outer space. The ability to benchmark Greenhouse gases between products and companies will increase the knowledge of our consumers and supply chains.”

3.1. Measuring GHG emissions from direct business activities

The overall objective is to achieve a common global system for measuring environmental impacts not only for direct business activities, but for the life cycle of the products and services offered by CGF member companies.
Although starting with greenhouse gases (GHG) emissions, the CGF sustainability pillar plans to extend its work over time to cover other sustainability issues such as water.

This is the first level of measurement that CGF member companies should implement. It covers emissions from the business operations.

Measuring with the WRI/WBCSD GHG protocol [12]

The Greenhouse Gas Protocol (GHG Protocol) was developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD). It is the most widely used international accounting tool for government and business leaders to understand, quantify, and manage greenhouse gas emissions. It provides a classification of GHG emissions into three scopes (1, 2 and 3).

Direct business activities encompass scope 1 and 2 emissions.
Scope 3 emissions are accounted for product life cycle measurement.

Companies can find guidance on how to prepare a GHG emissions inventory in "The GHG Protocol Corporate Standard" available on **http://www.ghgprotocol.org/standards.**
This document explains the accounting of the six greenhouse gases covered by the Kyoto Protocol.[13]

We recommend...

In September 2010, the Board agreed that CGF companies should measure the greenhouse gas (GHG) emissions of their own business operations using the WRI/WBCSD GHG protocol which are then reported through the Carbon Disclosure Project.

12 **www.ghgprotocol.org**
13 carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF_6).

Reporting through the Carbon Disclosure Project (CDP)

Launched in 2000, the Carbon Disclosure Project (CDP) is an independent global system through which thousands of companies report their greenhouse gas (GHG) emissions. **www.cdproject.net**

Steps

Measurement

1 **CGF member companies are encouraged to report through the CDP.** Download and read the document for "first time responders." **https://www.cdproject.net/Documents/Guidance/2012/FirstTimeRespondererGuidance.pdf**

2 **Read "important information for CDP 2012" and "guidance to using the Online Response System (ORS)."**

https://www.cdproject.net/en-US/Pages/HomePage.aspx

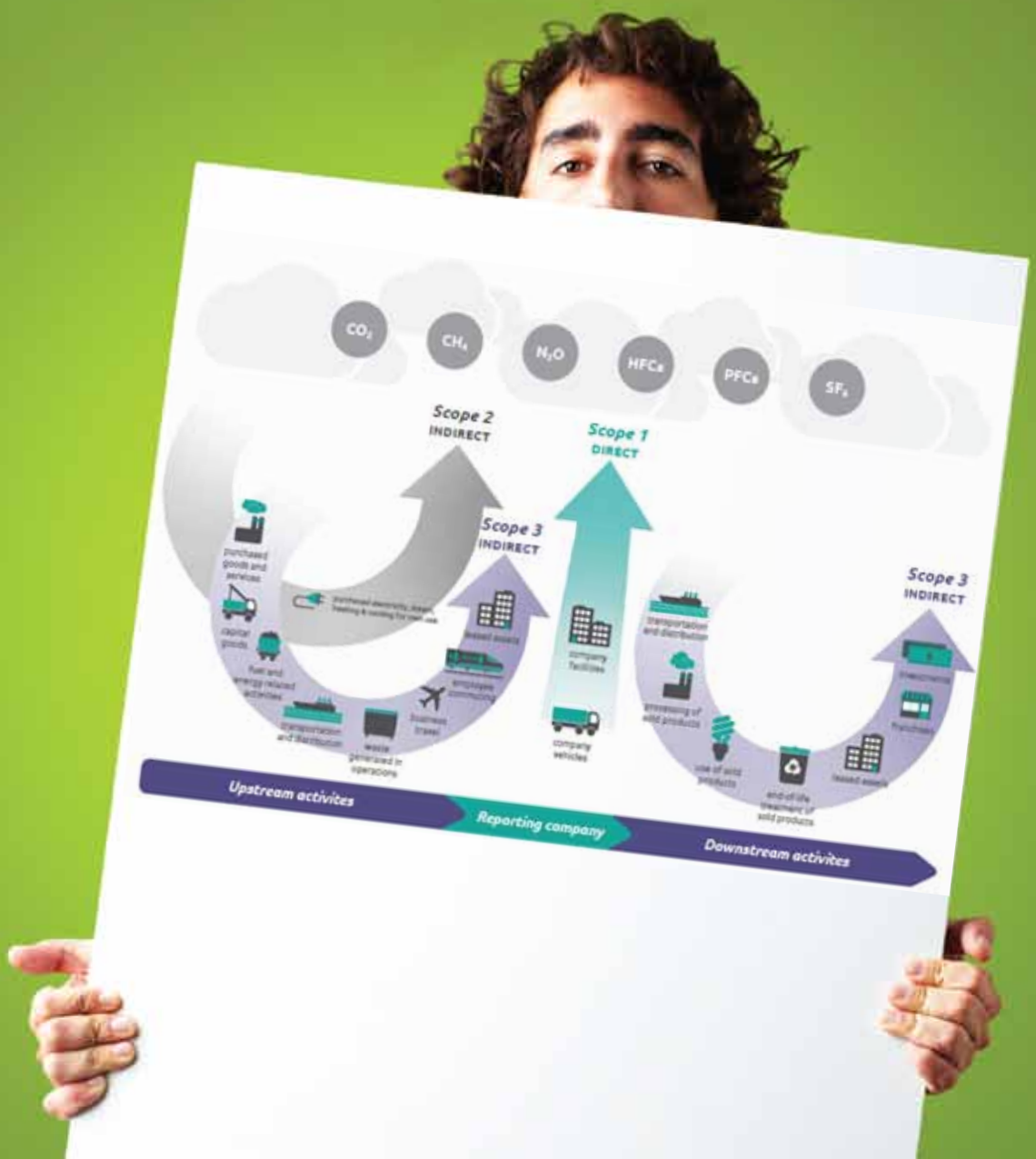
https://www.cdproject.net/en-us/pages/faq-reporting-process.htm

3 **Report business metrics using the Online Response System (ORS).**

The CDP runs a series of workshops to assist companies in preparing their emissions report. They are free to attend and are held at various locations around the world. To see a list of dates/locations and for registration go to **https://webadmin.cdproject.net/en-US/News/Pages/events.aspx**

3.2. Measuring emissions from product life cycle

In accordance with the GHG protocol "product standard", product life cycle emissions include scope 1 and 2 emissions (measured from direct business activities) and scope 3 (upstream and downstream),[15] including emissions associated to raw materials, manufacturing, transportation, storage, use and disposal of a product.



15 **http://goo.gl/CxIMk**

Rationale for measuring product life cycle emissions

The CGF recognises fours main drivers:

Consumers

They want to produce transparency and increase the demand for responsible products. However, with the proliferation of eco-labels and green claims, they are confused on what constitutes a sustainable product and need help in making informed decisions.

Supply chain

There is no set standard for suppliers to measure the sustainability of products throughout the life cycle. The data being used by existing measurement systems lack traceability and is sometimes incomplete. This lack of visibility can lead to unrealised potential in efficiency and economic value. Harmonised and transparent systems would reduce complexity and save costs throughout the supply

Global regulations

Although there are currently multiple existing and developing regulations for communication and labeling, the lack of a globally harmonised approach is challenging in a world of multinational companies.

Science

Science is a key enabler to understand the social and environmental impacts of consumer products over time. Consumers and companies need scientifically grounded and transparent data and methodologies.

The Sustainability Consortium (TSC)[16]

The Sustainability Consortium (TSC) is an independent organisation of over 90 participants working collaboratively to build a scientific foundation that drives innovation to improve consumer product sustainability. TSC has offices in the US, Europe and South America and engages companies, NGOs, academics and government agencies in work across consumer goods sectors.
TSC is developing a standardised framework called the Sustainability Measurement & Reporting System (SMRS) for the communication of sustainability-related information throughout the product value chain.
http://www.sustainabilityconsortium.org/smrs-how-it-works
TSC is also developing Category Sustainability Profiles (CSPs) to summarise the best available, credible, and actionable knowledge about the sustainability aspects related to a product over its entire life cycle. This will help companies prioritise and focus their sustainability efforts on the most pressing issues in those product categories.

The CGF Commitment

Product life cycle standards are still being drafted and there is a lack of agreed data. There is no "one size fits all" solution available but the CGF encourages greater global harmonisation by promoting alignment in three key areas:

- between the CGF and regional industry associations,
- between the CGF and government initiatives,
- between all the bodies developing measurement systems and standards including regulators like the EU and national governments, voluntary initiatives, trade associations and academics.

"The CGF Board is committed to look for the global harmonisation of systems to measure product life cycle emissions. In November 2011, they approved partnering with TSC to achieve a globally agreed approach to measuring and communicating product life cycles, while recognising local initiatives."
http://goo.gl/7zaHl

We recommend...

The CGF encourages TSC to engage with regional and major national initiatives representing an industry desire for a harmonised global measurement system.

The CGF also encourages TSC to continue advancing the quality of hot spot identification through the CSPs and to identify standardised performance indicators for a number of categories.

16 **http://www.sustainabilityconsortium.org**

Other references & contacts

Useful sources of information

"Initiatives in product sustainability measurement"
The CGF has published a document capturing current initiatives in sustainability product measurement to raise awareness amongst the CGF member companies.
http://goo.gl/d8AJ4

It provides a link to each initiative's website and a brief description of its background.
It is structured into four main chapters:

1. International standards - overarching and internationally recognised standards for carbon and environmental foot printing;

2. Country / governmental initiatives - initiatives by governments / local authorities;

3. Joint initiatives – trade associations, and cross sector (not driven by government) initiatives;

4. Other initiatives – initiatives launched by individual companies or specific sectors.

Useful links

GHG protocol
http://www.ghgprotocol.org

Four GHG standards can be downloaded from
http://www.ghgprotocol.org/standards
- corporate accounting and reporting standards
- project accounting protocol and guidelines
- corporate value chain (scope 3) accounting and reporting standard
- product life cycle accounting and reporting standard

GHG protocol animation video tells the story of the two new standards
http://goo.gl/UXhVZ

Carbon Disclosure Project
http://goo.gl/DInw

United Nations Environment Programme - life cycle management
This issue brief gives a clear and practical introduction to life cycle management
www.unep.org/dtie

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4: Packag

ing

"Excess packaging contributes to environmental pollution, and is a challenge the Industry will work on."

4. Packaging

4.1. Rationale for creating the GPPS

Our industry has a responsibility to review and optimise the environmental performance of the packaging it uses. For that purpose, the full life cycle should be reviewed, including the impact of product losses if packaging is insufficient. Finding the balance between under-packaging and over-packaging is the aim for all of our businesses.
Packaging spans the entire value chain and is a shared responsibility for all trading partners. To be able to address this responsibility effectively, trading partners need to have a common way of talking about packaging and sustainability.
The Global Protocol on Packaging Sustainability (GPPS) intends to deliver that common language and to enable better decision making, both within companies and across the value chain. In turn this will result in cost reductions, reduced environmental impact and improved consumer perception.
It has two elements:

- **The Framework:** "A global language for packaging and sustainability – a framework and measurement system for our industry" that offers a common/harmonised language and describes the platform for the system;

- **The Protocol:** the "Global Protocol On Packaging Sustainability" describes metrics and indicators for the sustainability of packaging.

The GPPS also brings together existing work taking place across our industry rather than starting from scratch. The core input comes from projects taking place in ECR Europe, EUROPEN, the Grocery Manufacturers Association (GMA) and the Sustainable Packaging Coalition (SPC).
http://globalpackaging.mycgforum.com

4.2. The framework and the GPPS

The framework provides the context for the common language. It includes common definitions and principles, agreed metrics and indicators and guidance on usage. It explains the background, goals, and how packaging can contribute to improving sustainability.

The Global Protocol on Packaging Sustainability (GPPS 2.0) explains the measurement system and defines metrics. You could consider these metrics to be the words in the language and this document as the dictionary.

Just as it is not necessary to use every word in the dictionary in every conversation, so it is not necessary to use every metric in each discussion about the sustainability of packaging. The range of metrics aims to cover the full breadth of environmental and social aspects, but in each case the number and type of metrics used will depend on the business question being asked.

4.3. Recommendations for CGF member companies

The framework and protocol need to become part of the way we do business. This means full adoption within CGF member companies which are encouraged to follow these simple steps:

Steps

Packaging

1 **Download and read these 3 documents**

Framework	**http://goo.gl/zBC5B**
GPPS protocol	**http://goo.gl/kVVw3**
Q&A document	**http://goo.gl/HM27e**

2 **Watch the webinar, it provides a comprehensive introduction to the** project, the background and the deliverables **http://goo.gl/GXmS7**

3 **Engage with your trading partners to promote the framework and the** measurement system

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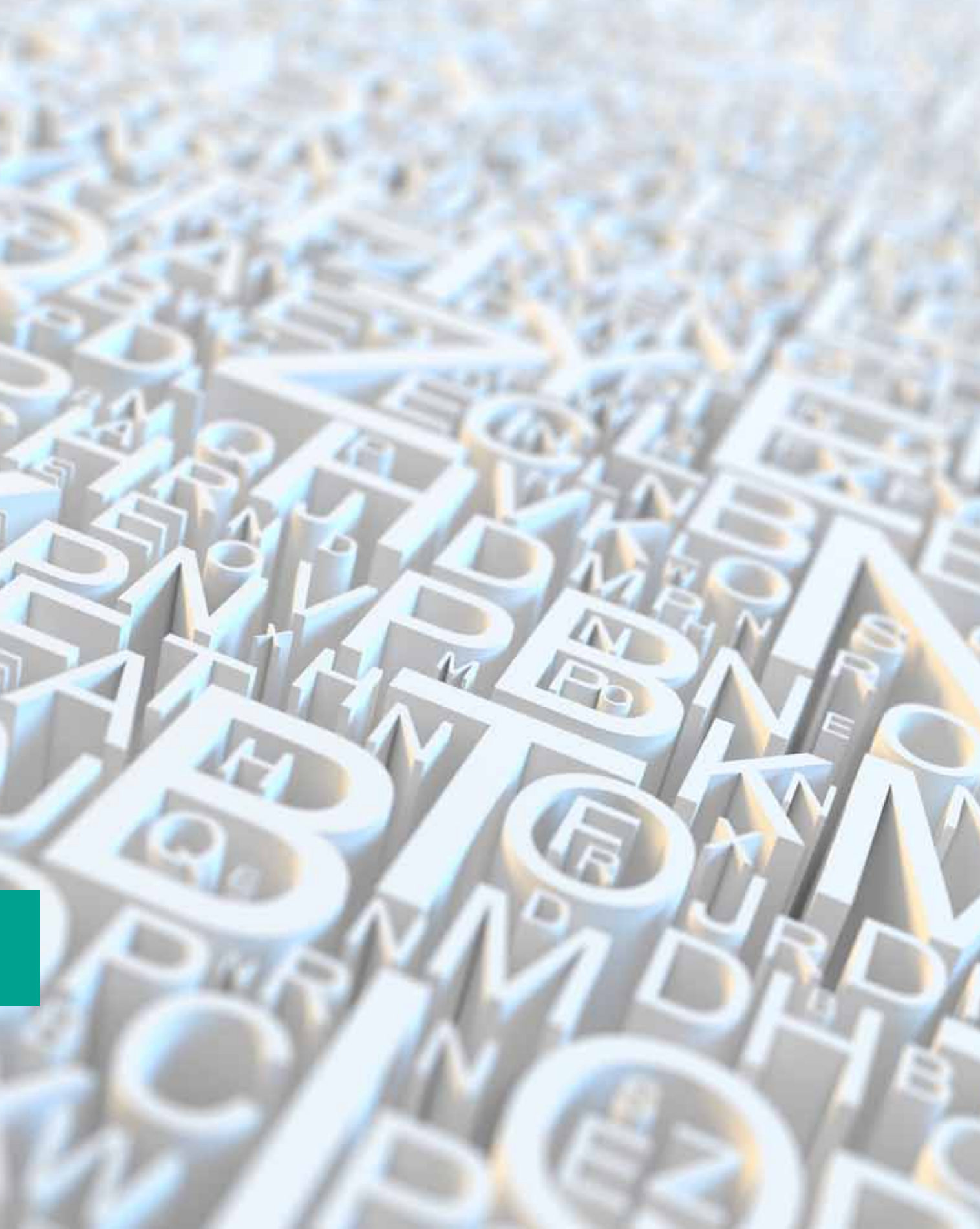
5: Glossary

"The absence of a common, well-defined lexicon of environmental sustainability terms makes it difficult for consumers to make informed choices."



5. Glossary

5.1. Rationale for creating a glossary

Environmental sustainability is increasingly important to consumers and businesses alike. Consumers are more likely to consider environmental impact in their purchasing decisions, and businesses are increasingly marketing themselves and their products based on their sustainability credentials. However, the absence of a common, well-defined lexicon of environmental sustainability terms makes it difficult for consumers to make informed choices. The variety of terms, usages, and claims that are being applied in the consumer goods industry can rob those terms of meaning, making it difficult for businesses that are genuinely leading in this area to differentiate themselves.

The purpose of the CGF glossary is to begin to harmonise and clearly define the terms that businesses use to describe their environmental sustainability efforts.

The benefits of this include:

- Consumers that are better educated about the relative impact that different environmental improvements have on the environment.
- Greater ability to make meaningful comparisons of companies and products based on their environmental impact.
- Purchasing decisions more accurately reflecting the impact that a product or company has on the environment.
- Companies competing on meaningful dimensions of environmental sustainability and being rewarded for outperforming their peers.

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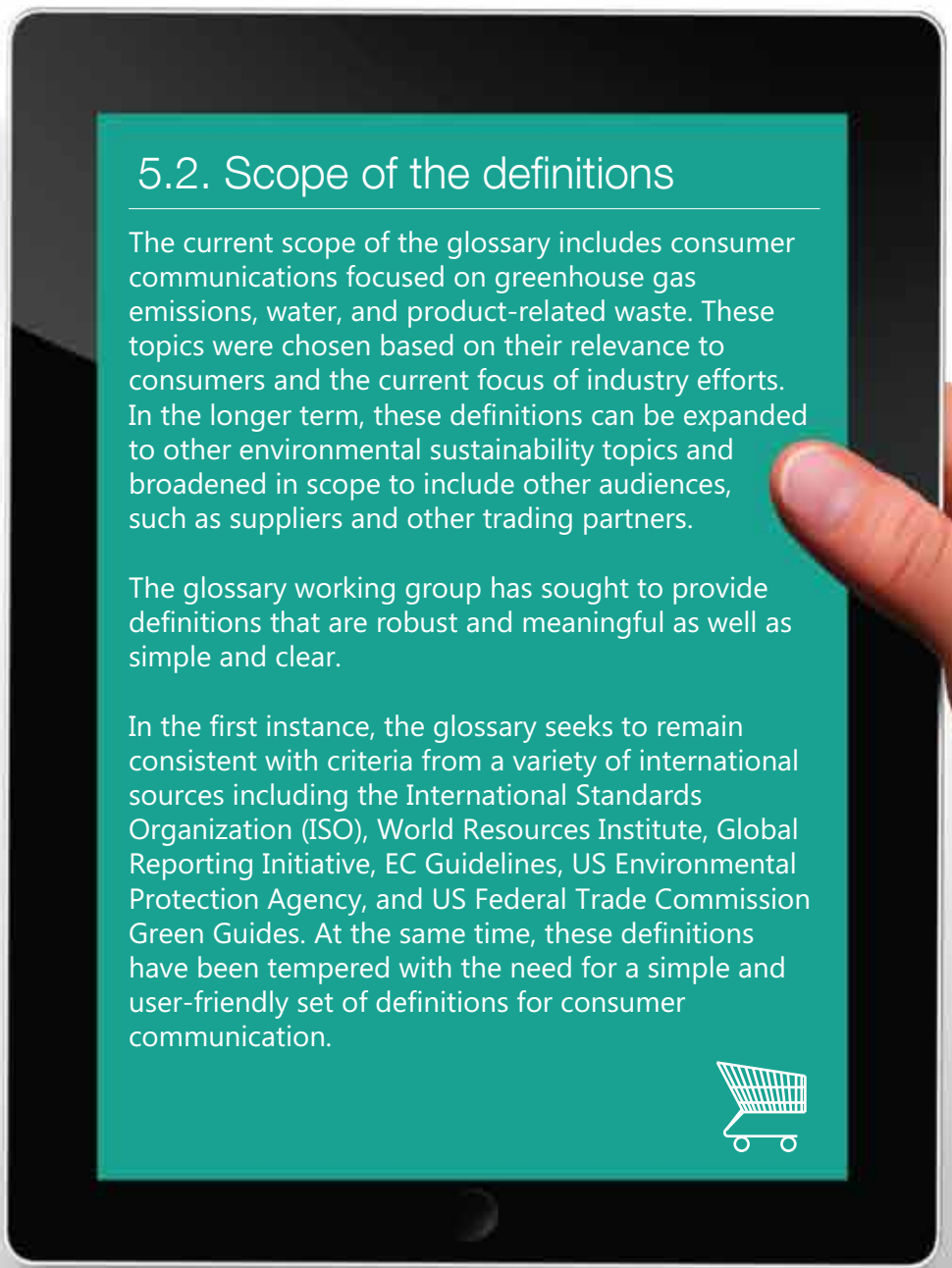


5.2. Scope of the definitions

The current scope of the glossary includes consumer communications focused on greenhouse gas emissions, water, and product-related waste. These topics were chosen based on their relevance to consumers and the current focus of industry efforts. In the longer term, these definitions can be expanded to other environmental sustainability topics and broadened in scope to include other audiences, such as suppliers and other trading partners.

The glossary working group has sought to provide definitions that are robust and meaningful as well as simple and clear.

In the first instance, the glossary seeks to remain consistent with criteria from a variety of international sources including the International Standards Organization (ISO), World Resources Institute, Global Reporting Initiative, EC Guidelines, US Environmental Protection Agency, and US Federal Trade Commission Green Guides. At the same time, these definitions have been tempered with the need for a simple and user-friendly set of definitions for consumer communication.

5.3. Recommendations for CGF member companies

The definitions have been reviewed by a number of NGOs and industry organisations (WEF, WWF, The Sustainability Consortium and the GPP steering group) and member companies can start using them with confidence.
The glossary is for the CGF an opportunity to show leadership around sustainability and CGF member companies are encouraged to use its terms with employees, stakeholders, customers and consumers.

To measure progress, the CGF intends to assess the number of companies using the glossary. To support the tracking of this KPI, CGF member companies are encouraged to report if they have referred to the glossary in their sustainability report and if they have placed a link to the glossary page on their website.

Steps

Glossary

1 **Link to those definitions or include them directly on consumer-facing** websites alongside pre-existing sustainability content and put a link to the glossary page. **Http://goo.Gl/enbcj**

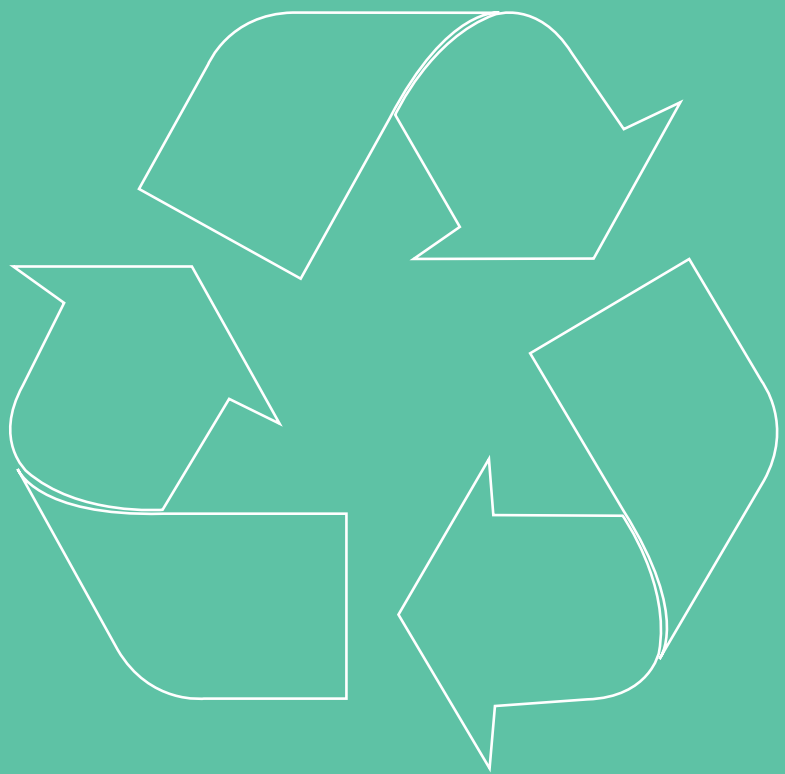
2 **Include a hyperlink to the glossary page on your company's website.**

3 **Use the definitions to support internal communications as well as** communications with trading partners.

4 **Promote the glossary, communicate the benefits of using it.**

5 **Make a reference to the glossary in all relevant published materials such as** the annual sustainability report.

6: Waste



"Global waste contributes to a whole range of environmental issues; resource scarcity, energy and water consumption and greenhouse gas emissions.The Consumer Goods Forum embraces the concept of a circular economy and will work to eliminate the concept of waste from their products and services"

6. Waste

6.1. Definitions

Integrated waste management is a method of waste management that employs waste control methods across the full life cycle, including source reduction, recycling, re-use, energy recovery, incineration and land filling.
According to the principles of integrated waste management, product-related waste efforts focus across the whole of the environmental sustainability framework, including reduction and conservation as well as recovery and disposal.

6.2. Rationale for addressing waste issues

Solid waste management performs a vital function in safeguarding human health and the environment. At a more fundamental level, waste generation is the opposite of resource efficiency, and globally, waste generation contributes to a whole range of environmental issues, including resource use and scarcity, energy and water consumption, greenhouse gas emissions and ecological impact.

Ineffective solid waste management contributes to climate change through the release of methane from landfills and from the emissions associated with the initial production of the materials that are wasted while effective waste management can positively contribute by saving emissions by materials recovery and recycling, and via energy recovery.

The issues of waste from consumer products, disposability and the “throw-away society” are often associated to consumer goods companies through “branded trash”.
In September 2011, the CGF has launched a working group on waste under the auspices of the sustainability pillar.

6.3 The CGF vision on waste

"The Consumer Goods Forum embraces the concept of a circular economy and will work to eliminate the concept of waste from the products and services of our members, throughout their life cycles, including supply chains, manufacturing operations, distribution, use and post-use recovery. CGF companies will prevent the production of waste and then maximise the social and economic value of any waste still produced via materials and energy recovery."

Our goals
We will work together to encourage all CGF companies to aim for the following goals:

- Operations: Minimise waste from our own operations, aiming to achieve zero waste going to landfill through the beneficial use of waste.

- Products and packaging: Design products and services to minimise waste throughout the life cycle. This will include designing packaging that saves more resources than it uses (by minimising product losses), minimises the amount of product and packaging waste that remains after consumer use, and maximises recovery and reuse of materials.

- Solid waste management: Help catalyse the development of waste and resource management systems that can recover value from product and packaging materials after consumer use and minimise overall environmental impact.

6.4. Current focus of the working group

The CGF working group is currently focusing on 'post-use consumer waste'. Meanwhile, they are continuing to monitor the work of organisations such as the GMA / FMI for possible future implementation and global application.

Post-use consumer waste

Where the focus is on eliminating product or packaging waste, manufacturers and retailers have influence, but not control of waste production and recovery. This is an area where companies need to work together, and with other stakeholders, including municipalities, governments, NGOs and the waste management industry.

The CGF will work with the informal waste sector and others to establish pilots to improve the effectiveness and efficiency of informal waste systems, and to increase the range of materials collected and recovered, including items such as flexible packaging and sachets.
This will build on work already underway.

Pilot project in Brazil

Following a workshop in Brazil, the CGF will set up a pilot project in Brazil to improve the effectiveness and efficiency of informal waste systems and to increase the range of materials collected and recovered, including items such as flexible packaging and sachets. The CGF will work together with CEMPRE (a Brazilian solid waste recovery organisation), whom are accepted by the Brazilian government as an industry partner on solid waste, and whom closely cooperates with a number of major industry associations. Finally, the CGF will organise a summit in Brazil to create awareness and get broader acceptance from non-CGF companies around the CGF waste project.

References and guidelines

The work conducted by the CGF on waste is still in its infancy and the group has not published any guidelines or tools for CGF member companies nor supported specific organisations.
Below are examples of organisations acting on waste that can be a useful source of information for member companies willing to develop waste management systems in developing countries:

GARSD

http://www.garsd.org
Five solid waste recovery organisations in Brazil, Columbia, Mexico, Thailand and Uruguay are founding members of the Global Alliance For Recycling And Sustainable Development (GARSD).
The alliance's mission is to promote sustainable household waste management in emerging and developing countries and has become a source of learning and exchange for recovery organisations.
CEMPRE (Uruguay, Brazil, Columbia) **www.cempre.org.uy**
www.cempre.org.br; www.cempre.org.co
SUSTENTA (Mexico) **www.sustenta.org.mx**
ADAN (Venezuela) **www.adan.org.ve**
PETCO (South Africa) **www.petco.co.za**
TIMPSE (Thailand) **www.tipmse.or.th**

ISWA – International Solid Waste Association

The association provides a range of publications and guidance on solid waste management.
www.iswa.org
"Integrated solid waste management: a life cycle inventory" 2nd Edition by McDougall, White, Franke and Hindle.
It describes the concept of integrated waste management (IWM), and the use of life cycle inventory (LCI) to provide a way to assess the environmental and economic performance of solid waste systems through case studies. It also includes chapters on waste generation, waste collection, central sorting, biological treatment, thermal treatment, landfill and materials recycling.

Inventory

http://sustainability.mycgforum.com/solid-waste.html
The CGF has compiled an inventory of regional and global waste initiatives. The purpose of the inventory is to raise awareness amongst the CGF members about the initiatives. This is a living document, updated twice a year.

sustainability

http://sustainability.mycgforum.com