INPUTS
Raw material ressources
Energy ressources

Life Cycle Inventory (LCI)
from cradle to gate

OUTPUTS
Air emissions
Water emissions
Solid waste

PRODUCTION

TRANSPORTATION

USAGE

END OF LIFE

Disposal

Recycling

Re-use

Other uses

Iron and steel*

- Production of quicklime/ hydrated lime

- Transport

- Waste water treatment*

- Building construction*
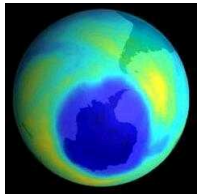
CICLO DE VIDA

Calentamiento Global

Energia Incorporada

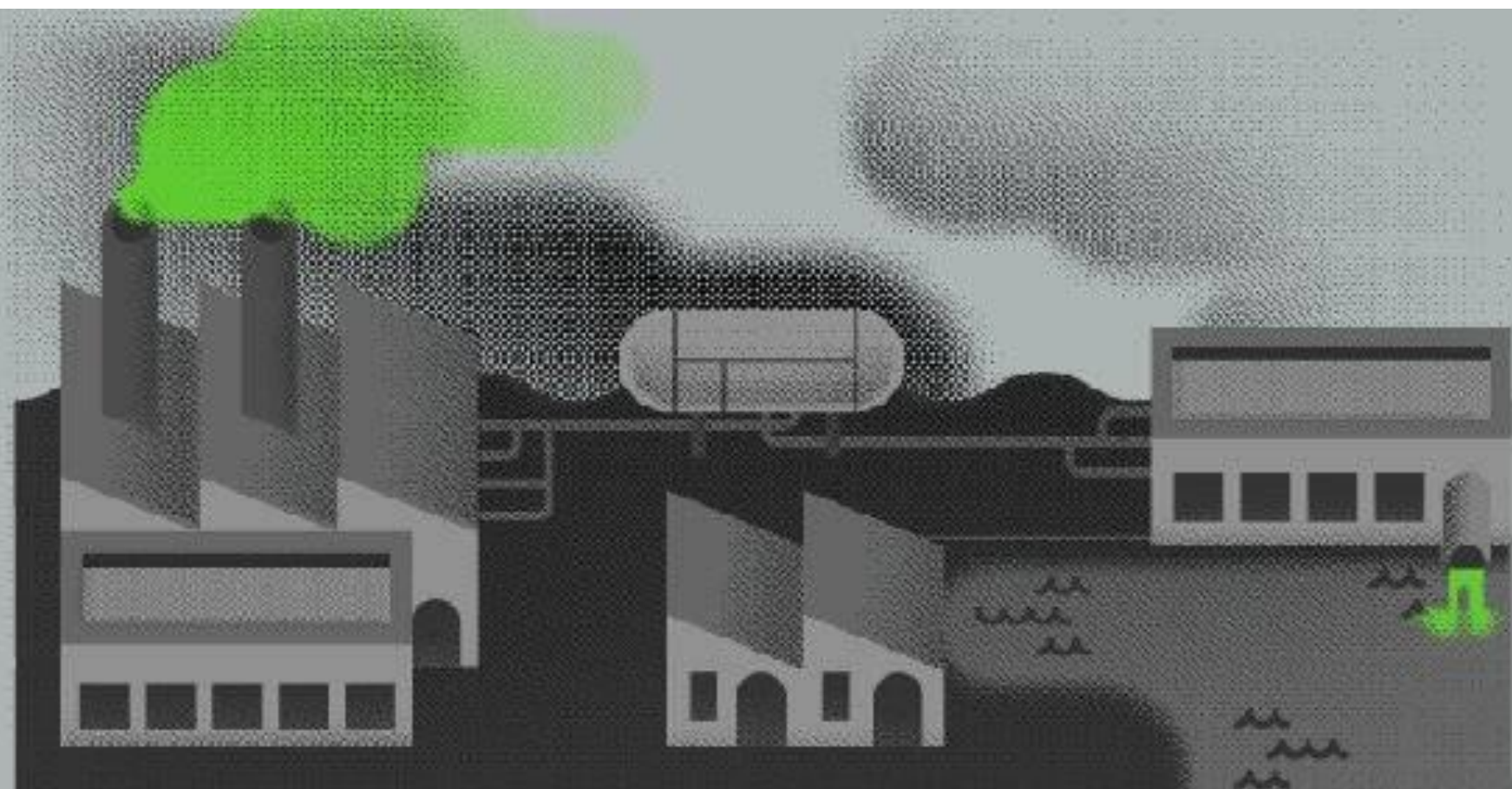**Reduccion de la Capa de Ozono**

Reducción de recursos

Toxicidad
- Humanos
- Ecosistemas
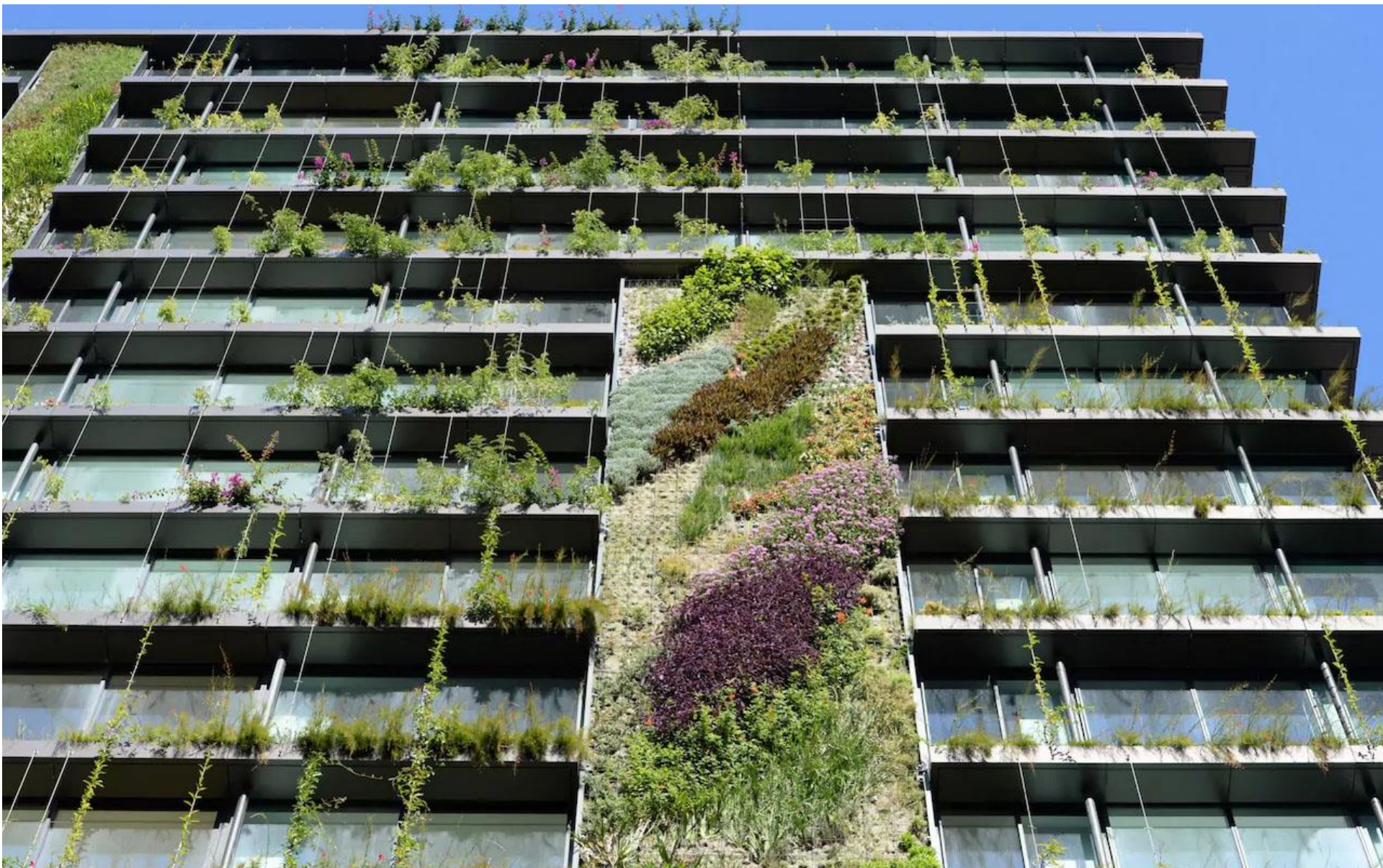
GREENWASHED

THE TRUTH ABOUT 95% OF SO-CALLED GREEN PRODUCTS

"greenwash" – la apropiacion superficial y sinica de principios "sostenibles" para ganancia politica o comercial

"greenwashing" es una forma de comunicacion en la que marketing "ambiental" es usado enganosamente para promover la percepcion de que los productos de una organizacion, sus objetivos o politicas, son ambientalmente responsables
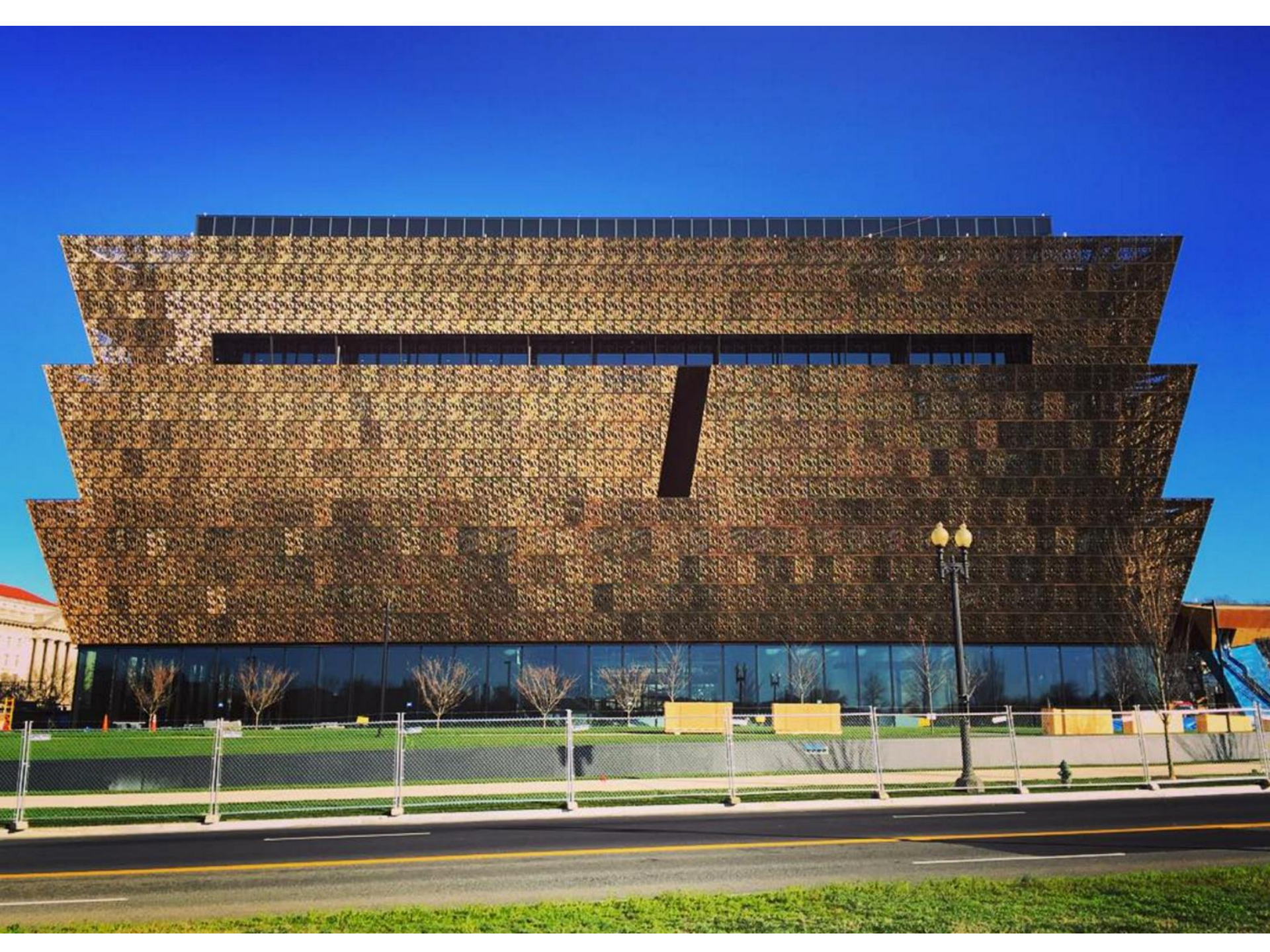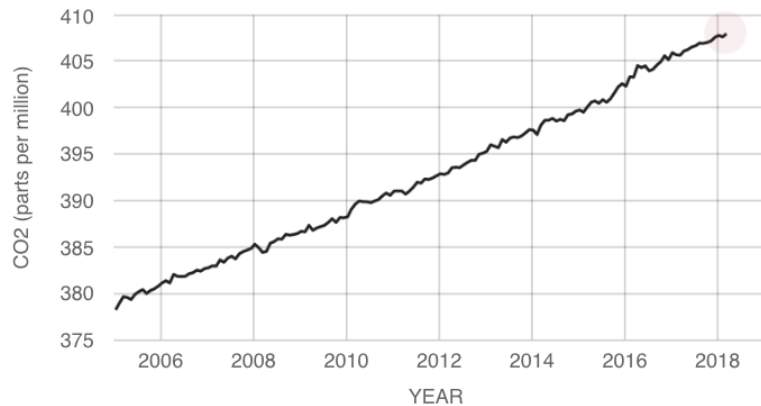
Carbon Dioxide

DIRECT MEASUREMENTS: 2005-PRESENT

Data source: Monthly measurements (average seasonal cycle removed). Credit: NOAA

Click+drag to zoom   RESET

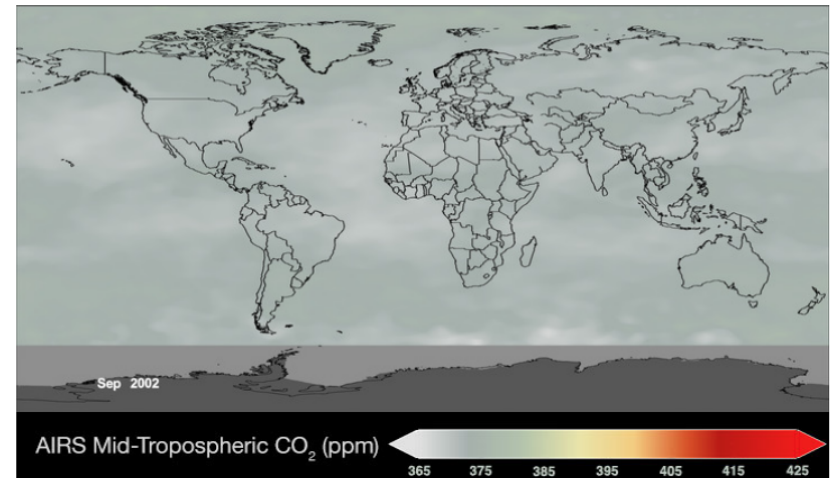Get Data: **FTP** | Snapshot: **PNG**

Carbon dioxide (CO_2) is an important heat-trapping (greenhouse) gas, which is released through human activities such as deforestation and burning fossil fuels, as well as natural processes such as respiration and volcanic eruptions. The above graph shows CO_2 levels measured at Mauna Loa Observatory, Hawaii, in recent years, with average seasonal cycle removed.

TIME SERIES: 2002-2016

Data source: Atmospheric Infrared Sounder (AIRS). Credit: NASA
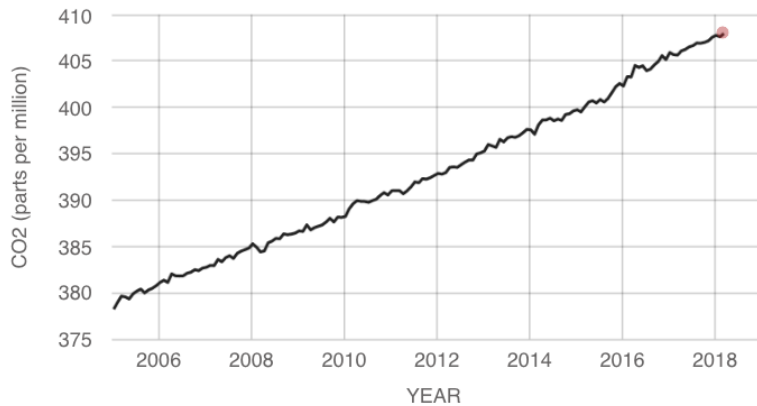

▶ 2002 ⚪────────────── 2016

The time series shows global distribution and variation of the concentration of mid-tropospheric carbon dioxide in parts per million (ppm). The overall color of the map shifts toward the red with advancing time due to the annual increase of CO_2.

full vital sign ›

Carbon Dioxide

DIRECT MEASUREMENTS: 2005-PRESENT

Data source: Monthly measurements (average seasonal cycle removed). Credit: NOAA

Click+drag to zoom   RESET

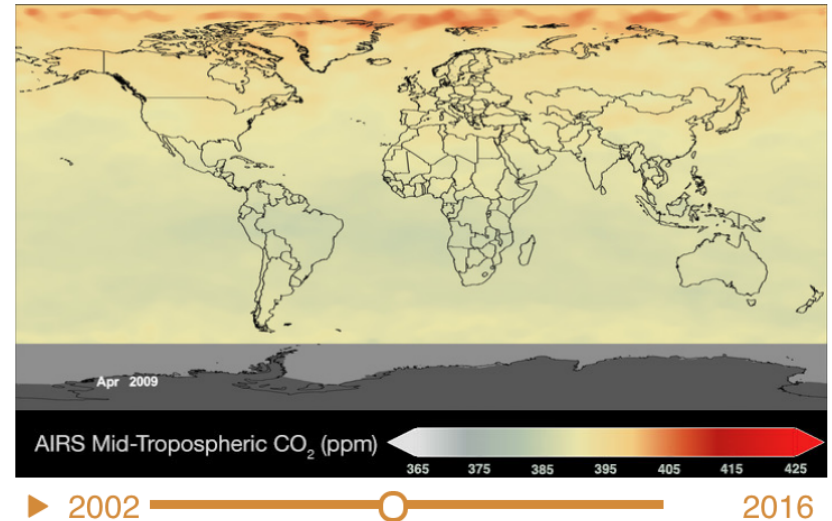Get Data: **FTP** | Snapshot: **PNG**

Carbon dioxide (CO_2) is an important heat-trapping (greenhouse) gas, which is released through human activities such as deforestation and burning fossil fuels, as well as natural processes such as respiration and volcanic eruptions. The above graph shows CO_2 levels measured at Mauna Loa Observatory, Hawaii, in recent years, with average seasonal cycle removed.

TIME SERIES: 2002-2016

Data source: Atmospheric Infrared Sounder (AIRS). Credit: NASA

APRIL
2009

AIRS Mid-Tropospheric CO_2 (ppm)
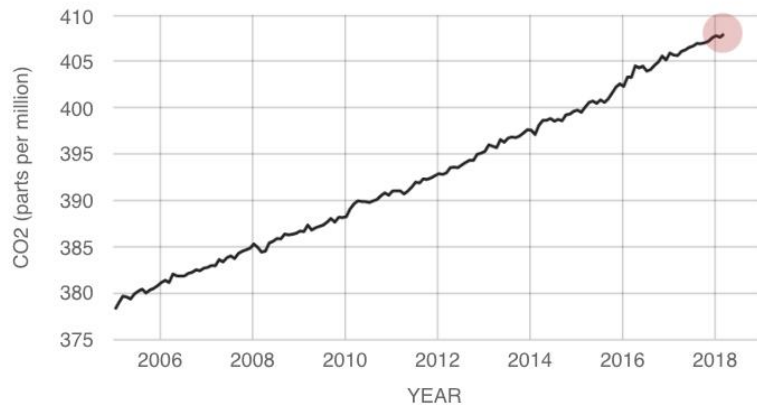365 375 385 395 405 415 425

▶ 2002 ———————○——————— 2016

The time series shows global distribution and variation of the concentration of mid-tropospheric carbon dioxide in parts per million (ppm). The overall color of the map shifts toward the red with advancing time due to the annual increase of CO_2.

full vital sign ›

Carbon Dioxide

DIRECT MEASUREMENTS: 2005-PRESENT

Data source: Monthly measurements (average seasonal cycle removed). Credit: NOAA

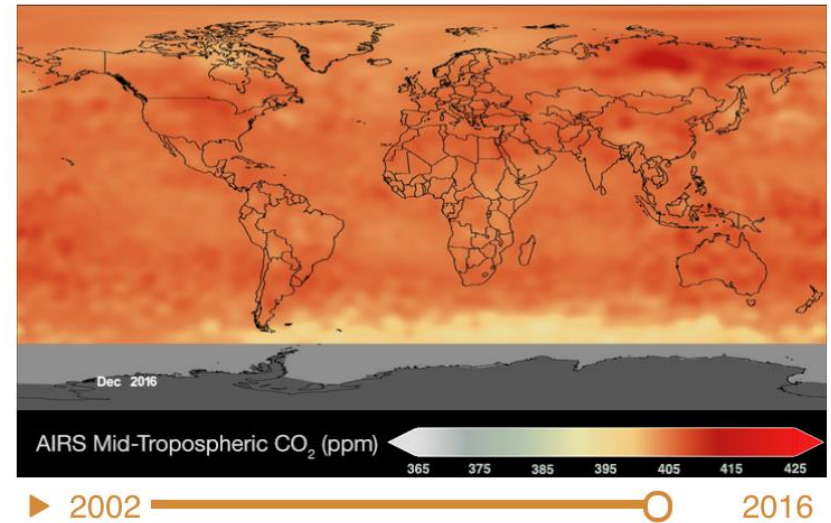Click+drag to zoom   RESET   Get Data: FTP | Snapshot: PNG

Carbon dioxide (CO_2) is an important heat-trapping (greenhouse) gas, which is released through human activities such as deforestation and burning fossil fuels, as well as natural processes such as respiration and volcanic eruptions. The above graph shows CO_2 levels measured at Mauna Loa Observatory, Hawaii, in recent years, with average seasonal cycle removed.

TIME SERIES: 2002-2016

DECEMBER
2016

Data source: Atmospheric Infrared Sounder (AIRS). Credit: NASA

AIRS Mid-Tropospheric CO_2 (ppm)
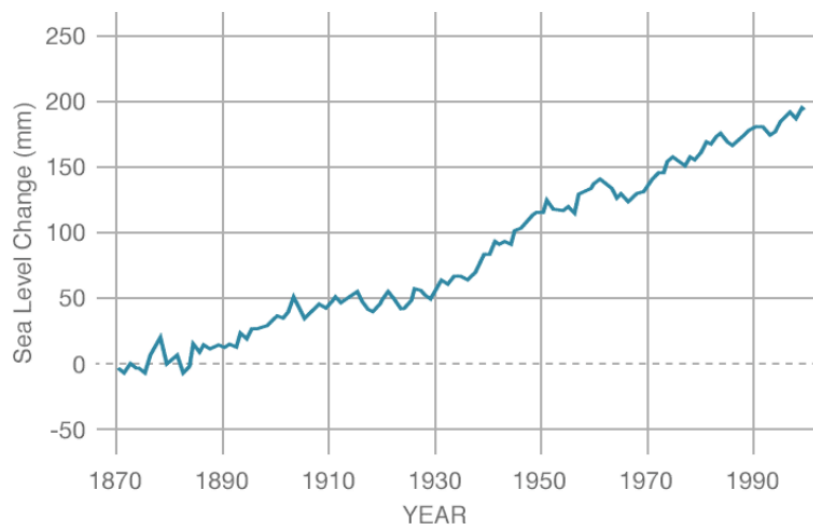
▶ 2002 ——————————————○ 2016

The time series shows global distribution and variation of the concentration of mid-tropospheric carbon dioxide in parts per million (ppm). The overall color of the map shifts toward the red with advancing time due to the annual increase of CO_2.

full vital sign ›

Sea Level

GROUND DATA: 1870-2000

Data source: Coastal tide gauge records.
Credit: CSIRO

Sea level rise is caused primarily by two factors related to global warming: the added water from melting ice sheets and glaciers and the expansion of seawater as it warms. The above graph, derived from coastal tide gauge data, shows how much sea level changed from about 1870 to 2000.

SATELLITE DATA: 1993-PRESENT

Data source: Satellite sea level observations.
Credit: NASA Goddard Space Flight Center

RATE OF CHANGE

↑3.2

millimeters per year
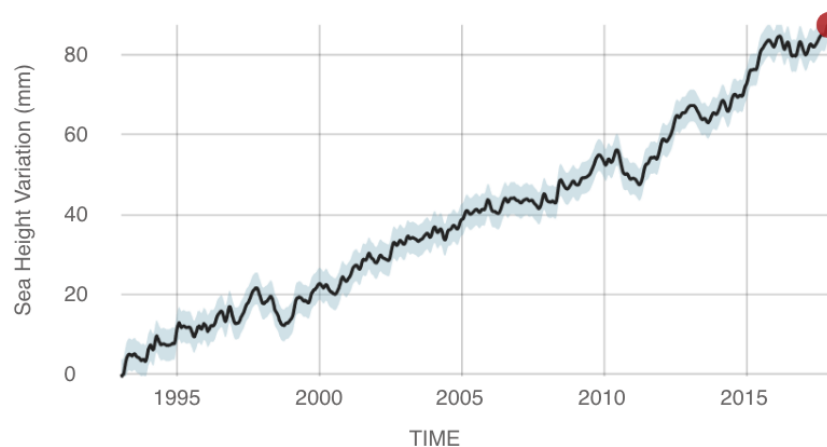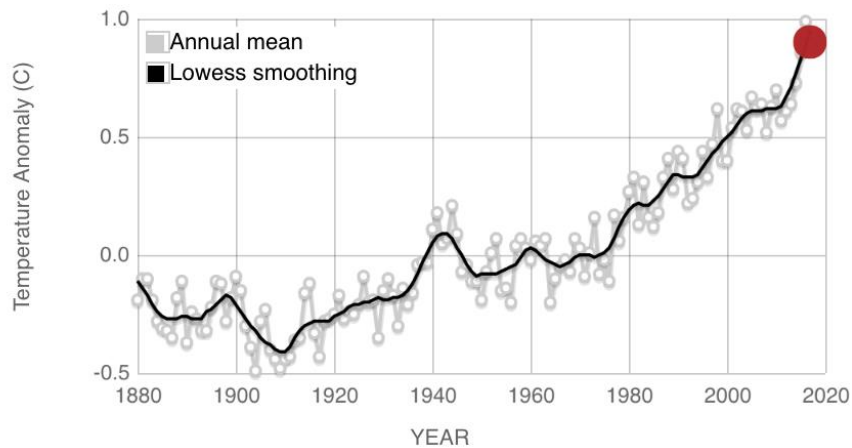

Click+drag to zoom   RESET   **Get Data:** FTP | **Snapshot:** PNG

This graph tracks the change in sea level since 1993 as observed by satellites. Data shown are latest available, with time allowed for processing. (Source)

Global Temperature

Annual mean
Lowess smoothing

Click+drag to zoom   RESET   **Get Data:** HTTP | **Snapshot:** PNG

This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures. Seventeen of the 18 warmest years in the 136-year record all have occurred since 2001, with the exception of 1998. The year 2016 ranks as the warmest on record. (Source: NASA/GISS). This research is broadly consistent with similar constructions prepared by the Climatic Research Unit and the National Oceanic and Atmospheric Administration.

1939

Temperature Difference (Fahrenheit)
-4 -3 -2 -1 0 1 2 3 4

C 1884 ——————O——————— 2017

The time series above shows the five-year average variation of global surface temperatures. Dark blue indicates areas cooler than average. Dark red indicates areas warmer than average.

full vital sign ›

Global Temperature

GLOBAL LAND-OCEAN TEMPERATURE INDEX

Data source: NASA's Goddard Institute for Space Studies (GISS). Credit: NASA/GISS
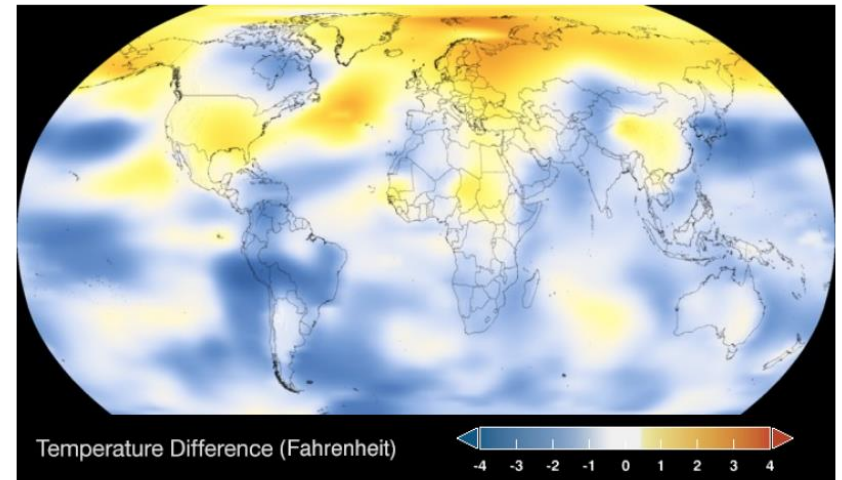

Click+drag to zoom   RESET   Get Data: **HTTP** | Snapshot: **PNG**

This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures. Seventeen of the 18 warmest years in the 136-year record all have occurred since 2001, with the exception of 1998. The year 2016 ranks as the warmest on record. (Source: NASA/GISS). This research is broadly consistent with similar constructions prepared by the Climatic Research Unit and the National Oceanic and Atmospheric Administration.

TIME SERIES: 1884 TO 2017

Data source: NASA/GISS
Credit: NASA Scientific Visualization Studio

1977
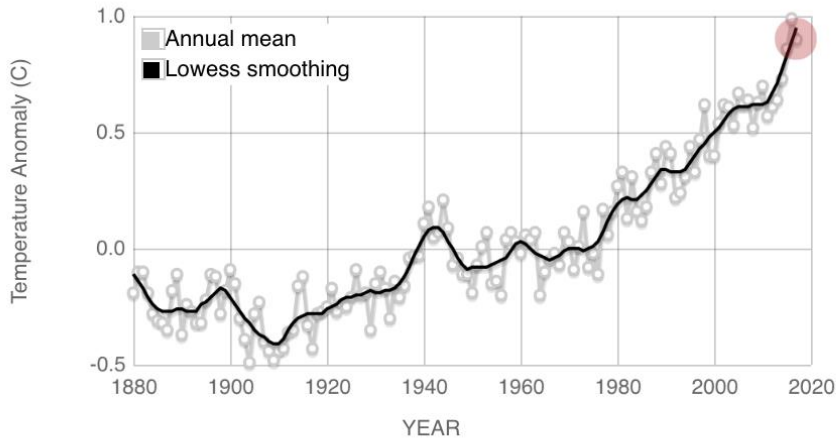

C 1884 ————————————O———— 2017

The time series above shows the five-year average variation of global surface temperatures. Dark blue indicates areas cooler than average. Dark red indicates areas warmer than average.

full vital sign ›

Global Temperature

GLOBAL LAND-OCEAN TEMPERATURE INDEX

Data source: NASA's Goddard Institute for Space Studies (GISS). Credit: NASA/GISS

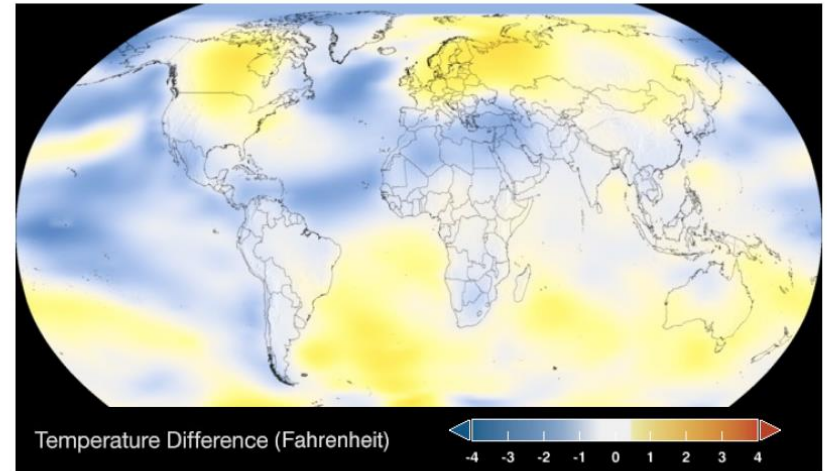Click+drag to zoom   RESET   Get Data: **HTTP** | Snapshot: **PNG**

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TIME SERIES: 1884 TO 2017

Data source: NASA/GISS
Credit: NASA Scientific Visualization Studio

1997
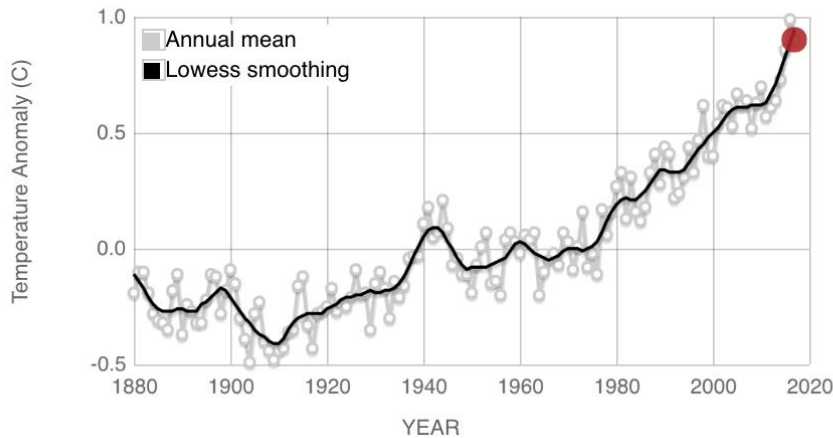

C 1884 ────────────────○──── 2017

The time series above shows the five-year average variation of global surface temperatures. Dark blue indicates areas cooler than average. Dark red indicates areas warmer than average.

full vital sign ›

Global Temperature

Data source: NASA's Goddard Institute for Space Studies
(GISS). Credit: NASA/GISS

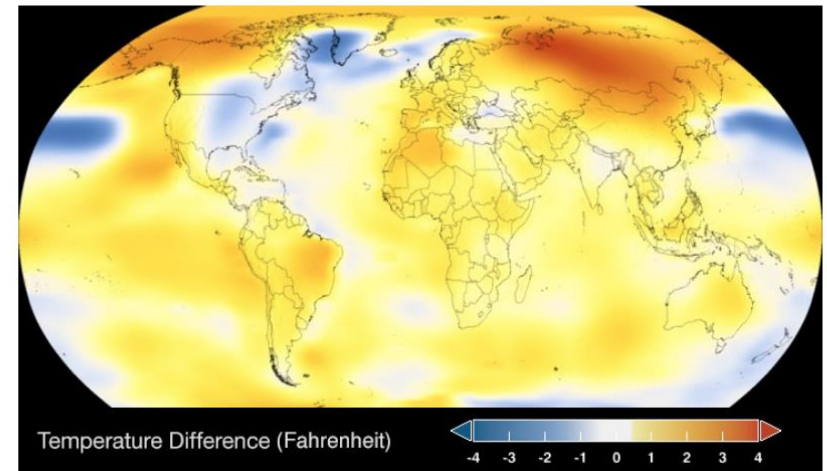Click+drag to zoom RESET   Get Data: HTTP | Snapshot: PNG

This graph illustrates the change in global surface temperature relative to 1951-1980 average temperatures. Seventeen of the 18 warmest years in the 136-year record all have occurred since 2001, with the exception of 1998. The year 2016 ranks as the warmest on record. (Source: NASA/GISS). This research is broadly consistent with similar constructions prepared by the Climatic Research Unit and the National Oceanic and Atmospheric Administration.

TIME SERIES: 1884 TO 2017

2017

Data source: NASA/GISS
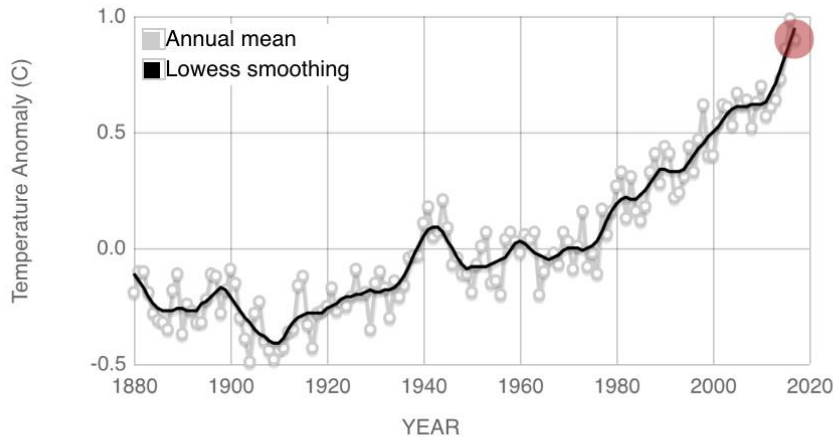Credit: NASA Scientific Visualization Studio

The time series above shows the five-year average variation of global surface temperatures. Dark blue indicates areas cooler than average. Dark red indicates areas warmer than average.

full vital sign ›

The Paris climate agreement: key points

The historic pact, approved by 195 countries, will take effect from 2020

Temperatures
2100

- Keep warming *"well below 2 degrees Celsius".* Continue all efforts to limit the rise in temperatures to *1.5 degrees Celsius"*

Finance
2020-2025

- Rich countries must provide **100 billion dollars from** 2020, as a "floor"

- Amount to be updated by 2025

Differenciation

- Developed countries **must continue to "take the lead"** in the reduction of greenhouse gases

- Developing nations are encouraged to "enhance their efforts" and move over time to cuts

Emissions objectives
2050

- Aim for greenhouse gases emissions to peak *"as soon as possible"*

- *From 2050:* **rapid reductions to achieve a balance between emissions** *from human activity and the amount that can be captured by "sinks"*

Burden-sharing

- ***Developed countries*** *must provide financial resources to help developing countries*

- *Other countries are invited to provide support* **on a voluntary basis**

Review mechanism
2023

- ***A review every five years*** First world review: **2023**

- *Each review will inform countries in "updating and enhancing" their pledges*

Climate damage

- *Vulnerable countries have won recognition of the need for "averting, minimising and addressing" losses suffered due to climate change*
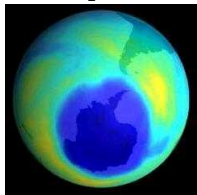
LEED Credit Categories

CICLO DE VIDA

Calentamiento Global

Energia Incorporada

Reduccion de la Capa de Ozono

Reducción de recursos

Toxicidad
- Humanos
- Ecosistemas

1000034785, Cambridge, MA

450 Kendall St Parcel G

LEED BD+C: Core and Shell (v2009)

GOLD, AWARDED NOV 2015

SUSTAINABLE SITES — AWARDED: 20 / 28

SSc1	Site selection	1/1
SSc2	Development density and community connectivity	5/5
SSc3	Brownfield redevelopment	0/1
SSc4.1	Alternative transportation - public transportation access	6/6
SSc4.2	Alternative transportation - bicycle storage and changing rooms	0/2
SSc4.3	Alternative transportation - low-emitting and fuel-efficient vehicles	3/3
SSc4.4	Alternative transportation - parking capacity	2/2
SSc5.1	Site development - protect or restore habitat	0/1
SSc5.2	Site development - maximize open space	0/1
SSc6.1	Stormwater design - quantity control	0/1
SSc6.2	Stormwater design - quality control	0/1
SSc7.1	Heat island effect - nonroof	1/1
SSc7.2	Heat island effect - roof	1/1
SSc8	Light pollution reduction	0/1
SSc9	Tenant design and construction guidelines	1/1

WATER EFFICIENCY — AWARDED: 7 / 10

WEc1	Water efficient landscaping	4/4
WEc2	Innovative wastewater technologies	0/2
WEc3	Water use reduction	3/4

ENERGY & ATMOSPHERE — AWARDED: 13 / 37

EAc1	Optimize energy performance	5/21
EAc2	On-site renewable energy	0/4
EAc3	Enhanced commissioning	2/2
EAc4	Enhanced refrigerant Mgmt	0/2
EAc5.1	Measurement and verification - base building	6/3
EAc5.2	Measurement and verification - tenant submetering	0/3
EAc6	Green power	0/2

MATERIAL & RESOURCES — AWARDED: 5 / 13

MRc1	Building reuse - maintain existing walls, floors and roof	0/5
MRc2	Construction waste Mgmt	2/2
MRc3	Materials reuse	0/1

MATERIAL & RESOURCES — CONTINUED

MRc4	Recycled content	2/2
MRc5	Regional materials	0/2
MRc6	Certified wood	1/1

INDOOR ENVIRONMENTAL QUALITY — AWARDED: 8 / 12

EQc1	Outdoor air delivery monitoring	1/1
EQc2	Increased ventilation	0/1
EQc3	Construction IAQ Mgmt plan - during construction	1/1
EQc4.1	Low-emitting materials - adhesives and sealants	1/1
EQc4.2	Low-emitting materials - paints and coatings	1/1
EQc4.3	Low-emitting materials - flooring systems	1/1
EQc4.4	Low-emitting materials - composite wood and agrifiber products	1/1
EQc5	Indoor chemical and pollutant source control	1/1
EQc6	Controllability of systems - thermal comfort	0/1
EQc7	Thermal comfort - design	0/1
EQc8.1	Daylight and views - daylight	0/1
EQc8.2	Daylight and views - views	1/1

INNOVATION — AWARDED: 5 / 6

IDc1	Innovation in design	4/5
IDc2	LEED Accredited Professional	1/1

REGIONAL PRIORITY — AWARDED: 2 / 4

SSc3	Brownfield redevelopment	0/1
SSc7.1	Heat island effect - nonroof	1/1
SSc7.2	Heat island effect - roof	1/1

TOTAL — 60 / 110

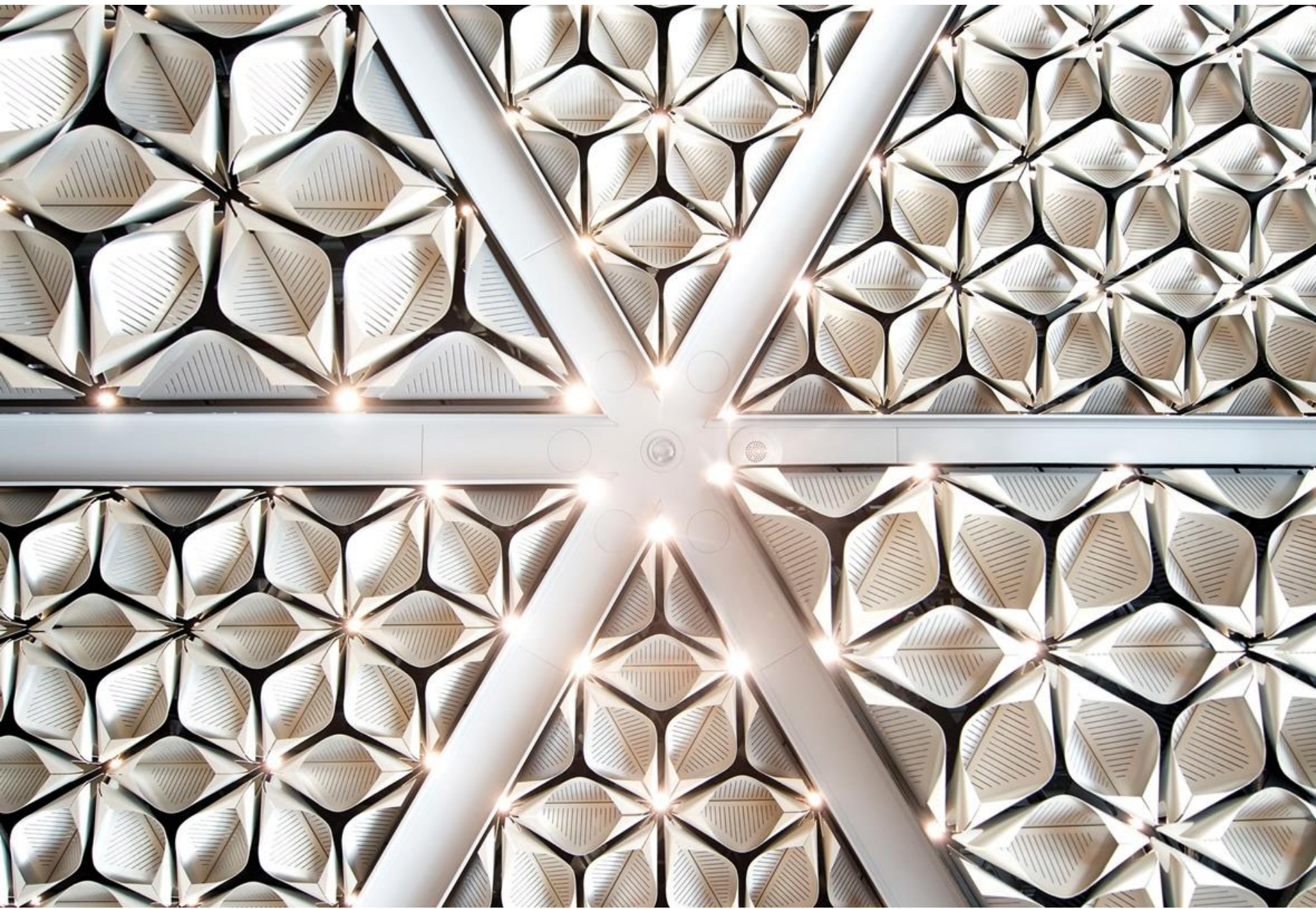| 40-49 Points	50-59 Points	60-79 Points	80+ Points
CERTIFIED	SILVER	GOLD	PLATINUM
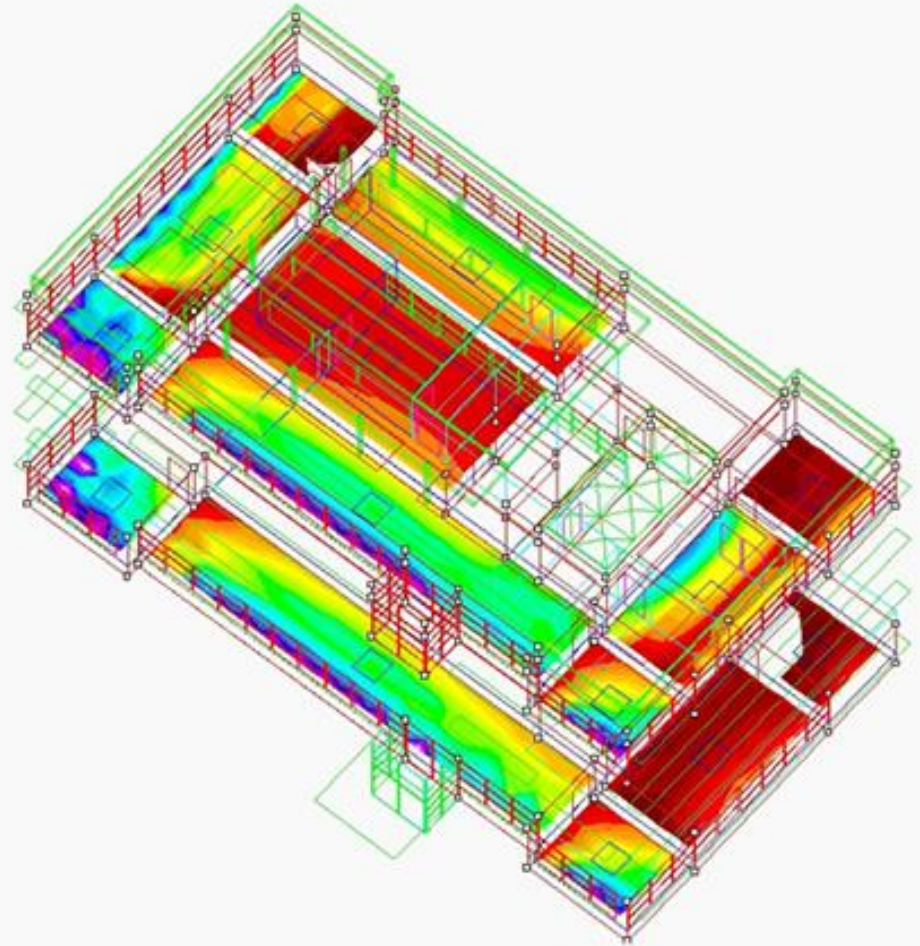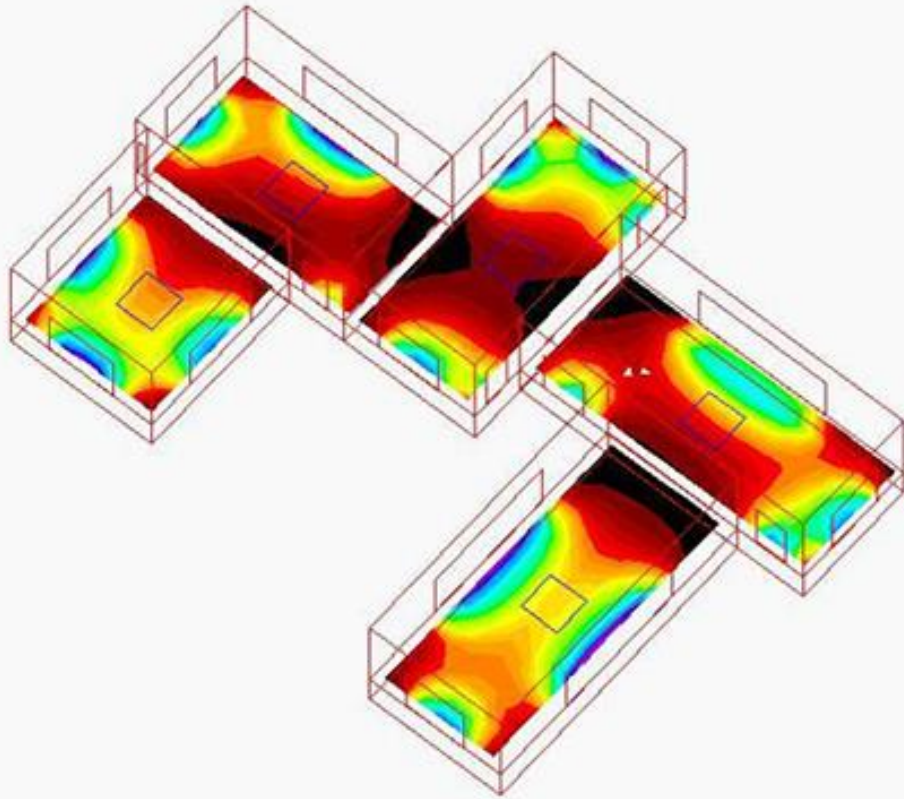
SAO PAULO 2012

ECONOMICS
Production & Resourcing
Exchange & Transfer
Accounting & Regulation
Consumption & Use
Labour & Welfare
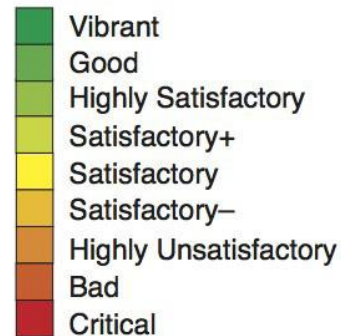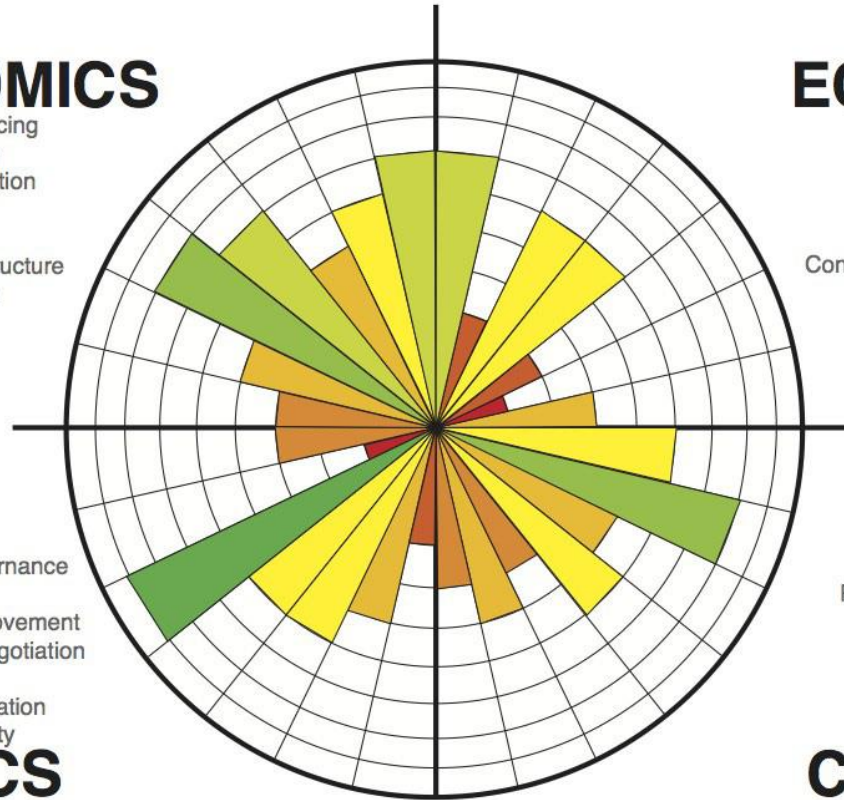Technology & Infrastructure
Wealth & Distribution

ECOLOGY
Materials & Energy
Water & Air
Flora & Fauna
Habitat & Land
Place & Space
Constructions & Settlements
Emission & Waste

POLITICS
Organization & Governance
Law & Justice
Communication & Movement
Representation & Negotiation
Security & Accord
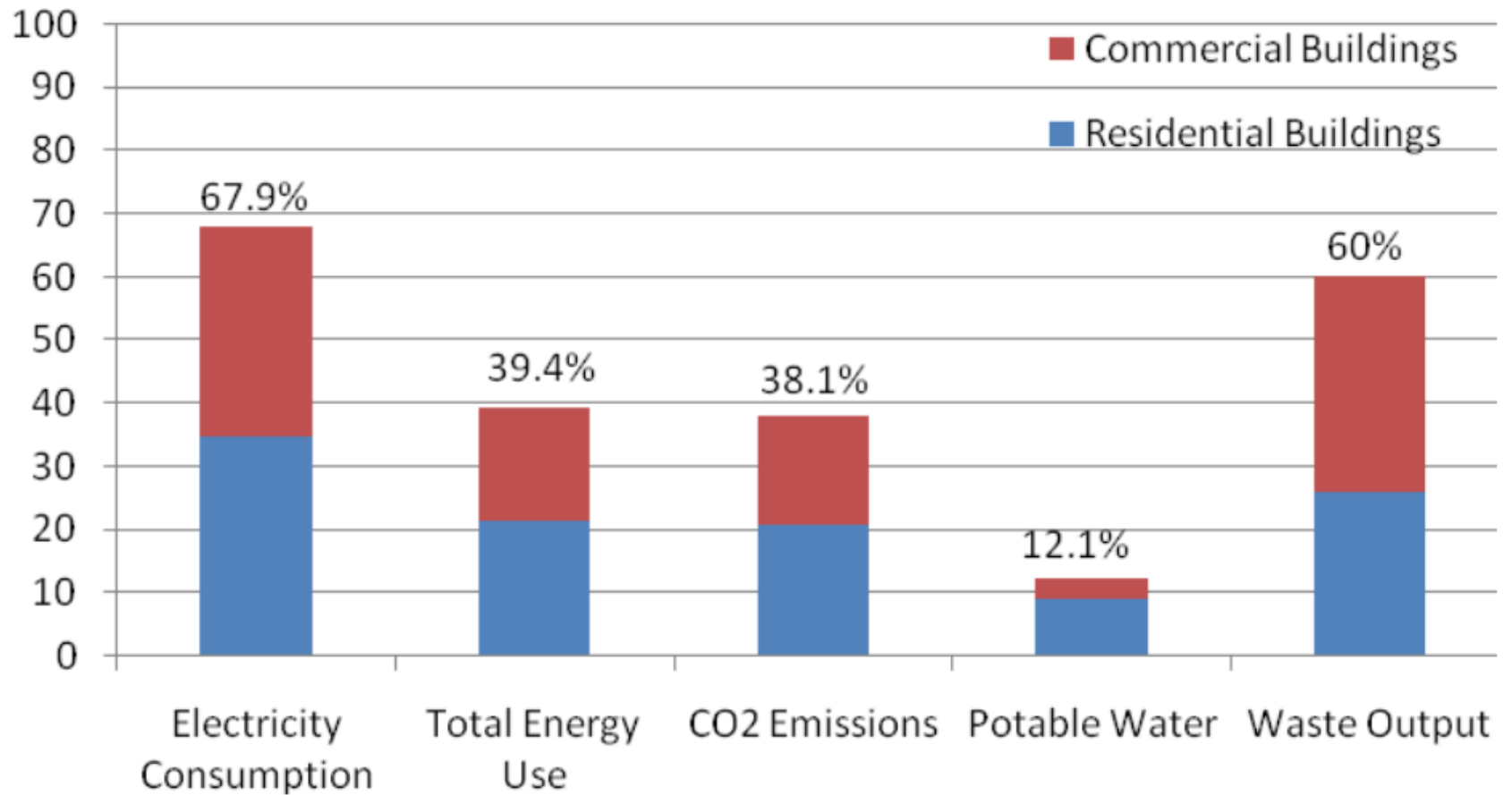Dialogue & Reconciliation
Ethics & Accountability

CULTURE
Engagement & Identity
Performance & Creativity
Memory & Projection
Belief & Meaning
Gender & Generations
Enquiry & Learning
Health & Wellbeing

Legend:
- Vibrant
- Good
- Highly Satisfactory
- Satisfactory+
- Satisfactory
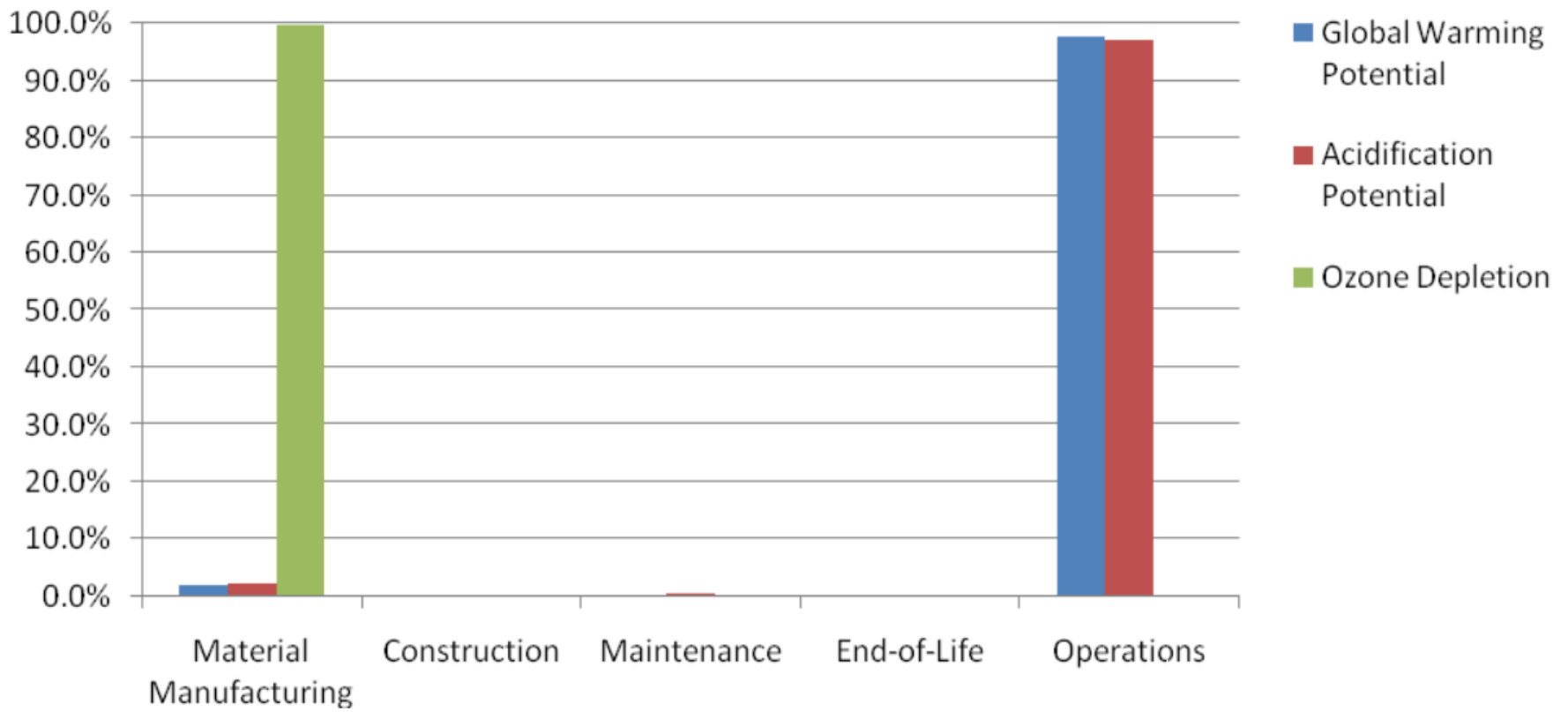- Satisfactory–
- Highly Unsatisfactory
- Bad
- Critical

*Sao Paulo Macro Metropolitan Region, 2012

CIRCLES OF SUSTAINABILITY

67% - ENERGIA

DISEÑO ADECUADO AL ENTORNO Y CLIMA LOCAL

SISTEMAS PASIVOS DE CLIMATIZACION Y CONFORT TERMICO

TECNOLOGIAS EFICIENTES QUE PERMITAN REDUCIR CONSUMO (ILUMINACION, CLIMATIZACION, OTROS)

GENERACION DE ENERGIA EN SITIO

60% - GENERACION DE DESECHOS

REUTILIZACION DE EDIFICIOS Y ESTRUCTURAS EXISTENTES

SISTEMA CONSTRUCTIVO Y ESPECIFICACION DE MATERIALES PARA REDUCIR DEMANDA DE MATERIA PRIMA

SISTEMA CONSTRUCTIVO QUE PERMITA CERRAR CICLO DE VIDA CRADLE TO CRADLE

Los mayores contribuidores de emisiones incorporadas de CO2 al material y su proceso

hormigón, cemento, gypsum, piedra, y otros materiales cerámicos 39.2%
Minerales 24.2%
Hierro y acero 9.8%
Madera 9.3%

Giesekam encontró que el 44% de las emisiones d la construcción eran derivadas del cemento y el acero*
Yan encontró que el hormigón armado contribuye al 94% de las emisiones incorporadas al material**

*J.B. J. Giesekam, The greenhouse gas emissions and mitigation options for materials
**H. Yan Shen, Greenhouse gas emissions in building construction, a case study

12% - AGUA POTABLE

SISTEMAS SANITARIOS EFICIENTES

RECICLAJE DE AGUA

RECOLECCION DE AGUA LLUVIA

CUBIERTAS VERDES – CONTROL DE DESCARGA EN SISTEMAS URBANOS

All of this is surely a good idea, at some level: trying to repair some of the damage our lifestyle has done to the planet by integrating nature into what have been, especially in the modern era, wasteful, harsh, alienating, concrete urban deserts. But, despite the rhetoric of reconciling the city with nature, today's green urban dream is too often about bringing a technologically controlled version of nature into the city and declaring the problem solved, rather than looking at the deeper causes of our current environmental and urban discontents

Wade Graham's latest book is "Dream Cities: Seven Urban Ideas That Shape the World." He is a landscape designer as well as a historian and adjunct professor of public policy at Pepperdine Unversity.