



# Sustainable Facilities Management.

Dealing with Carbon footprint

Enrique Vallano, MRICS, Brussels 20th May 2010



## □ Why sustainability now?

□ Even though it is needless to explain why, I will bring some thinking facts:

□ Calendar

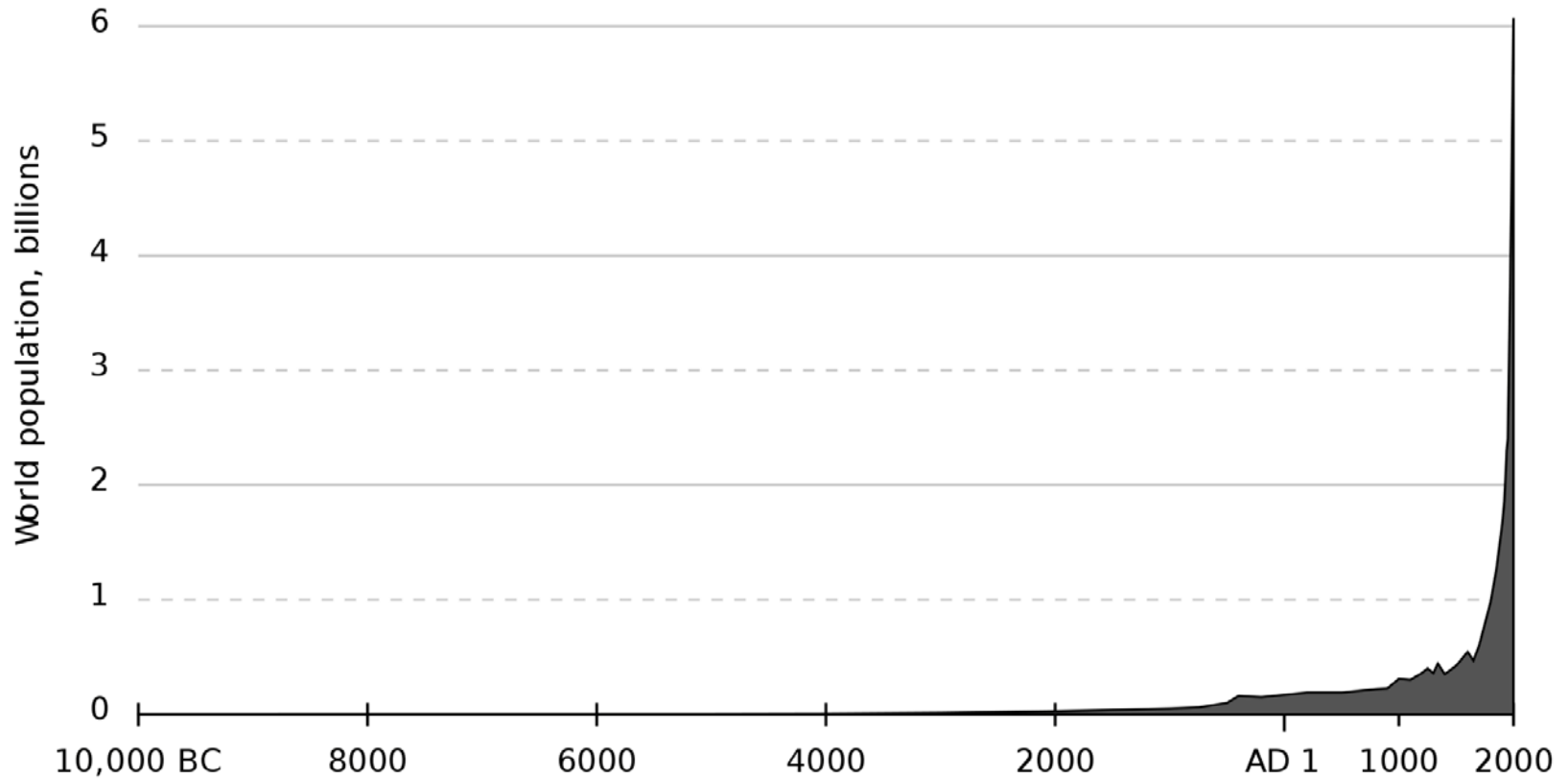
□ Emission vs recovery

□ Building & GHG emissions

□ World population growth

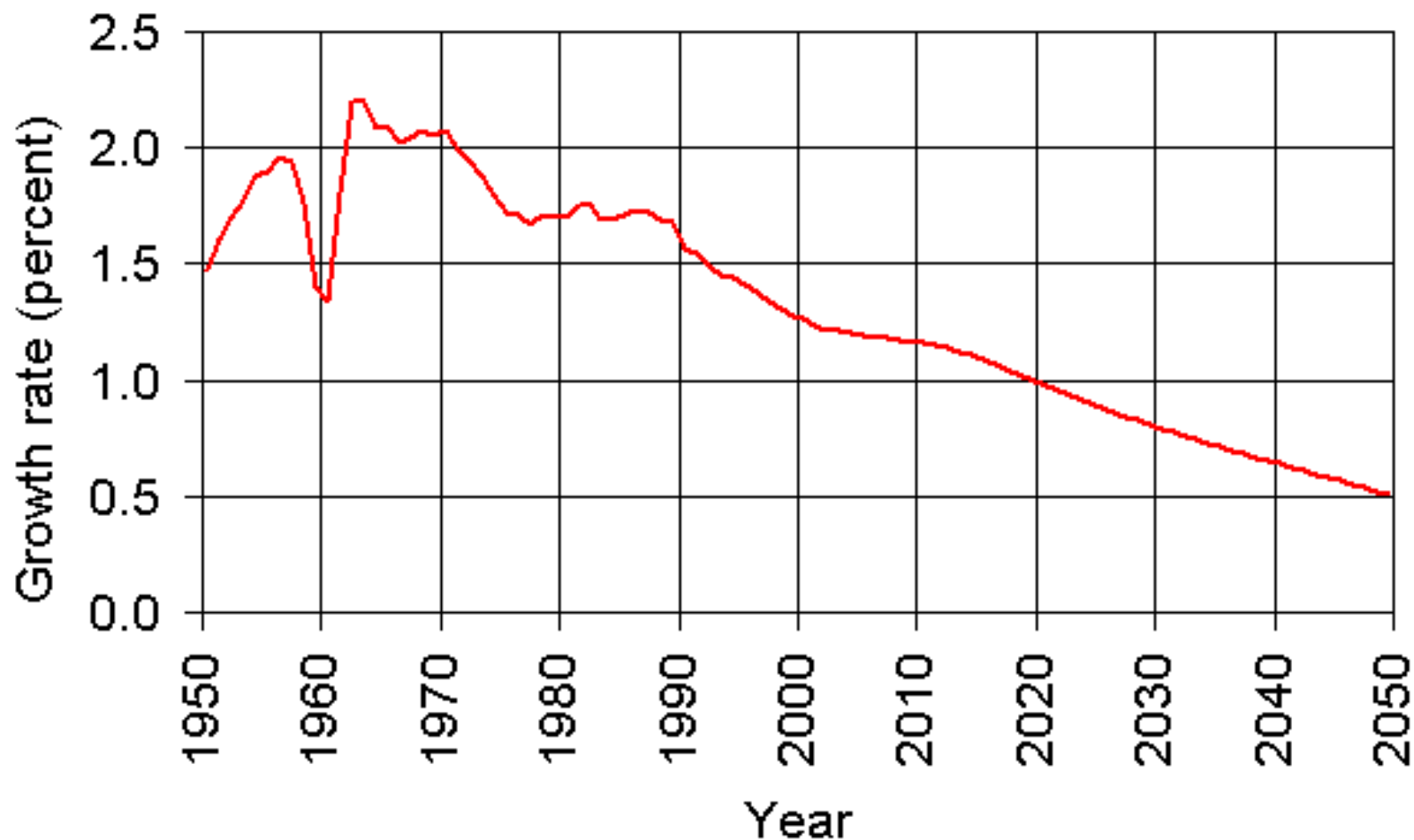
□ Polluting sources, Natural vs Human

# Human growth increase from 15<sup>th</sup> century



United Nations (UN), 1973, The Determinants and Consequences of Population Trends, Population Studies, No. 50., p.10.  
United Nations, 1999, The World at Six Billion, Table 1, "World Population From" Year 0 to Stabilization, p. 5,  
<http://www.un.org/esa/population/publications/sixbillion/sixbilpart1.pdf>

# World Population Growth Rates: 1950-2050

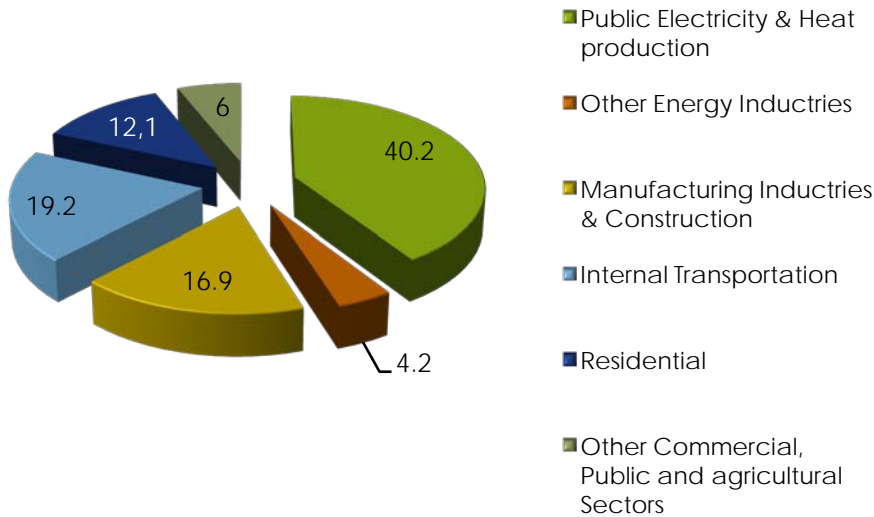


Source: U.S. Census Bureau, International Data Base, December 2008 Update.

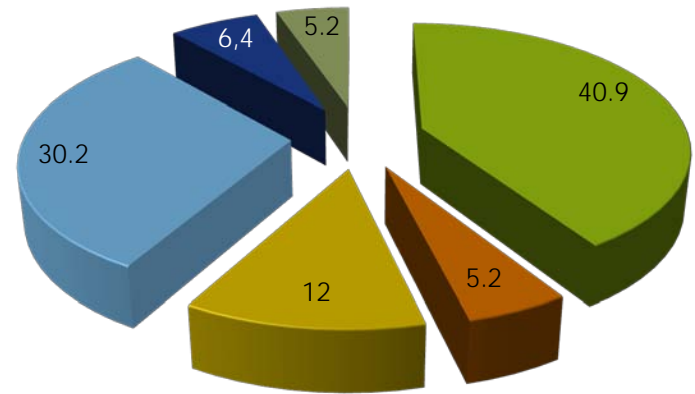


# Percentage of CO2 emissions by sector by continent, % considered per total continent

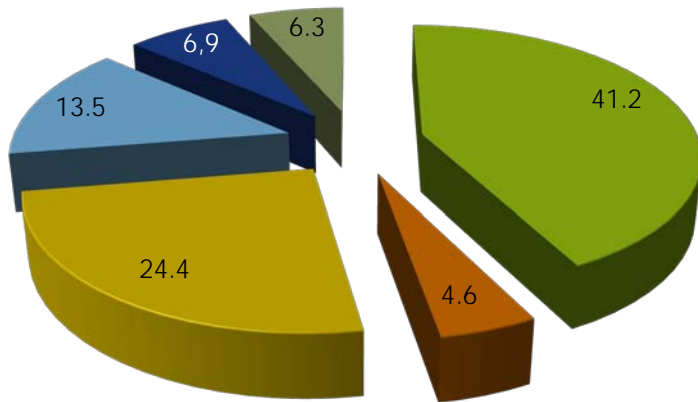
Europe - 6.156,9 million metric tones



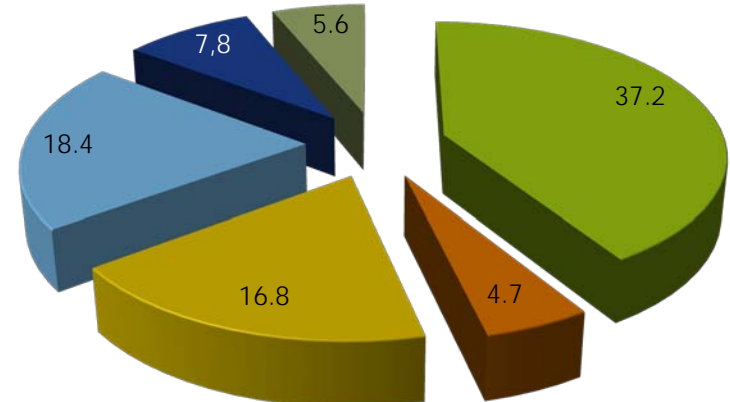
USA & Canada - 6.202,3 mmt



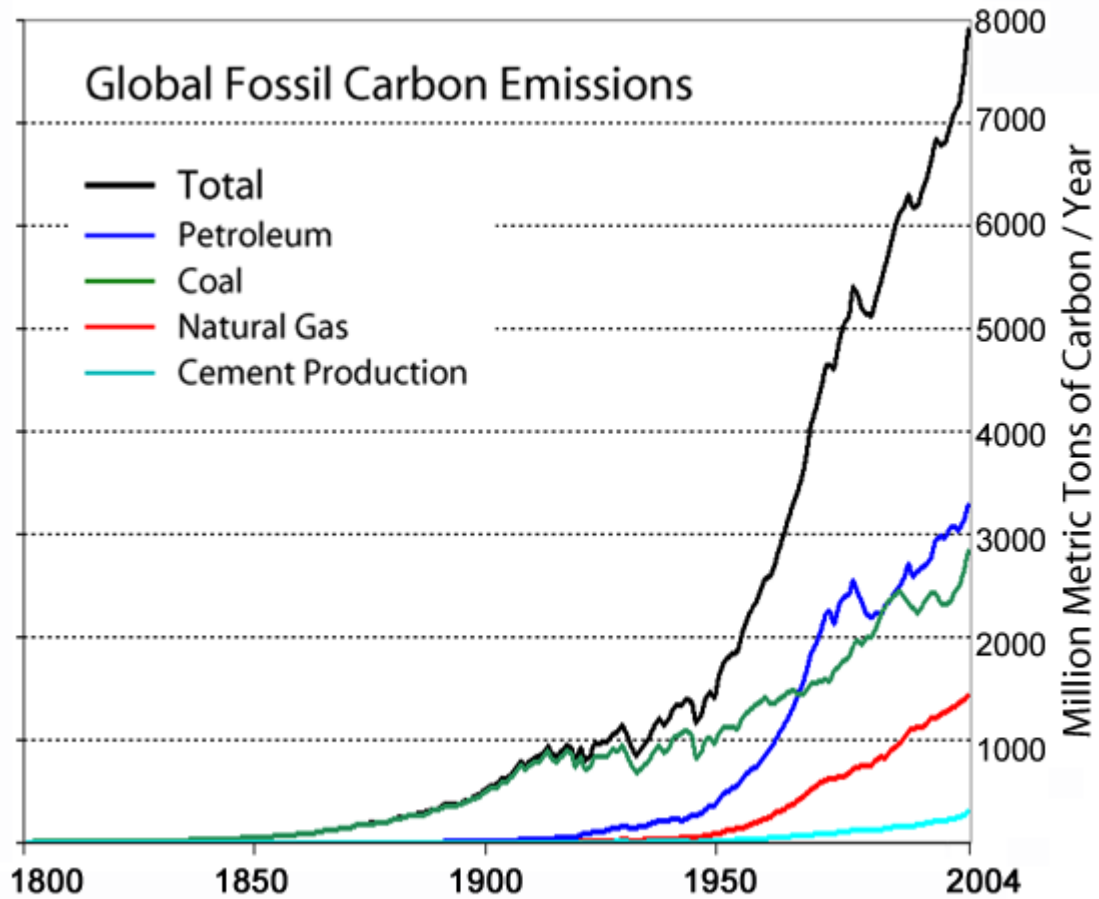
Asia 7.402,8 mmt



Total World - 27.898,2 mmt



Source: International Energy Agency (IEA), 2004. CO2 Emissions from Fuel Combustion (2003 Edition). Electronic database available online at: <http://data.iea.org/ieastore/default.asp>. Paris: Organization for Economic Cooperation and Development (OECD).

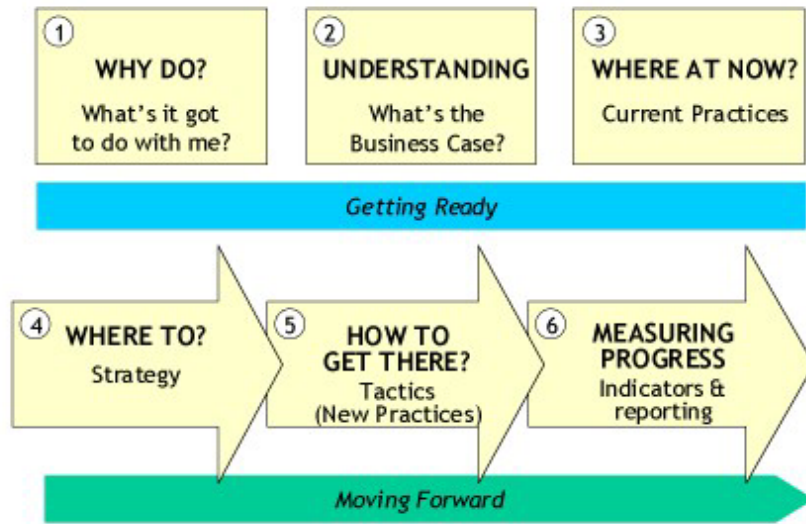


The Carbon Dioxide Information Analysis Center (CDIAC) is an organization within the [United States Department of Energy](#)

## ■ Considerations on Facility Management...:

- ✓ ...2<sup>nd</sup> largest account
- ✓ ...Value of building
- ✓ ...operating expenses
- ✓ ...40% CO2 emissions
- ✓ ...Investors
- ✓ ...tenancies and long term plan
- ✓ ...Government commitments
- ✓ ...Corporate Social Responsibility
- ✓ ... Chain of value in RE

... makes sense to ask Facility Managers what can they do



- 1- Why, is done
- 2- Understand and make our own BC, to do
- 3- Where now and where do we want to be, to do
- 4- Fix objectives, to do
- 5- How, to do
6. Measure, communicate and benchmark, to do

## Actions:

- ① Standardize ( related to steps 3 & 4)
- ② Measure performance (3&4)
- ③ Establish best practices (5)
- ④ Adapt performance to our needs, objectives (5)
- ⑤ Benchmark and communicate (6)



# ① Standards

- Sustainability, a product?
  - US: LEEDS
  - UK: BREEAM
  - France: HQE
  - Japan: CASBEE
  - ISO 14001
  - ISO 9000
  - AS 4801
  - Green Globe Certification
  - Global Reporting Initiative - G3 Guidelines
  - IPD Environment Code
  - RICS Life Cycle Costing of Sustainable Design
  - Many other are apportioning good ideas, standards, etc.
  
- Too many standards?
  
- Actual available sustainability

## ② Measuring Performance

- Data collection:
  - Select a criteria, e.g.: Global Reporting initiative - G3 Guidelines, or IPD code
  - Consider:
    - I. Energy
      - a. Electricity: bought, generated, mix
      - b. Fuels: Gas, oil, solid,
      - c. Renewable: electricity, biogas, biodiesel, biomass, etc
      - d. Communal: cooling, heating
      - e. Nature: geothermal,
    - II. Water: Bought, wells, harvested rain/snow, recycled
    - III. Waste: non recycled, landfill, incinerated no CO2 emission, incinerated CO2 emission, Recycled, Composted
    - IV. Transport: Individual, Communal, cycle parking, biogas/fuel burnt, public.
    - V. Equipment: HCFC friendly, frequency of revisions, fitting, setting, lightning, etc.
    - VI. Health: Operable windows, % fresh air intake in HVAC system, moisturizers, lightning luxes, noise, etc

Balance, the weakest point

Balance, Difficult to measure

Efficiency vs Cost

Political commitment

## ② Measuring Performance

- In order to calculate CO2 equivalent emissions:

**CO2 emission (tonnes)=Energy consumed per fuel type (KWh) x Fuel Emission Factor x 0,001**

- Fuel Emission Factor must be checked by country and fuel type, as it may vary from type of generation, country, time, fuel, etc. Supplier or Environment Department of local Governments can provide this data in order to self evaluate the CO2 emission
- The Greenhouse Gas Protocol Initiative, also provides a resource to calculate CO2 emission internationally. [www.ghgprotocol.org](http://www.ghgprotocol.org)



- Source: IPD environment code

## ② Measuring Performance

- There are many software available to measure energy consumption, environmental performance of buildings, installations, depending on type and dedication of buildings.
  - National House Energy Rating System
  - Building Energy Rating Scheme
  - Green Globe 21
  - National Australian Built Environment Rating Systems – [www.deh.gov.au/industry/construction/nabers/index.html](http://www.deh.gov.au/industry/construction/nabers/index.html)
  - Energy Express, CSIRO energy express:
    - for Architects: focused on structure
    - for Engineers: Plus HVAC dimensioning, performance, calculating energy consumption, etc. More focused to operating the building
  - E-bench, is a full energy and utility software management system, which aim is to track energy use.
  - Life Cycle Analysis design, and Carbon Reduction Commitment for construction [www.construction-innovation.info/index.php](http://www.construction-innovation.info/index.php)
  - SIMA pro, professional tool to monitor environmental performance of products and services
  - LCA in sustainable architecture, LISA, identifies key environmental issues in construction – [www.lisa.au.com](http://www.lisa.au.com)

## ③ Best Practices

- ▣ KPI and SLA
- ▣ Quantitative vs qualitative indicators
- ▣ Bespoke Quantitative indicators
- ▣ Check qualitative indicators
- ▣ Crosschecking, comparing, drilling down

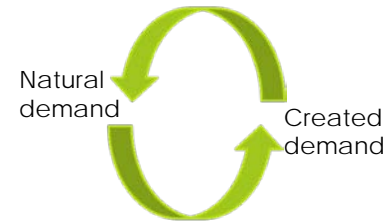
Indicators grid	Factor				
	ENERGY	WATER	WASTE	TRANSPORT	HEALTH
Annual Budget	Q	Q	Q	Q	Q
Annual change/variance	Q	Q	Q	Q	Q
Main unit	Q	Q	Q	q	q
Unit/m2	Q	Q	Q	q	q
Unit/Person	Q	Q	Q	q	q
annual ammount	Q	Q	Q	q	q
annual ammount variance	Q	Q	Q	q	q
Price/unit/time unit	Q	Q	Q	q	q
Total renewable qty	Q	Q	Q	q	q
Renewable Qty/m2	Q	Q	Q	q	q
Renewable qty/person	Q	Q	Q	q	q
Renewable qty variance	Q	Q	Q	q	q

Q- Quantitative

q- qualitaive

## ④ Adapting Performance to needs

- ❑ Indicators allow tailoring service.
- ❑ Adapt consumption to strict needs
- ❑ Educate needs
- ❑ FM as service and support
- ❑ Have you?:
  - ❑ Not open windows when HVAC is on ?
  - ❑ Implemented Freecooling?
  - ❑ Installed lightning in parallel to natural lightning, and in parallel segregation, so it can be switched off/on according to natural light, per areas.?
  - ❑ Installed ballasts in fluorescent lightning, balance reactive energy?
  - ❑ Installed meters in different areas, so to measure consumption per lease area, or use space?. Different dedication demand different lux amount.
  - ❑ Installed low flow taps, low capacity cisterns, dual flush, segregated metering?
  - ❑ Implemented No paper policy, recycled toner cartridges, reduced number of personal bins?
  - ❑ Implemented Responsible procurement, low packaging stationery, close suppliers?,
  - ❑ Avoided non reusable cutlery, dishes, etc.?
  - ❑ Provided communal transport, facilitate cycle parking, facilitate public transport, use close by suppliers?
  - ❑ Have a Noise control, adequate HVAC output and input, respect distribution, use nomad workstations?.
  - ❑ ...



## ④ Adapting Performance to needs

### Subject Areas covered by the Sustainability Challenge

WORKPLACE	MARKETPLACE	COMMUNITY	ENVIRONMENT	GENERAL
Diversity & inclusion	Reporting: CRI, GRI	CSR	Climate Change: science, effects, mitigation	Defining Sustainability
Governance	Assurance	Stakeholder engagement	Renewable energy & energy efficiency	Sustainable Development
Innovation	Reputation	Volunteering	Waste & water management	Business Case
Economic Sustainability	Social enterprise	Social Inclusion	Emissions trading	Sustainability as strategy
Ethics & Values	Responsible/ ethical investment	Community Investment & Philanthropy	Cleaner production	HR & OHS
Wellness	Green Economy	Transparency	Product stewardship	Law & Public Policy
Best Practice	Greenwash	Trust	Recycling	LOHAS
Attraction, retention & engagement	Trade Practices	Human Rights	Biodiversity	Leadership
Sustainability supply chain	Accreditation	Transport	Green buildings	Accountability

## ⑤ Benchmark, reporting, communicating

- Once done, tell it!!!
- Certification, and continuous commitment
- Account and monitor economical impact
- Communicate
- Note social progress
- Communicate
- Consider Environmental achievements
- Communicate
- Commit and excel achieved performance



- Refer to Global Reporting Initiative GRI 3 - <http://www.globalreporting.org/ReportingFramework/G3Guidelines/>



# ⑤ GRI G3 Guidelines exec summary

## Principles and Guidance

Apply the reporting Principles and guidance to ensure your report is focused and of value for internal and external stakeholders.

**Define Report Content**, by applying the principles of materiality, stakeholder inclusiveness, sustainability context and completeness

**Ensure reporting quality**, by applying the principles of balance, compatibility, accuracy, timeliness, reliability and clarity.

**Set report boundary**, by following the guidance provided to determine the range of entities that should be included in the report.

## Standard Disclosures

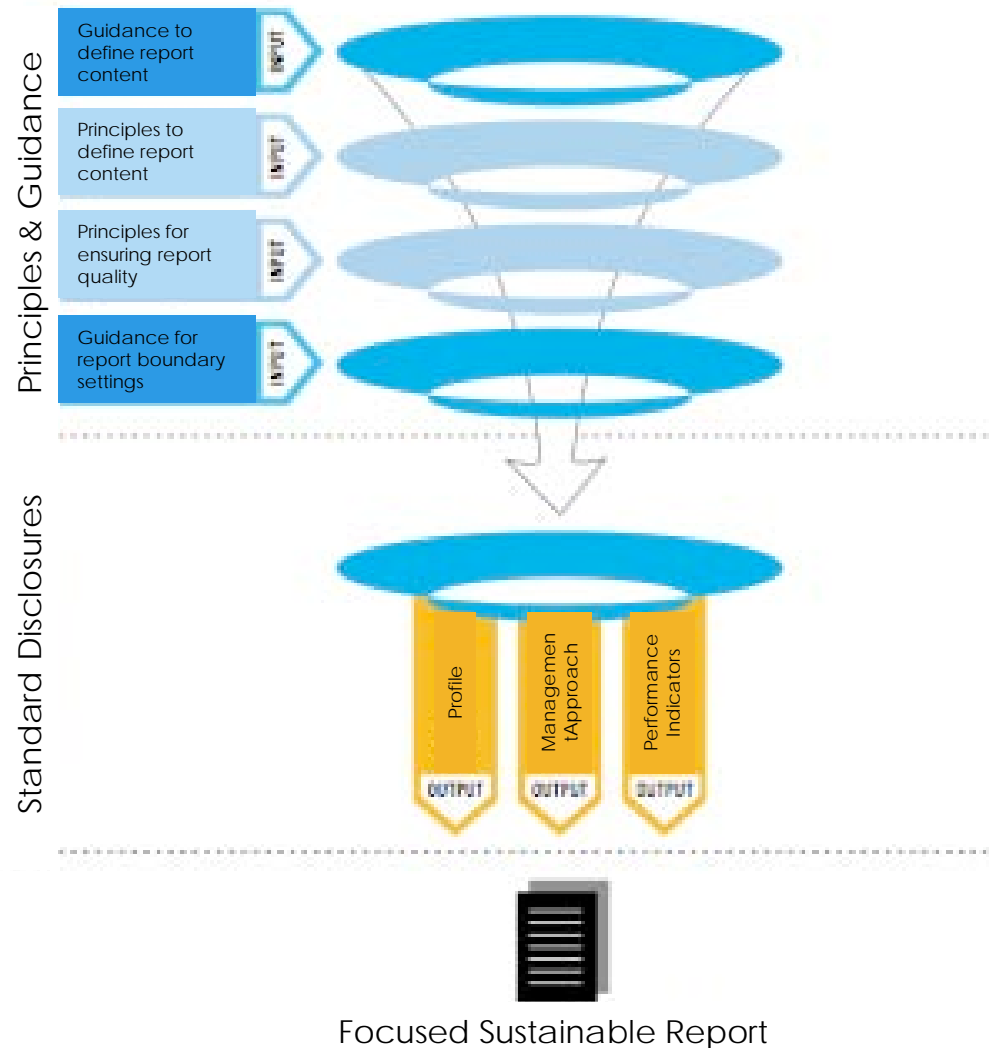
There are three different types of measures that can be used to express strategic approach, management goals, and performance results.

**Profile**, disclosures set the overall context for understanding performance, such as strategy and governance.

**Management approach**, disclosures explain how specific sustainability issues are managed, including goals and targets.

**Performance indicators**, elicit comparable information on economic environmental and social performance.

## Options for reporting



# The difficult balance

Human Interests

Environment  
Interests

Human activity is aggressive  
Sustainability vs € profitability  
What when it is not  
Economical interest vs life

Intangible

Tangible

Solid & water waste treatment resulting in with GHG  
production

Unbalanced

Balanced

Counting emissions from manufacturing start point, create a  
ROI related to GHG emission and savings

- Individual commitment is the quickest way to sustainability
- Green buildings are environmentally more friendly and economically cheaper to operate (IPD developing further analysis on this topic)
- Investors are more interested to buy Green Buildings
- Governments encouraging sustainability agreement compliance
- Life balance is delicate



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- ❑ <http://www.globalreporting.org/ReportingFramework/G3Guidelines/>
- ❑ <http://www.good-bye-lenine-la-rouille-en-plus.eu/>

# Questions, Debate & Thanks

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