



Challenges and way forward in implementing eco-efficiency at the local level

- How to quantify citywide greenhouse gas emissions based on a consumption approach?*

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Why focus on cities?



Population Concentration

- Now: 50%*
- 2030: 60% (=1986 population)*

Energy Consumption & GHG Emissions

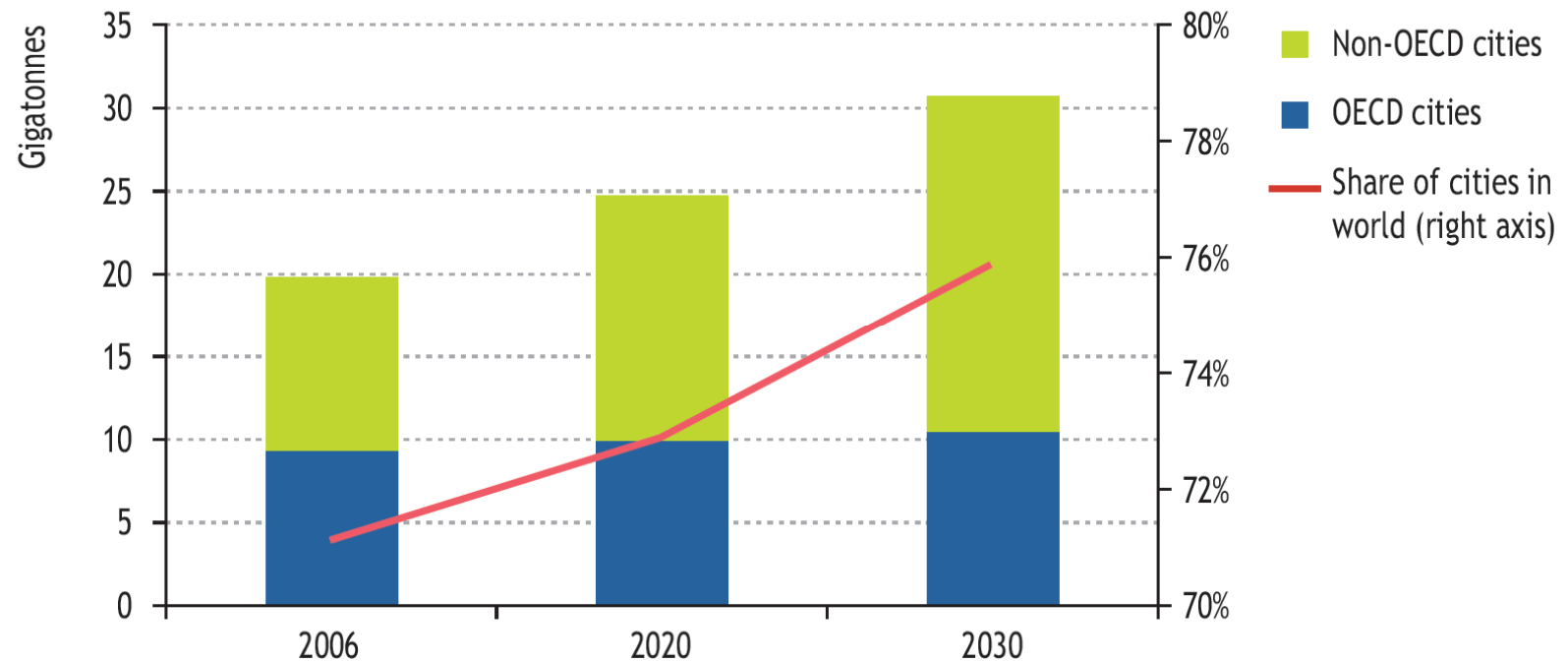
- >70%*

Control of Emission sources

- Municipal governments have direct control on many emission sources



Energy Related CO2 Emissions in Cities





Why accounting GHG emissions?



Baseline emissions?

Current emissions?

Why Accounting GHG Emissions



Reduction target?

Sources of emissions?

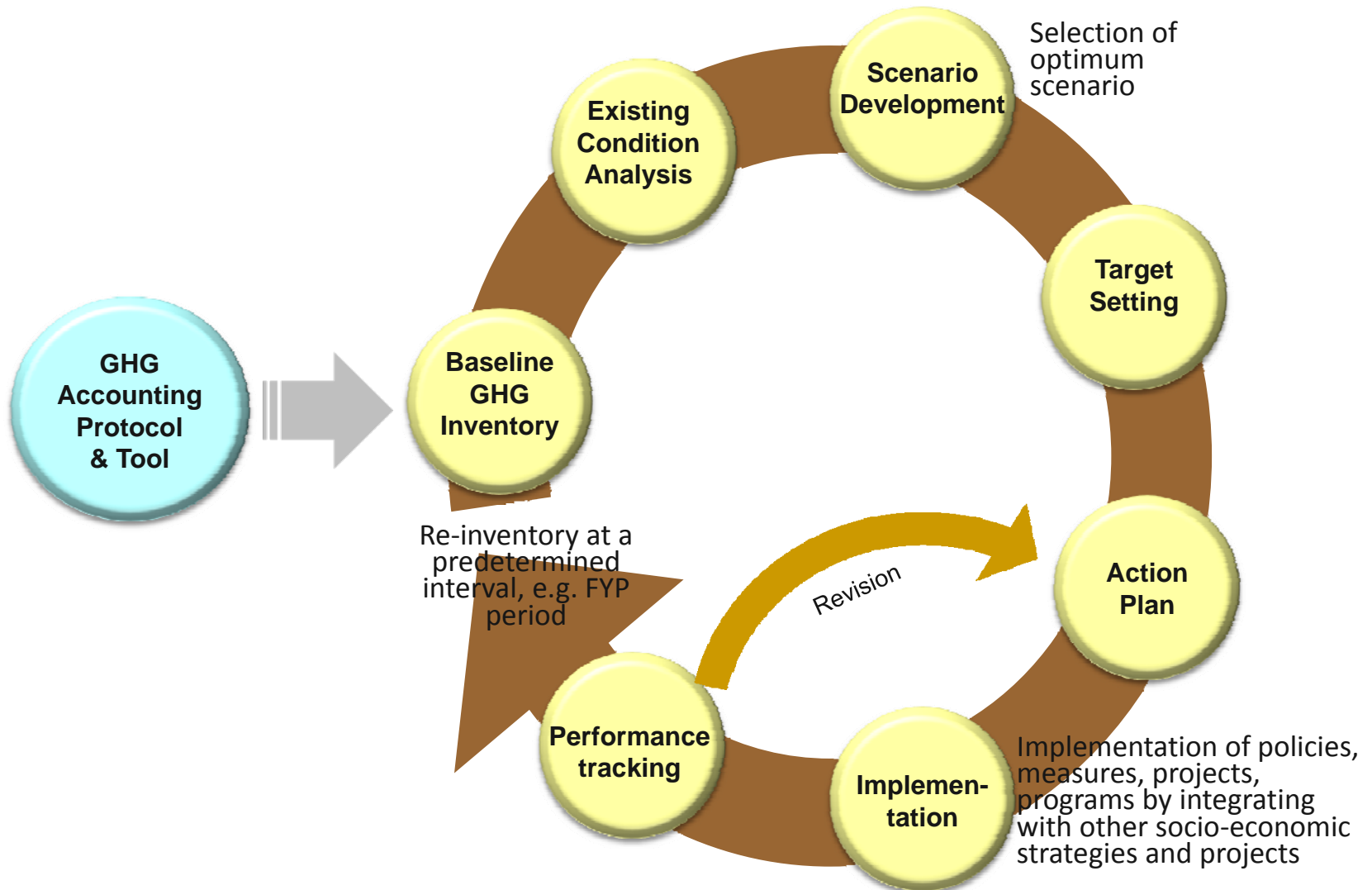
Where to cut emissions?



*You Can't Manage
What You Can't Measure*



Low-carbon city planning process



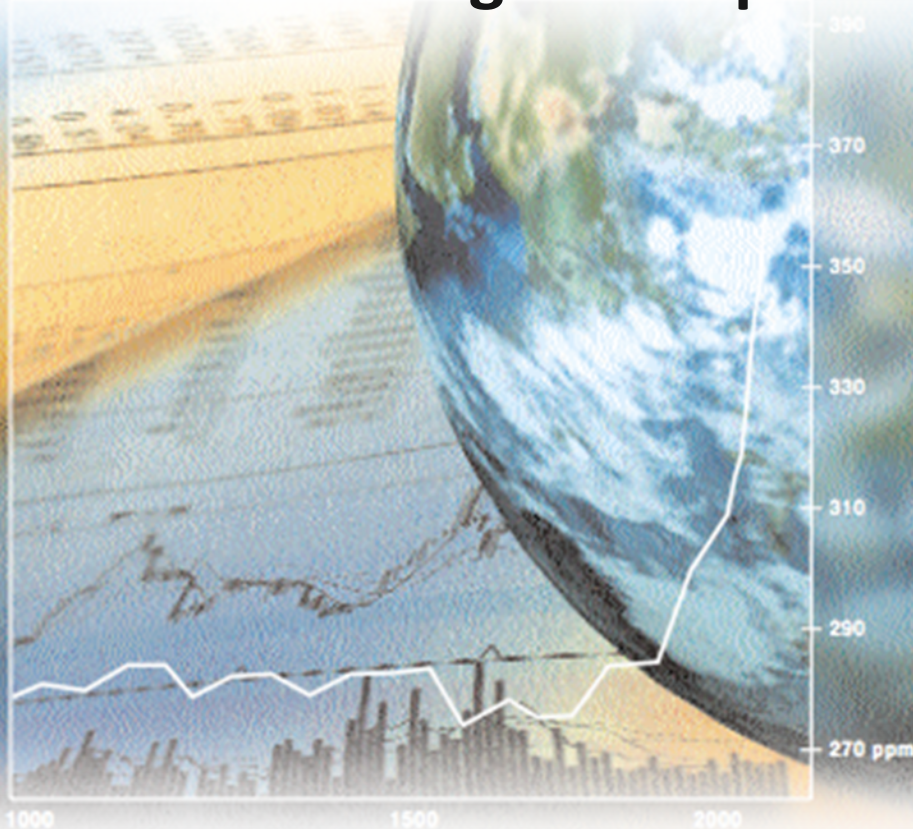


WRI and GHG Protocol Initiative



WORLD
RESOURCES
INSTITUTE

Greenhouse Gas Protocol Corporate Accounting and Reporting Standard



Published in 1998 by:



The Greenhouse Gas Protocol Initiative
The foundation for sound and sustainable climate strategies



WORLD
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World Business Council for
Sustainable Development

Source of graphic: GHG Protocol Corporate Standard

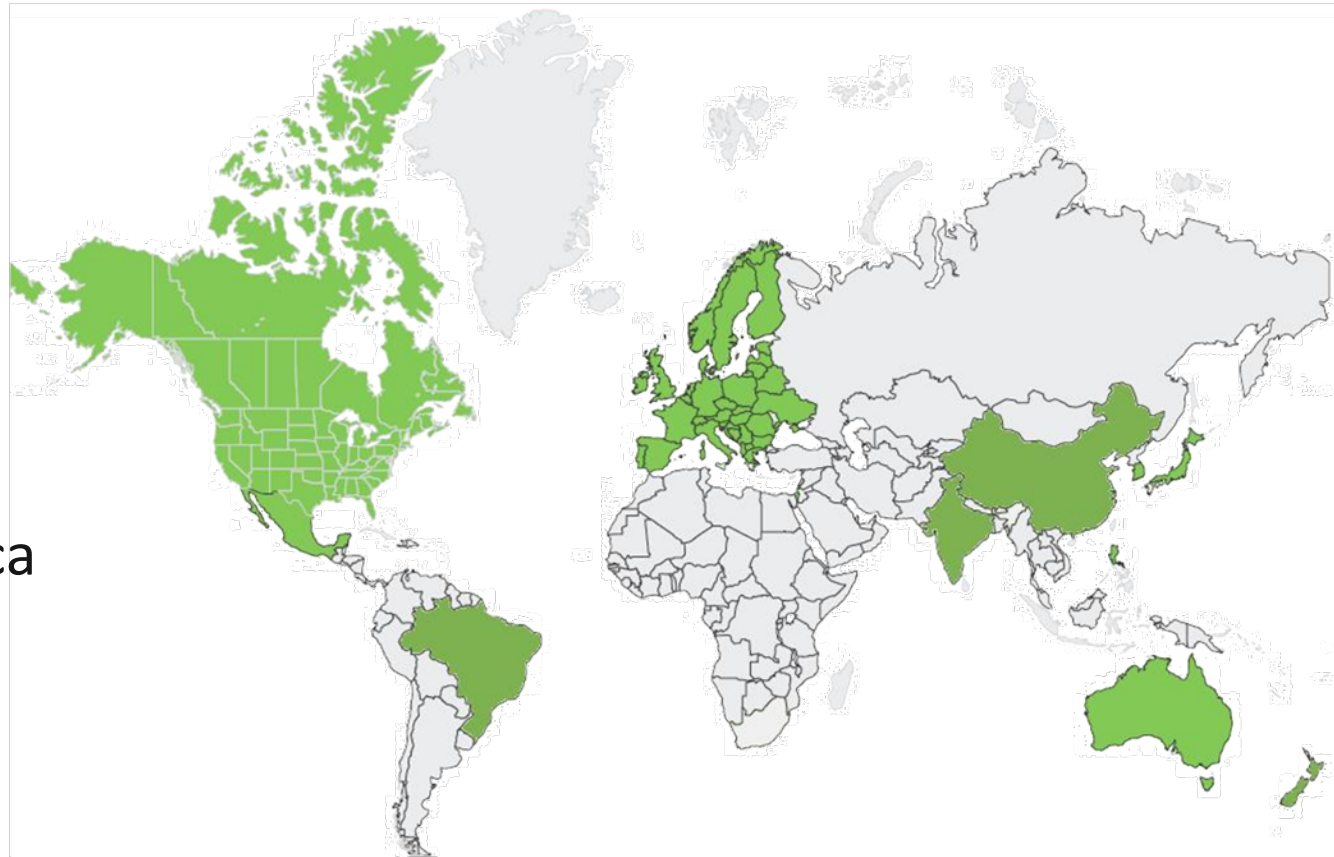


Adopted by 60% of Fortune 500 companies



GHG Protocol has convened and established partnerships to facilitate the design and implementation of GHG programs in:

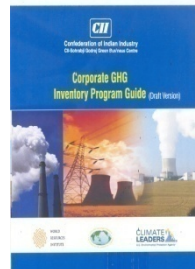
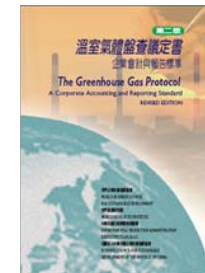
- Brazil
- China
- India
- Mexico
- Philippines
- North America



GHG Protocol 1998-2010



CARBON DISCLOSURE PROJECT





The Greenhouse Gas Protocol



The Greenhouse Gas Protocol for the U.S. Public Sector

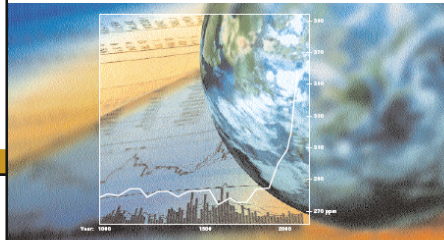
The GHG Protocol for Project Accounting



Interpreting the Corporate Standard for U.S. Public Sector Organizations



The Greenhouse Gas Protocol



A Corporate Accounting and Reporting Standard REVISED EDITION



Product Standard

Scope 3 Standard



How to quantify GHG emissions in a complete, relevant, and consistent manner?



Consumption-based emissions

<http://www.triplepundit.com/2010/03/enviance-carbon-reporting/>
<http://www.fairloanrate.com/2009/04/04/economic-myths-in-america-part-ii-consumption-myths/>



Production-based GHG accounting

500,000
tCO₂e



A City

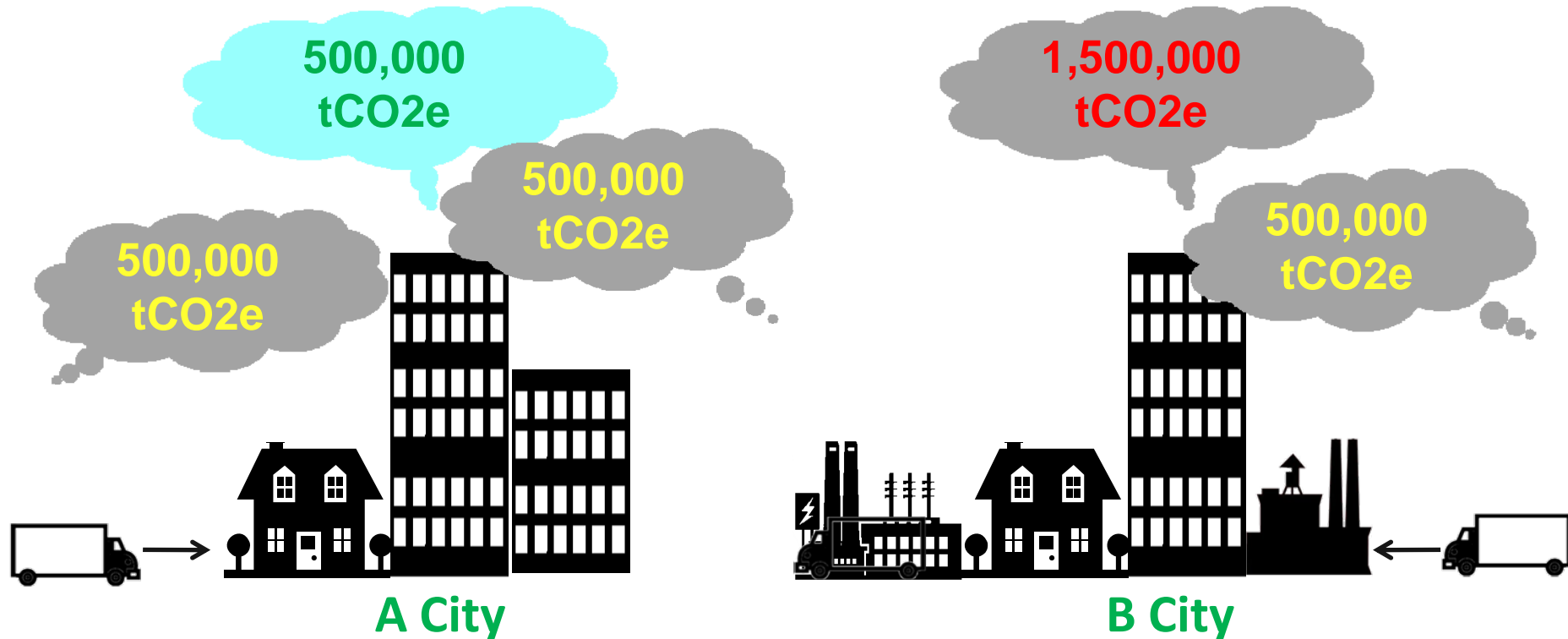
1,500,000
tCO₂e



B City



Consumption-based GHG accounting

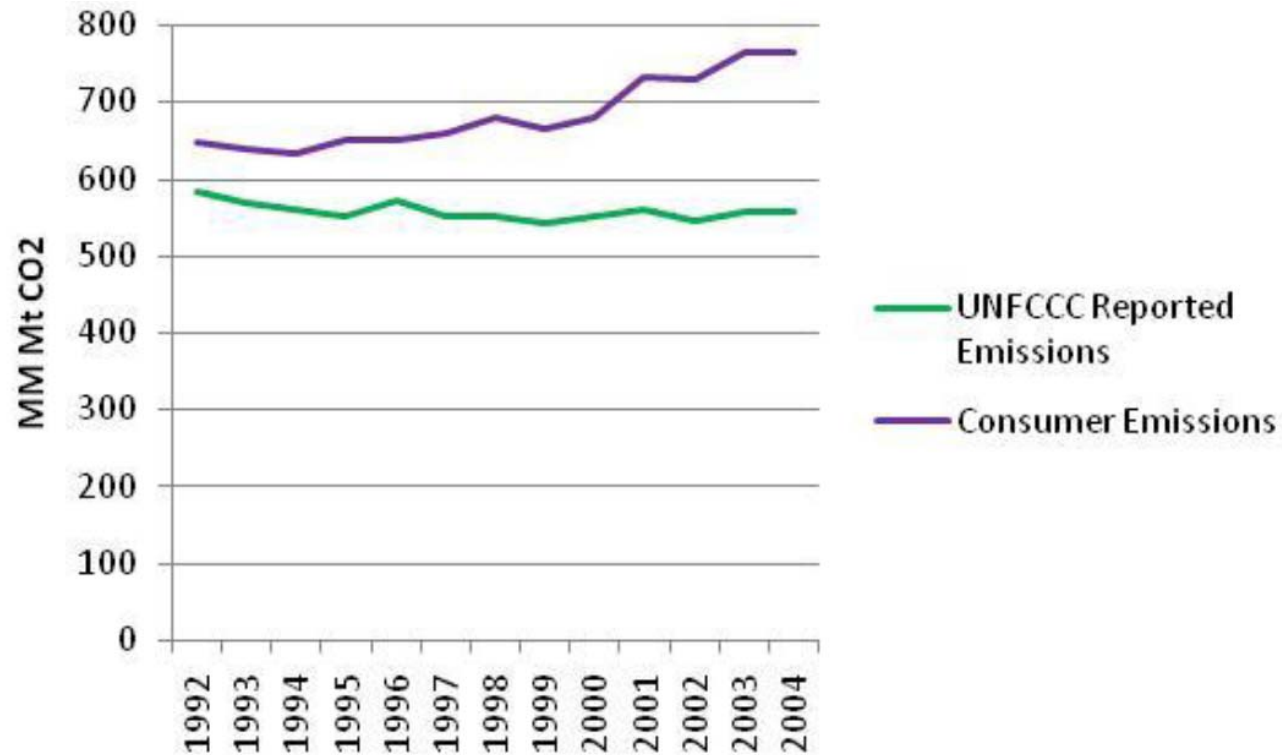


Direct emissions = 500,000 tCO₂e
Indirect emissions = 1,000,000 tCO₂e

Direct emissions = 1,500,000 tCO₂e
Indirect emissions = 500,000 tCO₂e

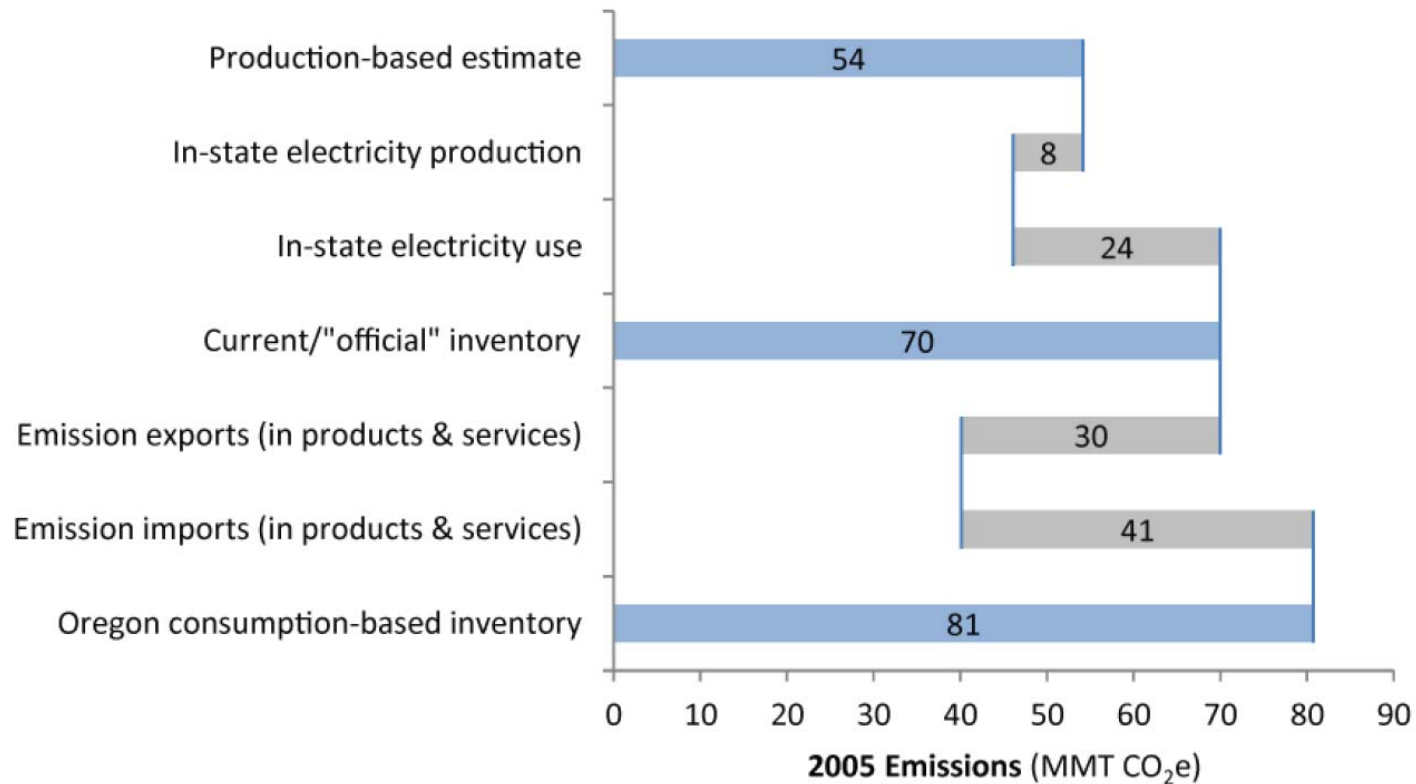


UK GHG emissions





Oregon GHG emissions





Existing metrics

Standard/Protocol

Tools

**Int'l Standard for Determining GHG
Emissions for Cities, UNEP *et al.***

**Int'l Local Gov't GHG Emissions
Analysis Protocol, ICLEI**

2010

Project 2 Degrees - C40

The CO2 Calculator - Denmark

2005

Bilan Carbone - France

ECO2Region - Switzerland, Germany, Italy

CO2 Grobbilanz & EMSIG - Austria

2000

GRIP - UK



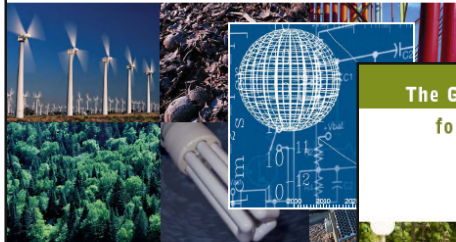
Issues

- ❖ Most of the existing citywide GHG accounting tools focus only on direct emissions and some of the indirect emissions
- ❖ Indirect emissions/impacts of their activities in other locations?
- ❖ Comparison between cities of different nature?
- ❖ Emission leakages?
- ❖ Reduction of overall emissions?
- ❖ Recognizing the effort changing lifestyle and consumption pattern to reduce indirect emissions?





The Greenhouse Gas Protocol



The Greenhouse Gas Protocol for the U.S. Public Sector

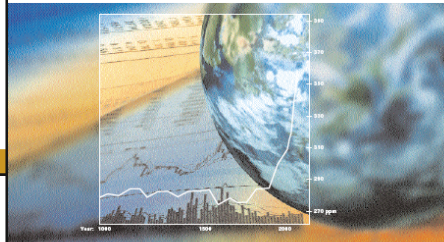
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Product Standard

Scope 3 Standard

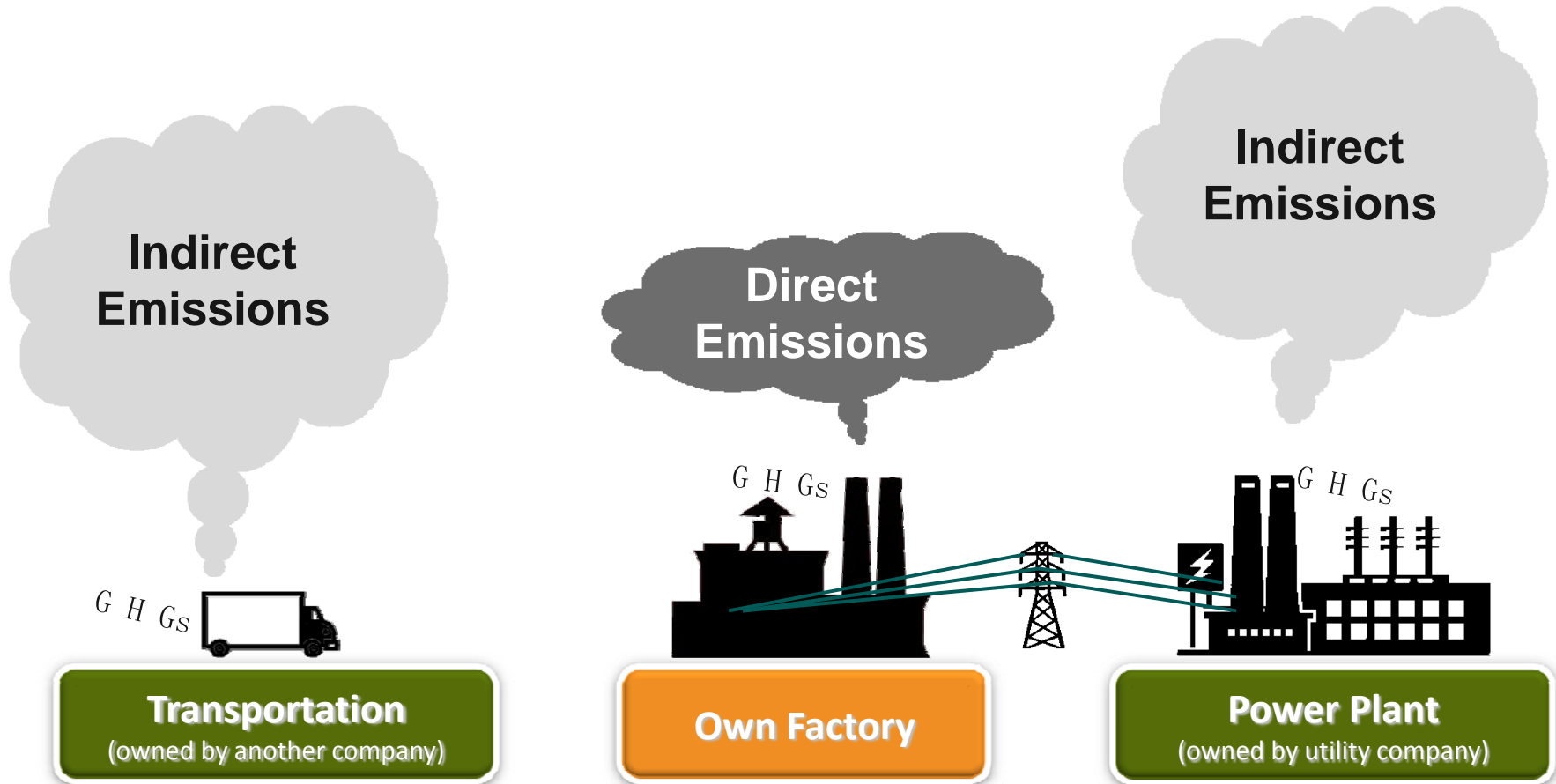
GHG Accounting
Framework for
Cities
(*Developing*)



- ❖ *How to comprehensively identify all major direct and indirect emissions without double counting?*
- ❖ *How to standardize different accounting methodologies*
- ❖ *Data availability*

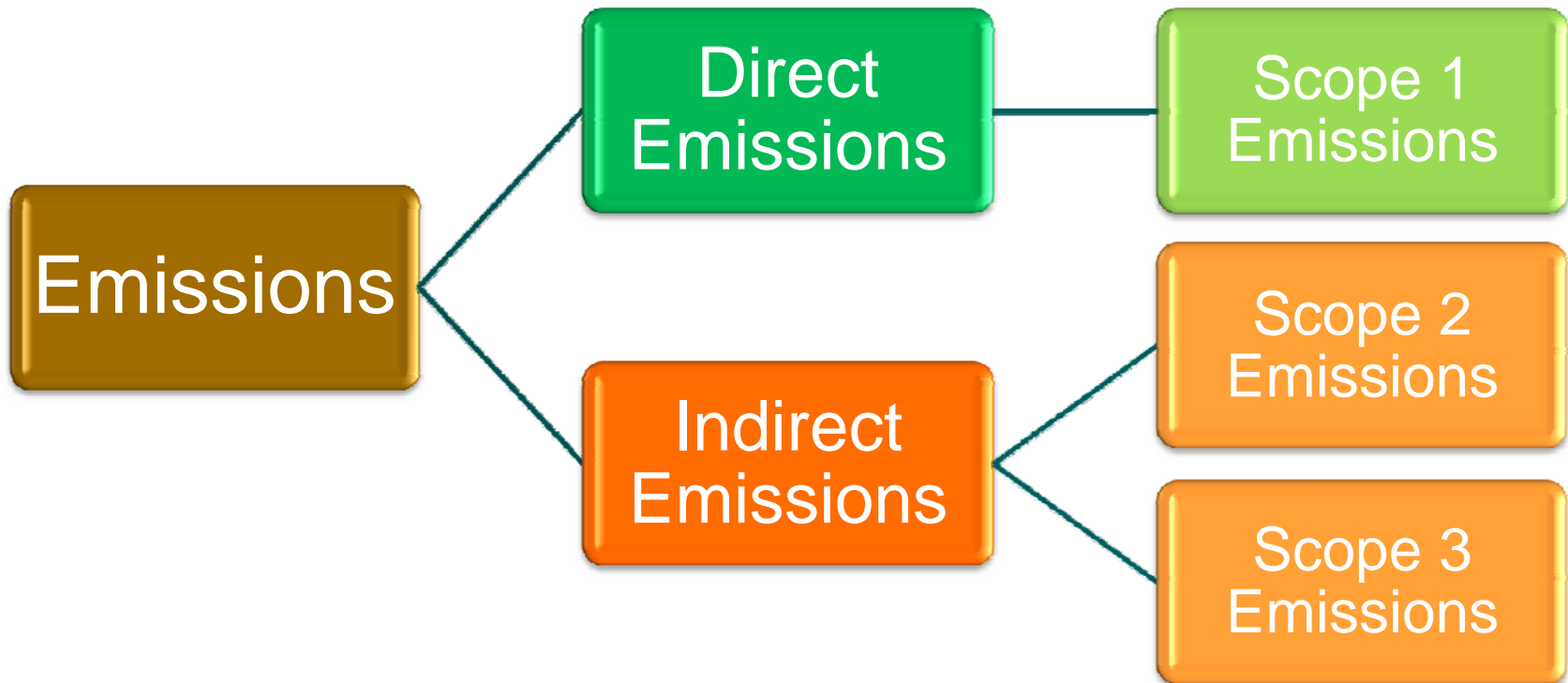


Corporate direct and indirect emissions



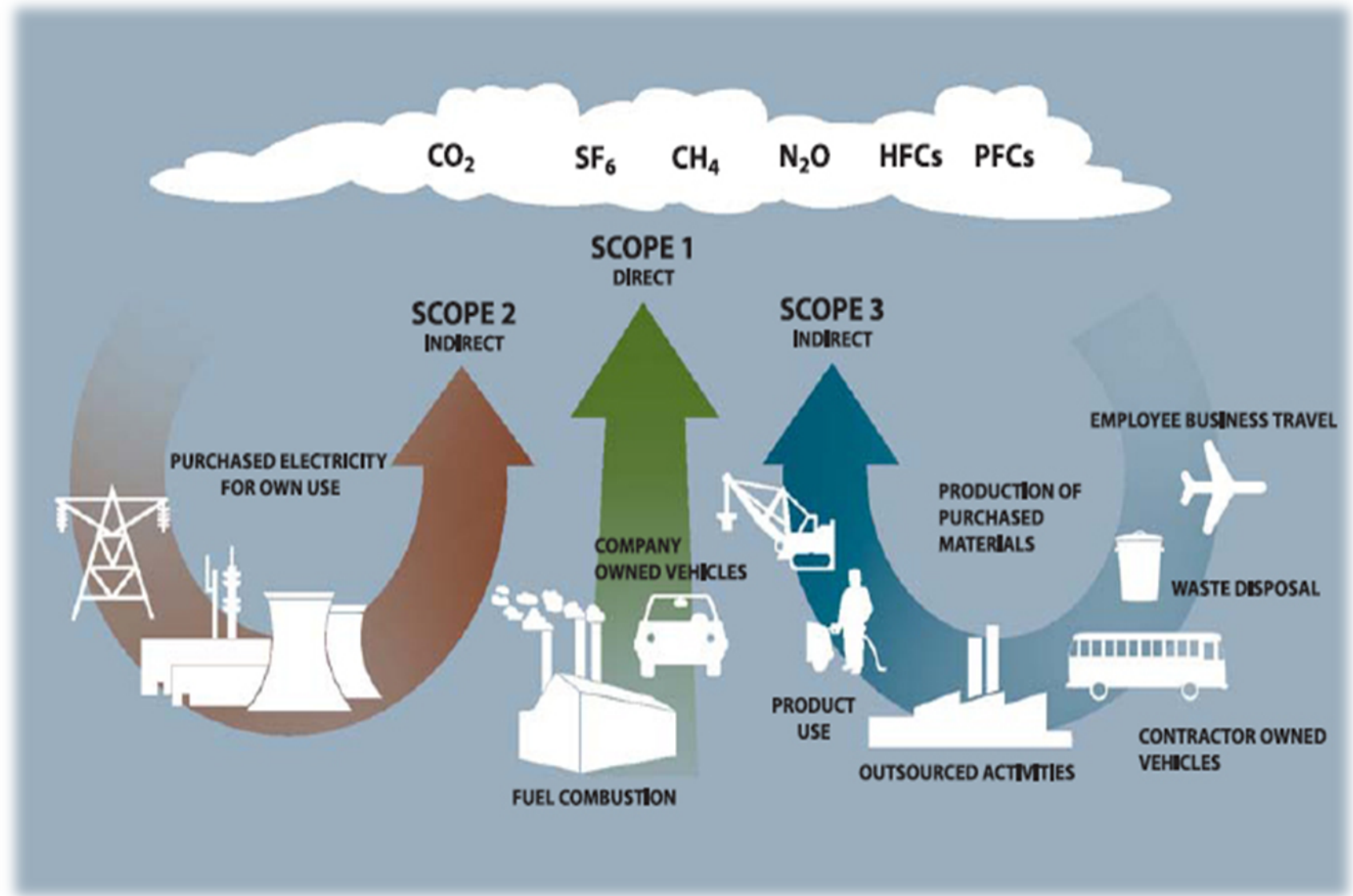


Emissions scopes





Corporate emissions scopes





Production approach vs. Consumption approach

DIRECT
EMISSIONS

INDIRECT EMISSIONS

Scope 1
Emissions

Scope 2
Emissions

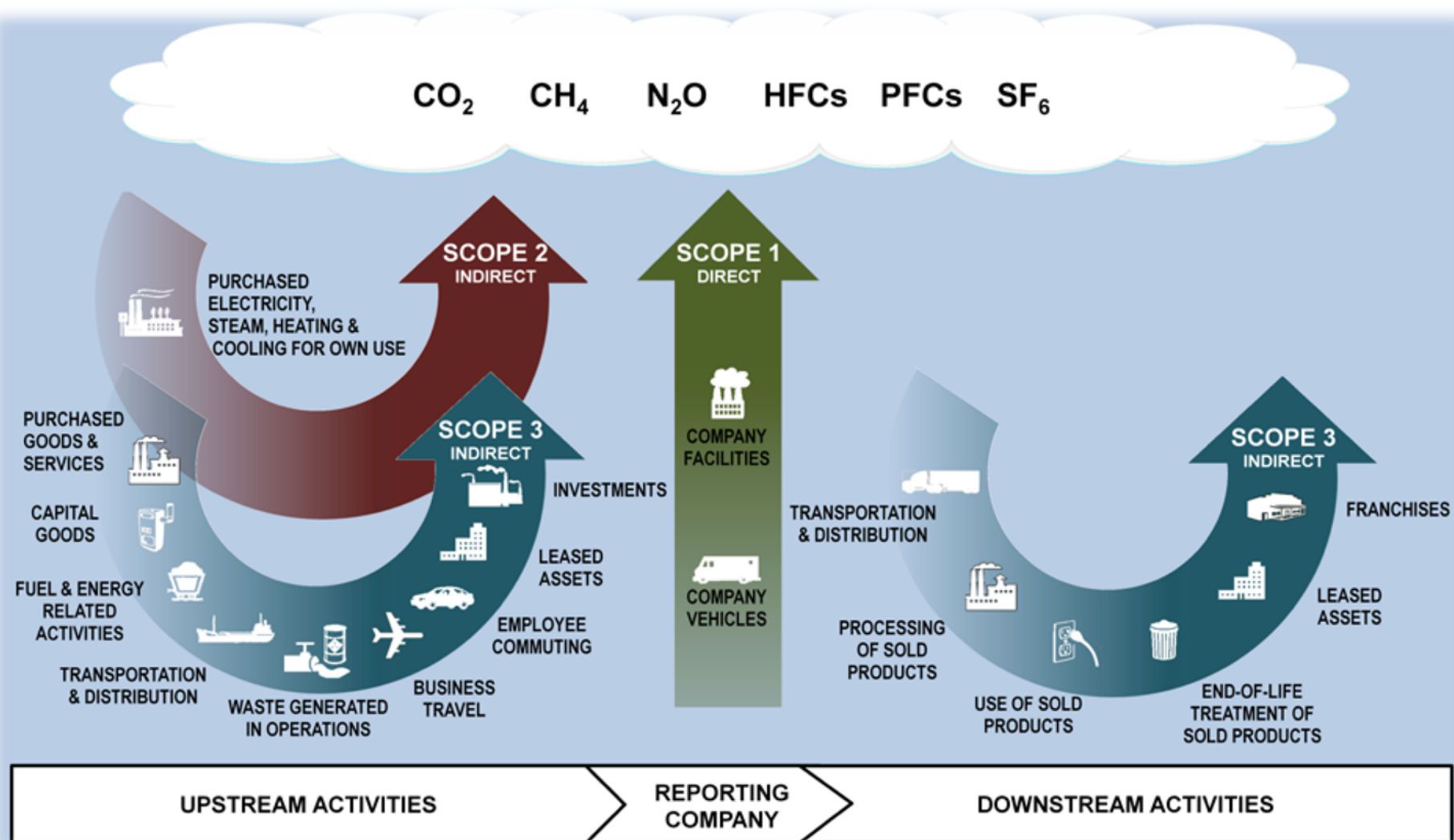
Scope 3
Emissions

Production
Approach

Consumption
Approach



Scopes and emissions across corporate value chain



- ❑ Allows local government, businesses, and residents to see both the **direct** and **indirect** GHG emissions of their activities.
- ❑ **Fair** comparison between cities of different nature.
- ❑ **Avoid** emission leakages (relocating high emitting industries).
- ❑ Helps government to draw **policies** and **strategies** to cut emission within and outside the city.
- ❑ It **recognizes** not only the control of direct emission sources within the city, but also reduction of indirect emissions due to change of lifestyle and consumption pattern.



Thank you!

www.wri.org
www.ghgprotocol.org

