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Overview of GHG Inventory Management & Reporting

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Agenda

- Introduction to TCR
- Overview of GHG accounting
 - Benefits of GHG inventory
 - GHG reporting protocols
 - Reporting methodologies
 - Categories of Emissions
- Third-party Verification
- Data Management



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INTRODUCTION TO TCR



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Who We Are

- U.S.-based NGO specializing in greenhouse gas (GHG) measurement, reporting and verification
- The only government-endorsed GHG registry in North America
- A community of over 270 business, governmental and NGO leaders
- Our mission is to empower our generation to reduce its carbon footprint





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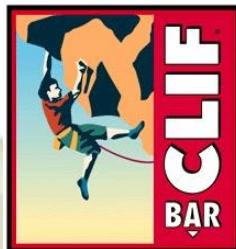
Community Of Members



BONNEVILLE
POWER ADMINISTRATION



BROWN-FORMAN



CalEPA
California Environmental
Protection Agency



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What We Do

We empower the world's leading organizations with the highest quality carbon data in order to operate more efficiently, sustainably, and competitively.

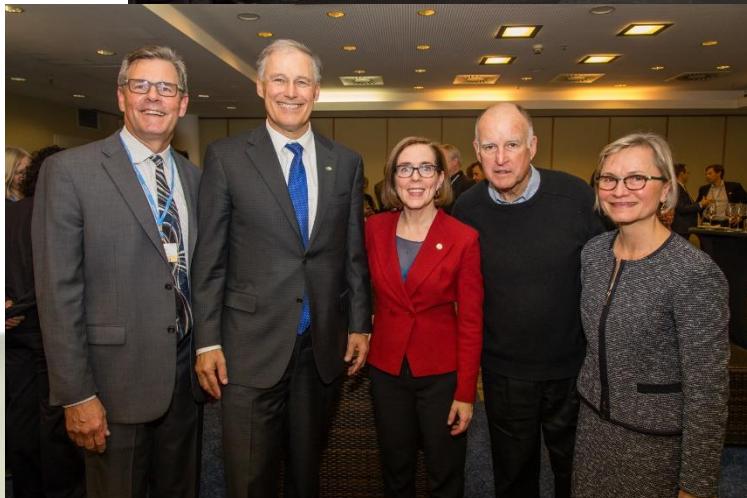
- Operate the only state-endorsed GHG reporting program in the U.S.
- Author reporting and verification guidance
- Provide tools and member support
- Design and operate a proprietary software tool
- Convene a community of members & policy makers
- Recognize leadership

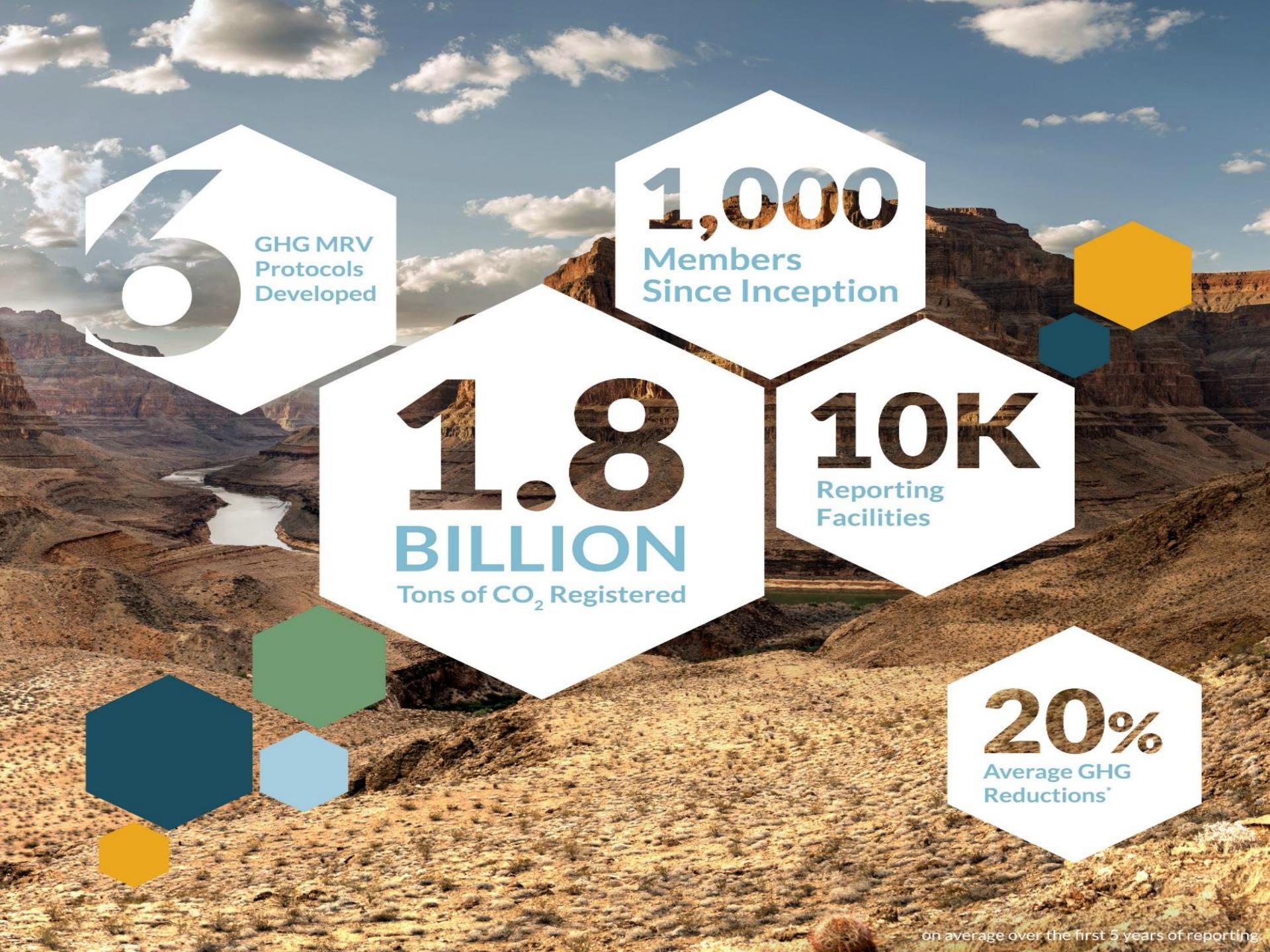
“Let’s make global warming history”



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U.S. Climate Leadership



A scenic view of the Grand Canyon with the Colorado River winding through the bottom, under a blue sky with scattered white clouds.

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GHG MRV
Protocols
Developed

1,000

Members
Since Inception

1.8

BILLION

Tons of CO₂ Registered

10K

Reporting
Facilities

20%

Average GHG
Reductions*

on average over the first 5 years of reporting



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OVERVIEW OF GHG ACCOUNTING



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The Basics of a Carbon Footprint

Carbon Footprint/Greenhouse Gas Inventory:
Measure of an organization's impact on the environment in terms of GHG emissions released into the atmosphere



Benefits of GHG reporting to companies

Be more competitive



Reporting your GHGs will help you save money and become more energy efficient and competitive

Be prepared for future climate policy



Reporting your GHGs will put you in a strong position when it comes to future carbon regulations and markets

Be a leader in the low-carbon economy



Reporting your GHGs will help you be seen as a leader to your vendors, customers, and other key stakeholders

Track your success

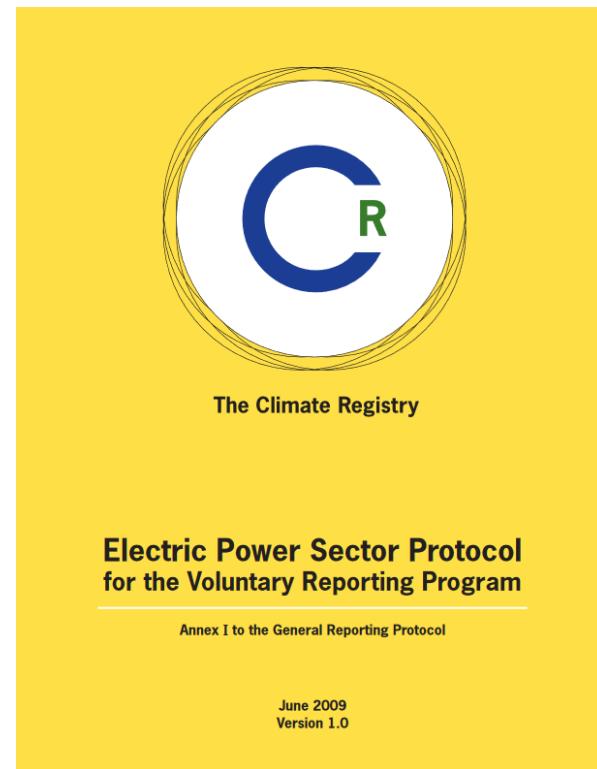
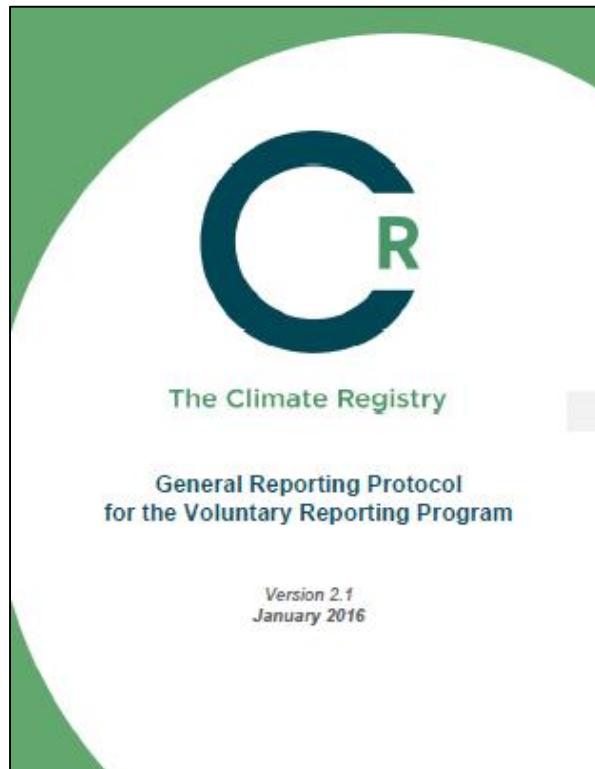


Reporting your GHGs annually sets a baseline for future performance and allows you to track and record your progress and your reductions over time



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Reporting Protocols





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Other Reporting Protocols

- TCR & ICLEI – Local Government Operations
 - Community Protocol
- GHG Protocol
 - Corporate Standard
 - Scope 3 Standard
 - Product Life Cycle Standard
- ISO 14064-1



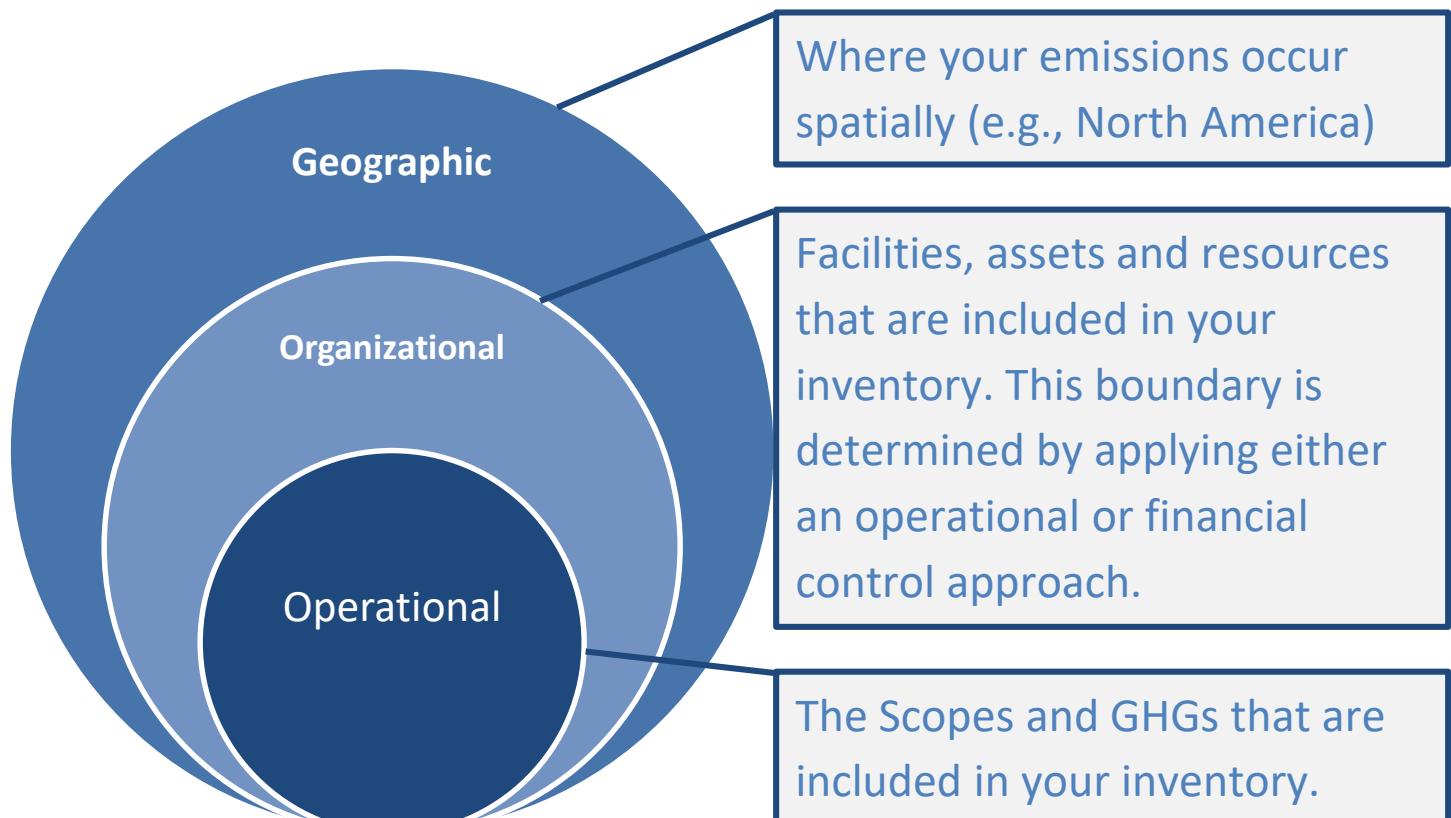
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Reporting a Carbon Footprint to TCR

- 1) Define reporting boundaries
- 2) Organize the GHG inventory by establishing facilities
- 3) Identify emission sources and collect GHG data
- 4) Calculate GHG Emissions
- 5) Prepare for verification (optional)



1. Define Reporting Boundaries





2. Establish Facilities

- Facility: single physical premise
- Can include:
 - Stationary facilities (ex: factories)
 - Commercial buildings
 - Ground-based vehicle fleet
 - Marine voyages (ex: ships)
 - Aircraft flights
 - Other special facilities



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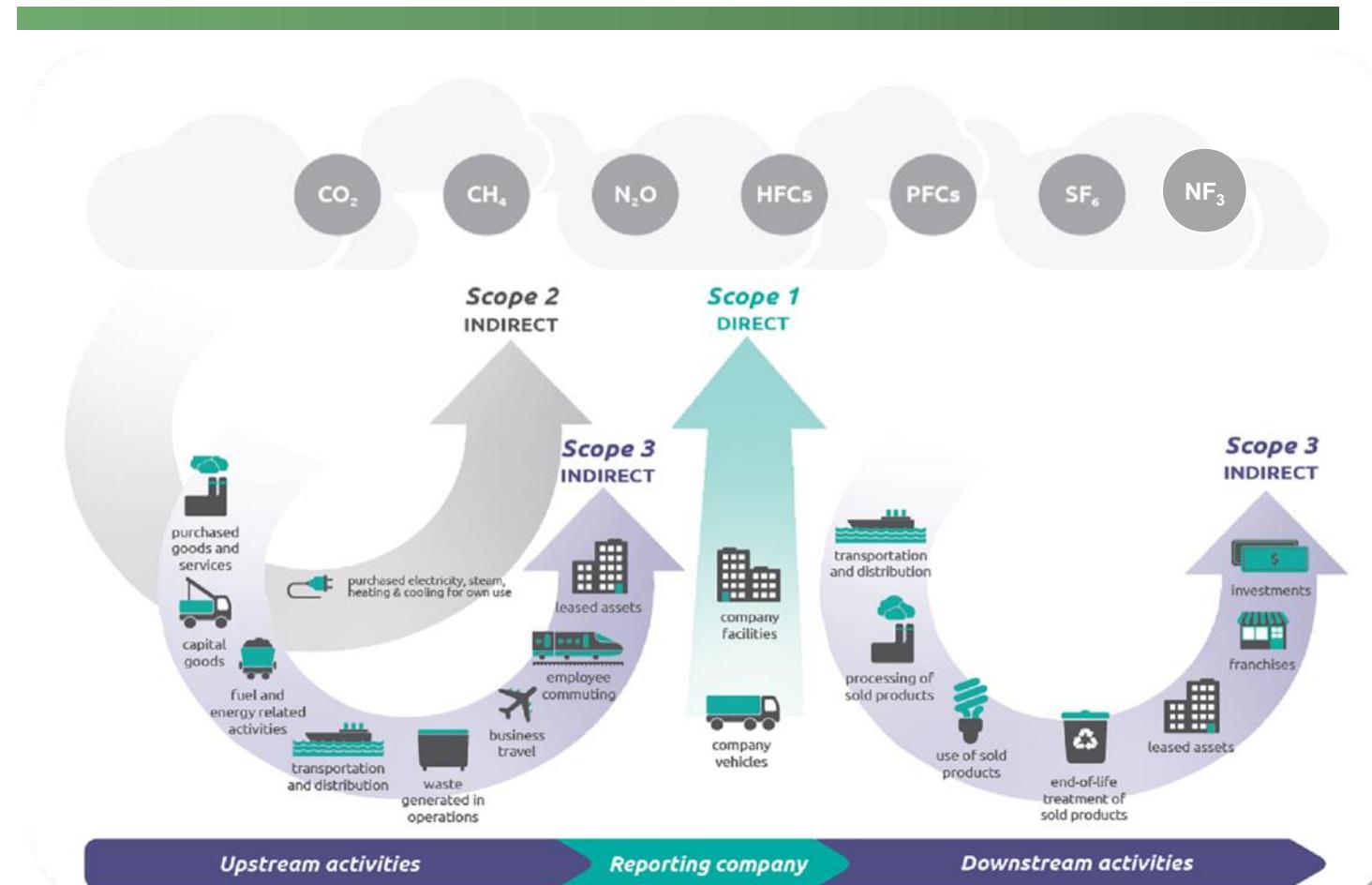
3. Identify Sources & Collect Data

The Kyoto Protocol identifies seven internationally recognized GHGs

- Carbon dioxide (CO₂)
- Methane (CH₄)
- Nitrous oxide (N₂O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur Hexafluoride (SF₆)
- Nitrogen Trifluoride (NF₃)



Scope 1, 2 and 3 Emissions



Graphic courtesy of GHG Protocol (World Resources Institute/World Business Council on Sustainable Development)



Emissions Examples

Scope 1 direct emissions

- Stationary combustion-e.g., diesel generator (CO₂, CH₄ & N₂O)
- Mobile combustion-e.g., passenger vehicles (CO₂, N₂O & CH₄)
- Process emissions-e.g., aluminum production (CO₂ & PFCs)
- Fugitive emissions-e.g., refrigerators (HFCs & PFCs)
- Biogenic emissions-e.g., boiler using landfill gas (CH₄ & N₂O)

Scope 2 indirect emissions

- e.g., purchased electricity (CO₂, N₂O & CH₄)

Scope 3 non-Scope 2 indirect emissions (**optional**)

- e.g., employee commuting



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Data Examples

- Fuel consumption
- Vehicle mileage
- Vehicle make, model and year
- Electricity consumption
- Natural gas use
- Refrigerant leakage

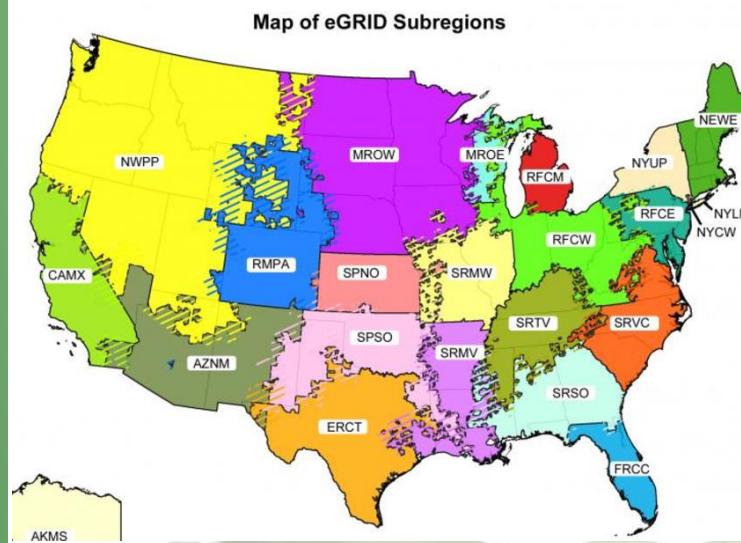


Scope 2 Reporting

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Dual scope 2 reporting (2 totals)

- Location-based method
- Market-based method



eGRID subregion graphic courtesy of EPA



Scope 2 Emission Factor Hierarchy

→ Location-based emission factor hierarchy

- Direct line
- Regional or subnational
- National

→ Market-based emission factor hierarchy

- Energy attribute certificates
- Contracts
- Supplier/utility-specific emission factors
- Residual Mix
- Location-based



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4. Calculate GHG Emissions

Activity Data:

quantity of fuel or material that, when used, emits GHGs



Emission Factor

(EF): converts activity data into amount of GHGs



$\times \text{EF} =$

GHGs

Global Warming Potential (GWP):

converts GHG emissions into CO₂e values

GHGs

$\times \text{GWP} =$

CO₂e



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5. Third-Party Verification

- A third-party review of our GHG inventory by an approved verification body.
- Steps to verify:
 - Select and contract a third party verification body
 - Provide requested documentation and assist the verifier in completing the verification activities
 - Review the verifier's findings
 - Complete corrective action





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Benefits of Third-Party Verification

Ensure conformance with protocol

Improves credibility of data

Identify reduction opportunities from baseline

Improve internal data management

Required for recognition opportunities

Benefits of Third-Party Verification

Improves data credibility, accuracy and consistency

Companies can:

Identify errors early and before there are penalties

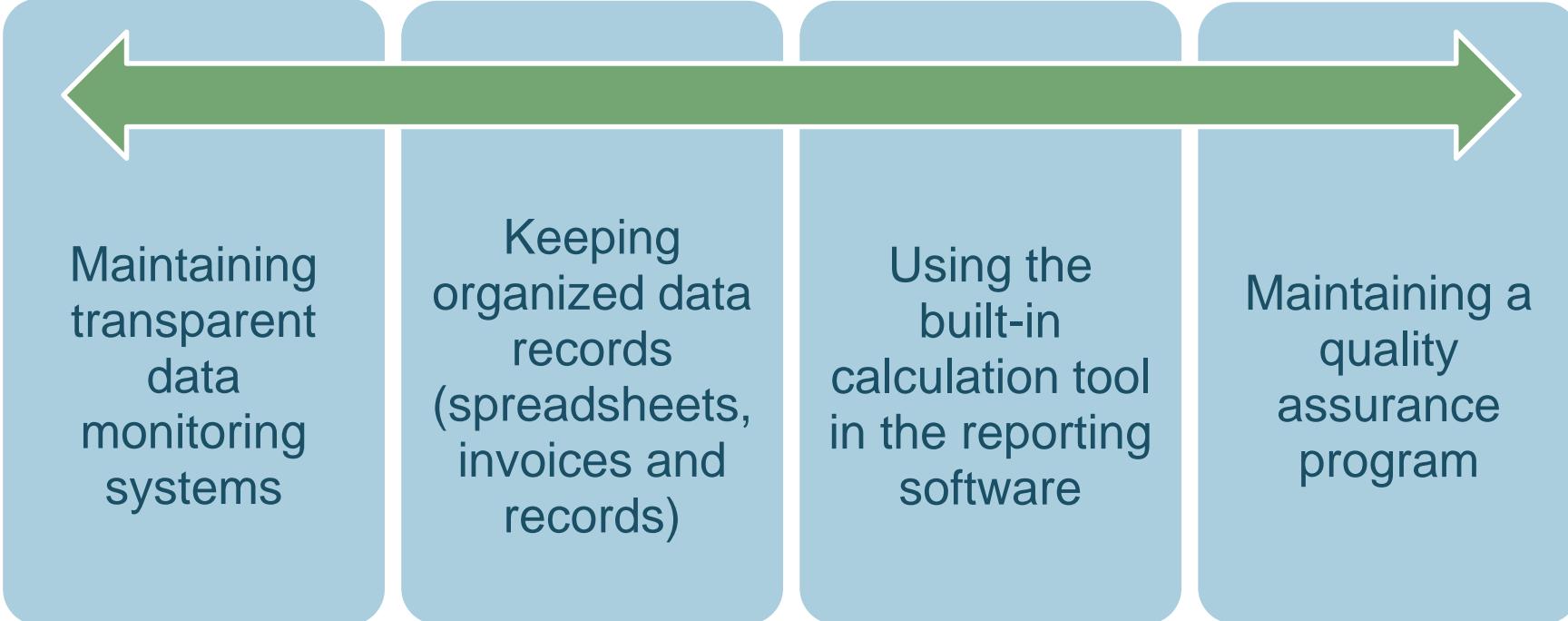
Identify reduction opportunities from an accurate baseline

Improve their data management systems

Be confident in the data they choose to make public

Mitigating the Cost of Verification

You can reduce the cost of verification by:



Maintaining transparent data monitoring systems

Keeping organized data records (spreadsheets, invoices and records)

Using the built-in calculation tool in the reporting software

Maintaining a quality assurance program



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Data Management

How GHG Inventory data can be used and managed:

- Can help demonstrate compliance, leadership, and transparency
- Underpins public disclosure and education efforts
- Supports year-on-year tracking of progress against GHG targets and strategies



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TCR in 2018

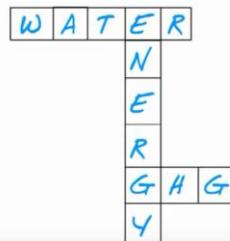


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LEADERSHIP
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UNITED NATIONS CLIMATE CHANGE CONFERENCE

Solving the



puzzle

NEER
NATIONAL ENERGY
EFFICIENCY REGISTRY