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An Introduction to Greenhouse Gas Data Management: Building Systems for Corporate/Facility-Level Reporting

Ms. Chelsea Hasenauer
The Climate Registry
www.theclimateregistry.org

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Overview

1. What is The Climate Registry?
2. The Context for GHG Reporting
3. Corporate/Facility-level Reporting 101
4. GHG Data Management Systems
5. Case Studies
6. Questions and Discussion

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WHAT İS THE CLİMATE REGİSTRY?

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The Climate Registry (TCR)

- U.S.-based non-profit organization that builds capacity in facility-level GHG measurement, reporting and verification
  - We operate the pre-eminent North American voluntary GHG registry
  - We have also worked with:






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TCR's products and services

- TCR designs and advises on **economy-wide and sector-specific GHG reporting and verification guidance.**
- TCR operates a proprietary **online GHG reporting platform** that incorporates calculation tools and can be customized for diverse jurisdictions (e.g., Thailand).
- TCR provides **training and technical assistance** on GHG MRV to organizations representing over 2,500 facilities from more than 30 different industrial sectors.

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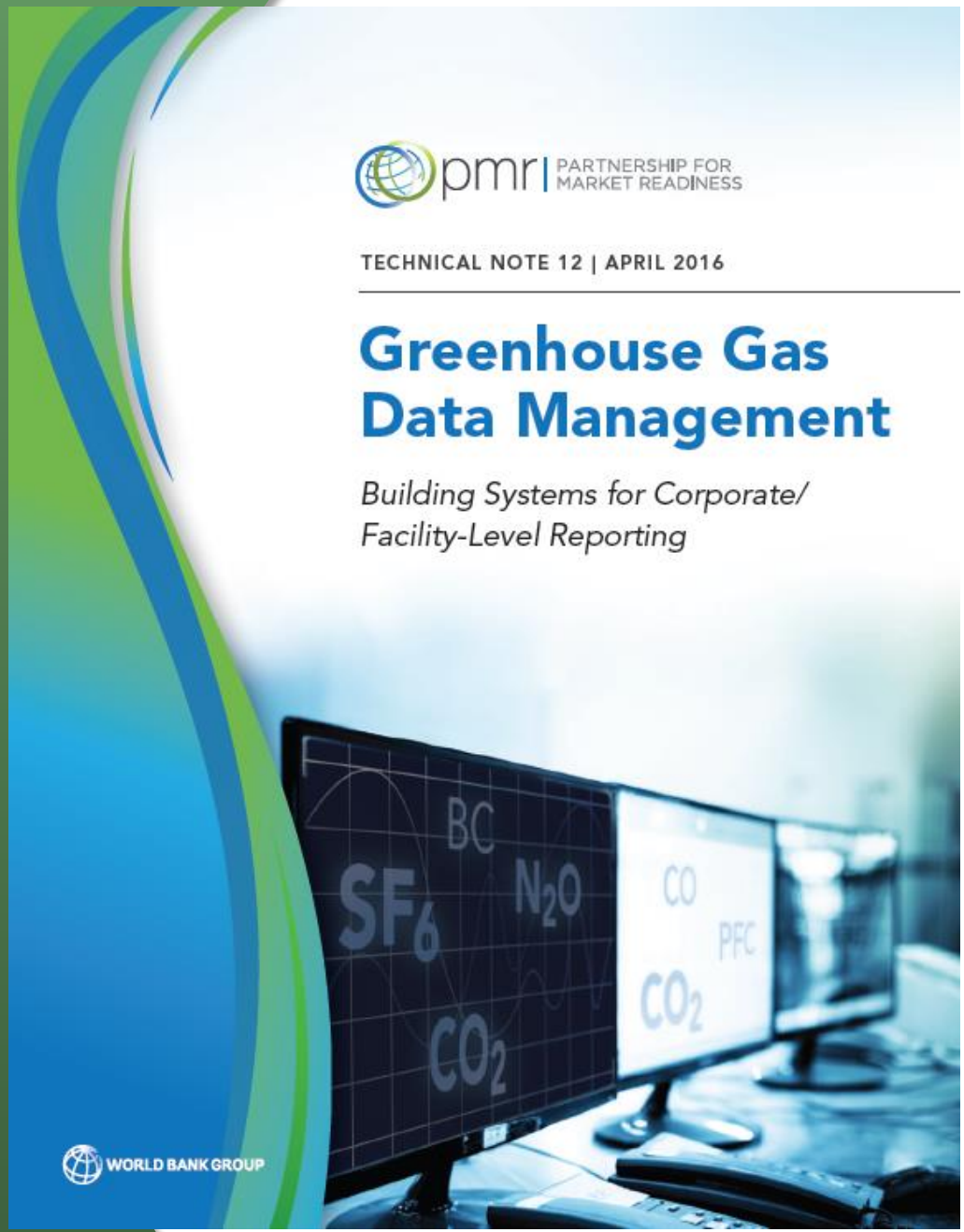
TCR-World Bank collaboration



- This guide resulted from a wide collaboration led by the **World Bank's PMR**, **The Climate Registry (TCR)** and **ICF International.**

- Key insights were provided by over **10 national and sub-national jurisdictions** with experience designing and implementing GHG data management systems for corporate/facility-level reporting.

- **Available here:** http://www.worldbank.org/en/topic/environment/publication/greenhouse-gas-data-management-building-systems-for-corporatefacility-level-reporting

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THE CONTEXT FOR GHG REPORTİNG

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Paris Agreement emphasizes transparency

- Calls for an enhanced transparency framework requiring all countries to work toward the same standards of transparency and accountability
- All countries will be required to report on their GHG emissions and implementation efforts at least every two years
- Corporate or facility-level (i.e., bottom up) GHG reporting can help close existing capacity and data gaps in developing nation national inventory reporting

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What is a corporate GHG reporting program?

- A **corporate GHG reporting program** helps companies and organizations measure and report the emissions associated with their **operations**
- Can be voluntary or mandatory
- A **GHG registry** is the reporting platform used to collect the data in the corporate GHG reporting program (i.e., GHG data management systems).

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Sub-national/bottom-up policy mechanisms are proliferating

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Corporate GHG reporting programs: the foundation for carbon activities

GHG reductions

Existing reporting efforts e.g. national inventory

Offset programs

Future market mechanisms

Builds GHG MRV capacity across reporting community (government, reporters, verification bodies, etc.)

Corporate GHG reporting program

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CORPORATE/FACİLİTY-LEVEL REPORTİNG 101

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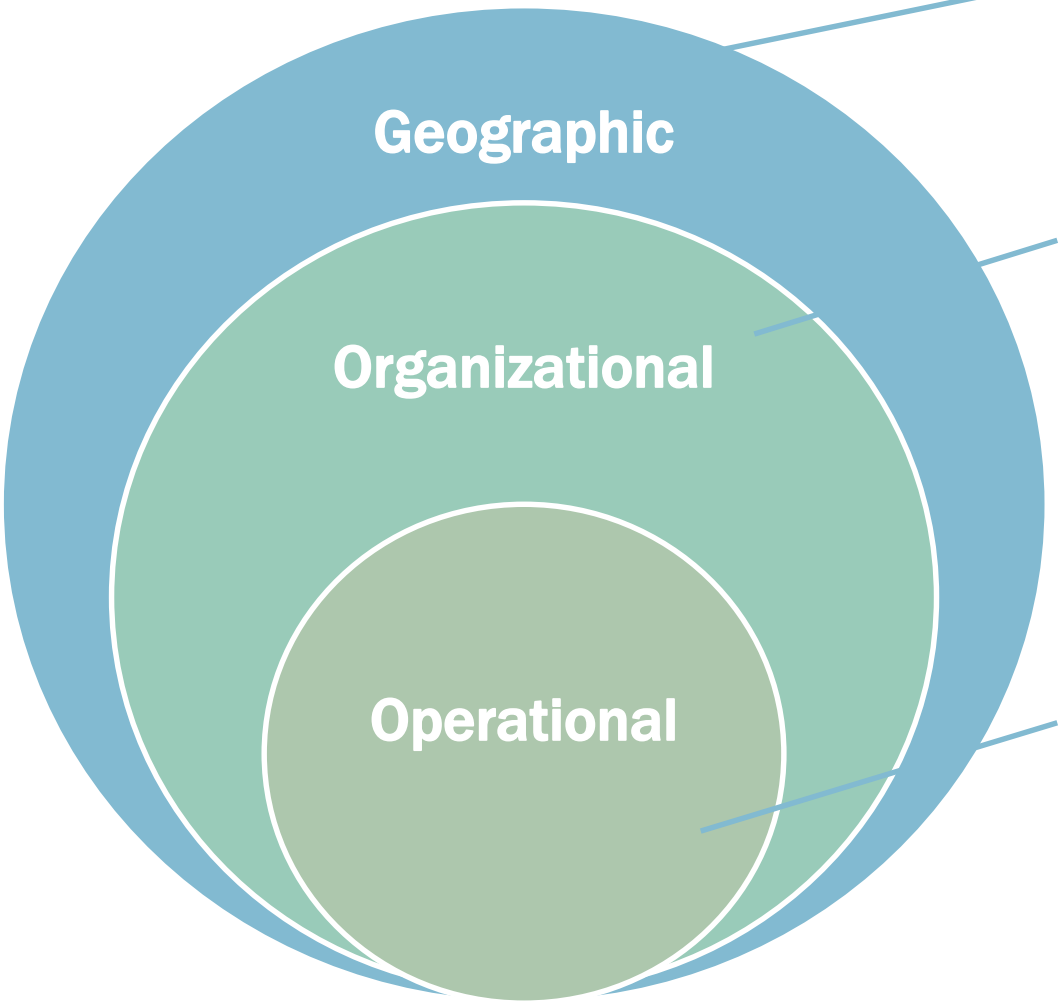
Corporate/Facility-level reporting basics

1. Define reporting boundaries
2. Identify facilities and emission sources based on boundaries
3. Organize and collect data on emission sources
4. Quantify and report emissions from those sources
5. Verify that reported emissions meet program requirements

Step 1: Define reporting boundaries

Reporting boundaries determine what emissions are included in each GHG inventory. Reporting programs may prescribe inventory boundaries for consistency in reports.



Where emissions occur spatially

Facilities, assets and resource types that should be included in each organization's inventory

The scopes and GHGs included

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Step 2: Identify facilities & emission sources based on boundaries

The types of facilities and sources that will be reported must be identified before data can be gathered for emissions measurement.

Determines:

- The methods that will be used to quantify emissions
- The data required to support those quantifications
- Data that is readily available versus data that is lacking
- Any special sources of GHGs or other emissions
- Stakeholders and their engagement levels
- Transparency requirements

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Step 3: Organize and collect data to quantify emissions

Data Types for Corporate/Facility-level Reporting	
CEMs GHG data	Direct measurement GHG data from continuous emissions monitoring systems (CEMS)
Activity data	The fuel, material, or activity that causes GHGs (annual consumption totals)
Emission factors (EF)	Approved location-specific or general default metrics that convert activity data into GHG data
Global Warming Potentials (GWP)	Standard metrics published by IPCC that convert GHG data into CO2 equivalents (CO2e) for comparison purposes
Units	Standard unit-of-measure conversions and prescribed units for reporting

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Step 4: Quantify emissions for reporting

$$Activity\ Data \times EF \times GWP = CO_2e$$

You Measure

CRIS Calculates

Organizations gather this information about their own operations based on program/legislative requirements

Organizations apply these approved or default data sets based on program/legislative requirements

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GHG DATA MANAGEMENT SYSTEMS

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Critical enablers for successful system development

Engage and consult with key stakeholders

BEFORE DEVELOPMENT

Legal, institutional and regulatory frameworks for the reporting program are defined

Program design decisions are made

System requirements are defined

Conduct testing

DEVELOPMENT

Training & support

AFTER DEVELOPMENT

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Key considerations before development

- **Reporting program design:**
  - Applicable **legal, institutional and regulatory frameworks** are identified and leveraged
  - Inventory **boundaries** and applicability are dictated (identifies stakeholders and data formats)
  - Existing **data sets**, support for data collection, and support for emissions quantification are identified and leveraged
- **System requirements:**
  - Level of data granularity and/or aggregation required
  - Desired flexibility in data upload
  - Support for QA/QC, verification, and transparency requirements

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System Requirements: data upload and input

Decisions about data upload and input to the data management system significantly impact design

Option 1:

Manual entry of data into a web interface

Option 2:

Manual entry of data into formatted spreadsheets, which are then uploaded into a system

Option 3:

Integration of separate data sets via web services (linking systems)

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Development approaches

	Development Approach	Examples
1	Create a new system (in-house or externally)	Kazakhstan, US, UK, Australia, Mexico, Turkey
2	Re-purpose an existing system	Chile
3	Customizing a third-party system	South Africa, California, Thailand

- A modular approach is useful when there are resource and/or time constraints, (e.g., South Africa, US, Chile, Kazakhstan).
- Leveraging existing systems to collect GHG data and/or integrate GHG data systems with other databases is rare.
- None of the jurisdictions studied were linking systems with other jurisdictions.

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Developing the GHG data management system

Step 1: Gather system requirements

Step 2: Develop functional requirements

Step 3: Make in-house vs. outsource decision

Step 4: Develop technical requirements

Step 5: Software development

Step 6: Systems integration (where applicable)

Step 7: Testing & QA (ongoing)

Step 8: Deployment & launch

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Provide support to and build the capacity of system users

Ensures smooth reporting cycles and accurate data input.

Available resources, reporting timelines, and accuracy requirements determine the appropriate type of support and training.

- **System user support options**
  - Help Desk (or telephone and email support)
  - Website
- **Training and capacity building options**
  - FAQ documents
  - System user guides/manuals by user type, with step-by-step instructions and associated screenshots (Kazakhstan found this most valuable)
  - Training materials and sessions

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CASE STUDIES

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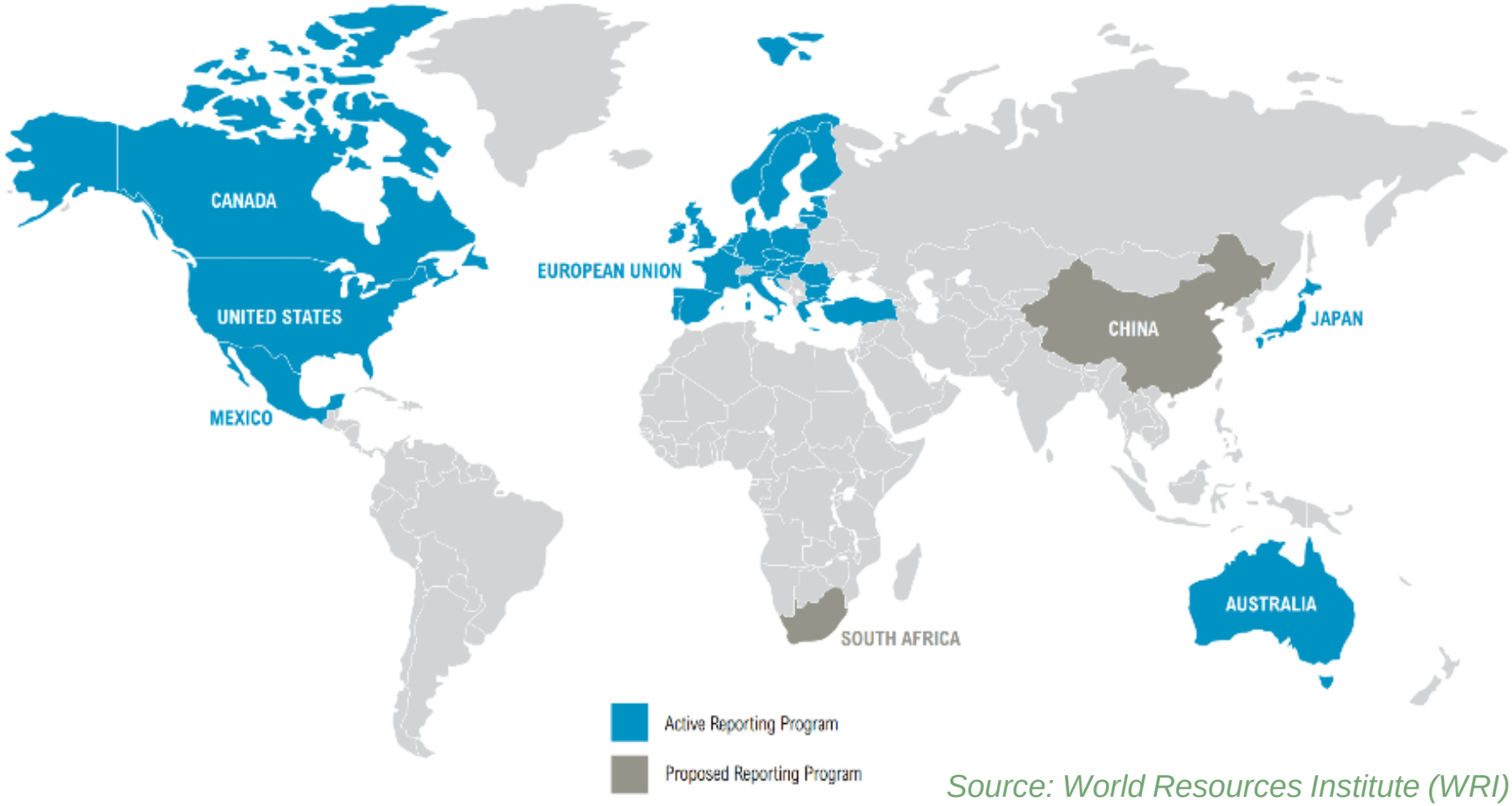
Jurisdictions included in the TCR-World Bank guide

Figure 1 | Mandatory GHG Reporting Programs Researched for this Report



Source: World Resources Institute (WRI) and Partnership for Market Readiness (PMR)
http://bit.ly/2cTXiw4

South Africa

Administrative Agency	Department of Environmental Affairs
Legal frameworks	National Environmental Management Act; Air Quality Act, 2004
Regulatory frameworks	Draft National GHG Emissions Reporting Regulations
GHG data management systems	South African Air Quality Information System (SAAQIS); National Atmospheric Inventory System (NAEIS)
Timeline	Regulations expected 2016, expanded pollutants by 2017
Confidentiality	Legally prohibited to share info that would compromise a company's competitive advantage
Planning process	Built in 3 phases, supports reporting for non-GHG pollutants, outsourced development of system based on a subnational platform
User types	Local authorities, provinces, and national authorities
Leverage existing programs & tools	Direct link between air quality-listed activities and IPCC source categories let to detailed mapping between the two systems; a data mining tool was built into the infrastructure.
QA/QC	Internal system checks & external audits by national authority
Lessons Learned	Stakeholder engagement led to program improvements, modular design reacts easily to changing policy, 3 month pilot conducted

Chile

Administrative Agency	Ministry of Environment
Legal frameworks	Voluntary, but will be required when carbon tac is operational (2018)
Regulatory frameworks	N/A
GHG data management systems	Pollutant Release and Transfer Registry (PRTR)
Timeline	Reporting and carbon tax implementation to begin 2018
Confidentiality	PRTR allows public access to all data submitted to the system
Planning process	System is a voluntary GHG reporting module incorporated into PRTR, predefined emissions thresholds & sources categories determine applicability
User types	Company managers and sector managers
Leverage existing programs & tools	Integrates GHG and pollutant data collection efforts; supports source-level reporting and the future carbon tax
QA/QC	Third-party verification
Lessons Learned	Registering business within PRTR was more complicated than expected so a help desk was implemented; lack of confidentiality provisions caused concerns in the business community

Mexico

Administrative Agency	Mexico Ministry of Environment and Natural Resources (SEMARNAT)
Legal frameworks	General Climate Change Law, 2012
Regulatory frameworks	Regulation to the General Law of Climate Change in Matters Relating to the National Registry of Emissions, 2014
GHG data management systems	Annual Emissions Report (COA) that integrates the Pollutant Releast Transfer Registry (PRTR)
Confidentiality	Requires both activity and emissions data (most granular)
Planning process	Applicable emissions thresholds and source categories are predefined; single, centralized repository collects both GHG & non-GHG pollutants; outsourced system development to National Institute of Geography and Statistics
User types	Company managers and sector managers
Leverage existing programs & tools	Integrates GHG and pollutant data collection efforts; supports source-level reporting and the future carbon tax
QA/QC	System checks if submissions are complete, third-party verification every 3 years
Lessons Learned	Specify functional requirements during development to increase ease of use and accommodate different reporting obligations; stakeholder engagement key to reducing reporting burden and for education.

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QUESTIONS?

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Thank you!

For further information, contact:

The Climate Registry
chasenauer@theclimateregistry.org
www.theclimateregistry.org