Statistics Canada - Approach to Data Suppression and Data Sharing

September 28, 2021

Éclairer grâce aux données, pour bâtir un Canada meilleur

Canadian Centre for Energy Information (CCEI)

- Brief Overview
- Key Priorities

Suppression

- Context
- Energy statistics program
  - Methods used to protect confidentiality
- Recent accomplishments, actions in progress and proposed

Why Canada needs a Centre for Energy Information

- Polarization of energy/environment debates aggravated by multiple and often conflicting data sources

- Data duplication, respondent burden, and general confusion from multiple sources of similar data

- Incoherent data and inconsistencies across sources

- Difficult to find Canadian energy data and substitution of data from international sources

Budget 2019 provided $15.2 million over five years, with $3.4 million per year ongoing, to establish a virtual Canadian Centre for Energy Information (CCEI) delivered by Statistics Canada and Natural Resources Canada, in collaboration with FPT partners.

A modern, independent energy information system

- The CCEI is an exciting partnership with provinces and territories that will:
  - Serve as a single point of access for all energy-related information and data, such as production, consumption, international trade and much more;
  - Compile, reconcile and integrate energy data from various Canadian sources;
  - Harmonize energy definitions, measurements and standards;
  - Improve the completeness, coherence and timeliness of Canada's energy information;
  - Provide new data products, visualization tools and expert analyses; and
  - Support analysis, modelling and forecasting in the academic and research community.

Independent, coherent and credible data will help inform decision-making and shape Canada's energy future.

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Canada

Canadian Energy Information Evolution
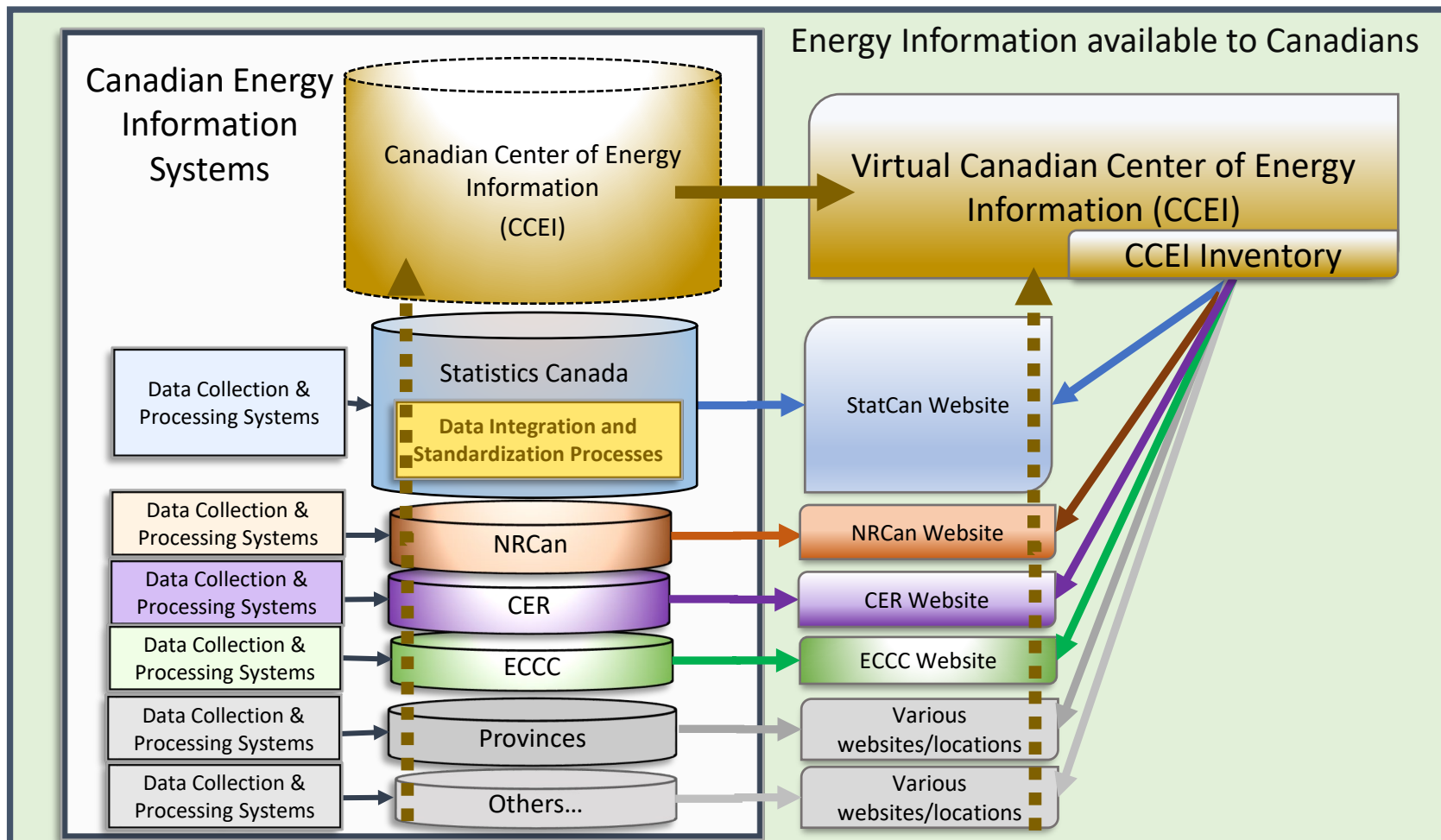
Deep dives are underway on key topics

Data reconciliation and integration

➢ Working groups with external partners and data suppliers are currently looking at: natural gas production, crude oil production, electricity production, electricity trade
➢ Pilot projects to integrate external data sets

Standards

➢ Adoption of SDMX
➢ Development of harmonized and standardized concepts and variables for the CCEI

Modelling and forecasting

➢ Consultation with modelling community on how to integrate modelling and forecasting into the CCEI

Data access

➢ Development of options to reduce data suppression
➢ Workshop to discuss how to improve the transparency, access and availability of energy data in Canada

✓ This is the core work of the CCEI – to improve the quality and coherence of energy data

✓ Engagement and partnership are driving the deep dive work – ensuring that the right experts are at the table

Data gaps:
Focus on data suppression

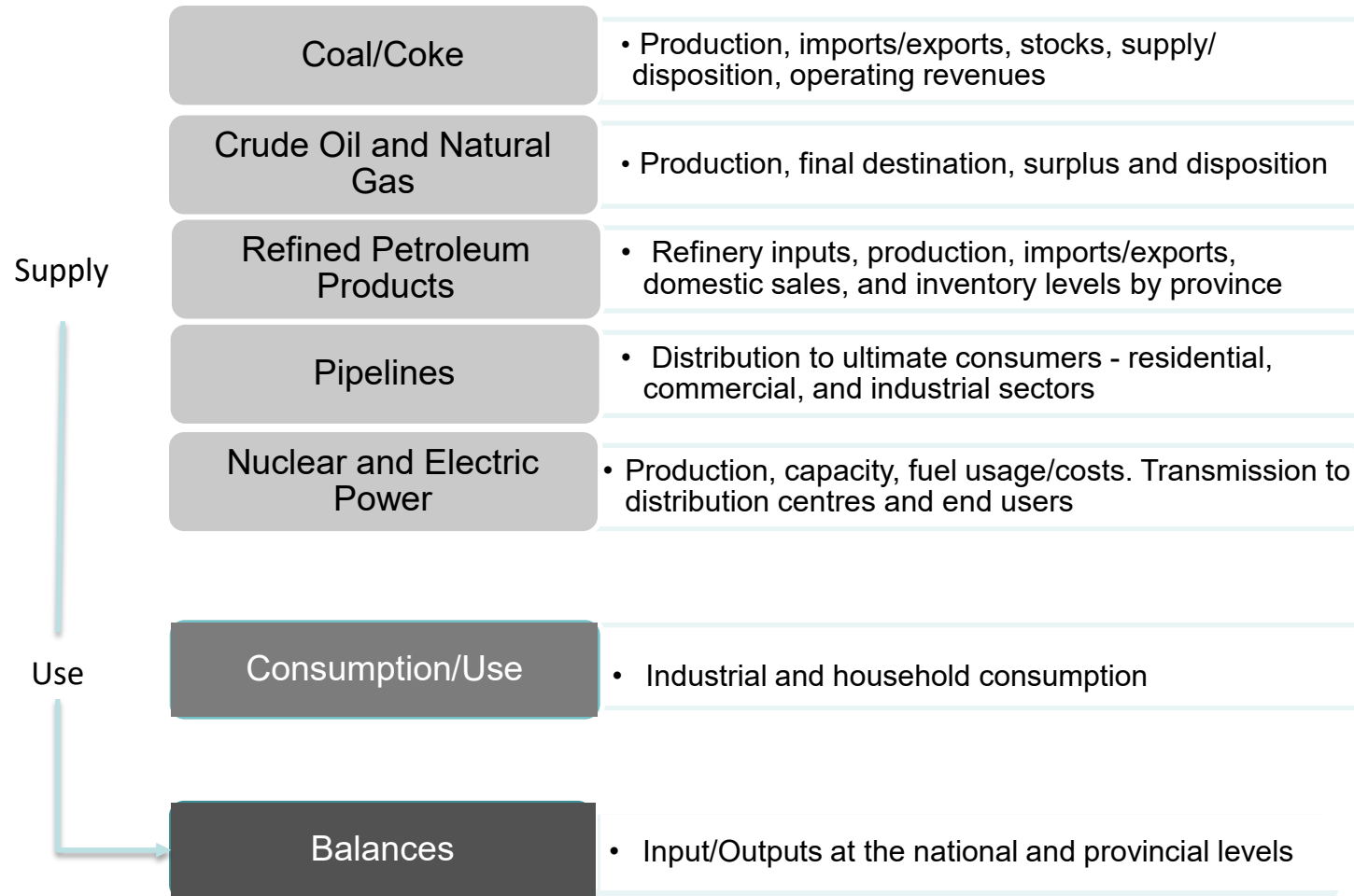Éclairer grâce aux données, pour bâtir un Canada meilleur

Energy Statistics Program – Overview

Supply

Coal/Coke	• Production, imports/exports, stocks, supply/disposition, operating revenues
Crude Oil and Natural Gas	• Production, final destination, surplus and disposition
Refined Petroleum Products	• Refinery inputs, production, imports/exports, domestic sales, and inventory levels by province
Pipelines	• Distribution to ultimate consumers - residential, commercial, and industrial sectors
Nuclear and Electric Power	• Production, capacity, fuel usage/costs. Transmission to distribution centres and end users

Use

Consumption/Use	• Industrial and household consumption
Balances	• Input/Outputs at the national and provincial levels

Key Uses

- Monitoring the Economic Health of the Industry
- System of Macroeconomic Accounts (Calculation of GDP)
- Key input in deriving Environmental Indicators e.g. National Greenhouse Gas Inventory
- Supports Managing Energy Security and Preparedness (Domestic and International)
- Energy efficiency indicators
- Energy forecasts
- Modelling (supports predictive analysis for industry's reaction to change)

Framework

Mandate/objectives:

✓ To provide statistical information and analysis about Canada's economic and social structure to:

➢ develop and evaluate public policies and programs

➢ **improve public and private decision-making for the benefit of all Canadians**

Obligations:

✓ Legal obligation to protect confidential information collected under the *Statistics Act*

➢ **Challenge:** High concentration of the industrial sector and several provinces and territories

✓ Maintain respondent's trust

Data suppression : Basic methodological rules

Disclosure constraints:

- ✓ Number of potential respondents
- ✓ Proportions of contributions for each respondent, for each cell
- ✓ Waivers signed
- ✓ Residual disclosure

Other considerations:

- ✓ Need to publish all national level estimates
- ✓ Establish a coherent and constant suppression pattern through time
- ✓ Consider cross tabulations – data may be suppressed to prevent the disclosure of confidential estimates in other tables *(RESD is a good example of having additional suppressions to protect suppressions in the feeders)*.

Report on Energy Supply and Demand: Data Sources - Summary

Main sources	Source Type	Frequency	17.2.G	Suppression method
Natural Gas Transmission (MNGT)	Survey	Monthly	YES	None required
Natural Gas Storage (MNGS)	Survey	Monthly	YES	None required
Natural Gas Distribution (MNGD)	Survey	Monthly	YES	None required
Electric Power Generating Stations (AELE)	Survey	Annual	YES	None required
Electric Power Thermal Generating Station Fuel Consumption (EPTG)	Survey	Annual	YES	None required
Refined Petroleum Products (MRPP)	**Survey**	**Monthly**	**NO**	**New method since RY 2019***
Coal (MCOAL)	**Survey**	**Monthly**	**NO**	**New method since RY 2019**
End Use Refined Petroleum Products (AEND)	**Survey**	**Annual**	**NO**	**New method since RY 2017**
Secondary distributors of Refined Petroleum Products (SRPP)	**Survey**	**Annual**	**NO**	**New method since RY 2017**
Industrial Consumption of Energy (ICE)	**Survey**	**Annual**	**NO**	**New method since RY 2018**
Trade data from IATD	Admin	Annual	NO	All releasable
Canadian Energy Regulator (CER)	Admin	Monthly	NO	All releasable
Crude oil and Natural Gas (MCONG)	Admin	Monthly	NO	All releasable

Recent Accomplishments - _Results following the introduction of new methods_

a) Annual data on End Use, and Secondary distributors of Refined Petroleum Products (2019)

- ✓ RY 2018 & 2019: No more suppression at the National level
- ✓ **_Zero suppression_** for the vast majority of provinces

b) Monthly data on Refined Petroleum Products **_(2020)_**

- ✓ RY 2013 to now : No suppression at the National level
- ✓ RY 2013 to 2018 inclusivly: **30 to 35% increase** of the number of cells published

c) Annual Survey on Industrial Consumption of Energy **_(2020)_**

- ✓ RY 2018 to 2019: **20% increase** of the number of cells published

Acknowledgment of issues caused by data suppressions

1. Challenges for provinces :
   - ✓ Needs a minimum of quality data in support to establish and evaluate policies pertaining to energy transition
     - ➢ For the sake of transparency, these data should be available to all
     - ➢ Quality: Comparable, consistent and accurate time series

2. Issues of multiple users having to estimate the missing values in order to complete their models.
   - ✓ Models and simulations with similar hypotheses can lead to different result simply because the us of different estimation methods for missing values.

Additional actions to minimize or eliminate data suppressions and increase data access

Strategy for obtaining and renewing waivers

1. Engagement and Awareness *:*
   - ❑ With respondents directly
   - ❑ With provincial partners
   - ❑ With the associations

2. Process improvements
   a) Clarifications/explanation of the benefits of an approval
   b) Clarifications/explanation of the impacts of a refusal
   c) Partial waivers considerations:
      i. Sub-set of key variables
      ii. Annualized data
      iii. Historical data

   ➤ *Risk: Uncertain results*

Maximise data sharing – based on the *Statistics Act*

1. Maximise the use of sections 11, 12, & 17(b) of the *Statistics Act,* allowing data sharing with federal, provincial and territorial government departments, as well as other key users

2. Providing direct access to data for specific uses (deemed employee)

   ➢ *Challenges (in both cases) = These data can not be shared with the general public, and so, these options do not respond to the need of transparency and accessibility for all*

Lines of investigations from a CCEI perspective

A. Suppression Methods: Sensitivity vs data usefulness

1. Investigate the level of sensitivity of the data, and re-evaluate the disclosure risks
   - ❑ "Historical" data
   - ❑ Non-sensitive data cells

2. Identify and prioritize the minimum set of key data cells required at the provincial level
   ❑ Considerations: Potential structural change in the data dissemination:
        i) Agreggation of petroleum products ii) Geographic grouping iii) Other aggregations/groupings

B. Methodologies, (other than suppression)

1. Consider the option to add random noise to the data in order to allow its dissemination

2. Consider the "centralisation" of the key users' multiple imputation methods

C. Identify other options (I.e.: Use of other administrative data sources)

Appendix

Resources — Statistics Canada

- **Sections 11, 12, 17(1) (b), 17(2) (g) of the Statistics Act:** http://laws-lois.justice.gc.ca/eng/acts/S-19/FullText.html

- Most programs use a common set of suppression rules which are embedded in a software package (*G-Confid*) developed at Statistics Canada, for more information: http://www5.statcan.gc.ca/olc-cel/olc.action?ObjId=10H0109&ObjType=22&lang=en&limit=0

- **Statistics Canada's Privacy Framework:** https://www.statcan.gc.ca/eng/reference/privacy/framework

- **Statistics Canada's Quality Guidelines:** https://www150.statcan.gc.ca/n1/pub/12-539-x/2019001/ensuring-assurer-eng.htm

Resources — Statistics Canada

CCEI Website – launched October 2020
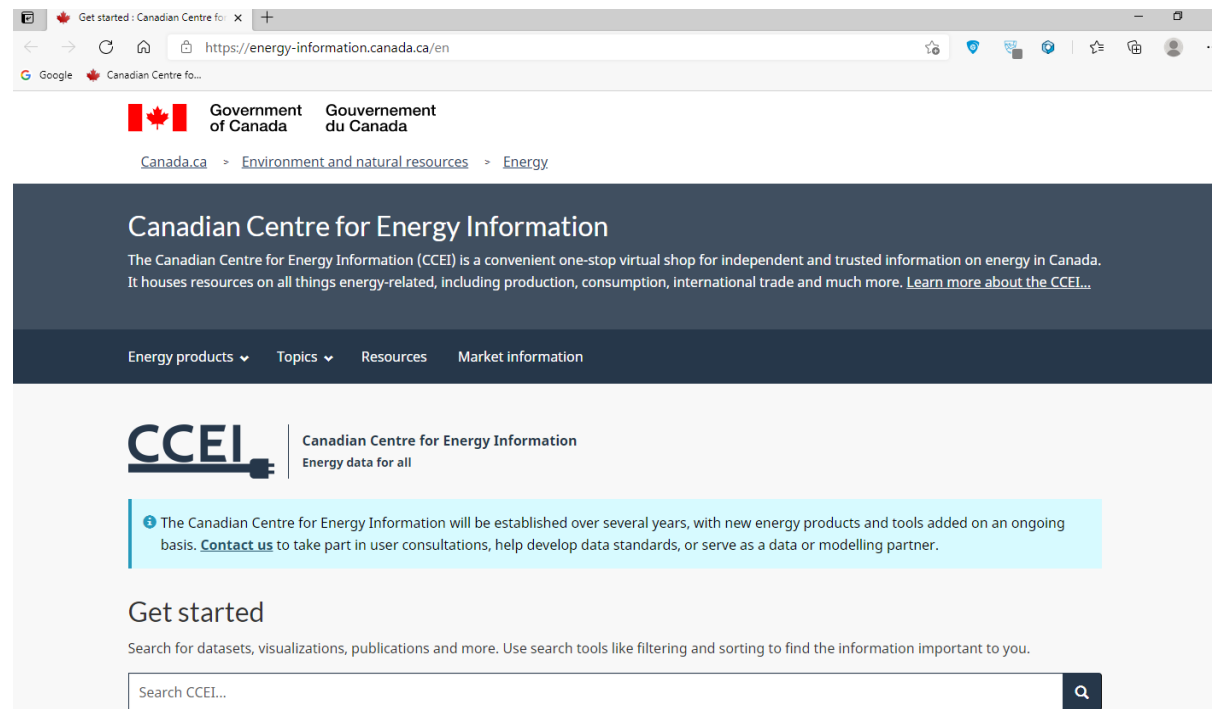
Initial website:

- ✓ User-centric design, based on feedback from user consultations and usability testing
- ✓ Initial foundation on which to build future data reconciliation and integration of non-StatCan data sets and development of new tools
- ✓ One-stop shop for energy information – provides search for users to find more than **550 energy information products from more than 80 different sources**

https://energy-information.canada.ca/en