Residential Sector – Canada's data collection strategy

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Introduction

Natural Resources Canada (NRCan)

a federal government department responsible for the sustainable development and use of natural resources

OEE

a branch of NRCan mandated to renew, strengthen and expand Canada's commitment to energy conservation and energy efficiency

Programs

OEE proactively promotes energy conservation and efficiency in all sectors

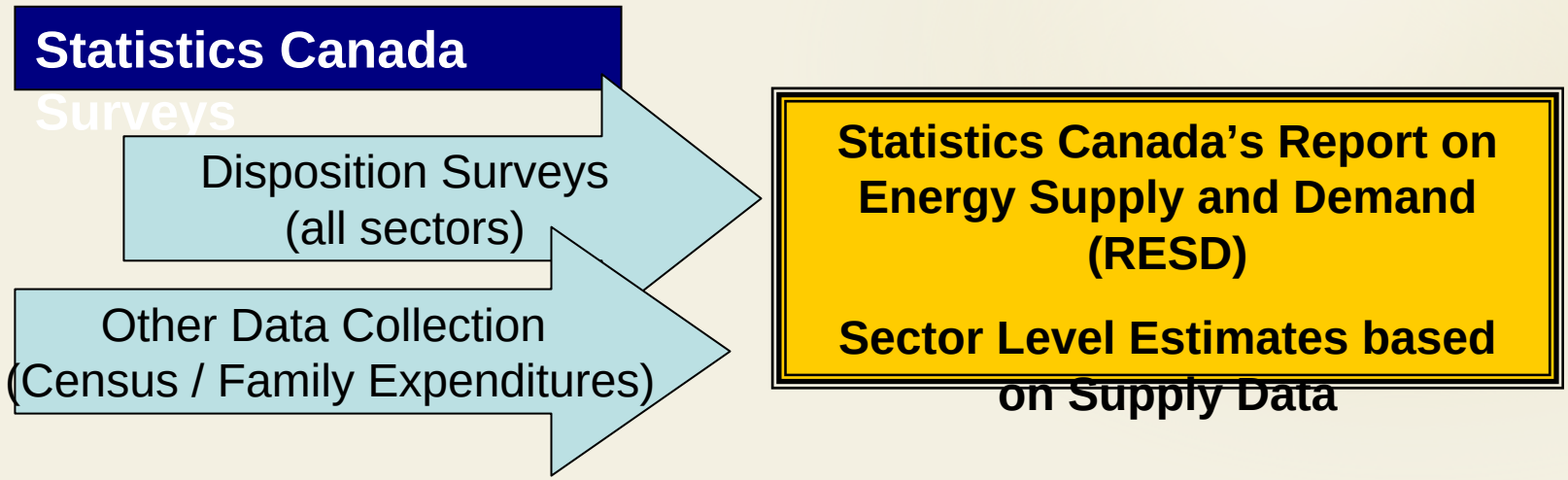
DPAD - NEUD

a division of OEE created to improve knowledge and understanding of where and how energy is used in all sectors of the Canadian economy

- Transportation
- **Residential**
- Commercial
- Agriculture
- Industrial

In the Beginning…

- Statistics Canada collected some relevant data for the residential sector; *examples:*
  - Disposition surveys collected energy sales data (electricity and fuels) for all sectors (including residential)
  - Survey of Family Expenditures, Census of Canada, etc. collected sparse information on household energy costs / use
- Statistics Canada produced energy use estimates (at a sector level)



Identified Data Challenges

- We required more accurate energy use information for all sectors of the economy (including residential) for:
  - **National Energy Use Database (NEUD):**
    - perform market analysis and modeling
    - track trends in energy use, energy efficiency, GHGs
    - disseminate information
  - **OEE Programs:**
    - Benchmarking
    - Regulations
    - Evaluation of energy consumption activities
    - Monitoring and Tracking impacts of programs
    - Tracking potential for energy efficiency improvement
    - Targeting future programs

How we Addressed the Challenges

1. New Data Collection Activities:

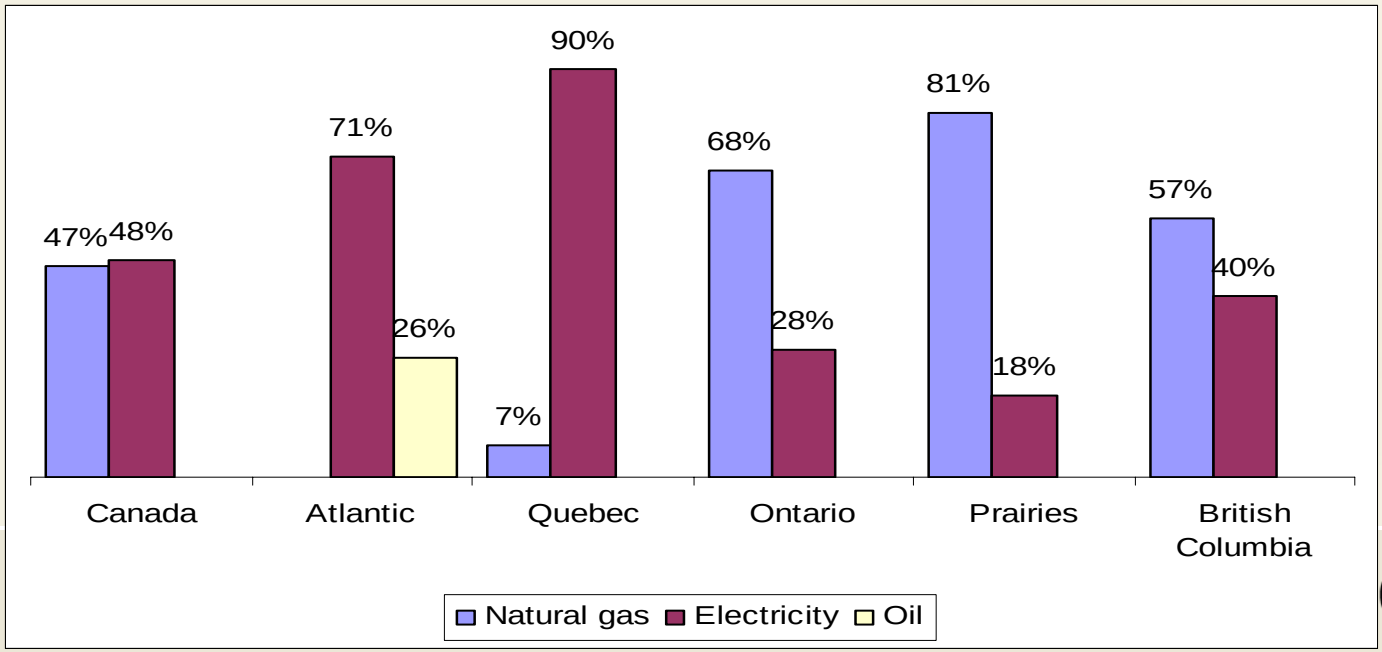
- OEE engaged Statistics Canada to collect energy use information in the residential sector
  - Survey of Household Energy Use (SHEU): 1993, 1997, 2003
- Statistics Canada performed other surveys
  - 1994 – Survey of Houses Built in Canada
  - 1994-1995 – Survey of New Household Equipment Purchases
  - 1994-1995 – Home Energy Retrofit Survey
- OEE worked with industry to collect information
  - Energy Consumption of Major Household Appliances - data from appliance manufacturers on shipments obtained; linked with unit energy consumption data
- Data and Analysis Centres created at universities across Canada
  - data warehouses for information, data revision and analyses

Results – New Data Collection

2003 Survey of Household Energy Use (SHEU-2003)

- Objective was to gather information on energy use and the factors affecting energy use in households during 2003; e.g.,
  - energy consumption
  - dwelling characteristics / energy efficiency characteristics
  - usage of appliances and other energy-consuming products

Examples of Results: Type of Fuels used, by Region



How we Addressed the Challenges

2. New Modeling Framework:

RESD →

- Stock Information
  - Survey of Household Spending

e.g.: number of households; appliances, space cooling & heating, and water heating stock

  - Survey of Household Energy Use

e.g.: floor space

- Flow Information
  - CAMA - *e.g.: sales of major appliances*
  - HRAI - *e.g.: sales of heating equipment*
- Unit Energy Consumption & Usage Profiles
  - Data and Analysis Centers

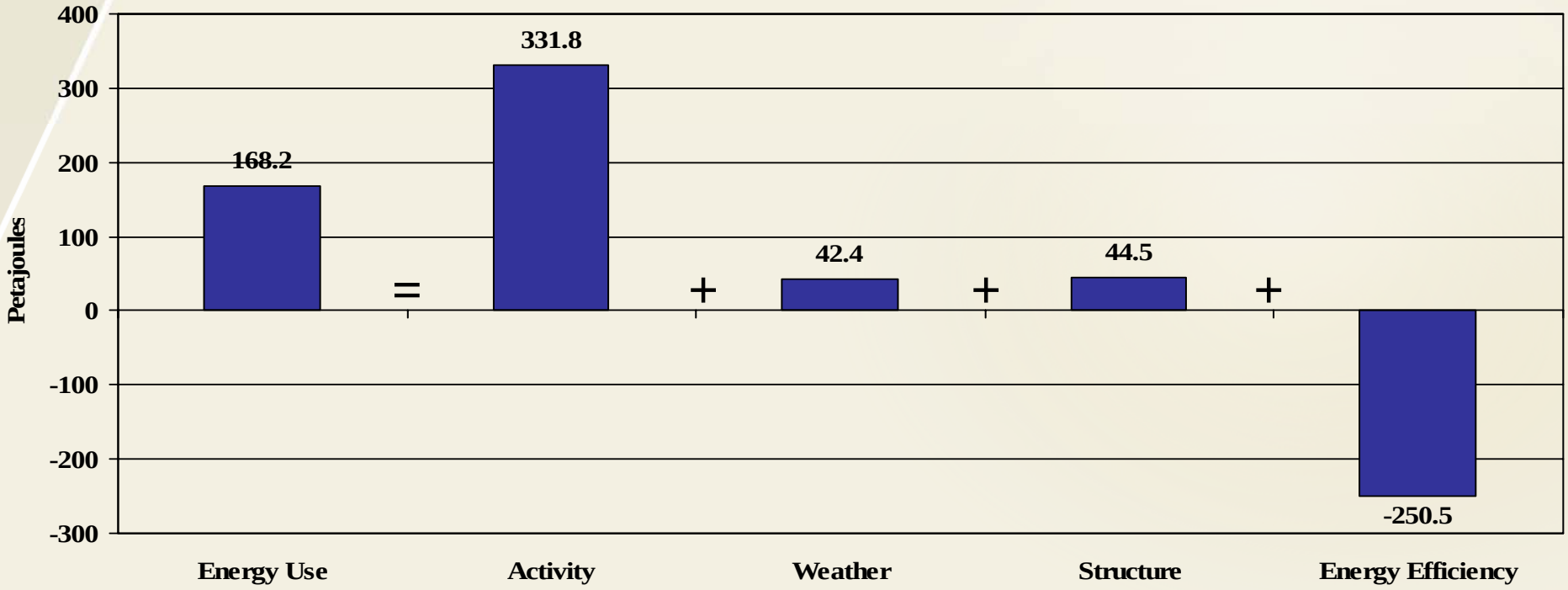
e.g.: per unit energy use for water, lighting

  - Consultant Research; Internal Database

→ Space Heating
→ Space Cooling
→ Appliances
→ Water Heating
→ Lighting

Results – New Modeling Framework

Impact of Activity, Weather, Structure and Energy Efficiency on Energy Use, 1990 - 2003 (petajoules)



Current Data Situation

Statistics Canada Surveys

Disposition Surveys (all sectors)

Survey of Household Energy Use (SHEU – 1993, 1997, 2003)

Information from Industry (Appliance Manufacturer Data)

Other Statistics Canada Surveys

Statistics Canada's Report on Energy Supply & Demand (Sector Level)

Parts of each dataset are used by DPAD in the residential model, to get market-level estimates

Ideal Data Situation

Statistics Canada Surveys

Disposition Surveys (all sectors)

Survey of Household Energy Use (annually)

Other Statistics Canada Surveys

Information from Industry (appliance manufacturer Data)

Statistics Canada's Report on Energy Supply & Demand (Sector Level)

- **annual** end-use surveys
- one integrated source for all stock and flow information
- integrating this information into the RESD

DPA

- more consistent data for DPAD's market level estimates
- link between market level estimates & program activities

Next Steps

Ongoing Challenges:

Data

- Funding for annual end-use surveys in the residential sector
- Consistency issues related to integrating different data sources
- Changing the *status quo*

Analytical

- Drilling down to program analysis using market level estimates

Addressing the Ongoing Challenges:

- Interdepartmental Working Group on Energy Statistics involving key energy statistics users
- Funding for energy statistics
- Continuous improvement to modeling framework as new information becomes available

http://oee.nrcan.gc.ca/

http://oee.nrcan.gc.ca/corporate/statistics/neud/dpa/home.cfm?attr=

- Databases
- Glossary and abbreviations
- Publications
- Data and analysis centres