



**An
Phríomh-Oifig
Staidrimh**

Central
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Office

Expert Forum for Producers and Users of Climate Change-Related
Statistics

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Use of Administrative Microdata for Climate-related Statistics
in Ireland

Gerry Brady

Environment and Climate Division

Central Statistics Office Ireland

Overview of Presentation

- 2021 Climate Action Plan
- Utility meter data
- Energy efficiency of buildings
- Adding value by combining microdata
- Work-in-progress
- Conclusions



2021 Climate Action Plan

- The 2021 Climate Action and Low Carbon Development (Amendment) Act set legally binding national emissions reduction targets
- Economic data held by statistical offices can be used to monitor the economic and employment impact of reducing emissions for NACE groups with high emissions and transitioning away from fossil fuels
- Administrative microdata may have more complete geographical coverage making it a possible input to the development of local authority Climate Action Plans

Sector	2030/2018 reduction target
Electricity	-70%
Transport	-50%
Commercial and Public buildings	-45%
Residential buildings	-40%
Industry	-35%
Agriculture	-25%



Utility meter data

- CSO Environment division receives microdata files of electricity, gas, and water meter data under the Statistics Act, 1993
- The files are a mixture of meter readings and consumption calculated by the utility company
- The customer (name and address etc.) and microdata files both include the meter number which allows the customer and data files to be linked
- The CSO publishes annual statistical releases based on the utility data
- The volume of meter data allow size class analyses to identify low and high consumption as well as time series trends e.g. number of meters reducing their water consumption during a prolonged dry period or customer responsiveness to energy prices
- The electricity customer file was used by CSO to identify around 70 meters belonging to data centres which facilitated a new thematic statistical release



Metered electricity
consumed by
data centres



5% | **14%**

in 2015

in 2021

Metered electricity
consumed by
urban dwellings



21%

in 2021

Metered electricity
consumed by
rural dwellings



12%

in 2021

In 2021...



Median
residential
metered
electricity
consumption

3,594
kWh

Around 10%
of residential
customers
consumed
less than

1,000
kWh

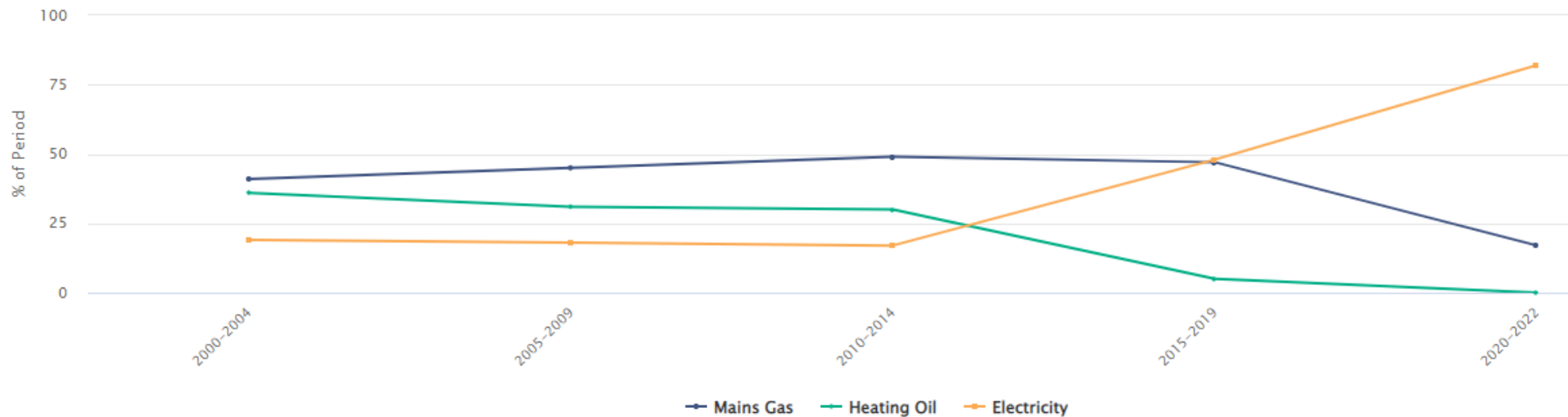


Energy efficiency of buildings

- The CSO receives monthly files of all residential and non-residential energy audits
- The files contain around 400 variables including energy rating, main space heating fuel, main water heating fuel, period of construction, total floor area, type of dwelling (e.g. mid-floor apartment), etc.
- The files contain the electricity meter reference number and a postcode which is unique at address level in Ireland
- The file shows a large swing in recent years to using electricity as the main space heating fuel
- The effectiveness of using building regulations to improve energy efficiency standards can be monitored
- Linking the energy ratings with administrative data can provide insights into energy poverty



Figure 1: Main Space Heating Fuel by Period of Construction (2000–2022)

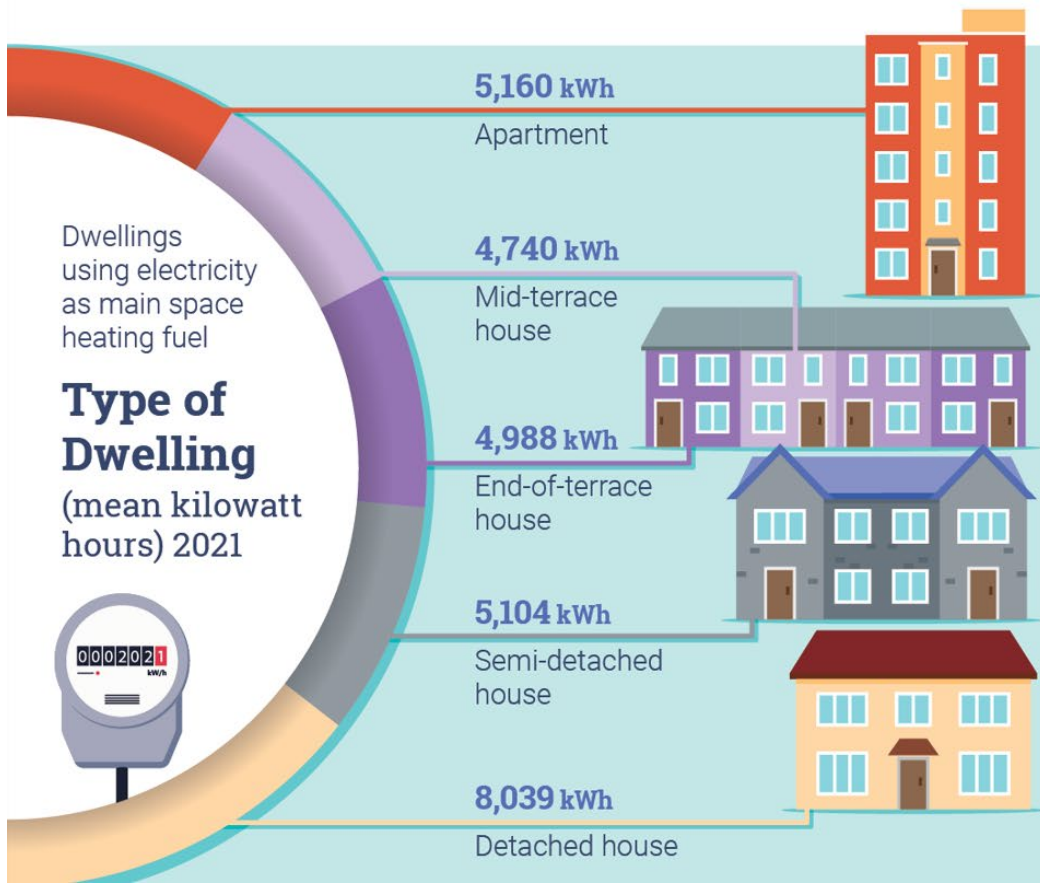


Adding value by combining microdata

- The CSO is in the unique legal position of being able to combine microdata files using unique identifiers
- The resulting new dataset can provide new insights to users and policy-makers
- The CSO combined metered gas and electricity consumption with building energy ratings. The new datasets gave actual consumption and the energy ratings dataset provided classifiers such as type of building, period of construction, total floor area, main space heating fuel, and metered kilowatt hours consumption per square metre.
- The results showed that more energy efficient dwellings used less gas and electricity per square metre but they had more floor area and hence used more energy kWh consumption per dwelling
- F and G rated dwellings used less electricity per square meter than C/D/E rated dwellings suggesting fuel poverty issues and use of supplementary heating



Household Electricity Consumption by Building Energy Ratings 2021



Type of Dwelling
(mean kilowatt hours) 2021



Energy Rating

(mean kilowatt hours per square metre) 2021

A + B 42 kWh/m²

C 75 kWh/m²

D 79 kWh/m²

E 79 kWh/m²

F + G 67 kWh/m²

Work-in-progress

- The CSO is undertaking data quality checks on odometer readings from vehicle road worthiness tests. Our objective is to calculate annual vehicle kilometres travelled and to analyse the data by various characteristics such as fuel type, vehicle type, and urban/rural location.
- The CSO is working on a new report that will show time series trends in emissions, employment and economic activity. The purpose is to examine the economic impact of reducing emissions.
- We would like to bring financial data more into our climate and emissions work
- - Affordability is a barrier for many households that want to improve the energy efficiency of their homes and change from diesel and petrol vehicles
- - Financial costs are relevant for enterprises especially those with large diesel fleets with the risk of stranded assets (commercial vehicles and taxi companies)
- We would like to integrate our data at sub-national level to facilitate local Climate Action Plans
- A climate data rescue project is being undertaken to computerise hand-written daily meteorological data for the period 1870-1959. The objective is to examine trends in the occurrences of climate indicators such as droughts, heatwaves, very wet days, storms, etc.



Conclusions 1

- There is a considerable amount of statistical and improved timeliness potential in administrative microdata
- Statistical offices should have a right of access to the confidential microdata
- Administrative microdata may reduce the survey burden on enterprises and households
- The completeness of administrative microdata facilitates sub-national analyses
- Using size consumption thresholds and excluding residential meters allowed CSO to produce estimates of typical Small and Medium Enterprise gas and electricity use as an input into policy development during the current energy situation
- Working with public authorities to develop the administrative microdata can greatly improve its statistical potential
- Combining administrative microdata files using unique identifiers creates huge potential for achieving added value



Conclusions 2

- Household level utility microdata can be used as signs of activity in relation to vacant or under-used properties e.g. to check field work from a Census
- The utility data can be combined with other administrative data to examine per capita consumption, risk of energy poverty, effectiveness of home renovations, differences by period of construction
- Sector specific analyses can be undertaken e.g. trends in data centres energy consumption
- Odometer readings from vehicle tests allows calculation of annual vehicle kilometres by fuel type and monitoring of the pace of the green transition
- Access to the confidential microdata is a privilege for statistical offices and an opportunity to provide policy-makers and the research community with otherwise unavailable analyses
- Creating anonymised microdata research files can move the analysis burden from the statistical office to approved data researchers

