NEW STUDIES
AND
THE INCREASING USE OF ADMINISTRATIVE RECORDS
IN ENERGY STATISTICS

14th Session of the OIC StatCom
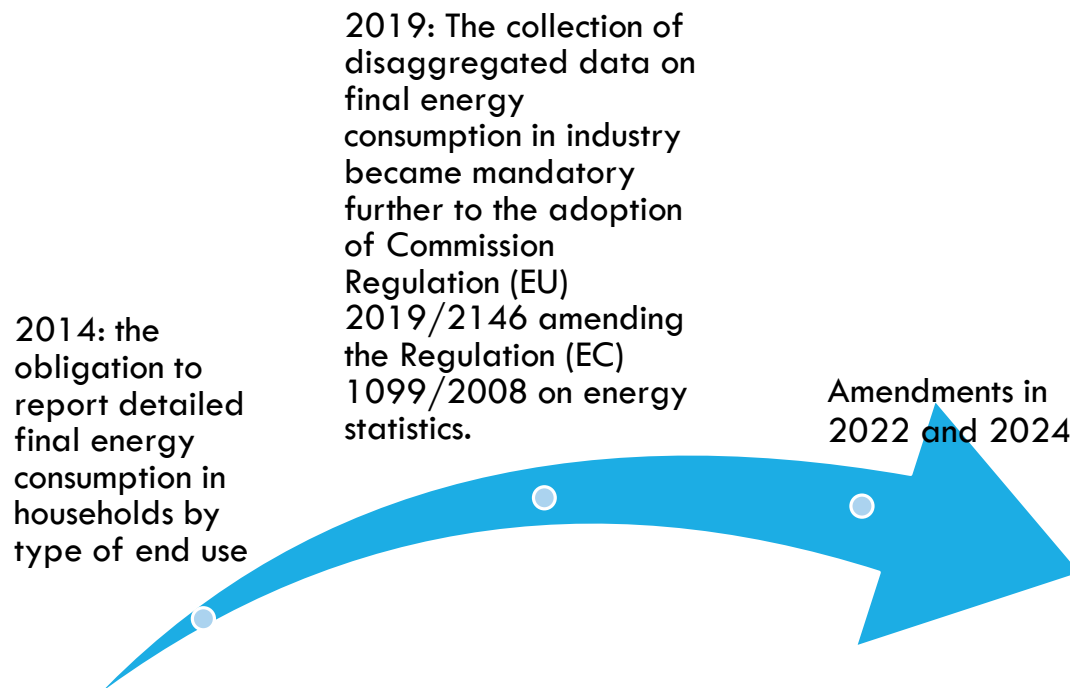01-03 October 2025, Ankara – Türkiye

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CONTENT

✓ **Adoption of the 2022 and 2024 Amendments in Energy Statistics Regulation (ESR) of the European Commission**

✓**The use of Administrative Records (AR) in energy statistics**

- **Energy Consumption in Households**
  - In Sampling Design
  - For Data Input and Survey Data Control
  - Secondary residences

- **Energy Consumption in Industry, Services and Transport**
  - Determining the Survey Framework
  - For Data Input and Survey Data Control

✓ **The Future Use of AR for Energy and Other Domains**

2022 and 2024 Amendments in ESR

2014: the obligation to report detailed final energy consumption in households by type of end use

2019: The collection of disaggregated data on final energy consumption in industry became mandatory further to the adoption of Commission Regulation (EU) 2019/2146 amending the Regulation (EC) 1099/2008 on energy statistics.

Amendments in 2022 and 2024

2022 and 2024 Amendments in ESR

Change	First reference period	Deadline to report	Questionnaire involved	Voluntary elements
Collect data on electricity production by sector (decentralised production)	2022	31/10/2023	Electricity and heat questionnaire	
Non-energy use of certain renewable fuels	2024 for 1 data point (2027 for the rest of data points)	31/10/2025 31/10/2028	Renewables and wastes questionnaire	Additional details in sectors and in fuel groups
Hydrogen	2024	31/10/2025	Hydrogen questionnaire (plus modifications in other annual questionnaires)	E-fuels
Energy storage: batteries	2022	31/10/2023	Electricity and heat questionnaire	Exchanges outside of the grid. Batteries below the minimum 1 MWh threshold
Heat pumps	2022	31/10/2023	Renewables and wastes questionnaire	

2022 and 2024 Amendments in ESR

Change	First reference period	Deadline to report	Questionnaire involved	Voluntary elements
Solar photovoltaic (PV) subcategories	2022	31/10/2023	Renewables and wastes questionnaire	Off-grid when below 1% of the band capacity
Newly installed and decommissioned capacities	2022	31/10/2023	Electricity and heat questionnaire (if applicable, also other AQs)	Repowering
Implement data collections on disaggregated final energy consumption in services	2022	31/03/2024	Services disaggregation questionnaire	Additional layers of disaggregation
Implement data collections on disaggregated final energy consumption in transport	2022	31/03/2024	Transport disaggregation questionnaire	Additional layers of disaggregation
Improving timeliness for annual data submission	2022	31/10/2023	Multiple annual questionnaires	

2022 and 2024 Amendments in ESR

Change	First reference period	Deadline to report	Questionnaire involved	Voluntary elements
Splitting final energy consumption in agriculture/forestry	2022	31/10/2023	All annual questionnaires where this split is present	
CHP (Combined heat and power generation)	2022	31/10/2023	Electricity and heat questionnaire	
Split of transmission and distribution losses	2022	31/10/2023	Electricity and heat questionnaire + Natural gas questionnaire	Non-technical losses
Final energy consumption in data centres	2024	31/03/2026	Services disaggregation questionnaire	Data centres below 1 MW
Supply side of the mini-questionnaires	2022	31/05/2023	5 mini-questionnaires	Consumption side of the mini-questionnaires
Remove M-1 oil and gas	January 2022 (first period that is not to be reported to Eurostat)	January 2022 (data for December 2021)	Short-term monthly oil questionnaire + Short-term monthly natural gas questionnaire	

The First Results on FEC in Households

✓ **Thorough a press release
on the 19th of February 2024**

- In line with the new ESR

- For the reference year of 2022

- 13 570 households surveyed with CATI&CAWI method

- End uses included

- In coordination with the Mınıstry of Energy and Natural Resources

- https://data.tuik.gov.tr/Bulten/Index?p=Final-Energy-Consumption-Statistics-in-Households-2022-53805

Use of Administrative Records in Statistics on FEC in Households

❖ Subscriber Data for Electricity and Natural Gas

- ✓ 21 main distributers for electricity and 72 main distributers for natural gas

- ✓ Roughly 48 million subscribers for electricity (38 million households and 10 million non-households) and 19 million for natural gas

- ✓ Date, tax identify number, identity number, consumption (kwh / m^3), address (buyer), subscription type (household, industry, business, government etc.).

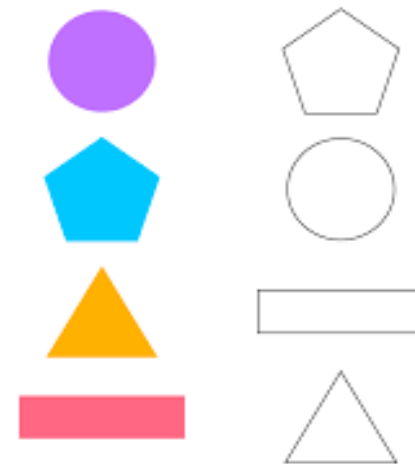# Use of Administrative Records in Statistics on FEC in Households

❖ In Sampling Design

o Better strata, better sample, better estimates.

o Almost 26 millions households in total frame of TR.

o Each subscriber has a consumption for 2022 in AR.

o Electricity data used for matching.

Stratified sampling
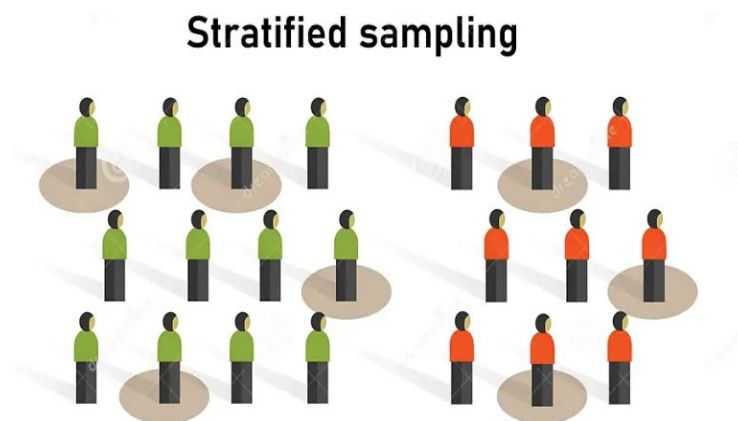
Use of Administrative Records in Statistics on FEC in Households

o Every household in the frame matched with AR to define consumption and to use consumptions as a strata.

o Identity number and address was the main parameters for matching.

Use of Administrative Records in Statistics on FEC in Households

❖ Kohonen artificial neural network was used to obtain the classes for 26 million HH.

❖ Why Kohonen?

- Same clusters

- Input fields etc.
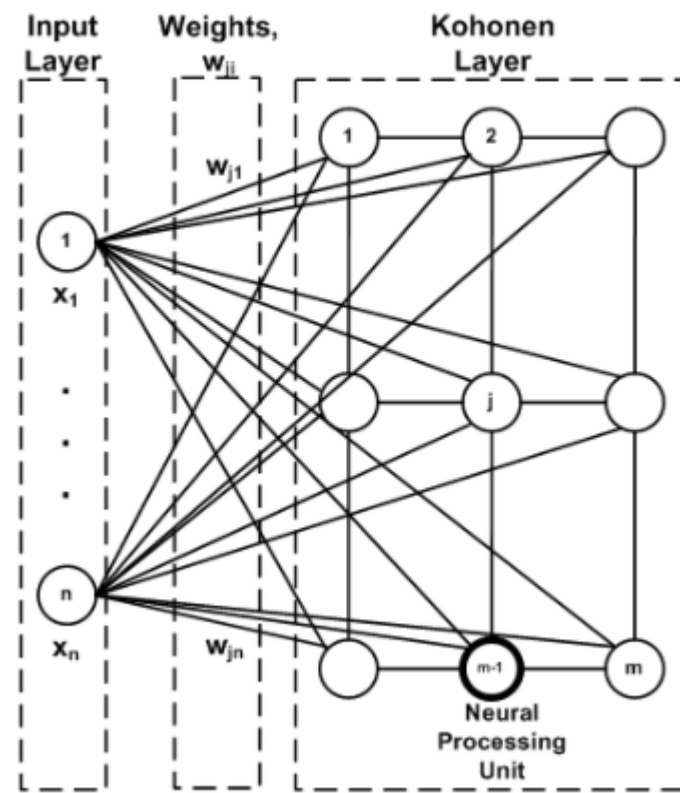
# Use of Administrative Records in Statistics on FEC in Households

❖ **Numbers and ratios of households**

CONSUMPTION_STRATA	COUNT_HH	AVERAGE_HH_PERSON	RATIO(STRATA)	SAMPLE_HH	RATIO(SAMPLE)
1	4,179,006	2.46	16.04	1991	11.97
2	1,018,110	2.46	3.91	981	5.90
3	1,043,354	2.37	4.00	1043	6.27
4	2,462,775	2.11	9.45	1469	8.83
5	1,647,065	2.76	6.32	1294	7.78
6	3,018,683	2.85	11.59	1626	9.78
7	3,441,296	3.32	13.21	1889	11.36
8	2,101,162	3.91	8.06	1361	8.18
9	1,729,884	3.35	6.64	1221	7.34
10	1,724,003	4.21	6.62	1168	7.02
11	1,641,325	4.05	6.30	1215	7.30
12	2,049,976	4.27	7.87	1376	8.27
TOTAL	**26,056,639**	**3.18**	**100.00**	**16634**	**100.00**

Use of Administrative Records in Statistics on FEC in Households

❖ **For Data Input and Survey Data Control**

- o Integration of electricity / natural gas subscriber administrative data with survey data

- o The use of administrative records in the analysis of household energy consumption survey
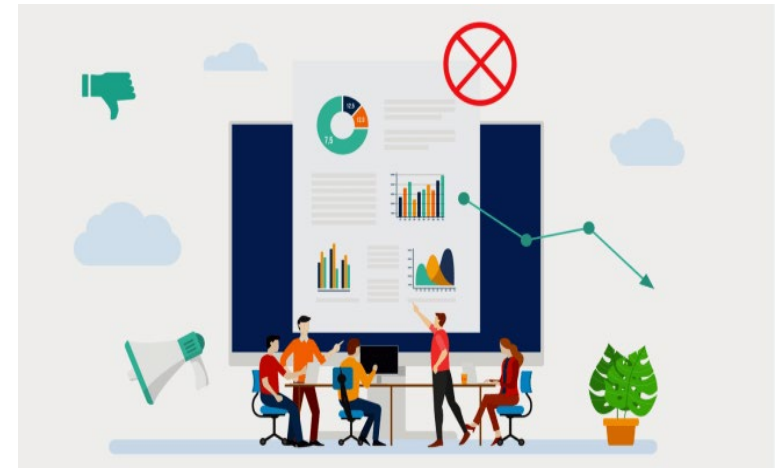
The First Results on FEC in Industry

✓ **Thorough a press release
on the 1st of November 2024**

- In line with the new ESR

- For the reference year of 2023

- 24 626 businesses surveyed with CAWI method

- End uses NOT included

- https://data.tuik.gov.tr/Bulten/Index?p=Statistics-on-Final-Energy-Consumption-in-Industry-2023-53806

The First Results on FEC in Services

✓ **Thorough a press release
on the 8th of November 2024**

- In line with the new ESR

- For the reference year of 2023

- 15 697 **businesses & public institutions & data centers** surveyed with CAWI method

- End uses NOT included

- https://data.tuik.gov.tr/Bulten/Index?p=Statistics-on-Final-Energy-Consumption-in-Services-2023-53807

Use of Administrative Records in Statistics on FEC in Industry/Services

❖ Forming the Surveys Framework

- o Turnover, employment, tax details, and other features for public sector, etc. from business registers

- o activity details from register records

- o Framework and sampling optimisation
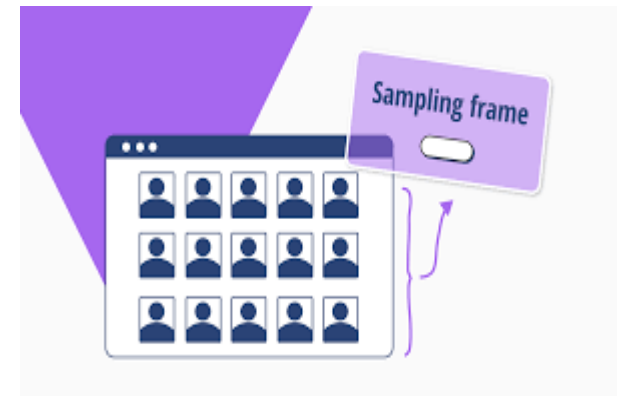
Use of Administrative Records in Statistics on FEC in Industry/Services

❖ For Data Input and Survey Data Control

o The use of administrative records in analysis of survey data

- Distributors data for 2023 (Selected 42.000 business records)

- To control the survey data

o Integration of electricity / natural gas e-invoice data with surveys data

The First Results on FEC in Transport

✓ **Thorough a press release
on the 27th of March 2025**

- In line with the new ESR

- For the reference year of 2023

- Covering road, rail, navigation and aviation modes

- https://data.tuik.gov.tr/Bulten/Index?p=Statistics-on-Final-Energy-Consumption-in-Transport-2023-57927

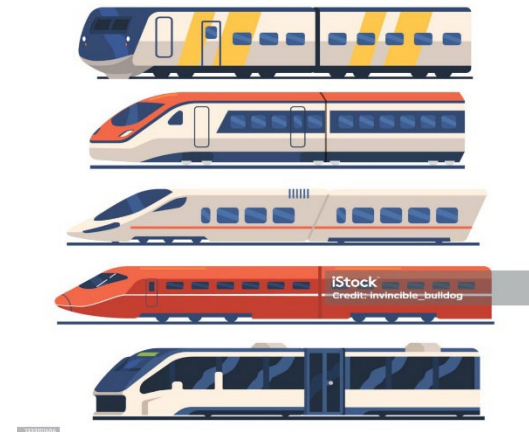# Use of Administrative Records in Statistics on FEC in Transport

❖ In Compiling Statistics

❑ Road Transport

- o Vehicle Register Data: Administrative records of Road Vehicles (DG of Security, Notaries, TurkStat)

- o Vehicle-km (Inspection) Data: Administrative records compiled during roadworthiness tests at the vehicle inspection stations (DG of Transport Services Regulation)

❑ Rail Transport

- o Data for convetional and high-speed-trains come from state institutions & private businesses

- o Data for tram&metro come from local municipalities

Vehicle Registration

Future Use of Administrative Records for Households

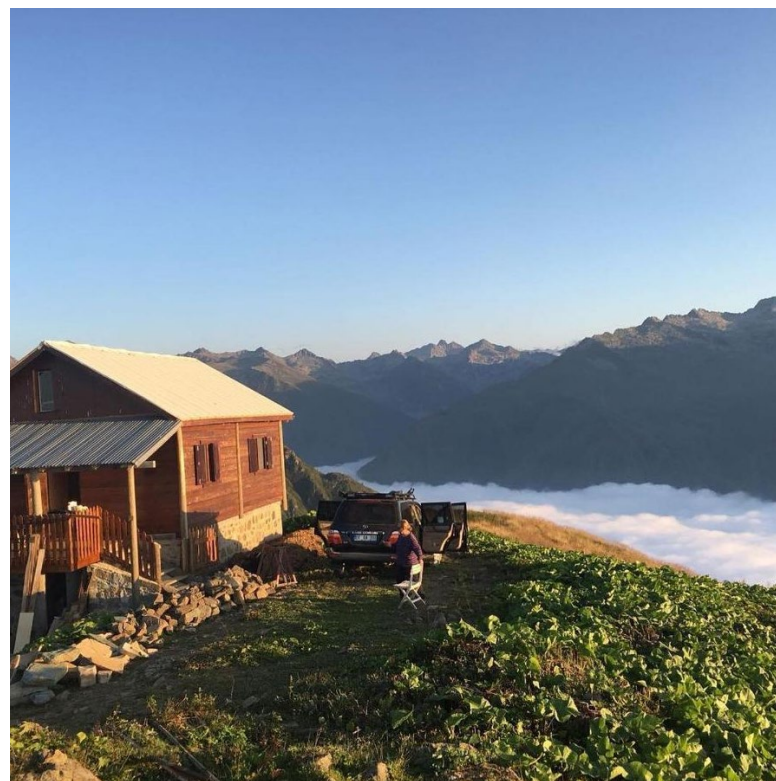❖ Creating framework for secondary residences

    ○ Only primary residences were included in the first study.

    ○ Considarable amount of secondary residence stock exists.

    ○ Different consumption patterns.
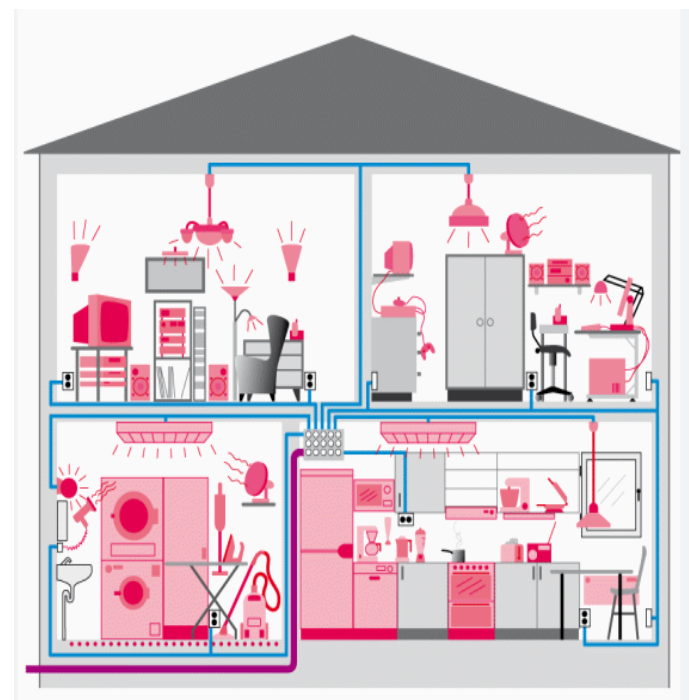
Future Use of Administrative Records for Households

❖ Creating framework for secondary residences

- One identity number has more than one electricty contracts, especially in different cities.

- One of the contracts is selected as main residence in different administirative records such as construction, demography.

- Location and total consumption patterns (none / low / high)

Future Use of Administrative Records for Households

❖ Creating framework for secondary residences

  o Including for the next round (2026)

  o Matching electricity administrative records with building registers by using «address» info – different approaches

  o These studies will also serve in determining the vacant housing/occupied housing stock within the country in the context of housing census

Future Use of Administrative Records for Businesses

❖ Distributors data

- ✓ Strengthen the data set with collaboration of the other organisations.

- ✓ Definitions, address-address codes, tax identify numbers etc.

- ✓ Ensure data quality – link to external data sources

- ✓ Distributing the total consumption to NACE sectors

Future Use of Administrative Records for Businesses

❖ E-invoice data

- Invoices issued in digital environment.

- Having the same characteristics as paper invoices

- Quantity, type, price and total cost etc. of the goods or services sold by the seller and presented to the buyer in digital environment.

- Must for businesses over 500 000 TL turnover since 01/07/2023

E-INVOICE

Future Use of Administrative Records for Businesses

❖ E-invoice data

- Granted select to Turkstat (agreed terms and domains).

- Huge data set

- Hard to match and select energy consumptions

- Differs to each company

Future Use of Administrative Records for Businesses

❖ E-invoice data

- For selected companies in both FEC of industry survey

- Cluster sampling method will be used and e-invoice electricity and natural gas consumptions will be the factors of obtaining clusters.

- Text mining, machine learning

Thank you for your attention!

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