EIA's data on feedstocks

Data and Harmonization to Improve the Circularity of Plastics
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January 24, 2023 | Virtual

Role in U.S. statistical system

- EIA arose in response to the 1970s Energy Crisis
  - Established as an independent agency by Department of Energy Organization Act (1977)
  - Required by Congress to expand its collections and reports (1992, 2005, 2007, 2021)
- Three part mission
  - Educate the public on energy markets
  - Promote efficient markets
  - Support policy makers (yet remain policy neutral)
- Legislation
  - Provides mandatory collection authority
  - Requires analytical reports and outlooks

Challenges and responses

- Challenges
  - EIA initially established to primarily focus on supply and consumption
  - Energy markets are evolving more quickly than in the past
  - Energy markets becoming more important part of U.S. economy
- Responses
  - Focus more on providing information on investment and infrastructure development
  - Investigate ways to get more timely information on emerging technologies
  - Further integrate EIA's data with national economic accounts
  - Provide clearer recognition of what we don't really know

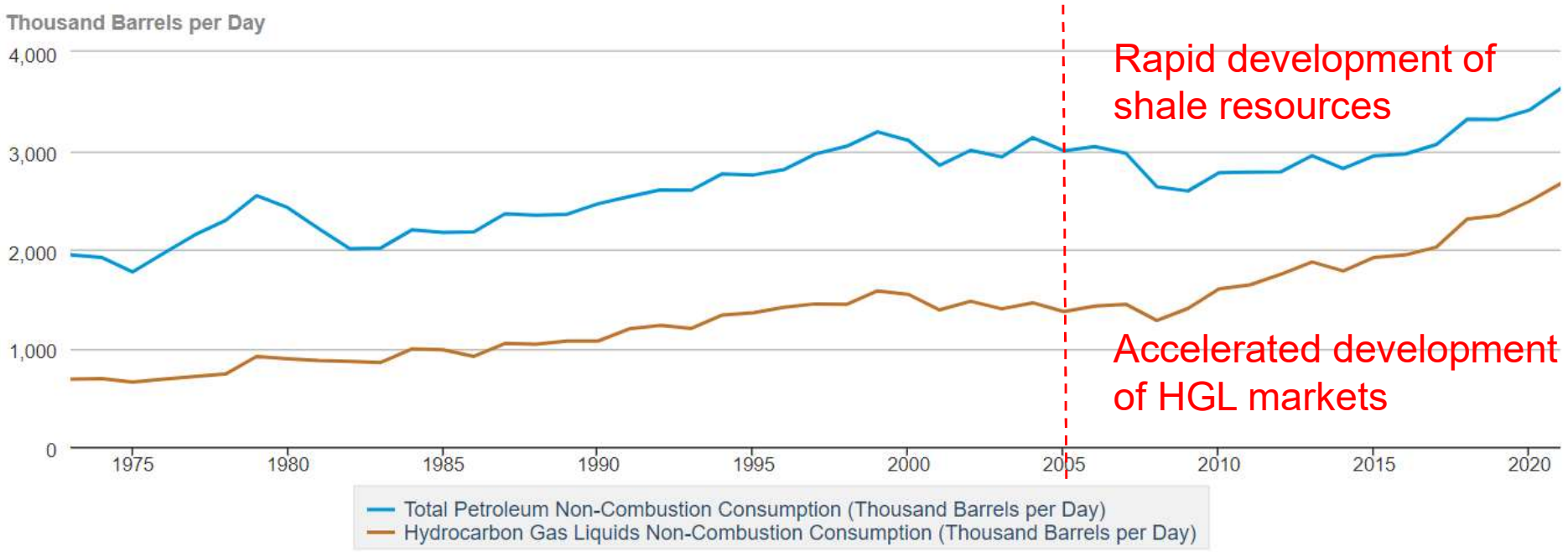
Data harmonization in Monthly Energy Review (MER)

- Closest energy-related analog to a national accounting system
- Data incorporated from EIA's collections
  - Over 30 monthly and weekly surveys
  - Three quadrennial benchmark energy consumption surveys
- Data incorporated from other sources
  - Survey data from at least 8 other statistical organizations
  - Administrative data from at least 3 other government entities
  - Private sector data collected for market analysis
- Guide: UN International Recommendations for Energy Statistics

Main data sources for feedstock statistics

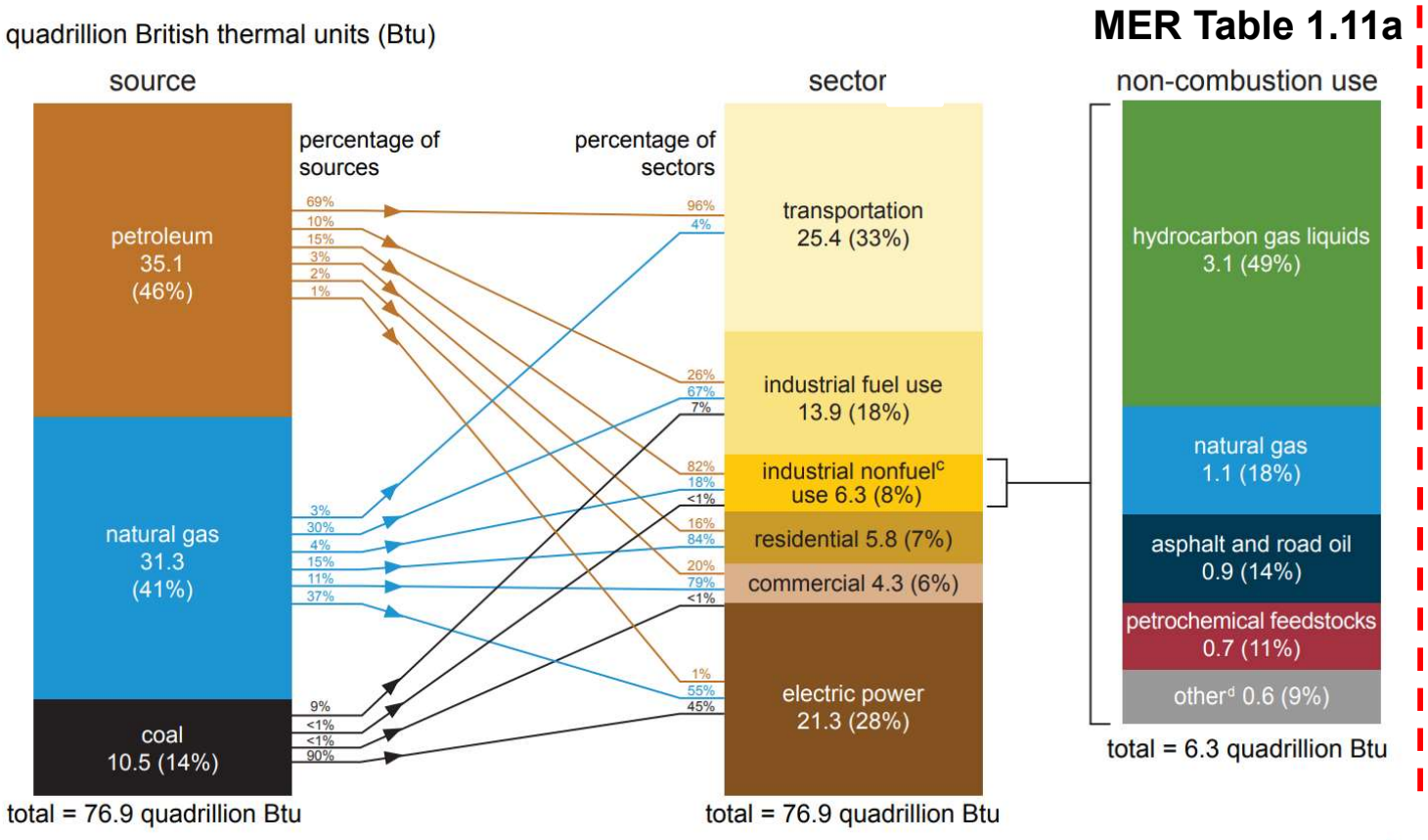
- Benchmark data
  - EIA's Manufacturing Energy Consumption Survey (MECS)
- Annual data for ratio-based breakouts for monthly statistics
  - EIA's Petroleum Supply Annual
  - EIA's Annual Refinery Report
  - Petroleum Education & Research Council
- Methodology and source data in detailed footnotes

MER Table 1.11a: Non-Combustion Use of Fossil Fuels



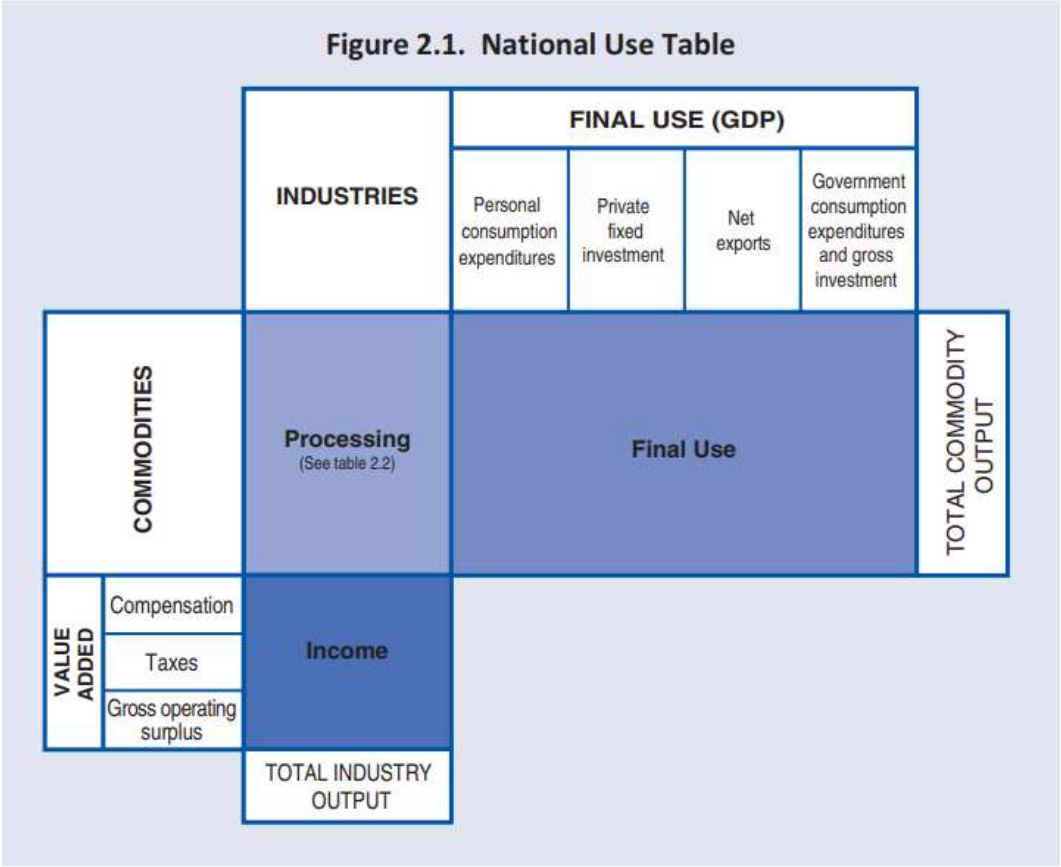
Note: HGLs include ethane, propane, normal butane, isobutane, natural gasoline, and refinery olefins (ethylene, propylene, butylene, and isobutylene).

U.S. Fossil Fuel Consumption by Source and Sector, 2021



Missing: mapping of intermediate inputs into final industries (MER)

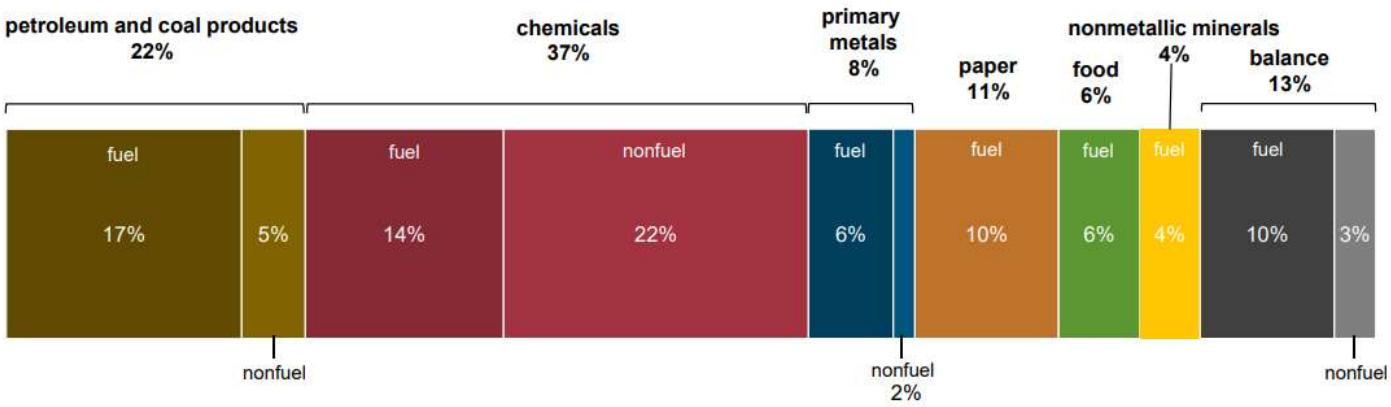
National input-output (I-O) tables pull it all together



- Annual and benchmark I-O tables produced by Bureau of Economic Analysis
- Show commodities used by industries and final users
- Form basis for economic impact studies and dynamic I-O models
- Challenge: Only plastic and petrochemical industry detail and only every 5 years

MECS: Most nonfuel consumption in the chemical sector

Manufacturing energy fuel and nonfuel (feedstock) consumption by subsector, 2018
percentage



total: 19.4 quadrillion British thermal units (Btu)
total nonfuel: 6.1 quadrillion Btu

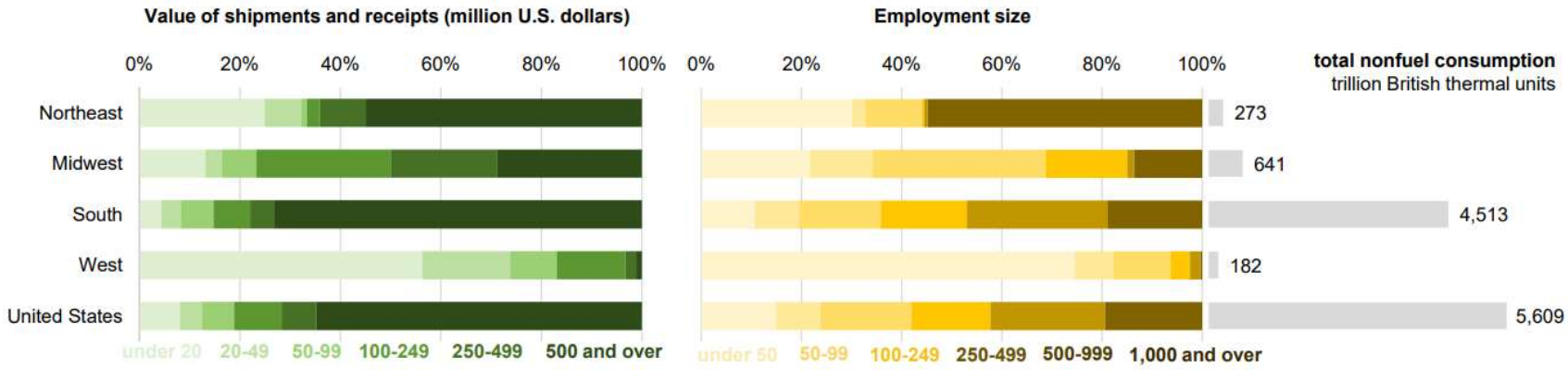
Note: To adjust for double counting, 1.6 quadrillion Btu are netted out of fuel consumption (MECS Table 1.2).

- Petroleum and coal products, chemicals, and primary metals account for more than 90% of feedstock use in manufacturing.
- Petroleum and coal products, chemicals, primary metals, paper, and food account for more than 84% of fuel used in manufacturing.

Note: The plastic materials and resins industry (NAICS 325211), which includes plastic resins and coatings, is by far more energy intensive than the plastics and rubber (NAICS 326---) sector, which includes plastic bags, bottles, packing film and laminated plastics. In 2014, use of feed stocks in NAICS 325211 were 75 trillion barrels; in NAICS 326---, less that 500,000 barrels.

MECS: South accounts for 80% of nonfuel consumption

Nonfuel (feedstock) use of energy sources by value of shipments and receipts and employment size, 2018
percentage



- The South had the highest nonfuel consumption (4,513 trillion British thermal units [TBtu]). Most of the consumption came from establishments with a value of shipments and receipts over $500 million. Nonfuel consumption was more spread out by employment size. Overall in the entire United States, establishments with 500—999 employees accounted for the largest percentage of nonfuel consumption (28%).
- Nonfuel use of energy sources was lowest in the West Census Region (182 TBtu). More than half (57%) of the consumption was for establishments with a value of shipments and receipts under $20 million, and 75% of the nonfuel consumption came from establishments with less than 50 employees.

MECS: Feedstock use in the plastics industry (table 2.1)

- Disclosure concerns can limit publication of more detailed information
  - MECS 2018: Only data on feedstocks from natural gas and “other” category
  - MECS 2014: Data for total feedstocks and HGLs, natural gas, and other categories
- Limitations are influenced by multiple factors
  - Industry concentrations
  - Sample size and selection
  - Complementary disclosure considerations
- Possibilities to fill in gaps
  - Larger sample or supplemental MECS survey
  - Identify or support the development of additional data sources

Wrap up

- An I-O framework provides many advantages
  - Provides comprehensive framework to integrate interrelated data
  - Structure designed to support rich set of economic analyses
- EIA has a wealth of data to consider for the effort but there are gaps
- EIA is interested in alternative data to improve our suite of products
- EIA assessing the possibility of a supplemental MECS survey in the future and soliciting feedback