

Consumption-Based GHG Inventory for Maine Part 1 - Overview

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Disclaimer

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EPA CBEI Project for NE States

CBEI = *Consumption-Based Emissions Inventory*

Goals

- Prepare CBEIs for northeast states
- Solicit GHGI data and feedback from state partners

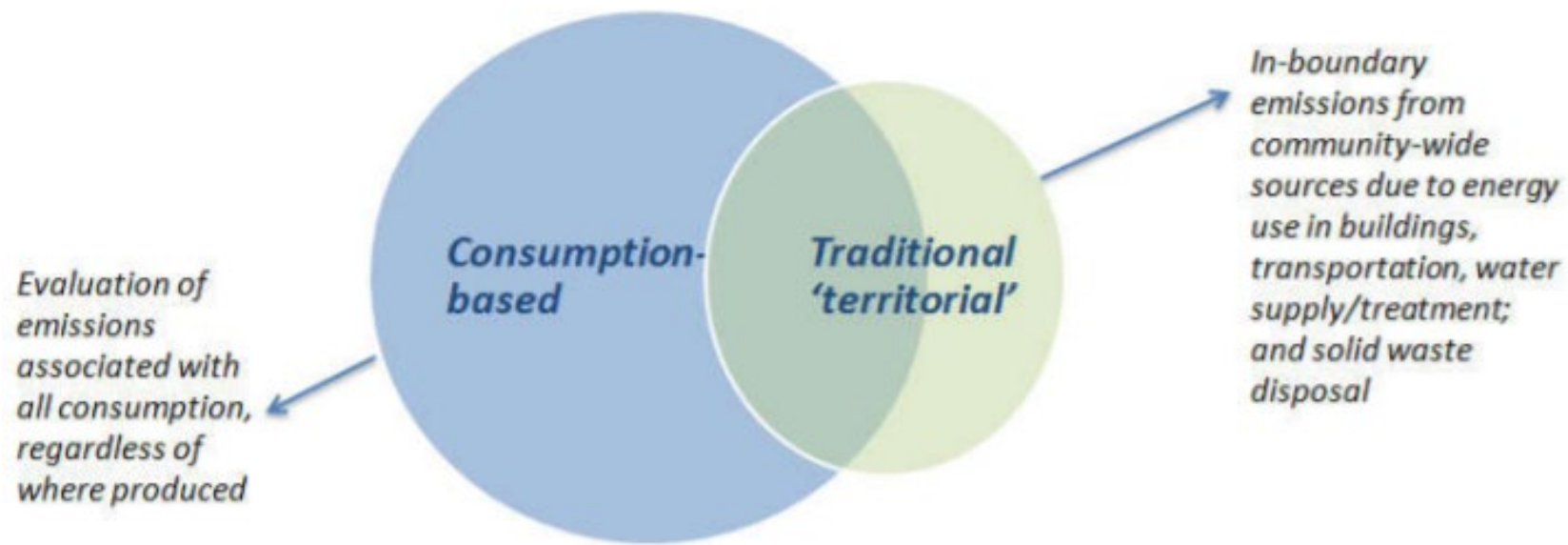


Timeline

- Produce report and tools by mid-2024



Consumption-based GHG Inventories

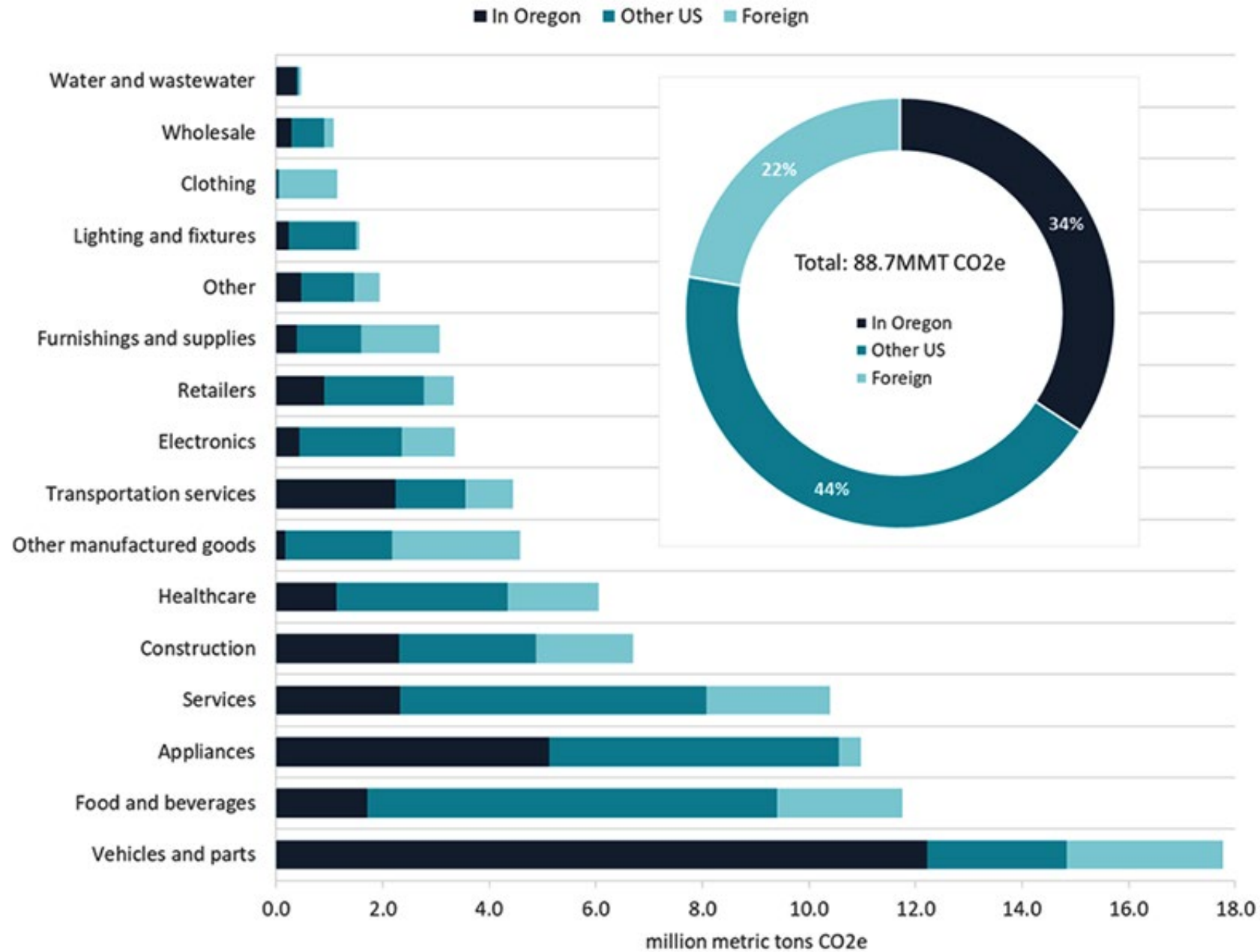


BCIT and Consulting (2017)

First State CBEI

Oregon

by OR Department of
Environmental Quality



CBEI – Requirements

1. GHGI

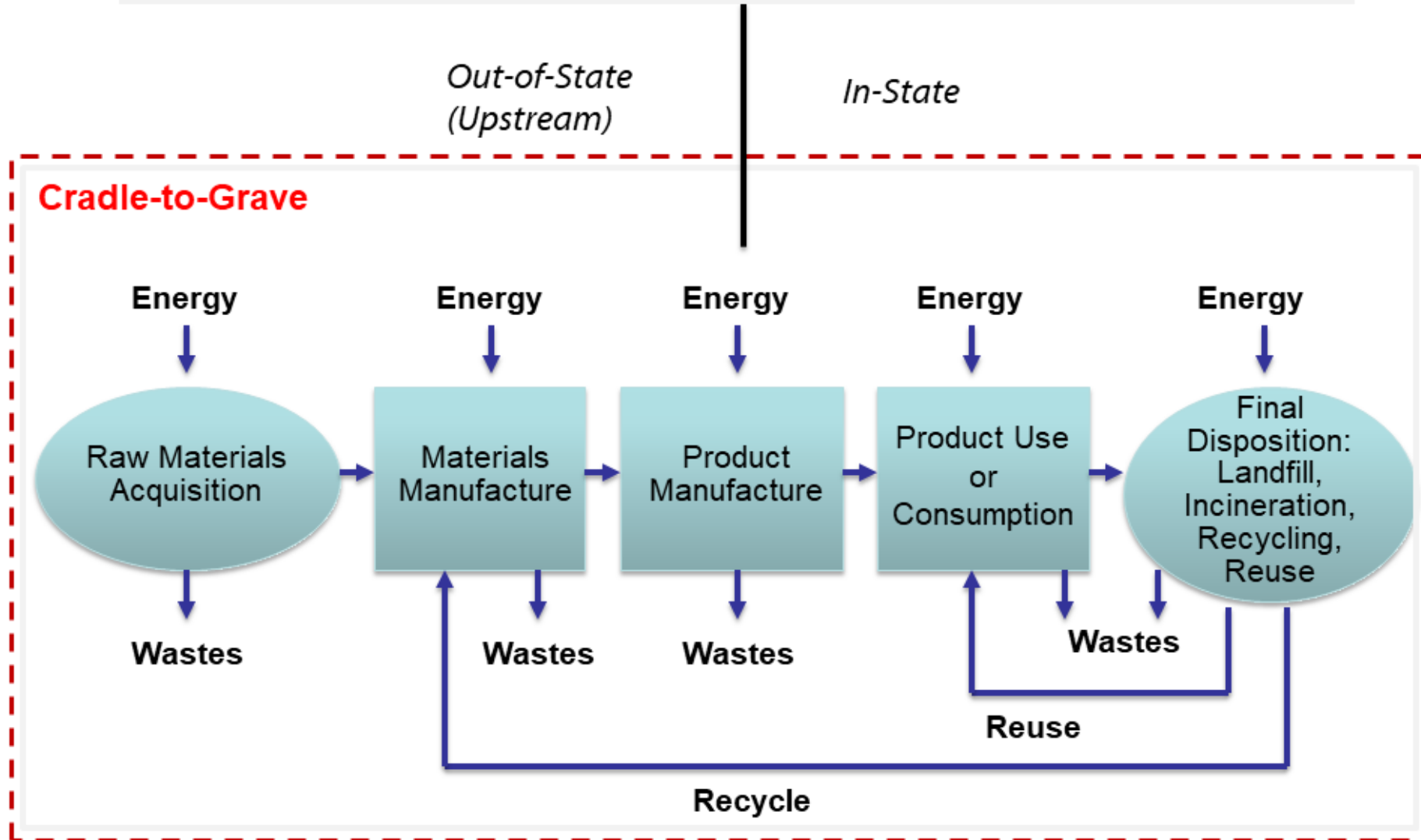
2. LCI

GHGI is territorial GHG Inventory (traditional) that is industry-specific

LCI is a complete life cycle inventory model with industries matching to GHGI

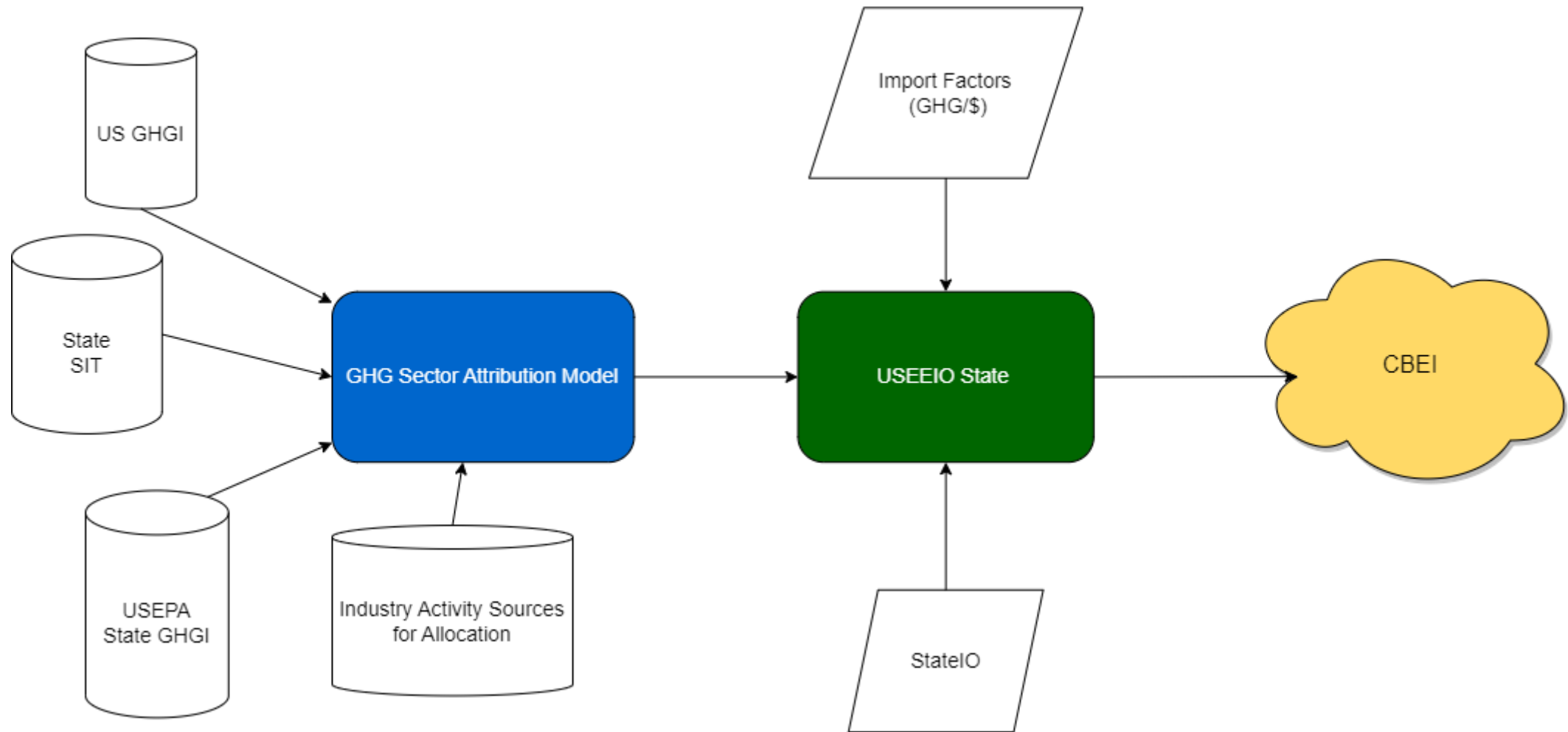
LCI Model Boundaries

Boundary of emissions that occur in-state and out-of-state varies by product



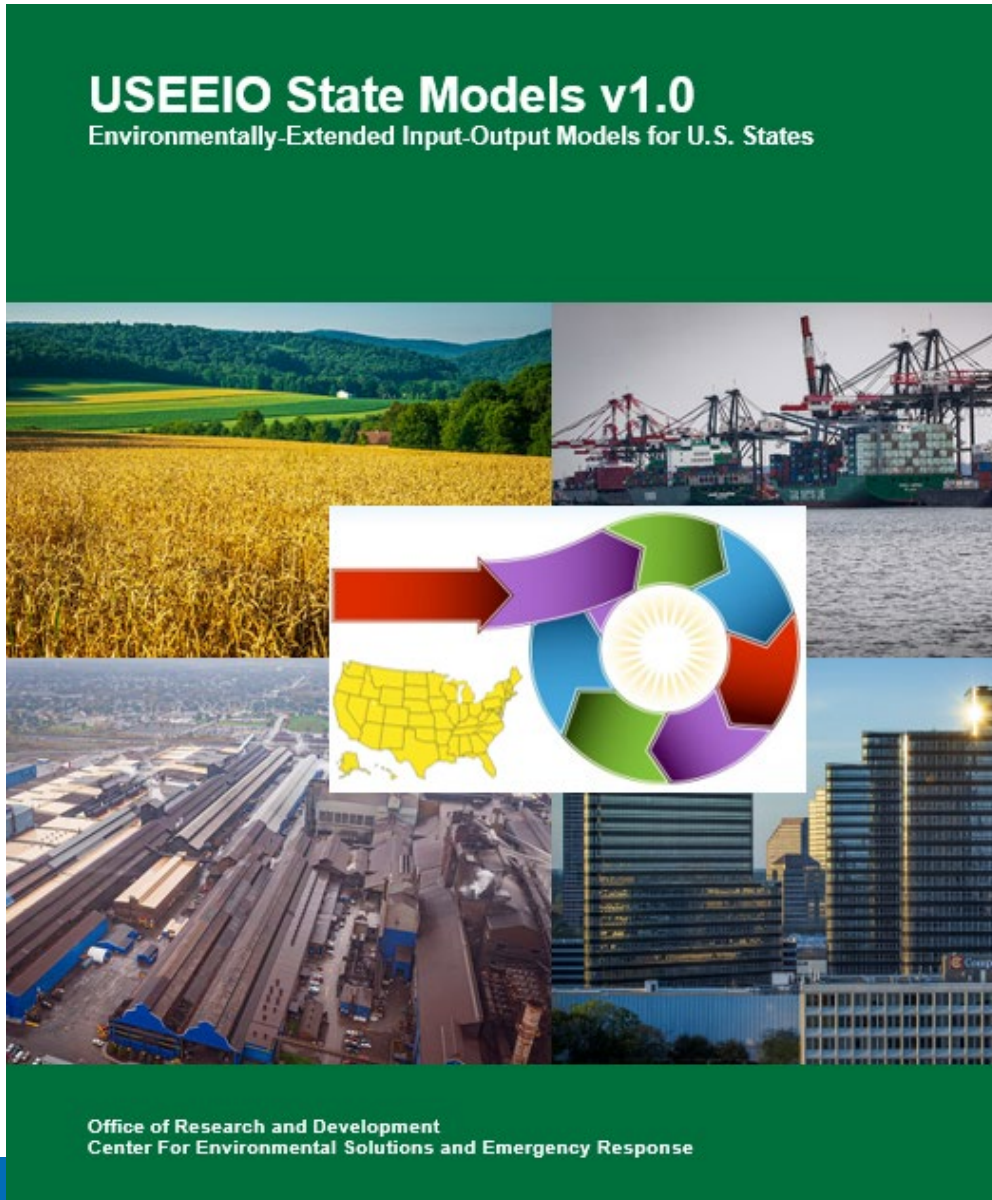
Our Approach to Conduct State CBEIs

Approach



- The Sector Attribution model produces totals by state and industry [NAICS](#) codes ('111/ME' = Farms in ME; '22/CA' = Utilities in California)
- Merge with EEIO to make kg/\$ of sector economic output

Selected LCI Models = USEEIO State Models

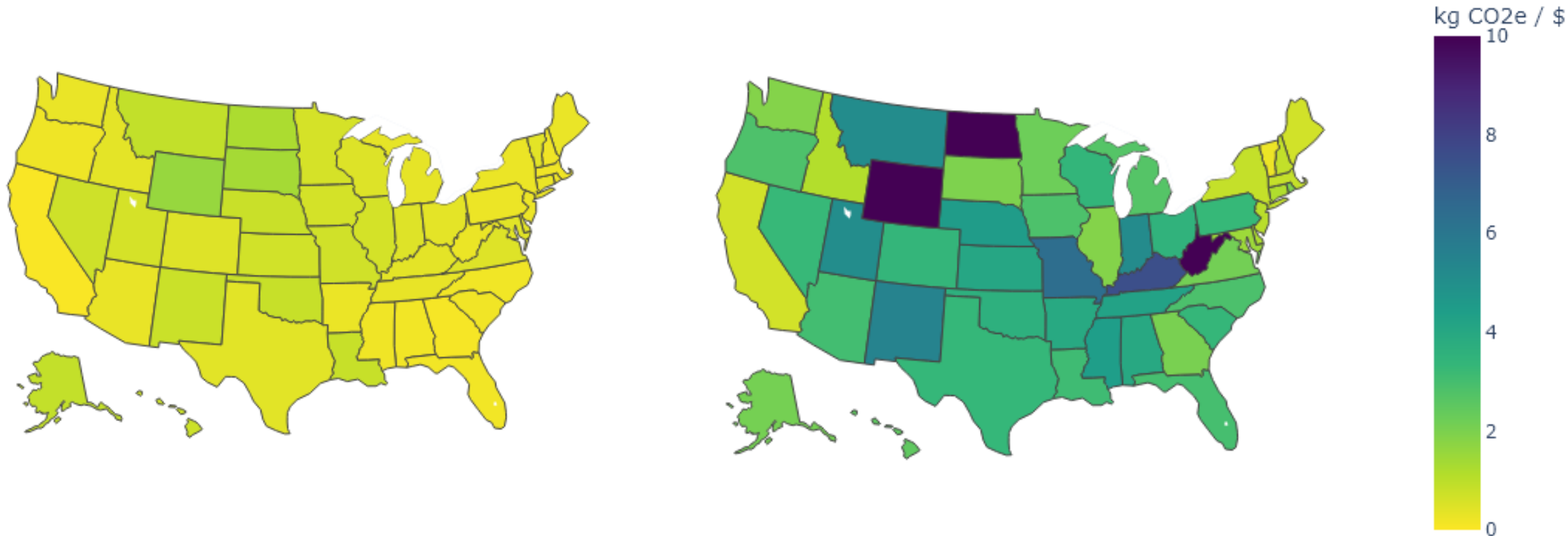


- Built on [USEEIO Models](#)
- Depict environmental and economic performance of all commodities and industries organized in 73 categories in US states with their supply chains
- Two-region format (State of Interest (Sol) + Rest of US (RoUS))
- Track ~1600 unique releases or resource types
- Report 15 environmental, resource and socio-economic impact indicator scores
- [Open source data and modeling framework](#)
- Overview articles of USEEIO national versions in Journal of Cleaner Production (Yang et al. 2017); Scientific Data (Ingwersen et al. 2022)
- Described in upcoming EPA report (pictured on left)

U.S. GHG Intensity of Production

113FF: Raw forest products, wild-caught fish and game, agriculture and forestry

22: Electricity, natural gas, drinking water, and wastewater treatment

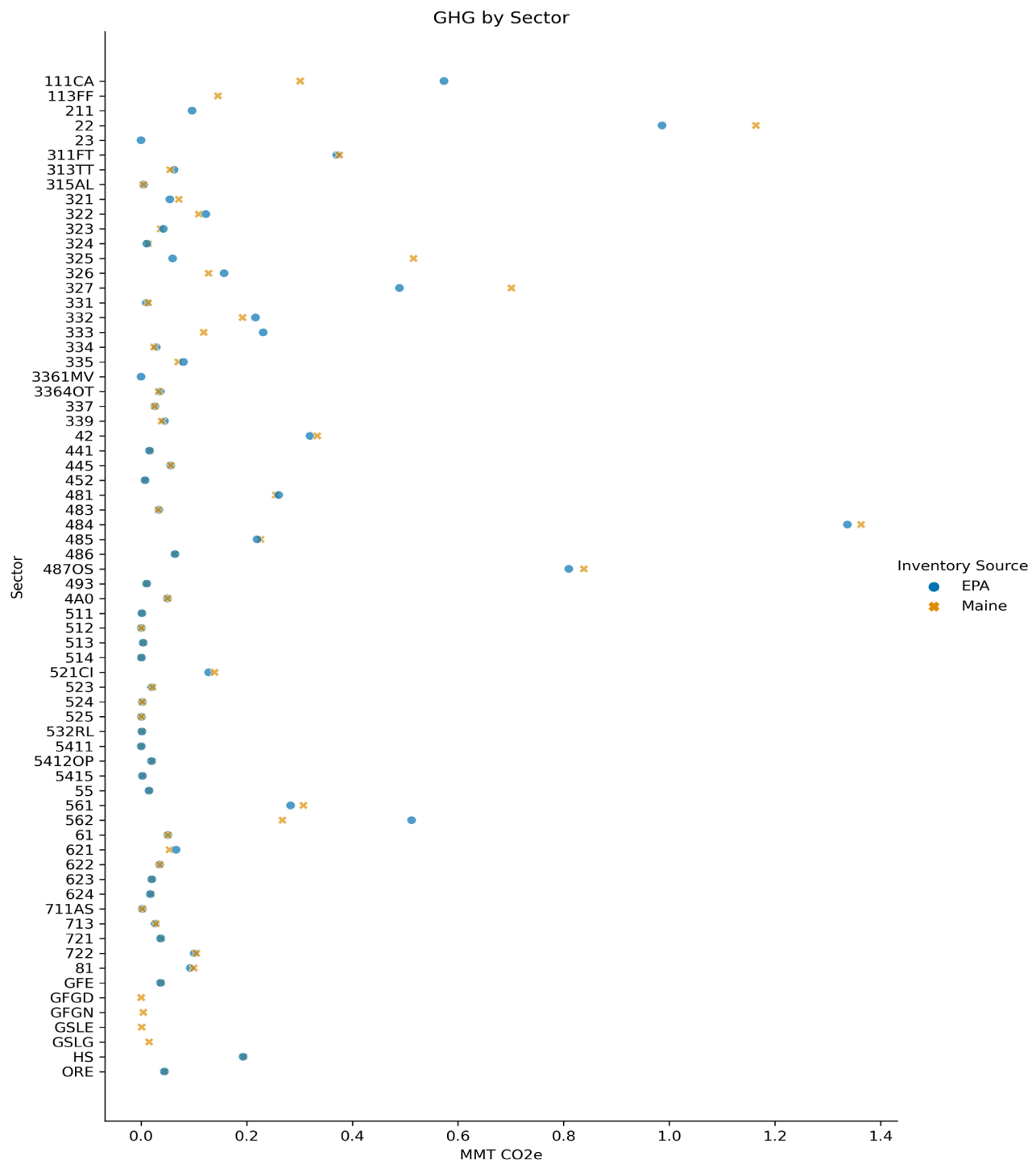


Based on USEEIO State Models Using EPA State Inventories. Link to figures for all sectors can be found in (EPA 2024)

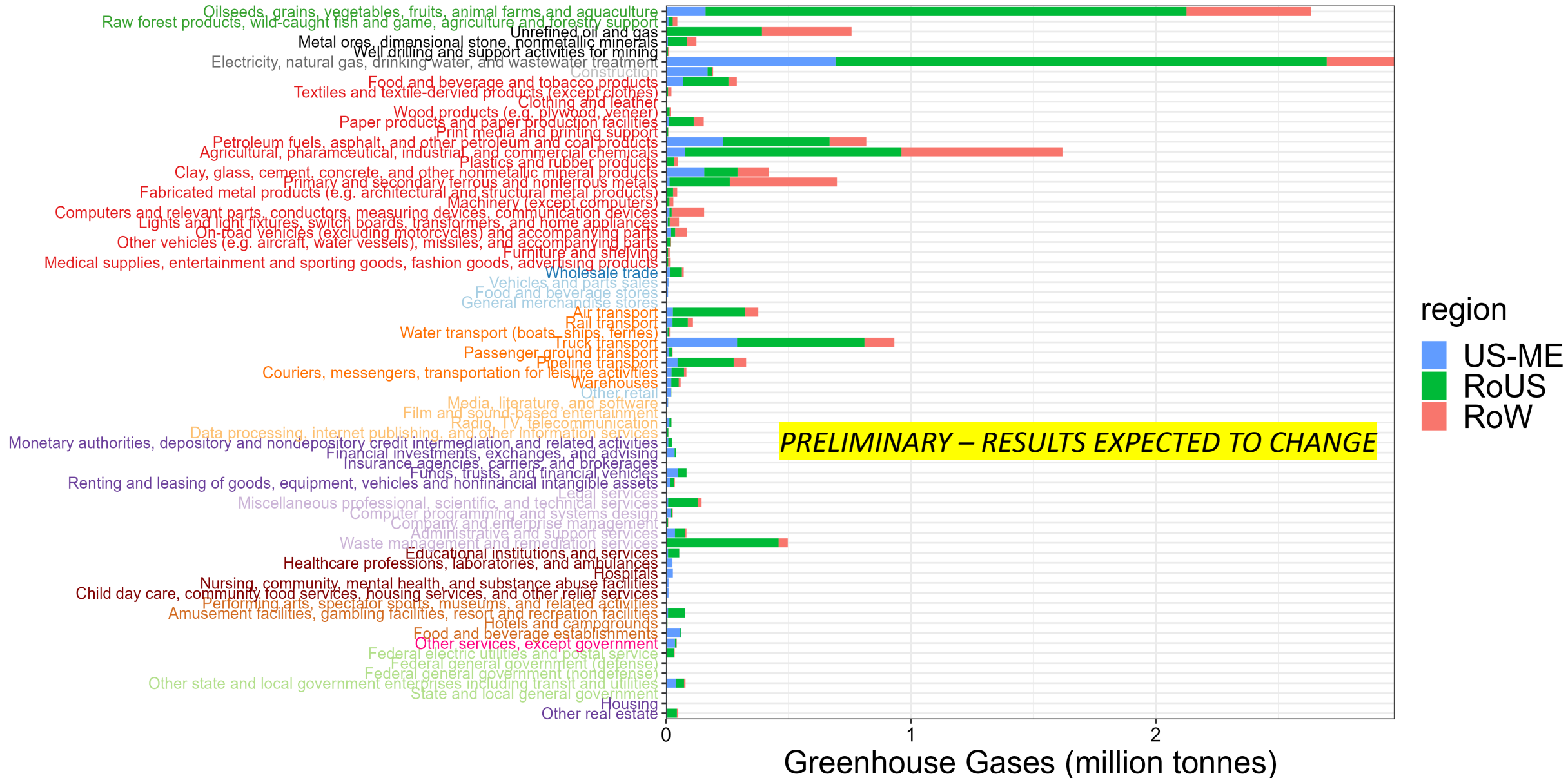
Example Results

PRELIMINARY – RESULTS EXPECTED TO CHANGE

ME Direct Emissions by Sector: *ME-Provided Inventory vs EPA-ME Inventory*



Source of GHGs Emissions for ME Consumption



Summary and Next Steps

Benefits of Our Approach

1. Consistency with supply chain GHG factors and national models used by EPA for Sustainable Materials Management
2. Fully reproducible/open source
3. Models can provide other results beyond GHGs (air quality, water quality, human health)

Next steps

- Complete new GHG estimates of international imports, document in EPA report
- Add household emissions into USEEIO State models
- Compute CBEI results for ME and other Northeast states
- Draft an EPA report describing the CBEIs
- Provide resources and training for all states to use to conduct CBEIs

Project Team

- Wesley Ingwersen, Chris Beling (EPA)
- Ben Young, Jorge Vendries, Eric Bell, Sarah Cashman (ERG)
- Andy Bray (former), Shaina Cohen, Melissa Lavoie (NEWMOA)
- NEWMOA Climate and Materials Workgroup (ME, VT, NY, MA, CT, NH, RI)

References

- BCIT, and Cora Hallsworth Consulting. 2017. “ecoCity Footprint Tool Pilot: Iowa City Summary Report.” <https://www8.iowa-city.org/weblink/0/edoc/1768592/iowa>
- Erickson, Peter, David Allaway, Michael Lazarus, and Elizabeth A. Stanton. 2012. “A Consumption-Based GHG Inventory for the U.S. State of Oregon.” *Environmental Science & Technology* 46 (7): 3679–86. <https://doi.org/10.1021/es203731e>
- Ingwersen, W.W., Li, M., Young, B. et al. 2022. USEEIO v2.0, The US Environmentally-Extended Input-Output Model v2.0. *Sci Data* (9): 194. <https://pubmed.ncbi.nlm.nih.gov/35504895/>
- Yang, Yi, Wesley W. Ingwersen, Troy R. Hawkins, Michael Srocka, and David E. Meyer. 2017. “USEEIO: A New and Transparent United States Environmentally-Extended Input-Output Model.” *Journal of Cleaner Production* 158 (August): 308–18. <https://pubmed.ncbi.nlm.nih.gov/30344374/>
- USEPA. 2024. “USEEIO State Models v1.0: Environmentally-Extended Input-Output Models for U.S. States. EPA 600/R-23/228. U.S. Environmental Protection Agency. Washington, DC.