

What do we know so far?

The social, economic, and environmental outcomes of global extended producer responsibility systems for packaging

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October 6, 2026

2026 NERC Rethinking Resource Use Conference

From Policy to Impact: Consumer Impacts, Global
Lessons, and What Comes Next



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For decades, governments around the world have adopted different models of packaging producer responsibility.

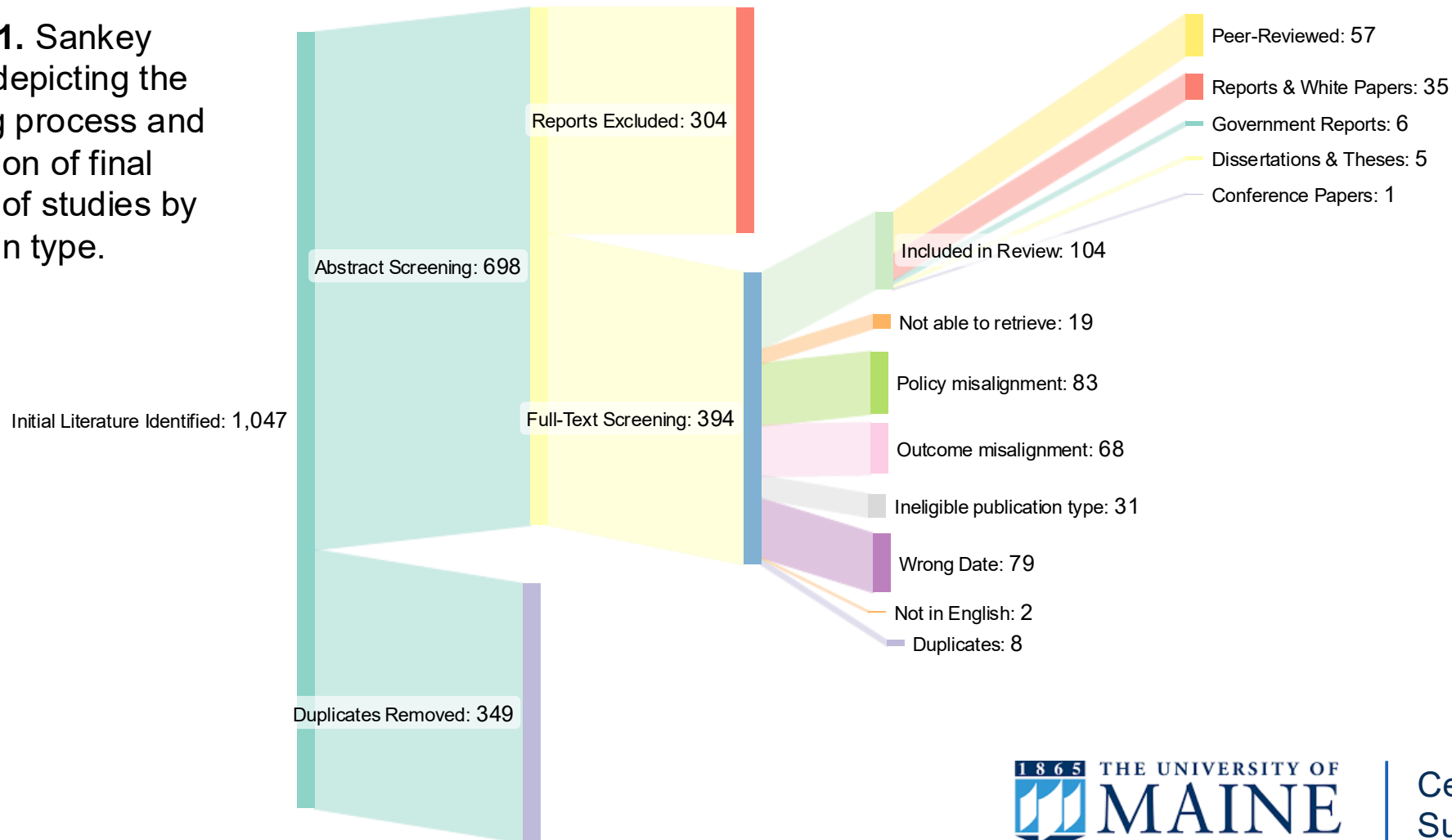


Our team at the University of Maine asked:

What do we actually know about the environmental, economic, and social outcomes of these policies?

A systematic search produced many publications, but few studies provided empirical evidence of policy outcomes.

FIGURE 1. Sankey diagram depicting the screening process and composition of final selection of studies by publication type.



The evidence base is **global in reach** but **>75% of the studies are concentrated in Europe.**

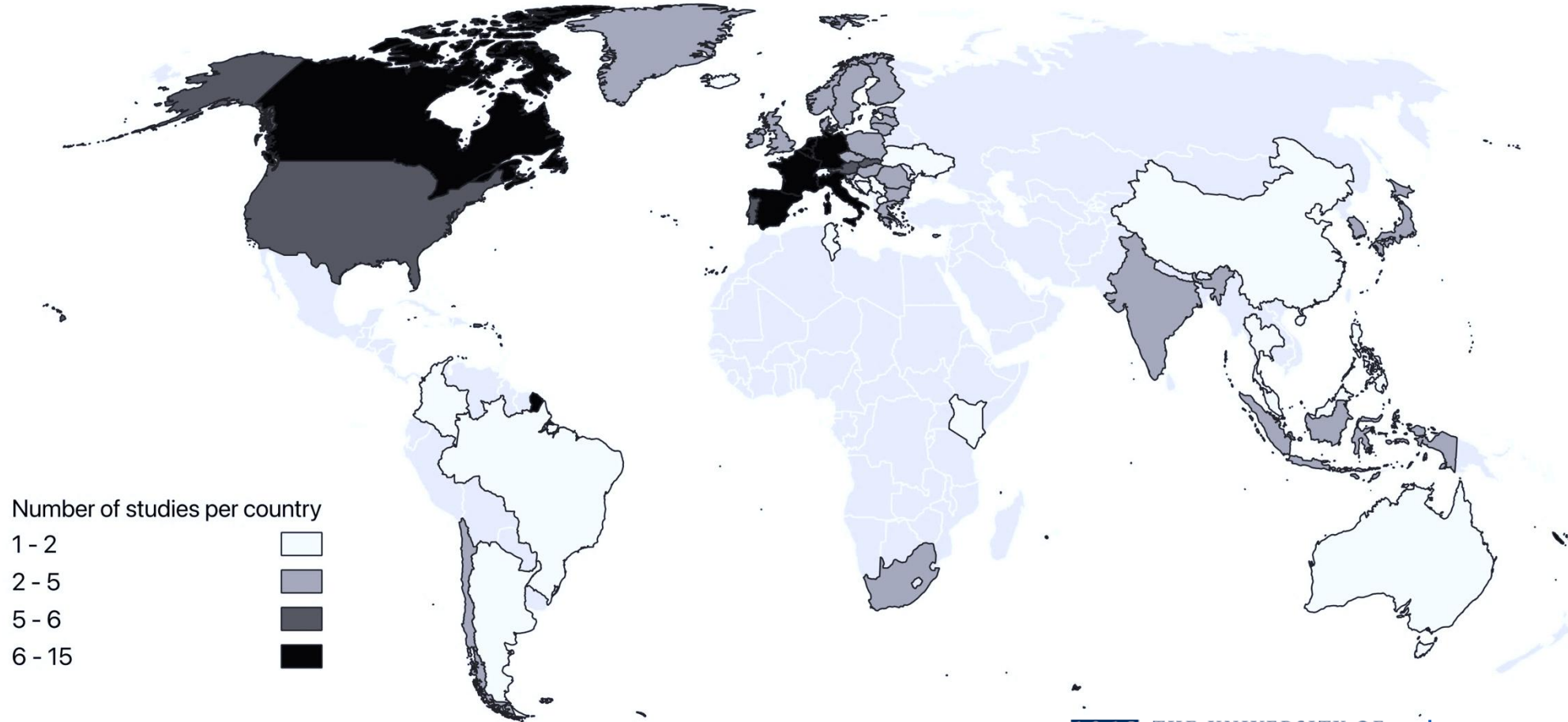


FIGURE 2. Geographic focus of packaging extended producer responsibility studies represented in the literature

The literature primarily focuses on **environmental** and **economic** outcomes, with far less attention to **social** outcomes.

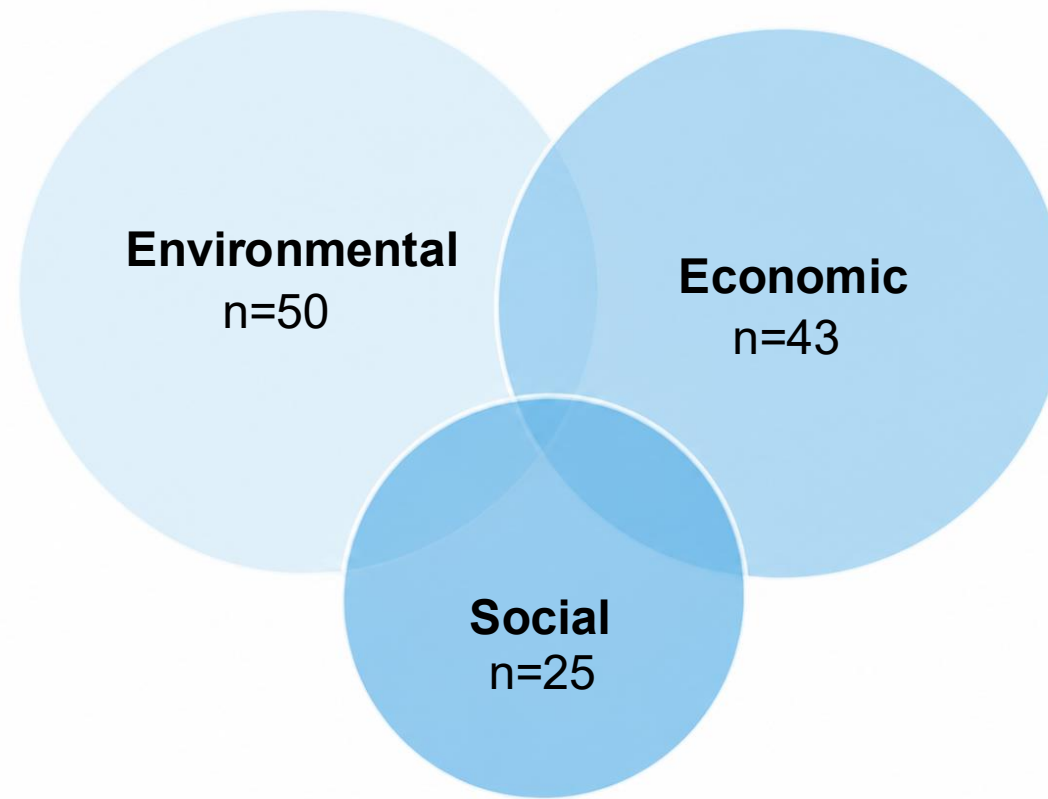


FIGURE 3. Venn Diagram depicting the overlap of outcome domains in literature on packaging EPR.

Recycling rates often increase with EPR, but recycling is not the same as environmental benefit.

Recycling rates: How recycling rates are defined vary by study and program making comparisons difficult. They generally increase with EPR—often even more when paired with deposit return systems.

Environmental impacts: Material flows are measured far more often than downstream impacts. When assessed, the focus is primarily on greenhouse gas emissions.

Material use: Packaging has become less material-intensive, but EPR's role is unclear. Lightweighting may be driven more by cost savings and can sometimes come at the expense of recyclability.

“Carbon Tunnel Vision”

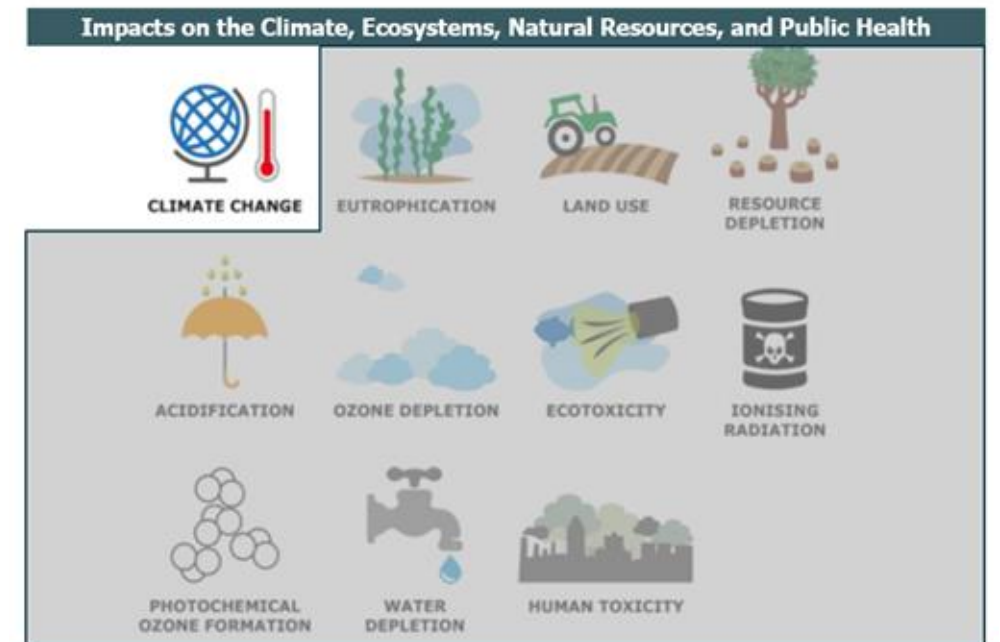


Photo credit: [Papangelopoulou et al. 2025](#), modified by Reed Miller

EPR shifts who pays, but the economic effects depend heavily on policy design and market conditions.



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Design for Environment (DfE): EPR fees have generally been too weak to drive meaningful packaging redesign.

Distribution of costs & benefits: EPR shifts costs and benefits unevenly across producers, municipalities, recyclers, and consumers.

System costs: system costs vary substantially with program design and operational structure

Recycling market dynamics: Recycling economics remain tied to volatile secondary-material markets.

Packaging EPR affects more than jobs and recycling access, **but the broader societal impacts remain understudied.**

Societal distribution of costs & benefits



Photo credit: Mother Jones 2025

Human health & wellbeing



Photo credit: City of Portland 2026

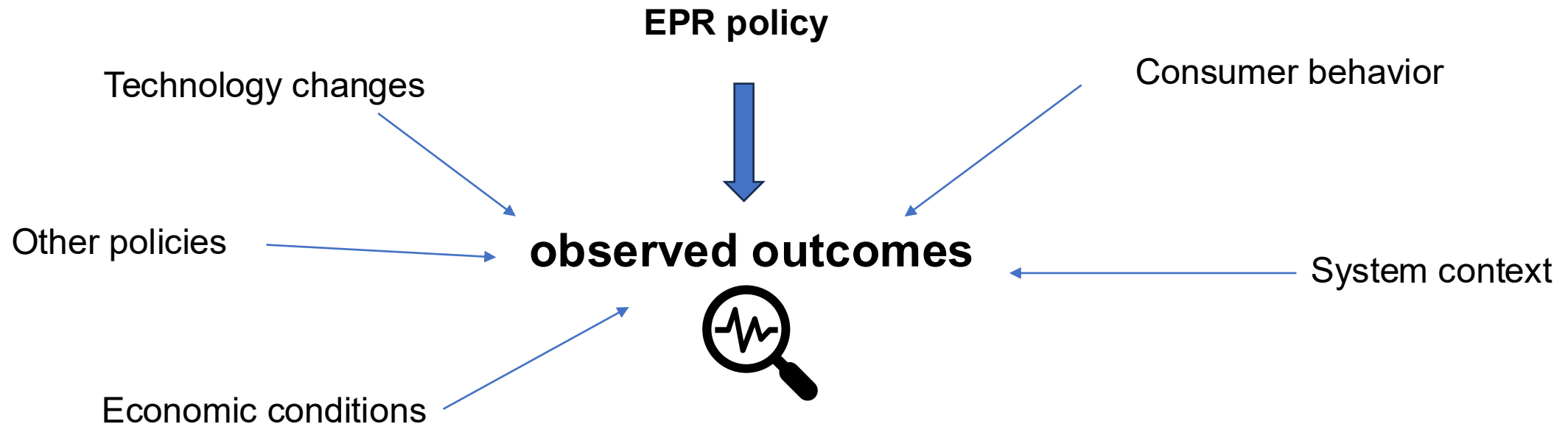
Governance



Photo credit: Surfrider Foundation 2025

Quantitative studies often rely on a single proxy measure for “social” outcomes, while qualitative studies provide richer but case-specific analysis of how communities are affected by policy.

Attributing outcomes to EPR is difficult because its effects are hard to isolate from other changes in the system.



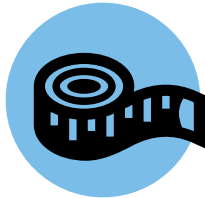
How much of the observed change can be attributed to EPR?

The next generation of packaging policies should be **designed and evaluated** around the outcomes we truly care about.



Design for outcomes

Be explicit about what success looks like.



Measure what matters

Look beyond collection and recycling rates.



Make tradeoffs visible

Make the environmental, economic, and social trade offs more explicit — and build in flexibility for re-evaluating & modify policies as unintended consequences emerge.

What's Next?

Modeling the environmental, economic, and social trade-offs of different design for environment (e.g., design for recyclability, source reduction, reuse).

Thank you.

Questions? Contact me:

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This research was supported by funding from:



**ENVIRONMENTAL RESEARCH
& EDUCATION FOUNDATION™**
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With thanks to our project advisory board

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