



Department of Administration  
Purchasing Division  
2019 Washington Street East  
Post Office Box 50130  
Charleston, WV 25305-0130

State of West Virginia  
Centralized Request for Proposals  
Service - Prof

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|--------------------------------------------------------------------------|----------------------------|-------------------------|---------------------------------|
| <b>Proc Folder:</b> 1756985                                              |                            |                         | <b>Reason for Modification:</b> |
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| <b>VENDOR</b>                |                            |                   |       |
| <b>Vendor Customer Code:</b> | VS0000045736               |                   |       |
| <b>Vendor Name :</b>         | Signalfire Group 416       |                   |       |
| <b>Address :</b>             |                            |                   |       |
| <b>Street :</b>              | Longshore Drive            |                   |       |
| <b>City :</b>                | Ann Arbor                  |                   |       |
| <b>State :</b>               | Michigan                   | <b>Country :</b>  | USA   |
|                              |                            | <b>Zip :</b>      | 48105 |
| <b>Principal Contact :</b>   | Brianne Haven, COO and CFO |                   |       |
| <b>Vendor Contact Phone:</b> | 734.996.1361               | <b>Extension:</b> |       |

**FOR INFORMATION CONTACT THE BUYER**

Joseph (Josh) E Hager III  
(304) 558-2306  
joseph.e.hageriii@wv.gov

|                                                                                                               |                         |                              |
|---------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------|
| <b>Vendor Signature X</b>  | <b>FEIN#</b> 38-2649280 | <b>DATE</b> October 10, 2025 |
|---------------------------------------------------------------------------------------------------------------|-------------------------|------------------------------|

All offers subject to all terms and conditions contained in this solicitation

**ADDENDUM ACKNOWLEDGEMENT FORM**  
**SOLICITATION NO.: CRFP DEP26\*02**

**Instructions:** Please acknowledge receipt of all addenda issued with this solicitation by completing this addendum acknowledgment form. Check the box next to each addendum received and sign below. Failure to acknowledge addenda may result in bid disqualification.

**Acknowledgment:** I hereby acknowledge receipt of the following addenda and have made the necessary revisions to my proposal, plans and/or specification, etc.

**Addendum Numbers Received:**

(Check the box next to each addendum received)

|                                                    |                                          |
|----------------------------------------------------|------------------------------------------|
| <input checked="" type="checkbox"/> Addendum No. 1 | <input type="checkbox"/> Addendum No. 6  |
| <input checked="" type="checkbox"/> Addendum No. 2 | <input type="checkbox"/> Addendum No. 7  |
| <input type="checkbox"/> Addendum No. 3            | <input type="checkbox"/> Addendum No. 8  |
| <input type="checkbox"/> Addendum No. 4            | <input type="checkbox"/> Addendum No. 9  |
| <input type="checkbox"/> Addendum No. 5            | <input type="checkbox"/> Addendum No. 10 |

I understand that failure to confirm the receipt of addenda may be cause for rejection of this bid. I further understand that any verbal representation made or assumed to be made during any oral discussion held between Vendor's representatives and any state personnel is not binding. Only the information issued in writing and added to the specifications by an official addendum is binding.

\_\_\_\_Resource Recycling Systems, Inc\_\_\_\_  
Company

\_\_\_\_\_\_\_\_  
Authorized Signature

\_\_\_\_10.21.025\_\_\_\_  
Date

NOTE: This addendum acknowledgement should be submitted with the bid to expedite document processing.  
Revised 6/8/2012

**DESIGNATED CONTACT:** Vendor appoints the individual identified in this Section as the Contract Administrator and the initial point of contact for matters relating to this Contract.

(Printed Name and Title) Brianne Haven, COO/CFO  
(Address) 416 Longshore Drive, Ann Arbor, MI 48105  
(Phone Number) / (Fax Number) 734-996-1361 (phone) 734-996-5595 (fax)  
(email address) bhaven@recycle.com

**CERTIFICATION AND SIGNATURE:** By signing below, or submitting documentation through WVOASIS, I certify that: I have reviewed this Solicitation/Contract in its entirety; that I understand the requirements, terms and conditions, and other information contained herein; that this bid, offer or proposal constitutes an offer to the State that cannot be unilaterally withdrawn; that the product or service proposed meets the mandatory requirements contained in the Solicitation/Contract for that product or service, unless otherwise stated herein; that the Vendor accepts the terms and conditions contained in the Solicitation, unless otherwise stated herein; that I am submitting this bid, offer or proposal for review and consideration; that this bid or offer was made without prior understanding, agreement, or connection with any entity submitting a bid or offer for the same material, supplies, equipment or services; that this bid or offer is in all respects fair and without collusion or fraud; that this Contract is accepted or entered into without any prior understanding, agreement, or connection to any other entity that could be considered a violation of law; that I am authorized by the Vendor to execute and submit this bid, offer, or proposal, or any documents related thereto on Vendor's behalf; that I am authorized to bind the vendor in a contractual relationship; and that to the best of my knowledge, the vendor has properly registered with any State agency that may require registration.

By signing below, I further certify that I understand this Contract is subject to the provisions of West Virginia Code § 5A-3-62, which automatically voids certain contract clauses that violate State law; and that pursuant to W. Va. Code 5A-3-63, the entity entering into this contract is prohibited from engaging in a boycott against Israel.

Signalfire Group  
(Company)

Brianne Haven  
(Signature of Authorized Representative)  
Brianne Haven, COO/CFO

(Printed Name and Title of Authorized Representative) (Date)

734-996-1361 (phone) 734-996-5595 (fax)

(Phone Number) (Fax Number)

bhaven@recycle.com

(Email Address)

# REQUEST FOR PROPOSAL

## Extended Producer Responsibility Study

- 6.8. Availability of Information:** Proposal submissions become public and are available for review immediately after opening pursuant to West Virginia Code §5A-3-11(h). All other information associated with the RFP, including but not limited to technical scores and reasons for disqualification, will not be available until after the contract has been awarded pursuant to West Virginia Code of State Rules §148-1-6.3.d.

By signing below, I certify that I have reviewed this Request for Proposal in its entirety; understand the requirements, terms and conditions, and other information contained herein; that I am submitting this proposal for review and consideration; that I am authorized by the bidder to execute this bid or any documents related thereto on bidder's behalf; that I am authorized to bind the bidder in a contractual relationship; and that, to the best of my knowledge, the bidder has properly registered with any State agency that may require registration.

Signalfire Group

(Company)

Brianne Haven, COO/CFO



(Representative Name, Title)

734-996-1361 (phone) 734-996-5595 (fax)

(Contact Phone/Fax Number)

October 10, 2025

(Date)



# EXTENDED PRODUCER RESPONSIBILITY STUDY

Proposal for the West Virginia Department of Environmental Protection  
CRFP 0313 DEP2600000002  
October 30, 2025 | Prepared by The Signalfire Group

Resource Recycling Systems, Inc DBA The Signalfire Group  
416 Longshore Drive  
Ann Arbor, MI 48105  
734-996-1361  
Authorized Signatory: Brianne Haven | [bhaven@recycle.com](mailto:bhaven@recycle.com)



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## TRANSMITTAL LETTER

Dear West Virginia DEP Evaluation Team,

Our team is pleased to respond to West Virginia DEP's request to conduct a comprehensive nationwide study of Extended Producer Responsibility (EPR) programs. We understand this project seeks a practical evaluation of EPR systems to inform West Virginia's recycling and materials management policy, and we are fully committed to delivering that work with depth, clarity, and local relevance. While EPR programs are advancing across the U.S. and Canada, each state brings its own priorities, infrastructure, and community context. Our approach to this study will build on that foundation, aligning state policy exploration with the realities of West Virginia's geography, infrastructure, and local governance structure.

I was fortunate to be invited to present on EPR policies and programs to the West Virginia Educational Conference on Litter Control and Solid Waste in 2022. It is fantastic to see the state take on a full evaluation of this approach to improving recycling and solid waste management outcomes. We commend West Virginia's commitment to exploring EPR best practices that can most effectively strengthen its recycling system and policy framework. Our team is dedicated to providing clear, actionable recommendations that build on the state's existing strengths and inform future decision-making.

Signalfire Group and its parent company, RRS, bring decades of combined experience in product stewardship, materials management, and policy implementation. Our work has supported state and local governments, national trade associations, major brands, and producer responsibility organizations across North America. We specialize in designing and evaluating EPR systems, conducting economic and environmental modeling, and facilitating stakeholder engagement to ensure practical and durable outcomes. Our team at Signalfire Group has a long history of accessing, interpreting, and clearly communicating federal, state, and local EPR and waste data, that will greatly contribute to this study.

We also recognize that West Virginia's recycling network, anchored by the Rehabilitation Environmental Action Plan (REAP), county Solid Waste Authorities, and partners such as the Recycling Coalition of West Virginia, already reflects a strong foundation of local collaboration and community participation. We recognize that successful EPR design builds on what already works; our team will ensure the resulting framework is balanced, durable, and tailored to West Virginia's unique context.

Finally, we would like to note that our designated Project Manager, David Stitzhal, is originally from West Virginia and continues to have family in the state. Our team firmly believes that maintaining a local connection to a project fosters deeper understanding and trust, and that such context significantly enhances the relevance, quality, and long-term impact of project outcomes. We look forward to the opportunity to partner with WVDEP on this important effort and welcome any questions regarding our approach, experience, or team.

Sincerely,



Resa Dimino | [resa@recycle.com](mailto:resa@recycle.com) | Signalfire Group Managing Partner

On behalf of the Signalfire Group and RRS

## MANDATORY REQUIREMENTS DOCUMENTATION

The Signalfire Group team affirms our full ability and commitment to meet all mandatory project requirements as described in the RFP. Signalfire also brings methods, tools, and coordination practices that go beyond the stated minimum requirements, ensuring WVDEP receives a technically sound, stakeholder-informed, and actionable EPR study. The following information corresponds to the mandatory requirements outlined in §4.2.2 of the RFP:

### 1. Project Understanding and Compliance

Requirement: Demonstrate understanding of the project goals and objectives.

Compliance: Signalfire fully understands WVDEP's goal of evaluating existing EPR models and identifying actionable recommendations tailored to West Virginia's regulatory and infrastructure context.

Exceeds: Signalfire brings decades of national EPR policy development, analysis, oversight, and implementation experience, giving WVDEP access to lessons learned from other states and provinces that are directly transferable to West Virginia.

### 2. Project Management and Communication

Requirement: Maintain effective project oversight and communication with WVDEP.

Compliance: Signalfire will designate a single Project Manager (David Stitzhal) responsible for all coordination, scheduling, and quality assurance. Monthly check-ins and ongoing updates will ensure transparency and responsiveness.

Exceeds: Signalfire will also maintain a shared project folder for WVDEP staff to access deliverables and other shared documents. Furthermore, the Project Manager will be supported by a full administrative support team to ensure that any challenges or issues can be addressed promptly and effectively.

### 3. Stakeholder Engagement

Requirement: Facilitate engagement with relevant stakeholders.

Compliance: Signalfire Group will identify and engage stakeholders representing local government, solid waste authorities, recyclers, and industry groups, including the Recycling Coalition of West Virginia and county solid waste authorities listed in WVDEP's Recycling Directory.

Exceeds: The Signalfire approach emphasizes early relationship building with local partners to validate findings and ground recommendations in West Virginia's operational realities.

### 4. Deliverable Development and Reporting

Requirement: Produce interim and final reports per WVDEP's requirements.

Compliance: Reports will meet WVDEP's content, formatting, and accessibility standards, with built-in review periods for agency feedback.

Exceeds: Deliverables will include data visualizations, comparative case study summaries, and concise policy briefs tailored for multiple audiences (technical, legislative, and public).

### 5. Quality Assurance and Timeliness

Requirement: Ensure accuracy and adherence to schedule.

Compliance: All work will undergo multi-level internal review prior to submission. Our project timeline includes checkpoints to verify deliverable progress.

Exceeds: Signalfire Group's QA/QC process exceeds industry norms by combining technical review, editorial review, and state context validation, ensuring WVDEP receives accurate, actionable products on time.

Signalfire Group takes no exceptions to any mandatory requirements and affirms compliance with all procedural and deliverable obligations.

# Technical Proposal

## OBJECTIVE STATEMENT

The Signalfire Group brings deep expertise in materials management and producer responsibility to support WVDEP in evaluating and advancing EPR programs. The objective is to deliver a comprehensive roadmap for EPR compliance, grounded in stakeholder alignment, technical rigor, and practical implementation strategies.

Signalfire Group will execute project management, research plan development, stakeholder engagement, and recommendation development as part of this project. The team will provide WVDEP with actionable recommendations grounded in research insights, designed to inform policy decisions and support WVDEP's goals for long-term program success.

In addition, the Signalfire Group can, if WVDEP is interested, facilitate introductions between key WVDEP staff and relevant colleagues nationwide. We regularly collaborate with state agencies, elected officials, policymakers, producers, recyclers, processors, waste collection industry members, and NGOs active in the EPR space. Connecting WVDEP staff directly with these peers and organizations would be mutually beneficial. For example, there are EPR forums specifically for state policy and program staff, as well as material trade associations focused on targeted regional operations and staffing.

Our team is also committed to prioritizing a West Virginia lens in our research, so as to identify existing infrastructure that can be strengthened, and opportunities for new processing and end-market infrastructure, as well as job generation in the state.

## PROJECT PLAN OVERVIEW

WVDEP has commissioned a comprehensive study to evaluate EPR programs across the country, while simultaneously assessing West Virginia's current Covered Electronic Devices (CED) EPR to provide relevant, actionable findings to WVDEP. This project will be delivered in two phases, each designed to build a foundation for informed policy development and eventual program implementation.

### Phase 1: EPR Research

*Work in Phase 1 focuses on research and evaluation.* The team will conduct a nationwide review of operational EPR programs, with an emphasis on product categories such as paint, mattresses, batteries, and electronics. This phase includes a targeted assessment of West Virginia's existing CED program. Through a mixed method approach (detailed Project Methodology Overview, below) the team will identify best practices and contextualize findings for West Virginia's regulatory and infrastructure landscape with sensitivity to its unique geographic, demographic, and economic conditions. This phase concludes with an interim report that summarizes preliminary insights and outlines the next steps.

### Phase 2: Final Report and EPR Recommendations

*Work in Phase 2 translates research into actionable recommendations.* The team will synthesize Phase 1 findings into a professionally prepared final report that includes tailored policy options, implementation pathways, and stakeholder-informed recommendations that recognize the state-specific context for West Virginia. As a part of developing this final report, the Signalfire Group will organize a facilitated workshop with WVDEP to seek additional feedback, validate, and refine the proposed recommendations. The final deliverables will support WVDEP in shaping future EPR policies, legislation, and program design.

## PROJECT METHODOLOGY OVERVIEW

The Signalfire Group will use a mixed-methods research approach for quantitative and qualitative data collection through desktop research and direct stakeholder engagement for this project. The methodology includes the following components:

### 1. Desktop/ secondary research (Phase 1, Task 1.1)

- **EPR Landscape Assessment:** Signalfire Group will review existing program documentation, reports, and performance data for operational EPR programs across the country. This review will gather core program metrics (collection, recycling rates, costs, revenue etc.) from operational EPR

programs from across the country. The team will also gather qualitative data in the form of program structures, operations, and outcomes across jurisdictions. The findings will guide the development of impact metrics and inform stakeholder engagement.

- **CED Program Evaluation:** Signalfire Group will review available literature on CED program to understand and document program efficacy and progress.

## 2. Structured Interviews (Phase 1, Task 1.2)

- **Identify Stakeholders:** Signalfire Group will identify and conduct structured interviews with up to 5 key personnel from West Virginia's waste and recycling sectors and up to 5 EPR program administrators from programs across the country.
- **Develop Questionnaire:** Signalfire Group will develop a questionnaire and create a focused interview guide to ensure consistent and targeted discussions.
- **Prepare and Conduct Interviews:** The Project Manager will prepare interviewers, participate in the interviews, and document key insights to inform program evaluation.

## 3. Facilitated Online Discussion (Phase 1, Task 1.2)

- **Select Participants:** Signalfire Group will host one facilitated online discussion to gather feedback from CED program administrators and other key stakeholders. For this, Signalfire Group in consultation with WVDEP will invite 5–6 participants who have contributed directly to the CED program.
- **Develop Discussion Guide:** The team will design a focused discussion guide to explore program performance, operational needs, and opportunities for improvement.
- **Facilitate Discussion:** The Project Manager will facilitate the two-hour session (with 90 minutes of active discussion) and summarize key themes and recommendations for inclusion in the report.

## 4. Synthesis and analysis (Phase 1, Task 1.3)

- **EPR Program Analysis:** The EPR program analysis will include:
  - analysis of core program metrics,
  - synthesis of impact metrics (operational, financial, environmental, and socio-economic domains), and
  - case studies incorporating key lessons and best practices.
- **CED program analysis:** Signalfire Group will conduct a comparative assessment of West Virginia's CED program. This evaluation will examine the program's structure, performance, and alignment with other states, identifying key strengths and opportunities for improvement.

## 5. WVDEP Feedback and Recommendation finalization (Phase 2, Task 2.1 and 2.2)

- **Consultative Workshop with WVDEP:** The Project Manager will facilitate the discussion at the workshop, with the project team taking notes to ensure that recommendations provided during the workshop are incorporated into the final report.

### PROJECT MANAGEMENT | PER SECTION 4.2.2.1 OF THE SPECIFICATIONS

To lay a strong foundation for project success, Signalfire Group will work closely with WVDEP through a structured planning process to ensure role alignment and clear communications protocols and expectations. This effort also encompasses strong management throughout the project to maintain scope, schedule, and quality control. Signalfire Group will apply its proven management framework to provide clarity, consistency, and responsiveness to WVDEP at every stage of the project. Our project management approach is further discussed below.

#### Project Kickoff and Workplan Finalization

At the outset of the project, Signalfire Group will bring together the WVDEP staff for a kickoff meeting designed to clarify project goals, expectations, timelines, and deliverables. In this session, roles and responsibilities for the Signalfire Group team will be confirmed, and the overall project scope and intended outcomes will be discussed in detail. The meeting will also provide an opportunity to finalize the project schedule, identify key milestone dates, and to determine essential resources, data sources, stakeholders, and communication pathways required for project success. Following this collaborative session, Signalfire Group will prepare a refined project workplan that captures the shared understanding and outlines a clear roadmap for executing the project. This will be an important time to clarify WVDEP priorities and identify opportunities to align with other relevant WVDEP goals and activities.

While the RFP outlines some of the priority materials (paint, mattresses, batteries, and electronics) for the assessment, the Signalfire Group has extensive experience with other materials and products managed under EPR programs, including tires, pharmaceuticals, mercury-containing lighting, carpet, used petroleum products, and more. The Signalfire Group will work with WVDEP to identify priority EPR material categories and programs.

### **Ongoing Project Implementation and Communication**

Throughout the project, Signalfire Group will manage all task coordination, communication, documentation, and scheduling activities. This will be led by the Signalfire Group Project Manager, who will serve as the primary point of contact for WVDEP. The Signalfire Group Project Manager will:

- Conduct monthly one-hour check-ins with WVDEP
- Maintain a folder/ document for project timeline, status updates, and project/meeting notes
- Monitor and ensure adherence to project timeline and budget
- Serve as the primary point of contact for the project

### **Quality Assurance**

Signalfire Group will apply its internal quality control protocols to ensure the clarity and accuracy of all deliverables. This includes:

- Multi-level review of reports and any other written deliverables
- Use of version control for documents
- Adherence to accessibility and formatting standards required by the WVDEP

### **Deliverables:**

- Kickoff meeting agenda and execution
- Finalized project work plan
- Shared project status document
- Client meetings schedule (10 virtual, one-hour meetings and email updates)

### **Assumptions:**

- WVDEP staff will designate a primary point of contact for day-to-day coordination.
- Project communications will occur via email, virtual meetings, and shared document platforms.
- WVDEP staff will internally consolidate and align any edits, comments, and input on draft documents prior to sharing a review copy with Signalfire Group.
- In the event of scope or budget changes, Signalfire Group will submit a formal change request with rationale, cost implications, and timeline impacts for approval.

## **PHASE 1 – SUMMARY OF EPR RESEARCH | PER SECTION 4.2.2.2 OF THE SPECIFICATIONS**

Phase 1 will establish a foundation for evaluating EPR programs across the U.S. and the possible expansion of EPR programs in West Virginia. This phase will use a mixed-methods research approach, combining primary and secondary data collection and case study development, to provide a robust, structured analysis of existing EPR models. This phase will also include a targeted evaluation of West Virginia's current CED EPR program to identify opportunities for improvement and alignment with best practices. Consistent with Addendum #2, our analysis prioritizes Covered Electronic Devices, Paint, Batteries, Mattresses, Tires, and Fluorescent Lighting, with a brief nationwide overview of other EPR programs; packaging is not included in the analytical scope.

### **TASK 1.1: SECONDARY/ DESKTOP RESEARCH AND DATA COLLECTION**

Task 1.1 will focus on compiling current knowledge of EPR programs available in reports, briefs, memos, published data on websites, and other similar sources. The Signalfire Group will conduct in-depth desktop research to understand the EPR landscape and the existing data, and to develop evaluation metrics. Signalfire's long history of direct involvement in EPR programs and policy development will allow efficient completion of this task.

#### **1.1.1. EPR Landscape Analysis**

As outlined in the Program Management section, the Signalfire Group will identify priority material categories and EPR programs during the project kick-off, with WVDEP's input. The graphic below depicts the broad spectrum of EPR programs across the U.S., many of which the Signalfire Group is familiar with and has experience examining in terms of program design, implementation, and policy outcomes. As mentioned before, Signalfire Group has worked on diverse EPR programs including tires, pharmaceuticals, mercury-containing lighting, carpet, used petroleum products, packaging, and more.

**Sample graphic:** EPR programs and product categories across U.S. states



**Note:** This graphic is shared as an example of Signalfire Group's work and not intended for wide distribution.

Based on this determination, the Signalfire Group will undertake desktop research of existing EPR programs, gathering existing quantitative and qualitative information. Data collected will address aspects of existing EPR programs in the U.S., such as policy design, implementation strategies, and outcomes. Data sources will primarily be Producer Responsibility Organizations (PRO)/ program annual reports, websites, published studies, and EPR law texts. A combination of quantitative and qualitative data on EPR will be tabulated, including target material, date implemented, key elements of the policy, PRO, and governance structure, and the status of implementation (captured in terms of program maturity, collection rates and strategies, lessons, etc.). Additional data gathered will include quantitative (e.g., pounds of target material diverted, number of collection locations, convenience standards for collection, GHG emissions averted, etc.) and/or qualitative (e.g., customer satisfaction, lessons from the program, role of regulatory bodies, etc.).

The EPR landscape analysis will capture the following information:

- Analysis of state EPR laws, target material, key elements of policy, PRO model, and performance targets set by the law.
- Collate reported quantitative data on the status of implementation, collection rates (disaggregated by material where available)/ quantity of target material diverted from landfilling, convenience standards for collection, consumer participation rates, and GHG emissions averted.
- Reported qualitative data on program success, best practices, consumer perceptions, and lessons learned (though likely limited, this data will be used to inform case studies).
- Assess the roles, responsibilities, and resources required from state and local agencies to support EPR rollout, such as staffing levels, time commitments, and administrative needs.
- Public acceptance forms a key building block for the success of any EPR program, though measuring objective and reliable information can be inexact and time-consuming. To obtain the highest quality data on public acceptance, the Signalfire Group will access existing surveys and reports on public perceptions/ acceptance of EPR in jurisdictions with EPR programs. We can also develop proxy measures during stakeholder engagement to reflect acceptance levels.

The Signalfire Group will determine the range of years for EPR data outlined above, ensuring that the resulting dataset is reliable, robust, and consistent.

### 1.1.2. Identification of key states and impact metrics

In tandem with the EPR desktop research detailed above, the Signalfire Group will build impact metrics using core program metrics. For this, Signalfire Group will first identify successful EPR programs in the U.S., with a key selection criterion being the availability of robust, high-quality data. To this end, while all available data will be gathered, only a subset of programs is expected to have comprehensive datasets suitable for detailed analysis. Next, to evaluate existing EPR programs, Signalfire Group will develop impact metrics across operational, financial, environmental, and socio-economic domains. A Sample Table of how this will be carried out is provided below.

**Sample Table:** Impact metrics for EPR program evaluation

| EPR Program       | Operational metrics                             |                            |                             | Financial metrics                  |                        |                                    | Environmental metrics |                                                                             | Socio-economic metrics |              |                                          |
|-------------------|-------------------------------------------------|----------------------------|-----------------------------|------------------------------------|------------------------|------------------------------------|-----------------------|-----------------------------------------------------------------------------|------------------------|--------------|------------------------------------------|
| Program Metrics   | Collection rate/ Recovery rate/ Diversion rate* | Number of collection sites | Producer participation rate | Cost per ton of material collected | Revenue from materials | Administrative costs as % of total | GHG emissions averted | Tons of material diverted/ sent to end markets/ destroyed (pharmaceuticals) | Jobs created           | Cost savings | Public awareness and participation rates |
| Paint Stewardship | Data to be inputted                             |                            |                             |                                    |                        |                                    |                       |                                                                             |                        |              |                                          |

\*Depending on most reported data format

A key challenge we anticipate in developing this evaluation is finding/ translating the existing data into comparable metrics. For example, some programs may collect recovery rates or diversion rates, whereas others may focus on recycling rates. The definition of recycling rate may also vary between programs, with some equating recycling to material directed to MRFs, while other laws may require that the materials be sent to an end market to be considered within the recycling rate.

Finally, while metrics will be identified and developed based on data collected during the desktop research, these metrics will be validated through consultations with subject-matter experts and program administrators (during Task 1.2), ensuring they reflect real-world program conditions and policy relevance, and meet the planning needs of WVDEP.

### 1.1.3. CED EPR Program Evaluation

The Signalfire Group will first compile existing resources on the program and work closely with WVDEP to gather resources (reports, data, analysis, etc.) and contacts for key personnel who can provide insights, lessons, and challenges from the implementation of the CED EPR program. As a part of this assessment, the Signalfire Group will also gather information on the CED Recycling Grant Program to understand its efficacy in establishing CED recycling, takeback programs, CED collection events, and CED recycling education programs.

(<https://grants.wv.gov/grants/Pages/grantdetails.aspx?grantid=80>)

During this initial phase, the Signalfire Group will focus on compiling current knowledge of the program and outlining data gaps that will be filled through interviews with key personnel.

## TASK 1.2: PRIMARY DATA COLLECTION

Based on the groundwork laid in Task 1.1, Signalfire Group will facilitate structured outreach to develop case studies, supplement knowledge, and validate findings. This will be conducted through interviews and a facilitated discussion.<sup>1</sup> Below is a breakdown of the Signalfire Group's strategy for this outreach.

<sup>1</sup> The Signalfire team will draw on our broad network of existing relationships – across stakeholder types and materials categories – to allow timely, efficient, gathering of relevant input from key people and programs.

### 1.2.1. Targeted Engagement Plan Development

Detailed interviews and facilitated group discussions are important means to collect data and will form the basis of this task. As a first step, the Signalfire Group will develop a targeted engagement plan including a list of key personnel and their contact information, a timeline for engagement, and a questionnaire for the interviews.

Based on the project goals, the Signalfire Group has detailed below the two engagement approaches that will be used to collect primary data:

#### (1) Structured Interviews

- ***West Virginia Waste and Recycling Industry (online, up to 5):***
  - Signalfire Group will conduct one-hour virtual interviews (up to 5) with stakeholders across West Virginia to understand their current needs, challenges, and capacity to participate in EPR implementation. The questionnaire for these interviews will be developed by the Signalfire Group in advance of the interviews.
  - Stakeholders will include industry representatives (such as the West Virginia Recycling Association), government entities, and community organizations. The Signalfire Group will identify and prioritize personnel for these interviews based on WVDEP's recommendations and project needs.
  - These interviews will directly inform the development of a tailored EPR framework for West Virginia, ensuring recommendations are grounded in the state's unique geographic, demographic, and economic conditions.
- ***EPR Program Experts and Administrators (online, up to 5):***
  - Signalfire Group will conduct one-hour virtual interviews (up to 5) with experts and program administrators from EPR programs in other states to gather insights into EPR operations and implementation. The Signalfire Group will develop the interview questionnaire in advance of the interviews.
  - By leveraging our experience working with state regulators, implementation companies, and EPR advocacy organizations, the Signalfire Group will identify key personnel who will be prioritized for these interviews.
  - The goal of these interviews will be to validate key lessons, supply additional program data to refine evaluation metrics (as described in Task 1.1), support the development of case studies highlighting successful EPR models, and capture public acceptance of EPR programs.

#### (2) Facilitated Group Discussion

- ***CED Program Administrators (online, one session):***
  - To support evaluation of the CED EPR program, Signalfire Group will facilitate an online discussion with CED program administrators and other key personnel, including representatives from the Solid Waste Management Board, Solid Waste Authorities, and WVDEP's REAP team.
  - The session will be facilitated by the Project Manager, using a focused questionnaire developed in advance to guide the discussion. Signalfire Group, with input from WVDEP, will identify 5–6 personnel who have been actively involved in the CED program to participate. The discussion will be scheduled for two hours, with approximately 90 minutes of active engagement.
  - The session will assess program performance, identify operational needs, and capture feedback to inform refinements to future program design and implementation strategies.

- Signalfire will rely on our lengthy experience developing, tracking, and assessing EPR programs for electronics and batteries. This includes our deep familiarity with financing and governance structures, as well as program evaluation.

### **1.2.2. Implementation of engagement plan**

Signalfire Group will develop a calendar of stakeholder engagements to ensure timely, organized interactions. A key anticipated risk is limited responsiveness to interview requests. To mitigate this, Signalfire Group will leverage existing professional connections and employ an engagement strategy in coordination with WVDEP to maximize participation.

Signalfire Group will execute the engagement strategy, aiming to uncover on-the-ground realities around EPR implementation across the country, West Virginia's current recycling industry, and the scope for EPR, and the status of the CED EPR program, through targeted outreach. As a part of this, Signalfire Group will:

- Schedule and facilitate the engagement activities appropriately across identified stakeholders
- Identify stakeholders requiring follow-up or additional information to ensure full participation.
- Capture key insights through interview notes and summaries on EPR programs, data, best practices, and recommendations for case studies
- Validate the assessment metrics (operational, financial, environmental, and socio-economic) for EPR evaluation.
- Signalfire Group will also document stakeholder feedback on potential policy tools, incentives, or DEP engagement that could inform EPR policy development in West Virginia.

## **TASK 1.3: SYNTHESIS AND ANALYSIS**

Following the completion of primary and secondary research, Signalfire Group will analyze and distill the qualitative and quantitative feedback into a structured interim report.

### **1.3.1. Evaluation of EPR Programs**

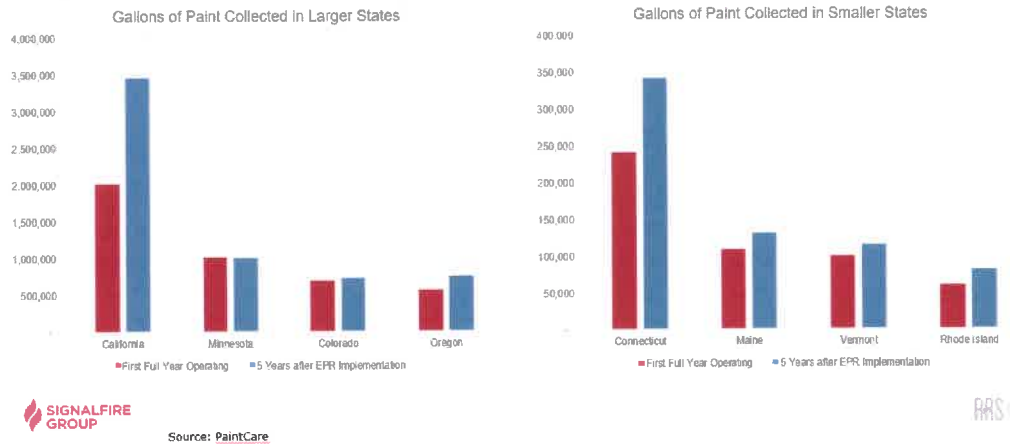
The evaluation of EPR programs will begin with a comparison of core program metrics, including recovery rates, cost savings, and revenue generated. Building on these data, a metrics-based assessment will analyze operational, financial, environmental, and socio-economic performance using the indicators developed and validated in Tasks 1.1 and 1.2. The evaluation will also highlight qualitative lessons drawn from implementation practices and program experiences through case studies.

#### **(1) Core Program Metrics**

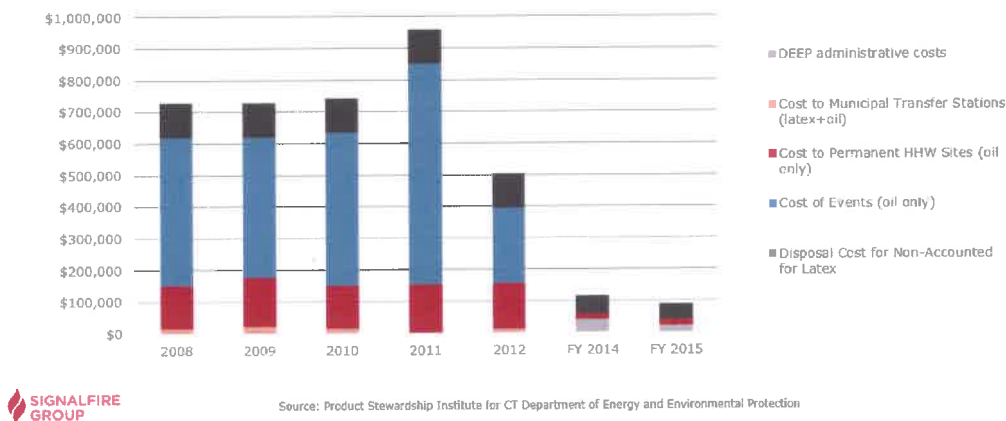
This will include a comparison of fundamental program data such as recovery rates, cost savings, and revenue generated, among other such data points gathered during primary and secondary data collection tasks. Examples of this kind of analysis by the Signalfire Group on paint EPR programs across the U.S. are shown in the graphic below.

***Sample graphic:** Comparison of paint recovered (in gallons) in EPR programs across various U.S. states during the first through fifth years of program implementation*

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**Sample graphic: Total state and local government paint management costs**



**Note:** This graphic is shared as an example of Signalfire Group's work and not intended for wide distribution.

## (2) Impact Metrics Assessment

Based on the metrics developed and validated in Tasks 1.1 and 1.2, the Signalfire Group will provide an assessment across operational, financial, environmental, and socio-economic domains of EPR programs. As shown in the Sample Table (Task 1.1), the Signalfire Group will use program metrics to examine and evaluate the different EPR programs. A key anticipated challenge is that many of the metrics may not be easily comparable across programs. Where metrics are not directly comparable, Signalfire Group will use normalized indicators and narrative explanations to ensure meaningful interpretation.

## (3) Case studies<sup>2</sup>

Case studies can provide essential insights into on-ground realities of implementing EPR programs, including lessons learned and best practices. The Signalfire Group will determine case studies based on recommendations from the interviews with EPR program administrators and in consultation with WVDEP. Case studies will capture actionable insights into EPR programs across product types, enabling WVDEP to receive a range of recommendations. Qualitative data collected during interviews on such factors as effective program structures, funding mechanisms, collection models, and public acceptance & perception will inform the case studies. To the extent possible, the Signalfire Group will include helpful infographics and photographs in these case studies.

<sup>2</sup> While the Signalfire Group will work towards developing 3-5 case studies per product, it is likely that some programs may have limited information, and some products may have limited or similar EPR programs. For instance, given that there is a single PRO for paint, it may be most efficient to develop a single state case study for paint EPR.

Qualitative analysis methods, such as thematic analysis, will be used to capture the typical concerns expressed by members of the public.

#### (4) CED program evaluation

Signalfire Group will analyze and synthesize data collected during Tasks 1.1 and 1.2 to perform a thorough examination of the CED program structure, performance, and alignment. Information gathered through research on the EPR landscape will inform a comparative analysis highlighting CED's strengths and service gaps/areas of growth relative to programs in other states.

#### Assumptions

- WVDEP will identify relevant stakeholders and provide existing program documentation.
- Comparable data from other states will be available and sufficient for benchmarking.
- Stakeholder participation will be voluntary but encouraged through WVDEP channels.
- The scope of Phase 1 is limited to research and interim reporting; policy recommendations will be developed in Phase 2.
- WVDEP staff will have 10 working days to provide feedback on the preliminary report shared by Signalfire Group.
- The Signalfire Group will work towards developing 3-5 case studies per product, it is likely that some programs may have limited information, and some products may have limited or similar EPR programs. The Signalfire Group is open to exploring the best path forward with WVDEP.

#### Deliverables

- **Interim Report:** A professionally formatted document summarizing:
  - Research methodology and data sources
  - Landscape analysis of EPR programs
  - Case studies capturing best practices
  - Framework for EPR in West Virginia
  - Evaluation of West Virginia's CED program
- **Stakeholder Engagement Summary:** Documentation of outreach activities, feedback themes, and participation metrics.
- **Data Workbook:** Excel summary of key metrics.

### PHASE 2 – FINAL REPORT AND EPR RECOMMENDATIONS | PER SECTION 4.2.2.3 OF THE SPECIFICATIONS

Phase 2 will synthesize the research and stakeholder input gathered in Phase 1 into a comprehensive final report that delivers actionable recommendations for expanding EPR programs in West Virginia. This phase focuses on translating data into policy options, aligning recommendations with the state's infrastructure, regulatory context, and socio-economic factors, and facilitating stakeholder engagement to validate and refine proposed strategies.

#### Task 2.1: Consultative Workshop with WVDEP

Signalfire Group will facilitate a 3-hour structured consultative workshop with WVDEP staff<sup>3</sup> to present preliminary findings from Phase 1, including insights from the national EPR landscape and CED program evaluation. The workshop will provide a forum to review potential program models, governance structures, funding mechanisms, and implementation considerations. Signalfire Group will develop an agenda and presentation in advance, with the preliminary findings, to solicit targeted feedback from WVDEP staff. The team will circulate pre-read materials to participants to ensure informed discussion and maximize efficiency.

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<sup>3</sup> Note we budgeted for the workshop to be in-person, but welcome input from DEP on whether a single virtual workshop, or perhaps two two-hour virtual workshops might be preferable due to time and budget considerations.

At the workshop, the Project Manager will present the preliminary findings and facilitate a discussion on key recommendations. The team will prepare structured discussion prompts to encourage participation and elicit actionable recommendations. Feedback will be documented to ensure all insights are captured for integration into the final report.

Following the workshop, the Signalfire Group will analyze workshop notes and integrate key recommendations into the final report.

### Task 2.2: Roadmap Development

Based on insights from Phase 1 research and feedback from the consultative workshop, Signalfire Group will develop a roadmap for EPR implementation in West Virginia. This roadmap will synthesize findings into a clear, actionable plan, highlighting:

- Evaluation of existing EPR programs across relevant product categories
- Comparative insights tailored to West Virginia’s context
- Policy options that are actionable, practical, and supported by quantitative and qualitative data
- Implementation considerations, including governance, funding, reporting, and stakeholder engagement

The roadmap will be delivered as a professionally prepared final report, suitable for dissemination in both print-ready and editable digital formats. It will include visualizations, tables, and infographics to effectively communicate the findings. A first draft will be submitted for WVDEP review, with a structured timeline for feedback and revisions. Recommendations will be validated through the integration of stakeholder perspectives and rigorous quality assurance processes to ensure accuracy, clarity, and usability.

### Assumptions

- WVDEP will coordinate and support stakeholder participation in the workshop.
- Feedback from Phase 1 stakeholders will be available and integrated into the final recommendations.
- The final report will be used to inform future rulemaking, program design, and legislative efforts.
- The scope of Phase 2 does not include implementation support but may inform future phases of technical assistance.
- WVDEP staff will have 10 working days to provide feedback on the final report shared by Signalfire Group.
- The budget supports one round of review by WVDEP, which is responsible for consolidating comments, questions, and edits. A review period will be established prior to delivery to WVDEP, after which the draft will be considered final.

### Deliverables

- **Final Report:** A professionally formatted document that includes:
  - Executive summary and key findings
  - Comparative analysis of EPR models
  - Tailored policy options for West Virginia
- **First Draft Report:** Submitted for WVDEP review prior to finalization, including all major sections and preliminary recommendations.
- **Stakeholder Workshop Summary:** Documentation of workshop proceedings, feedback themes, and revisions made to the final report.
- **Presentation Materials:** Slide deck and handouts used during the stakeholder workshop, suitable for reuse in public or legislative settings.

**PROJECT TIMELINE**

Upon project authorization, Signalfire, in collaboration with WVDEP, will identify a start date agreeable to both parties. The following preliminary project timeline will be discussed and confirmed at project authorization.

| Month                                                                                            | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|--------------------------------------------------------------------------------------------------|---|---|---|---|---|---|---|---|---|----|----|----|
| <b>Program Management   Per Section 4.2.2.1 of the Specifications</b>                            | X | X | X | X | X | X | X | X | X | X  | X  | X  |
| <b>Phase 1 – Summary of EPR Research   Per Section 4.2.2.2 of the Specifications</b>             |   | X | X | X | X | X | X | X | X | X  |    |    |
| <b>Phase 2 – Final Report and EPR Recommendations   Per Section 4.2.2.3 of the Specification</b> |   |   |   |   |   |   |   |   |   | X  | X  | X  |

## Project Team

Signalfire Group has a motivated and mission-driven team of consultants, engineers, and associates with decades of combined experience ready to assist and serve your project needs. Key staff are highlighted below. Additional Signalfire Group and RRS staff are available to support the project as needed. Team resumes are included as Attachment A.

### PROJECT TEAM ORGANIZATION AND MANAGEMENT STRUCTURE

| STAFF MEMBER              |                                                                | PROJECT ROLE & RESPONSIBILITIES                                                                                                                                                                                                                                                                                                         | YEARS EXPERIENCE |
|---------------------------|----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|
| <b>David Stitzhal</b>     | Project Manager                                                | Serves as WVDEP's primary day-to-day contact. Manages project schedule, workplan, and deliverables; coordinates task execution among team members; and facilitates stakeholder engagement. Ensures alignment between WVDEP expectations and project outputs.                                                                            | 35               |
| <b>Resa Dimino</b>        | Project Director                                               | Provides overall strategic oversight and ensures the project meets technical and policy objectives. Oversees coordination between Signalfire Group and RRS, manages contract performance, and reviews all deliverables prior to submission.                                                                                             | 35               |
| <b>Apurupa Gorthi</b>     | EPR Policy & Technical Support, Administrative Project Manager | Leads project logistics, internal coordination, and document management while providing substantive policy and technical support. Oversees task tracking, scheduling, and integration of inputs across project phases. Contributes to policy research, data synthesis, and drafting of analytical content for interim and final reports | 7                |
| <b>Garth Hickie</b>       | Policy Advisor and Senior Technical Specialist                 | Provides expert analysis on EPR policy frameworks and best practices. Supports legislative and regulatory review, comparative analysis, and quality assurance for key technical deliverables.                                                                                                                                           | 35               |
| <b>Isabelle Borkowski</b> | Project Support                                                | Conducts research, organizes data, supports stakeholder engagement tracking, and assists in drafting and formatting project deliverables.                                                                                                                                                                                               | 5                |

## INDIVIDUAL BIOGRAPHIES

### David Stitzhal | Signalfire Group Managing Partner Project Manager



David Stitzhal is a Managing Partner at Signalfire Group with more than three decades of experience leading EPR strategy, policy design, and on-the-ground implementation. He has guided state agencies, producer responsibility organizations, national trade groups, and major brands through EPR program development across packaging, electronics, paint, batteries, solar, and other priority materials. David's work spans legislative analysis, rulemaking support, cost and performance modeling, PRO formation, and stakeholder facilitation. He is frequently tapped to translate complex regulatory requirements into workable systems for producers and governments, with a track record of delivering clear, defensible recommendations.

As Project Manager, David builds disciplined work plans, keeps multi-party teams aligned, and drives deliverables to completion on time and within scope. He is known for structured communications, practical risk management, and rigorous internal QA that ensures high-quality reports and recommendations. Raised in West Virginia, with family still there, David resided there through his twenties, and still returns to visit family in the Mountain State. He has a deep love of the state's geography, a commitment to its varied communities and economic health, and a desire to improve and expand right-sized EPR solutions to keep West Virginia wild and wonderful. He holds a master's in City and Regional Planning from Cornell University.

### Resa Dimino | Signalfire Group Managing Partner Project Director



Resa Dimino is a nationally recognized expert in EPR, recycling systems, and sustainable materials management with more than 35 years of experience spanning public agencies, private industry, and nonprofit organizations. She has led statewide recycling and product stewardship initiatives, designed and implemented EPR frameworks, and advised on policy and infrastructure modernization efforts across North America. Her work bridges policy and operations, bringing a practical, implementation-minded perspective to complex systems change. Resa has served as policy lead for the New York State Department of Environmental Conservation, where she helped develop New York's "Beyond Waste" 10-year sustainable materials management plan and led the state's first e-scrap EPR legislation.

As Project Director for this engagement, Resa will provide strategic oversight and ensure coordination across technical and policy workstreams. She brings extensive experience managing multidisciplinary teams, directing large-scale data and policy analyses, and facilitating collaboration among government, industry, and community stakeholders. Resa's leadership has guided clients such as the Oregon DEQ, Vermont DEC, Circular Action Alliance, and the Natural Resources Council of Maine through EPR program development and implementation.

### Apurupa Gorthi | Consultant



Apurupa Gorthi brings seven years of experience in sustainability, EPR, and circular economy policy, with a strong background in project coordination and technical analysis. At Signalfire Group and RRS, she supports EPR program implementation, stakeholder engagement, and policy analysis for clients across North America. Her recent work includes tracking EPR implementation in Oregon, California, Minnesota, and Massachusetts, conducting regulatory analysis for packaging and printed paper systems, and supporting Circular Action Alliance and Circular Materials in modeling and eco-modulation framework development. Apurupa is adept at translating technical and policy insights into actionable project outputs that align with state and producer objectives.

As Administrative Project Manager for this engagement, Apurupa will coordinate all project logistics, communication, and documentation to ensure alignment between Signalfire Group and WVDEP. She will manage internal workflows, track progress against deliverables, and support the development of key research and reporting materials. Apurupa's combined expertise in EPR and project management ensures clarity, efficiency, and high-quality deliverables throughout each phase of the project. She holds a Master of Science in Earth, Atmospheric, and Planetary Science from Purdue University and a Bachelor of Engineering in Chemical Engineering from Ramaiah Institute of Technology.

### Garth Hickle | Signalfire Group Managing Partner



Dr. Garth Hickle is a recognized expert in product stewardship, recycling policy, and sustainable materials management with more than 35 years of leadership in the field. He is a Managing Partner at the Signalfire Group and an associate senior consultant at RRS, where he advises on EPR policy design, program implementation, and producer responsibility systems across a wide range of materials and geographies. He previously led the Minnesota Pollution Control Agency's product stewardship program and was the state's technical lead on EPR-related legislation. Garth has contributed to national and international stewardship dialogues and is a widely published author on circular economy, governance, and recycling system design.

Garth brings particular strength in policy analysis, institutional design, and producer engagement strategy. He has supported packaging EPR implementation in Maine, New York, and Canada, developed national policy tracking tools, and advised NGOs and private clients on EPR cost modeling and regulatory strategy. He is also a senior lecturer at the University of Minnesota, teaching bioproducts and sustainability. Garth holds advanced degrees in environmental law, public administration, and industrial ecology, and earned his PhD in Cleaner Production from Erasmus University in the Netherlands.

### Isabelle Borkowski | Signalfire Consultant



Isabelle Borkowski is an environmental policy and recycling systems consultant with a strong foundation in research, stakeholder coordination, and project management. Since joining RRS in 2021, Isabelle has supported a broad portfolio of projects spanning EPR, recycling infrastructure analysis, and sustainable materials policy. She brings deep experience in synthesizing complex regulatory data into clear, actionable insights and developing communications tools that support informed policy and operational decision-making. Her work includes EPR policy tracking and analysis for the Carton Council, Circular Polymers, and the Northwest Product Stewardship Council, as well as administrative project management and implementation support for Niagara County's solar panel EPR program.

As Project Support for this engagement, Isabelle will assist in research coordination, stakeholder engagement tracking, and document development across all phases of the project. She will maintain project documentation, support communications between Signalfire Group and WVDEP, and contribute to the preparation of reports, presentations, and data summaries. Isabelle's background in public policy and environmental systems allows her to bridge technical content and policy analysis with strong organizational and communication skills. She holds both a Master of Public Policy and a Bachelor of Arts in Environmental Policy from Loyola University Chicago.

## Qualifications and Experience

Signalfire draws on decades of experience and expertise to deliver high-quality results that achieve its clients' objectives.

Below, please find our team's broad experience and qualifications organized under the following skillset categories:

- Expertise in Extended Producer Responsibility
- Environmental and Economic Impact Assessment
- Research and Data Collection
- Engagement and Policy Communication
- Project Management and Report Development

## Expertise in Extended Producer Responsibility

The Signalfire team has supported EPR policy development and implementation in states at every stage of program maturity, from early evaluation and design (Oregon, Washington) to full-scale implementation and review (Maine, Vermont, New York). Each project required balancing producer responsibility with the realities of local recycling infrastructure and regional economic conditions. Those same dynamics are present in West Virginia, where a practical, data-informed approach is essential to ensure any future EPR policy complements existing solid waste authority systems and recycling networks. Our direct experience navigating these policy and operational intersections positions us to deliver recommendations that are both feasible and effective within West Virginia's context.

### NATURAL RESOURCES COUNCIL OF MAINE

#### **Assist in the Successful Implementation and Define the Producer Landscape to Support Maine's EPR for Packaging Law**

Maine enacted legislation in the US to establish an EPR program for packaging. Implementing the law requires extensive rulemaking by the Maine Department of Environmental Protection (DEP). The Natural Resources Council of Maine (NRCM) sought support to conduct research and analysis that will form the basis of recommendations to inform DEP's rulemaking process. This project supported that effort by providing a deeper understanding of the state's producer landscape, sales channels, and opportunities for structuring eco-modulation to foster eco-design.

The work involved gathering data on existing recycling programs, activities, and costs (to the extent possible), and utilizing available and modeled cost data to recommend formulas for municipal reimbursement and producer fee setting. The Signalfire team also developed recommendations for program performance targets, drawing from the experience of existing programs and policy frameworks, including fee-setting frameworks in other jurisdictions with EPR systems. Throughout the project, the team documented the data needed to track and measure the performance of key players in the new EPR system. It recommended data that would need to be generated or reported as a part of the programmatic and regulatory structure.

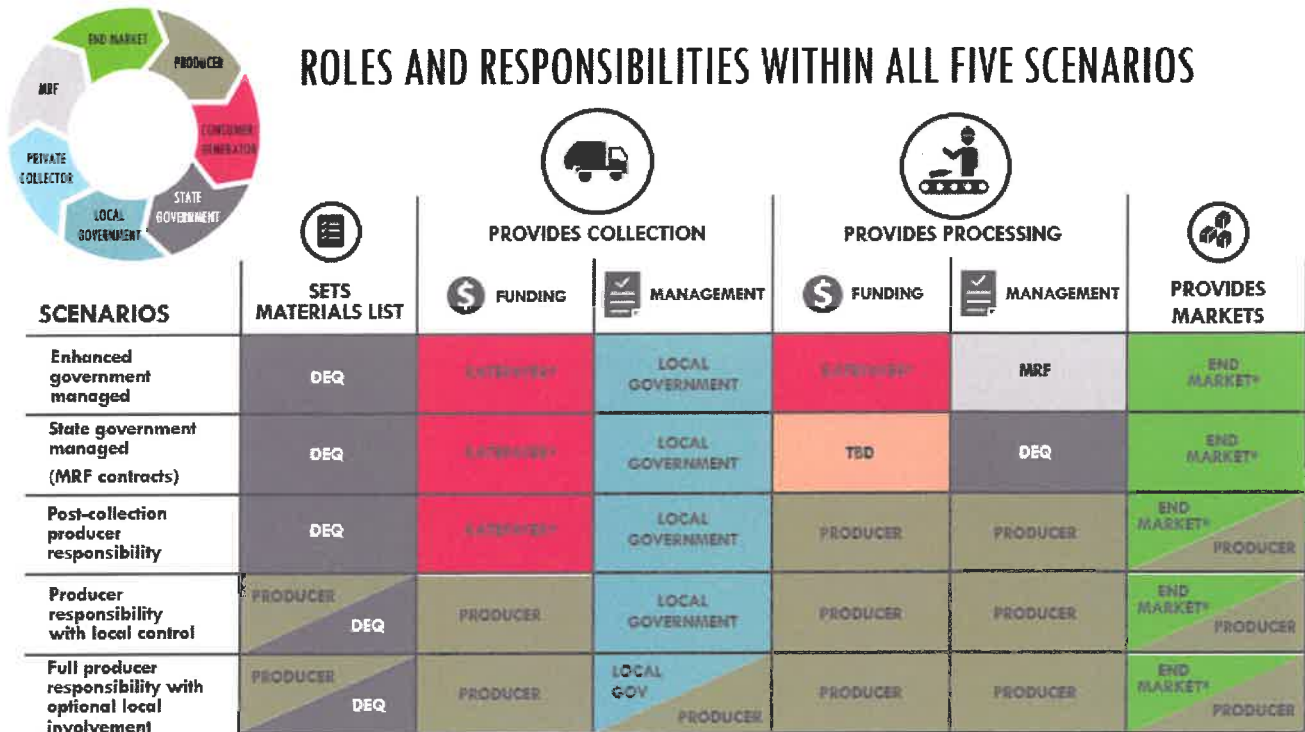
### OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

#### **Recycling System Frameworks**

In response to the collapse of recycling markets in late 2017, the Oregon Department of Environmental Quality (DEQ) formed the Recycling Steering Committee (RSC) in early 2018 to modernize Oregon's recycling system. The RSC's work addresses recycling infrastructure and legal frameworks, and in 2019, RRS was hired to explore alternative legal and relational frameworks with sustainable materials management and circular economy objectives. This report evaluates five alternative scenarios for legal and relational frameworks to improve Oregon's recycling system by addressing gaps in integration, accountability, and system harmonization.

The five scenarios fall into two governance categories: government-managed and EPR. The government-managed scenarios propose enhanced government regulation or state contracts with material recovery facilities

(MRFs) to improve system harmonization and accountability. The EPR scenarios require producers to take financial and operational responsibility for recycling, offering reliable funding and incentives for sustainable design. The scenarios range from post-collection producer responsibility to full producer responsibility, with varying levels of local government involvement. Each approach aims to build on existing strengths while addressing current system weaknesses. This research and report laid the groundwork for extended producer responsibility for packaging and printed paper in state.



\*DEQ regulatory oversight included in all elements except those noted with an asterisk.

### EPR for PPP Research

In 2020, RRS conducted research for the Oregon Department of Environmental Quality Recycling Steering Committee to understand better how extended producer responsibility for packaging and printed paper (EPR for PPP) impacts several key functions of a robust recycling system.

- **Recycling Market Stability:** RRS examined the impact of recent market disruptions resulting from the 2018 restrictions on importing recyclables from the US and Canada, implemented by China and other Southeast Asian countries. The research identified notable reductions in material categories accepted for recycling in five US states and one jurisdiction in Canada without EPR for PPP. The research found only minimal reductions in community acceptance of materials for recycling in Canadian jurisdictions with EPR for PPP.
- **Packaging Design:** The RRS team performed a literature search to identify any academic or other studies documenting changes in packaging design or material choices resulting from EPR fees, eco-modulated fees, or EPR policy for packaging. The team also modeled a hypothetical scenario to quantify the value of eco-modulation incentives to provide some context for considering whether such incentives would be significant enough to stimulate design choices.
- **Price of Consumer Packaged Goods:** The RRS team performed a virtual shopping study that compared the price of a range of products in Canadian provinces with and without EPR for PPP policies. The research identified no significant correlation between product price and the presence of EPR for PPP policies.

- **Recycling Rates:** RRS compiled available data on recycling rates in jurisdictions that have implemented EPR for packaging and, in some cases, printed paper, before and after program implementation. In every jurisdiction where data were available, the recycling rates increased after the implementation of EPR for packaging. However, comparing recycling rates pre- and post-EPR implementation is challenging because in some cases, data is not available for the period before EPR implementation, and in others, the pre-program data is not comparable to what is reported after implementation.
- **Contamination in Residential Recycling Streams:** RRS studied recycling program contamination rates in Canadian provinces with EPR for PPP, and in neighboring provinces and U.S. states that do not have EPR policy in place. The research identified studies documenting recycling program contamination (i.e., non-recyclable items placed in recycling bins or sorted out as residue in recycling facilities) but did not identify any studies or data that addressed contamination in bales of recycled materials sent by MRFs to market. The RRS team could not draw any conclusions on the impact of EPR for PPP on contamination based on the available data, as both sets of jurisdictions had examples of both high and low contamination rates.
- **Costs, Environmental Goals and Equity:** To answer questions on the costs, environmental goals and equity strategies associated with EPR for PPP, RRS reviewed data and interviewed experts to understand key details, such as the legal requirements underpinning the EPR program activities (related to equity) and the allocation of program costs by category (related to the cost analysis). The team reviewed the compiled information and recorded any data related to program environmental goals and policy provisions that address the equity considerations. In short, the research identified fairly extensive statements of recycling and/or recovery goals, but limited inclusion of other environmental targets. In researching equity, RRS found that policies are generally addressed in the context of the broader waste management regulations, rather than the regulations that implement an EPR program.

## US TIRE MANUFACTURERS ASSOCIATION

### Connecticut Tire Stewardship Organization Set Up Planning

SignalFire is guiding the U.S. Tire Manufacturers Association (USTMA) in planning and establishing a Tire Stewardship Organization (TSO) in Connecticut, as required by Connecticut HB 6486. Work involved forming a dedicated working group, providing strategic guidance on TSO formation, and developing a comprehensive Tire Stewardship Plan. The plan outlines program operations, financing, performance goals, and public education strategies, prioritizing using existing infrastructure and service providers. Key deliverables include forming the working group, TSO corporate structure, tailored EPR presentations, extensive stakeholder outreach, planned program operations, financial modeling, and the completed Tire Stewardship Plan.

## NORTH AMERICAN ORGANIZATION

### EPR Model Development

An organization in the US sought RRS services to develop a model to predict costs and fees that may be incurred in a producer-funded recycling system in the US. The model was designed to estimate program costs and associated material fees at the national and state levels by adjusting key input factors. Project work defined fee-setting principles and developed an adaptable producer-funded recycling program cost and a material fee model.

## CONFIDENTIAL CLIENT

### California Statewide Paper Recycling Rates

RRS conducted a comprehensive analysis for a leading partner in the paper and wood industry to estimate California's statewide recycling rates for corrugated cardboard and paperboard materials under the California Recycling and Plastic Pollution Reduction Act (SB 54). This legislation establishes an extended producer responsibility (EPR) framework, with specific recycling rate thresholds required for material exemptions. RRS evaluated recycling and disposal data from residential and industrial, commercial, and institutional (ICI) streams for key materials like corrugated packaging and paperboard. Leveraging US Census, CalRecycle and industry data and insight, RRS produced accurate recycling rate estimates for 2022, informing industry compliance and supporting exemption requests under SB 54.

The project combined RRS's deep expertise in recycling systems, data analysis, and policy evaluation. The final

deliverables included a detailed methodology, data-supported findings, and a presentation-ready report tailored for the client's stakeholders, including policymakers and industry members. This analysis empowers the client to demonstrate compliance with California's stringent recycling goals and advocate for informed policy decisions, contributing to a sustainable circular economy.

## **MULTI-FUNDER ENGAGEMENT**

### **EPR and RR Model Evaluations**

RRS was retained to model the cost and impact of EPR and Recycling Refund (RR) (also known as Deposit Return Systems/DRS or bottle bills) programs across various scenarios. The goal of this work was to identify the most effective approach for increasing recycling and reducing greenhouse gas (GHG) emissions, recognizing that EPR and DRS policies are proven tools to drive recycling and increase recycled content availability. The aim was to recommend an optimal policy framework based on return on investment (ROI) for recovery, GHG reduction, and cost.

Objectives:

- Model cost and collection outcomes of EPR, RR, and combined systems.
- Create hypothetical fee schedules based on cost modeling.
- Identify the policy framework with the best ROI.

In collaboration with the funding sponsors, RRS applied this framework to Washington state-level data to estimate system costs, material recovery improvements, and associated GHG reductions. The project included a recovery and recycled content white paper and culminated in a publicly oriented report intended to support the funder's policy advocacy initiatives. The work enables the sponsor team, the Coalition for High Performance Recycling, and its partners to more effectively promote recycling policies with strong economic and environmental performance in future legislative efforts. The final report can be found

## **REGIONAL MATERIALS MANAGEMENT ORGANIZATION**

### **Packaging EPR Study**

In 2019, RRS concluded a research project exploring current stakeholder perspectives on Extended Producer Responsibility for Packaging and Printed Paper in the U.S. for a confidential client. To ensure a rich understanding of that landscape, the project included a briefing paper on the current state of play about EPR for PPP in the U.S. generally, and in key states, with a focus on stakeholder perspectives and their evolution over time.

## **ELECTRONIC MANUFACTURERS RECYCLING MANAGEMENT COMPANY (MRM)**

### **Compliance and Reporting Support for E-waste Programs**

RRS provides comprehensive EPR compliance support for electronics manufacturers across U.S. jurisdictions. Through our subsidiary Signalfire, RRS manages the complete compliance lifecycle, preparing and submitting state-mandated registrations, annual reports, and manufacturer recycling plans. Our expert team aggregates sales and recycling data, ensures timely submissions, and works with recycling partners to collect and validate program performance documentation.

RRS streamlines complex compliance processes for e-waste programs while maintaining close communication with state regulators to interpret evolving policy requirements. This approach ensures full alignment and enables clients to efficiently meet diverse state regulations. RRS handles all deliverables with strict confidentiality, preserving data privacy and managing recycler information discreetly. RRS's experience and expertise demonstrate the ability to deliver regulatory compliance services with precision and deep familiarity with the EPR landscape.

## **ASSOCIATION OF PLASTIC RECYCLERS (APR)**

### **Policy Tracking and Model Legislation Development**

RRS, through its Signalfire Group division, supported the Association of Plastic Recyclers (APR) with policy tracking, model legislation development, and communications collateral to advance market-based recycling solutions.

Work included weekly legislative alerts summarizing proposed bills related to EPR, recycled content mandates, container deposit systems, and other packaging policy topics. The team provided summaries of key legislation and participated in regular briefings to align on emerging trends and APR priorities.

In addition, Signalfire developed a model minimum recycled content bill, including proposed definitions, administration and enforcement provisions, and targets tailored to both food-grade and non-food-grade plastic products. Supporting materials included white paper guidance on policy provisions, talking points for advocates, and FAQs addressing common concerns.

The project equipped APR with strategic tools and insights needed to initiate and support multiple legislative campaigns at the state level and inform stakeholders on the economic and environmental benefits of postconsumer resin.

## CONSUMER TECHNOLOGY ASSOCIATION

### Multi-State E-Waste Evaluation

The Consumer Technology Association (CTA) serves as an advocate for forward-thinking innovators and producers in the consumer technology industry. CTA offers a platform that connects industry leaders as they collaborate to develop growth and progress in the field. To support that mission, CTA wanted to ensure that the e-scrap Extended Producer Responsibility (EPR) programs in Illinois, New Jersey, Connecticut, and Maine are accurately reporting the electronics collected and recycled. RRS was hired to conduct a series of evaluations to provide CTA with a robust understanding of how collectors and recyclers are tracking and reporting these important metrics. The RRS team developed a methodology and protocol for both desktop and onsite evaluations to ensure consistent data collection. RRS reviewed state-level policies, interviewed key stakeholders in state agencies, local governments, major collectors and recyclers, and manufacturers to gain insight into how the programs work and where challenges occur. After collecting and analyzing data, RRS produced a final report that mapped the flow of materials from collection points through downstream recycling and discussed policy implications for e-waste recycling in each state.

## CONSUMER TECHNOLOGY ASSOCIATION

### Policy Research

RRS conducted research to quantify the delta between what municipalities pay in processing fees in the current market and compared that to historical averages with a particular emphasis on the proportion of each material category cost relative to overall processing fee. This analysis was provided in support of a packaging policy proposal for industry to take responsibility for filling the gap between recycling processing costs and material revenues.

## CALL2RECYCLE

### Vermont Primary Battery Program Assessment

Call2Recycle, a non-profit battery stewardship organization, initiated the first primary battery recycling program in Vermont on January 1, 2016. Since then, they have assisted in the recycling of over 350,000 lbs. of primary batteries. In response to Vermont's legal requirement for a five-year assessment, Call2Recycle engaged RRS for an evaluation. RRS reviewed program data, performed extensive stakeholder and community engagement, and compared Vermont's program with Canadian counterparts. The project involved a cost analysis and evaluation of collection effectiveness, conducting interviews with collection sites, assessing downstream processing, and providing recommendations for program enhancement. Interviews with selected collection sites offered valuable insights into the program's impact, and assessments of downstream processing helped ensure compliance with relevant regulations. The project yielded a comprehensive Assessment Report, summarizing the findings and offering recommendations for enhancing primary battery collections in Vermont.

## CONSTANTINE LEGAL

### Stewardship Ontario Arbitration Support

RRS was retained by Constantine Legal, an Ontario, Canada-based law firm, to prepare written and oral expert testimony on behalf of its client, Stewardship Ontario, a not-for-profit organization operating the curbside recycling program for printed paper and packaging and the recycling and safe disposal program for hazardous or special waste in Ontario. The work entailed preparation and analysis for three areas of disputed fee assessment by the Resource Productivity and Recovery Authority (RPRA) to Stewardship Ontario. RPRA is the regulator mandated by the Ontario government to enforce circular economy laws in the province. The fees in question relate to the execution of the provincial policy of extended producer responsibility which requires payment by the stewards to infrastructure operators that carry out the recovery of printed paper and packaging in the province of Ontario.

RRS carried out careful policy and economic analysis of the lengthy contract between Stewardship Ontario and RPRA. The work involved evaluation of the fee adjustments and the fairness of those fees and their relationship to the underlying contractual terms between the parties. The consequences of the imposed fees created a total sum of millions of dollars at dispute. Oral testimony about the technical aspects of this analysis was presented over the course of three days to a special master in Toronto who presided over the dispute.

## **NIAGARA COUNTY, NEW YORK**

### **Implementation of the Solar Panel EPR Law**

On August 1, 2021, Niagara County, New York, passed Local Law No. 4 requiring manufacturers of photovoltaic modules to finance and develop a takeback program for recycling of the modules, minimization of hazardous wastes, and recovery of valuable materials. This law is one of the first product stewardship local program aimed at solar panels. It follows the lead of Washington State, which adopted an extended producer responsibility program for Solar Panels in 2017, which will become effective in July of 2025.

Niagara County sought RRS support for implementation of this law through guidance, engagement and management of stakeholders, participation in and the fostering of stakeholder dialogue, assistance in developing an effective outreach and education strategy, and guiding the County program to meet expectations and goals.

## **Environmental and Economic Impact Assessment**

The Signalfire Group team's experience conducting life cycle assessments, cost modeling, and recycling market analyses across multiple jurisdictions directly supports WVDEP's need for balanced, data-informed policy evaluation. States like Minnesota and Oregon, much like West Virginia, must manage recycling and materials programs across rural and regional contexts with varied infrastructure and cost profiles. Our work modeling environmental and economic outcomes, whether through life cycle analysis, market assessments, or system cost differentiation, ensures that WVDEP will receive recommendations grounded in both fiscal practicality and environmental performance. This analytical approach will help the state identify scalable, right-sized EPR and recycling strategies that strengthen local programs while aligning with long-term sustainability goals.

## **CIRCULAR MATERIALS (FORMERLY CANADIAN STEWARDSHIP SERVICES ALLIANCE)**

### **Material Cost Differentiation Project**

Circular Materials (CM) is a national nonprofit organization that represents the interests of Canadian businesses and provides support services to paper packaging and printed paper (PPP) stewardship programs across four provinces in Canada. RRS is the technical consultant working to support CM's Material Cost Differentiation (MCD) Project to define the methodology used to measure each material's impact on the cost of the recycling system activities based on its characteristics. This provides an important input to the overall fee setting process in the four participating Canadian packaging and printed paper (PPP) recycling programs to ensure those fees reflect the relative impacts of material characteristics on the cost of recycling system activities. RRS' work involves conceptual system design, cost modeling, and field testing and measurement to support the groundbreaking MCD approach. For more on the MCD project, see <https://www.circularmaterials.ca/resources/fee-setting/material-cost-differentiation-mcd-methodology/>.

## **CIRCULAR MATERIALS (FORMERLY CANADIAN STEWARDSHIP SERVICES ALLIANCE)**

### **Research For End Market Prices of Recycled Materials**

Circular Materials (CM) is a national nonprofit organization that represents the interests of Canadian businesses and provides support services to paper packaging and printed paper (PPP) stewardship programs across four provinces Canada. Their work depends on regional data of commodity market sales in the provinces it services as a key element in fee setting for the packaging stewardship programs it manages. RRS used its extensive expertise, research, and a series of interviews with MRFs, buyers from MRFs, and brokers, to create a report that provides expert opinion, and recommendations on the current methods that CM uses to monitor recycled materials markets.

RRS also provided current and historical pricing for domestic and export transactions for targeted recycled materials for each of the provinces served, the national or North American price (whichever was available), and the export price from each coast. RRS developed a map of the geographical coverage and listed capacities of Canadian and North American markets within reach of Steward materials for each province in this study. RRS provided indicators for raw material pricing indices for the following materials and summarized its relevance. RRS described differences in recovered vs. virgin pricing trends in the marketplace, based on research in the top trade journals for each material.

## **MINNESOTA POLLUTION CONTROL AGENCY**

### **Life Cycle Assessment of Environmental Impacts of Food Management**

RRS, in collaboration with respected life cycle assessment firm ERG, is undertaking an evaluation of the environmental impacts of various food waste management scenarios. These scenarios will consider food scraps generated from residential households, commercial establishments, and industrial sectors. The assessment gauges a range of management solutions, such as anaerobic digestion (AD), composting, co-digestion, and other common dispositions.

The outcome of this analysis is intended to equip the Minnesota Pollution Control Agency (MPCA) with insight into the environmental ramifications associated with each management pathway, including aspects like greenhouse gas emissions, soil health, water quality, toxicity, among others. The assessment and tools are designed to provide a thorough, comprehensive, and actionable analysis of pertinent food waste management alternatives. These can serve as a foundation for a more enlightened decision-making process for the MPCA and can significantly influence the future direction of food waste management in the state.

## **NATIONAL WASTE AND RECYCLING ASSOCIATION (NWRA)**

### **Economic Impact of Beverage Container Deposits on Municipal Recycling Processing Costs**

The United States has experienced a significant increase in recycling-related policy activities, the most active period in over 25 years. The National Waste and Recycling Association (NWRA) sought to understand the impacts of beverage container deposits on municipal recycling systems. This understanding was intended to help NWRA develop informed policy positions and decide on potential support for policy actions.

#### **Key Elements of the Approach:**

- Analyze the financial and operational impacts of beverage container deposits on municipal recycling systems.
- Summarize policy tools to mitigate any negative impacts on municipal recycling programs.
- Present findings and policy options to NWRA for review and feedback.

The RRS Team leveraged its extensive experience in policy analysis and recycling program management to execute this project, building on prior research and conducting additional modeling and analysis as needed, and compiled the analysis and policy options for NWRA's review.

#### **Final Results**

The analysis conducted by RRS provided NWRA with a detailed understanding of the financial and operational impacts of various beverage container deposit scenarios on municipal recycling systems. Key findings included:

- **Impact on Recycling Rates:** Changes in recycling rates for different materials under each deposit scenario.
- **Commodity Value Impacts:** Effects on the commodity value per MRF ton for each scenario.
- **Volume Shifts:** Analysis of material volumes moving from MRFs to the deposit system and its implications.
- **Cost Implications:** Evaluation of shifts in processing fees, fixed costs, and disposal cost savings.
- **Qualitative Impacts:** Summary of qualitative impacts on MRF operations and municipal recycling programs.

RRS helped the NWRA to understand the financial implications of beverage container deposits on municipal recycling programs by providing detailed analyses, policy options, and recommendations for mitigating negative impacts, helping NWRA to develop informed policy positions and support strategies. The final report can be viewed [here](#).

## Research and Data Collection

The Signalfire Group team brings extensive experience conducting mixed-method research to inform recycling, materials management, and Extended Producer Responsibility (EPR) initiatives across North America. Our expertise spans quantitative and qualitative data analysis, including the design and implementation of surveys, stakeholder interviews, case studies, and policy reviews. We are highly proficient in sourcing, interpreting, and synthesizing data from federal, state, and local sources, as well as from producer responsibility organizations and industry associations.

This experience directly supports WVDEP's need for an evidence-based, context-aware study that reflects the unique recycling landscape of West Virginia, where solid waste authorities, county programs, and regional service providers form the foundation of the state's materials management system. Our data-driven approach will ensure that research findings and recommendations are both technically sound and practically applicable to West Virginia's existing infrastructure and policy framework.

### **MULTIPLE CLIENTS (ASSOCIATION OF PLASTIC RECYCLERS, FOODSERVICE PACKAGING INSTITUTE, CARTON COUNCIL, INTERCHANGE)**

#### **Legislative Monitoring and Policy Interpretation – National Coverage**

The Signalfire Group supports multiple national trade associations through comprehensive bill tracking and policy monitoring services across all 50 states. Focused on waste and recycling legislation, including Extended Producer Responsibility (EPR), the Signalfire Group team sources and analyzes legislative data to help clients anticipate and respond to emerging policy trends. Deliverables typically include weekly or biweekly reports that summarize newly introduced, amended, or advancing bills relevant to packaging, recycling infrastructure, labeling, and circular economy topics.

Through this work, Signalfire Group sources, aggregates, and analyzes legislative data to generate custom reports and provide policy interpretation tailored to each client's specific interests and operational footprint. These insights help clients prepare internal positions, align messaging, and engage with stakeholders throughout legislative cycles. Signalfire Group's expertise in distilling complex policy language into actionable intelligence supports strategic planning and advocacy efforts at the local, state, and national levels.

### **MULTIPLE CLIENTS (ASSOCIATION OF PLASTIC RECYCLERS, FOODSERVICE PACKAGING INSTITUTE, CARTON COUNCIL, INTERCHANGE)**

#### **EPR Regulatory and Implementation Data Tracking**

Signalfire Group provides targeted regulatory tracking and implementation monitoring for clients navigating EPR policies in states with active laws. The team focuses on the seven states with enacted EPR legislation and three additional states conducting packaging needs assessments. Signalfire Group gathers and interprets regulatory updates, advisory council activities, implementation timelines, public notices, draft rules, and stakeholder engagement opportunities relevant to each jurisdiction.

Clients use Signalfire Groups' intelligence to stay ahead of evolving compliance requirements and to participate effectively in rulemaking and program development processes. Signalfire Group delivers tailored reporting with regulatory context, risk identification, and recommended engagement strategies. This ongoing support allows clients to maintain regulatory readiness and maximize influence in shaping fair, effective, and transparent EPR frameworks.

## INDUSTRY PRODUCT STEWARDSHIP ORGANIZATION

### Program Evaluation and Performance Assessment

This non-profit material stewardship organization, supported by manufacturers of the target material, facilitates, and manages the collection and proper management of the target material. The organization contracted with RRS to conduct independent third-party program evaluations and performance assessments in numerous sub-markets nationally.

- **Program Data Analytics & Reporting** – The RRS team analyzed detailed operational datasets in order to calculate KPIs and quantify program metrics. Analysts employed a variety of analytical tools to model results and build informative data presentations and graphical elements that visually convey trends. The analysis included:
- **Program Overview Analysis:** Evaluated national and regional program performance metrics over time of the program including the total quantities of target material collected, annual growth, and identification of trends.
- **Supply Chain Analysis:** Target material quantities collected by location type, number and percentage of stores returning material shipments, correlation of shipments to target material quantity and collection efficiency, top performing channel partners, and impact of marketing behavior on successful recovery of materials.
- **National and Regional Data Analysis:** Temporal distribution of material shipments, partner shipment performance and rates of partner program participation, geographic comparisons, and rankings across KPI categories.
- **Region-specific Reports** – RRS developed comprehensive and detailed periodic reports complying with the various sub-market program requirements to quantify the program’s regional effectiveness including metrics outlined above and additional variables such growth and performance, historical comparisons, and an overview of the program’s current operations.

As a result of the analysis, the product stewardship organization has successfully tracked the rate of increase in materials collected, boosted supply chain partner participation rates and program performance of less active participants, and identified the impact of specific promotional activities to influence the effectiveness of marketing campaigns.

## THE AMERICAN INSTITUTE FOR PACKAGING AND THE ENVIRONMENT

### Used Packaging Recovery Fact Base and Knowledge Map, 100 Communities Project

The American Institute for Packaging and the Environment (AMERIPEN) is an industry trade organization that holds economic and environmental interest in the packaging value chain. AMERIPEN advocates science-based decision making in the sustainable future of packaging production, distribution and consumption through pivotal research, education, and networks. As part of our work plan, AMERIPEN looked to develop a concrete and foundational base of publicly available and proprietarily developed information on packaging materials, their associated collection and processing, and how recovery systems could be optimized to drive packaging recovery.

In the first stage of our process, RRS worked with experts in each packaging area to identify and compare common metrics across all the packaging types. This data provided the foundation for a packaging recovery knowledge map. In the next stage of our process, collaboration with packaging recovery experts inventoried current practices, unit costs, best practices, and performance gaps in both the recycling collection and recycling processing of packaging types. In the last phase of our work with AMERIPEN, our team finalized optimized recovery system solutions designed to drive used packaging recovery. This phase took into account cost and performance modeling, looking at key variables that will affect packaging recovery efforts including the potential risk factors, who will bear these risks and what policy recommendations could be made to solidify potential solutions.

The next phase of work included the “100 Cities Project.” RRS began by establishing recovery metrics for the 100 largest municipalities in the United States. The metrics included profiling current recovery, key program features, potential supply opportunities and improvement tracking to help develop emerging consensus on best practices for increasing packaging recovery among these largest municipalities. RRS developed basic City profiles to present initial core data in an easy to understand format structured around best practice frameworks.

## **CIRCULAR ACTION ALLIANCE**

### **Waste Systems Mapping Insights in California**

RRS is conducting an assessment of California's sorting and processing infrastructure as part of a statewide waste systems mapping initiative. The goal of this project is to provide CAA with a robust understanding of the recycling and waste landscape in California using published data sources and compilation of publicly available data. The project includes extensive compilation of detailed data on California's recycling programs, demographics, service offerings, service providers, and collection and processing infrastructure. As RRS completes this engagement, we will provide CAA with the most up-to-date and complete data sets and narrative summaries of key California program characteristics, to enable the Alliance to plan for program evolution and implementation of policy requirements.

## **Engagement and Policy Communication**

The Signalfire Group team brings extensive experience in stakeholder engagement, communications, and policy support, helping clients translate complex recycling and EPR systems into practical, actionable strategies. We have designed and facilitated engagement efforts for state agencies, local governments, industry coalitions, and non-profit partners to build consensus, inform rulemaking, and strengthen recycling infrastructure. Our team's approach emphasizes accessibility, transparency, and clarity, ensuring that technical findings are communicated effectively to both expert and public audiences.

This experience aligns directly with West Virginia's needs as it evaluates EPR and recycling policy opportunities. West Virginia's solid waste management system is characterized by its robust network of regional solid waste authorities, local recycling programs, and statewide partnerships, including the Recycling Coalition of West Virginia. Our engagement approach will ensure these stakeholders are represented and that findings are communicated in a way that supports practical decision-making, community understanding, and statewide coordination.

## **CARTON COUNCIL OF NORTH AMERICA**

### **Recycling Access, Infrastructure, and Policy Support**

RRS supports the Carton Council of North America (CCNA) through a comprehensive, long-standing engagement focused on expanding household access to carton recycling across the United States. RRS manages a national access tracking database that monitors more than 8,000 community recycling programs and uses verified documentation to calculate population- and household-level access. This tracking is paired with material flow modeling and GIS analysis to forecast post-consumer volumes, assess MRF readiness, and guide targeted outreach.

To build recovery infrastructure, RRS engages directly with MRFs, haulers, and local governments to support the adoption of cartons into recycling programs. The team develops community-facing outreach materials, manages stakeholder communications, and supports strategic messaging campaigns. RRS also assists in maintaining and protecting the Grade 52 material specification and monitors market acceptance challenges through close coordination with industry associations and regional stakeholders.

On the policy front, RRS helps CCNA identify strategic opportunities to promote carton recovery, develop partnerships with other material sectors, and advance supportive legislative or regulatory action. This includes organizing cross-sector coalitions like the Michigan Pro-Recycling Business Alliance, participating in key forums such as ISRI and SWANA, and advising national and state-level packaging policy. Through this work, RRS supports CCNA's mission to protect and grow end markets for cartons while improving system-wide recovery outcomes.

## **CIRCULAR ACTION ALLIANCE**

### **Oregon Recycling Systems Optimization Project**

RRS supported CAA's development of the Oregon Program Plan under the state's Recycling Modernization Act (RMA) by leading the execution of the Oregon Recycling Systems Optimization Project (ORSOP). The focus was on expanding recycling services and designing effective producer responsibility programs. The team managed client communications, overseeing strategic direction, and coordinating data collection from local jurisdictions to ensure the alignment of efforts with RMA's goals. This research was used to develop a comprehensive database, inventory, and cost estimate of program investments needed to meet obligations of the RMA framework. This work provided an accurate, data-driven estimate of the needs and associated costs of system expansion to support the implementation of Oregon's extended producer responsibility regime. This allowed CAA to reduce cost projections by hundreds of millions of dollars.

## **HIGH COUNTRY CONSERVATION CENTER**

### **C&D Diversion Policy**

RRS supported High Country Conservation Center and Summit County, Colorado, in the development of a local policy framework designed to increase the diversion of construction and demolition (C&D) materials from landfill disposal. The work built on the County's 2019 Waste Diversion Study and its five-year C&D Plan. The effort culminated in a C&D Diversion Policy Framework that outlines actionable pathways for local governments to require C&D materials recovery through permitting and enforcement mechanisms.

The final product was shaped by a detailed review of the County's unique infrastructure and market conditions, a benchmarking analysis of comparable communities, and engagement with regional stakeholders and local governments. RRS considered seasonal tourism-driven population fluctuations, available and emerging recovery infrastructure, local workforce capacity, and cost implications for construction project owners and builders. The resulting policy framework provides Summit County with a practical, tailored roadmap to implement ordinances and policies that will contribute meaningfully toward its goal of 40% waste diversion by 2035.

## **FOODSERVICE PACKAGING INSTITUTE**

### **Community Partnerships**

The Foodservice Packaging Institute (FPI), the trade association for the North American foodservice packaging industry, is dedicated to increasing the recovery of its members' products through recycling, composting, or energy recovery. This ongoing effort is targeted at overcoming barriers to the recycling and composting of foodservice packaging including hot and cold cups, fiber and resin-based take-out containers, pizza boxes and paper bags. RRS has worked with FPI on several facets of foodservice packaging recovery including research, end market development, collaborative projects with other industry groups, communications, and outreach. RRS has built an extensive website, [www.recyclefsp.org](http://www.recyclefsp.org), with resources for communities, MRFs, composters, end markets, and other stakeholders. Utilizing blog posts, webinars, speaking engagements, press releases, social media, and newsletter/emails, RRS supports the client's growth as the subject matter expert on foodservice packaging recovery. RRS has also supported FPI's Community Partnership program. The program partners with vetted communities to increase acceptance of foodservice packaging in curbside programs nationwide. RRS supports this program by conducting outreach to stakeholders (e.g., MRFs, haulers, end markets, composters, and communities), collecting data on waste stream composition and other program parameters, as well as developing and executing a communications plan. Communications collateral is developed in collaboration with each community partner to complement its existing outreach efforts. Metrics are reviewed at key milestones and a refresh campaign is encouraged to continue engagement with residents beyond the initial campaign launch.

## **Project Management and Report Development**

Effective project management and clear, actionable reporting are integral to every engagement delivered by Signalfire Group. Each project we undertake is managed through a defined structure that emphasizes communication, quality assurance, and on-time delivery. Our work consistently produces concise, data-driven

reports that guide state agencies, producer responsibility organizations, and private-sector clients in decision-making and policy development.

- For the *Oregon Department of Environmental Quality's Recycling Modernization Act implementation*, our team coordinated complex multi-stakeholder workstreams and delivered a series of technical memos and a comprehensive final report synthesizing program design recommendations for EPR rollout.
- For the *Vermont Department of Environmental Conservation's Bottle Bill system analysis*, we managed all phases of research, data validation, and stakeholder interviews, producing a policy options report that informed state-level decision-making on deposit return modernization.
- For the *Natural Resources Council of Maine*, we developed data methodologies, coordinated stakeholder outreach, and synthesized findings into a transparent reimbursement formula and accompanying policy documentation for Maine's first EPR for packaging law.

Across all projects, our team applies standardized project management tools, regular internal coordination, and multi-level review processes to ensure consistency and accuracy. This disciplined approach enables us to produce high-quality, well-structured reports that translate complex information into actionable strategies for our clients.

## References

### **Craig McOmie, WDEQ | Manager, Landfill Remediation and Cease & Transfer Programs**

(307) 473-3487 | [craig.mcomie@wyo.gov](mailto:craig.mcomie@wyo.gov)

**Scrap Tire Study** - RRS is evaluating Wyoming's scrap tire management system, including statewide stockpile assessments, cleanup planning, and development of a long-term sustainable program framework. The project includes data analysis, stakeholder coordination, and cost modeling to inform future program design. Findings will guide the state's strategy for tire recycling, processing, and regulatory improvement.

### **David Allaway, ORDEQ | Senior Policy Analyst**

[allaway.david@deq.state.or.us](mailto:allaway.david@deq.state.or.us)

**Recycling System Frameworks** - RRS was engaged by Oregon DEQ to evaluate alternative governance frameworks for modernizing the state's recycling system following market disruptions in 2017. The study analyzed five scenarios, including government-managed and EPR models, to improve system accountability and funding stability. The findings informed Oregon's subsequent development of statewide EPR legislation for packaging and printed paper.

## Attachment A

# David Stitzhal, MRP

**SIGNALFIRE GROUP MANAGING PARTNER**  
**FULL CIRCLE ENVIRONMENTAL, INC. PRESIDENT**

**STITZHAL@FULLCIRCLEENVIRONMENTAL.COM**  
**Operates Out of Seattle, Washington**



With over 35 years in environmental planning, David has developed strategic professional contacts in government, the business community, schools, non-profits, academic institutions, and environmental agencies. His diverse network of relationships allows him to draw upon appropriate resources as needed; he is as at home in policy development as he is in program implementation. David's competent and efficient management has resulted in a professional record of successful and award-winning projects completed on time and within budget. He has worked closely with manufacturers, retailers, recyclers, residential and commercial property managers, schools, and hundreds of businesses to bring about major and minor behavior change, resulting in increased energy conservation, recycling, composting, green purchasing, water protection and waste reduction. He is creative and results-oriented in his planning and implementation, and communicates equally well with residents, property managers, policymakers, businesses, industry, custodians, and other key stakeholders.

David has been particularly recognized for his long-standing work in Extended Producer Responsibility. He played a direct role with diverse public and private stakeholders in bringing about first-in-the-US EPR programs for electronics, pharmaceuticals, and packaging among other materials. Throughout his fifteen years as Coordinator of the Northwest Product Stewardship Council, and integral to his central consulting role in supporting producers in designing and complying with EPR program, David has designed and implemented surveys, facilitated focus groups, engaged stakeholders, provided direct public outreach, and crafted public engagement programs based on community-based social marketing principles.

David demonstrates a deep understanding of the interface between individual behavior and program design. He has drawn upon this knowledge to develop policy guidance, legislation, and to design programs that address challenging materials in complex situations, including such products as used motor oil, paint, electronics, mercury-containing lighting, mattresses, pharmaceuticals, packaging, and home carwash effluent.

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## PROJECT HIGHLIGHTS

### **Confidential Client - Deposit Return System (DRS) Policy Support**

Provided policy support for the development of a position paper on Deposit Return Systems (DRS). His contributions included reviewing and editing draft materials, advising on legislative tracking, and refining key messaging and layout. He also participated in client meetings and coordinated communications to help align the paper with evolving policy frameworks.

### **Circular Polymers - Carpet EPR Legislation Support**

Provided policy research and stakeholder engagement support to assess state-level readiness for carpet extended producer responsibility (EPR) legislation. He conducted interviews with agency staff, nonprofit advocates, and recycling industry representatives in priority states. His work involved

evaluating model bill language, synthesizing input from outreach, and identifying opportunities for legislative advancement in key jurisdictions.

#### **Coalition for High-Performance Recycling (CHPR) - On-Demand Policy Support – Washington Campaign**

Provided on-demand legislative and stakeholder engagement support for CHPR's Washington State campaign. He tracked state policy developments, coordinated with advocacy partners, and contributed to strategy discussions on extended producer responsibility (EPR) and deposit return systems (DRS). His work included reviewing and drafting testimony, managing communications with local coalitions and stakeholders, and supporting CHPR's presence at legislative hearings, forums, and receptions.

#### **EPR and Recycling Refunds Coalition - Coalition Management and Legislative Strategy**

Supported strategic planning and stakeholder engagement for the EPR and Recycling Refunds Coalition. His work included coalition coordination, policy research, meeting facilitation, and the development of legislative timelines and strategy decks. He helped organize and participate in lobbyist recruitment, developed key discussion materials for roundtables and subcommittee sessions, and provided ongoing support for partner outreach and steering committee updates. His efforts directly contributed to shaping legislative direction and refining advocacy approaches.

#### **Michigan Environmental Council - Policy Support**

Supported policy development efforts for the modernization of Michigan's bottle bill. His contributions included reviewing legislative drafts, analyzing key policy provisions, and participating in internal strategy and planning discussions. He also provided feedback on deposit system language and coordinated with team members to align on DRS-related content and messaging.

#### **Niagara County, New York – Implementation of the Solar Panel Law**

Supported Niagara County in the early implementation of its solar panel stewardship law. He participated in project kickoff and planning meetings, reviewed key program documents, and provided feedback on draft rules and regulations. His work included advising on installer outreach, enforcement strategies, and regulatory timelines, as well as coordinating with local stakeholders to align on compliance and communication materials.

#### **Natural Resources Council of Maine – EPR for Packaging Law Implementation**

Contributed technical support to the Natural Resources Council of Maine during the early implementation phase of the state's EPR for Packaging law. He worked on the development of reimbursement and fee-setting formulas, as well as defining performance targets for the new program. His contributions helped ensure that municipal funding and producer obligations were grounded in practical, equitable frameworks.

#### **Signalfire Policy Analysis - Policy Development and Communications Strategy**

Supported the development of a policy-focused newsletter and on-demand research for Signalfire, contributing to content creation, editorial planning, and strategy. His work included coordinating with internal and external stakeholders, refining messaging, and shaping outreach materials to support engagement on issues like reverse logistics and circular economy policy trends.

#### **Confidential Client – Packaging Recycling Policy Support**

Provided long-term policy support to a national nonprofit focused on improving packaging recycling systems. He contributed to extended strategy development, legislative tracking, stakeholder coordination, and facilitation of state-level policy discussions. His work included preparing for, managing, and facilitating State Leaders Forums, advising on EPR and DRS program development, and drafting supporting materials to guide legislative and regulatory planning across multiple states.

#### **US Tire Manufacturers Association – Connecticut Tire Stewardship Organization Set Up Planning**

Supported early-stage planning for the formation of a tire stewardship organization (TSO) in Connecticut, working closely with industry stakeholders and USTMA. His role included reviewing draft organizing documents, designing and facilitating internal strategy discussions, coordinating outreach planning, and supporting meeting logistics for the developing TSO workgroup. He also contributed to naming, branding, and organizational structure discussions, including distinctions between nonprofit and LLC options.

#### **Vermont Dept. of Environmental Conservation – Recycling System Analysis Study**

Supported Vermont's statewide recycling system review by contributing to analysis of alternative system models, including a producer responsibility-managed bottle bill (Model 2). His work included preparation and participation in project kickoff meetings, review of program design options, and collaboration with project leads to evaluate feasibility and implementation considerations for extended producer responsibility (EPR)-based models.

#### **SELECTED PUBLICATIONS**

Schoening, Joel; Dimino, Resa; Hickle, Garth; Stitzhal, David: "Coalitions: The EPR Differentiator." *Resource Recycling*; March, 2024.

Ellner, Adam; Stitzhal, David: "Where Rubber Meets Road." *Resource Recycling*; September, 2023.

Dimino, Resa; Hickle, Garth, Stitzhal, David: "In our opinion: How EPR picked up steam in 2023;" *Resource Recycling*; August, 2023.

Dimino, Resa; Hickle, Garth, Stitzhal, David: "How do we create consistency across EPR while recognizing that every state has unique needs?" *Resource Recycling*; December, 2022.

Stitzhal, D. MRP, "The Northwest Product Stewardship Council: A Lever Long Enough?" *Pollution Prevention Review*, Volume 10, No. 4, Autumn 2000.

#### **EXPERIENCE**

- Full Circle Environmental, Inc., President (President, 1993 to present)
- Seattle-China Environmental Business Exchange (Managing Partner)
- Resource Logic Consulting (Managing Partner)
- Washington Citizens for Recycling (Statewide Project Director)
- Cornell University Waste Management Institute (Researcher/Analyst)
- Chemung County, NY Solid Waste District (Assistant to the Solid Waste Manager)

**EDUCATION/CERTIFICATION**

**Cornell University, Ithaca, New York**

Master of City and Regional Planning

**Swarthmore College, Swarthmore, Pennsylvania**

Bachelor of Arts, Sociology/Anthropology, Psychology

**Community Based Social Marketing: Introductory and Advanced Training Certificates**

Trainer: Doug McKenzie-Mohr

# Resa Dimino

**SIGNALFIRE GROUP MANAGING PARTNER**

**RESA@RECYCLE.COM**

**Operates Out of Metro Albany Area, New York**



Resa Dimino brings 35 years of experience in waste reduction, recycling, product stewardship, solid waste management, and environmental economic development. She thrives at the intersection of policy and operations, bringing an operational grounding to policy development and a policy context to operational issues. Resa has worked in recycling businesses (Bronx 2000 / Big City Forest, WeRecycle!) and with trade groups (NAPCOR) and served as the lead policy staff for the New York State Department of Environmental Conservation (DEC). While at DEC, she managed the development of the state's Beyond Waste 10-year sustainable materials management strategy and helped to formulate the state's e-scrap EPR legislation. Resa is currently focusing on collaborative initiatives to improve recovery, increase sustainability, and facilitate product stewardship. She has extensive experience and deep networks in the recycling policy sector, including NGOs, trade groups and government entities active in the space. She has managed and directed multiple recycling supply chain and infrastructure gap analyses for public and private sector clients. Resa holds a Bachelor of Arts in American studies with a concentration in environmental studies and is the founder and current board member of the New York Product Stewardship Council.

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## PROJECT HIGHLIGHTS

### **Confidential Client - California Statewide Paper Recycling Rates**

RRS performed a comprehensive analysis of California's paper recycling rates across residential and industrial, commercial, and institutional (ICI) sectors. This initiative focused on gathering and analyzing data on the recycling system's performance and identifying policy recommendations to improve paper recycling infrastructure across the state. Contributed through policy discussions and strategic communications, and played a key role in shaping the strategic direction of the project by providing expert insights into the policy landscape and reviewing the project's initiation and management process.

### **Circular Action Alliance - Waste Systems Mapping Insights in California**

RRS is assessing California's sorting and processing infrastructure as part of a statewide waste systems mapping initiative. Played a critical role in facilitating meetings with CalRecycle and guiding the team's approach to gathering MRF data. Closely involved in discussions around reimbursement model recommendations, ensuring that financial strategies align with the goals of improving California's recycling system infrastructure, and will continue providing strategic guidance on this project going forward.

### **Circular Action Alliance - Oregon Recycling System Optimization**

Oversaw RRS' support of the Oregon Program Plan under the state's Recycling Modernization Act (RMA). This project was focused on expanding recycling services and designing effective producer responsibility programs across Oregon. Contributions included managing client communications and the strategic direction of the project. Work helped ensure the gathering of critical data from local jurisdictions, which will inform the broader strategy to improve recycling services and compliance with the RMA's goals.

### **State University of New York - New York Needs Assessment**

RRS conducted a comprehensive gap analysis of New York State's recycling system. Supported the project planning and scoping efforts, collaborating on data validation and stakeholder outreach, and overseeing the preparation of reports. Managed the coordination of various teams, leads client check-ins, and refines survey processes. Responsibilities also included drafting and editing reports, organizing presentations, and collaborating with stakeholders to ensure that the assessment aligns with New York's sustainability goals and strategic objectives.

### **Vermont Department of Environmental Conservation - Recycling System Analysis Study**

The Signalfire Group, a policy-focused subsidiary of RRS, is working with Vermont DEC to assess the state's beverage container redemption system under the Bottle Bill (BB) to explore improvements in efficiency and environmental impact. Performed critical work in developing and reviewing the project's workplan, overseeing data outreach and analysis, and guiding the planning process. Examined efficiency of the BB system, including creating models to evaluate the impacts of a PRO-managed system. Role includes conducting research, reviewing data diagrams, and participating in brainstorming sessions to explore innovative approaches for improving environmental and operational outcomes in the state's recycling infrastructure.

### **Canadian Stewardship Services Alliance - Material Cost Differentiation**

Led team on the Material Cost Differentiation (MCD) contract with the Canadian Stewardship Services Alliance to define the methodology used to measure each material's impact on the cost of the recycling system activities based on its characteristics.

### **Oregon DEQ - Recycling Systems Frameworks**

Coordinated collaborative team to research alternative legal and relational frameworks with sustainable materials management and circular economy objectives; exploring the existing residential and commercial recycling system and evaluated ten alternative existing frameworks and five potential framework scenarios in terms of how well each fulfills a pre-defined set of criteria that together characterize a well-structured, sustainably funded, high performing recycling system.

### **Regional Materials Management Organization - Packaging EPR Study**

Researched Extended Producer Responsibility for Packaging and Printed Paper in the U.S., developing a briefing paper on the current state of play with regard to EPR for PPP in the U.S. generally, and in key states, with a focus on stakeholder perspectives and their evolution (if any) over time.

### **Call2Recycle – Vermont Primary Battery Program Assessment**

Resa led critical components of this statewide program assessment for Vermont's primary battery stewardship system. Her role included developing and conducting stakeholder interviews (e.g., retailers, municipalities, processors), synthesizing site-specific insights, and reviewing collection cost data, processing logistics, and overall system performance. She collaborated closely with technical and policy team members to analyze qualitative feedback alongside quantitative performance metrics, culminating in a comprehensive recommendations report delivered to both the client and state regulators. The project showcased her ability to integrate field-based research with strategic policy insights and contribute to actionable improvements for a complex EPR system.

### **Carton Council – Legislative & Regulatory Policy Support**

Resa provided ongoing strategic policy support to the Carton Council, including legislative analysis, development of policy positions, and issue education across multiple states. Her work involved stakeholder engagement with internal and external partners, preparation of formal comment letters

(e.g., for WA SB1900), and synthesis of evolving regulatory frameworks. She played a central role in team coordination, internal policy alignment, and advocacy planning. This work required a multidisciplinary approach and combined qualitative policy review with quantitative analysis of state-specific data to inform Carton Council's national strategy.

#### **Northwest Product Stewardship Council Support – Cascadia Consulting**

Resa led and supported policy development and stakeholder engagement for the NWPSC, focusing on extended producer responsibility (EPR) and packaging policy. Her work included in-depth research on producer and packaging definitions, chemical recycling, FDA exemptions, and policy language development. She facilitated Packaging Policy Committee (PDT) meetings, prepared briefing materials, and developed strategic talking points on complex topics. This role required synthesizing technical, regulatory, and stakeholder inputs across jurisdictions and supported the Council's position on materials management policy in the Pacific Northwest.

#### **Circular Action Alliance – On-Demand Support**

Resa contributed to the development of a national extended producer responsibility (EPR) system for packaging through her work with Circular Action Alliance. She reviewed and advised on complex technical modeling frameworks (CTM), assessed and refined key system design elements such as material categorization, bulk densities, and mapping approaches, and authored recommendation memos for stakeholder and client review. Her role required integration of quantitative analysis, policy strategy, and systems modeling, demonstrating a multidisciplinary skillset and an ability to synthesize complex data for practical policy implementation.

#### **Circular Polymers – Carpet EPR Legislation Strategy**

Resa led development and strategic support for model extended producer responsibility (EPR) legislation specific to post-consumer carpet recycling. Her work included identifying priority states for potential adoption through qualitative legislative scans and stakeholder engagement; drafting and refining model legislative text; and preparing educational and advocacy materials. She provided strategic consultation to clients and collaborated with policymakers, nonprofits, and industry partners, demonstrating both deep policy expertise and the ability to coordinate multidisciplinary stakeholder processes to advance circular economy outcomes.

#### **Natural Resources Council of Maine – EPR for Packaging Implementation Support**

Resa contributed to the successful implementation of Maine's first-in-the-nation extended producer responsibility (EPR) for packaging law by developing data methodologies and conducting stakeholder outreach to inform the municipal reimbursement funding formula. Her work involved designing and distributing surveys to municipalities and materials recovery facilities (MRFs), conducting interviews with stakeholders, and synthesizing quantitative and qualitative data to support fair and transparent cost allocation. This project highlights her strengths in policy design, stakeholder engagement, and applied data analysis in support of complex systems change.

#### **PAST EXPERIENCE**

- Signalfire Group - 2021- Present; Partner
- RRS - 2017 – Present; Managing Partner
- Radimino & Associates - 2012 – 2016: Principal
- WeRecycle! (Now Sage Sustainable Electronics) - 2011 – 2012: Director Of Legislative Programs

- New York State Department Of Environmental Conservation - 2007 – 2011: Special Assistant; 2009 – 2010: Acting Director, Commissioner's Policy Office
- Bronx River Alliance - 2002 – 2007: Director Of Programs & Development
- Office of the Bronx Borough President - 2001 – 2002: Environmental Analyst, Planning and Development

## EDUCATION

### **Dickinson College**

*Bachelor of Arts, American Studies with a concentration in Environmental Studies*

# Apurupa Gorthi

**SIGNALFIRE AND RRS CONSULTANT**

**AGORTHI@RECYCLE.COM**

**Operates out of Plymouth, Minnesota**



Apurupa Gorthi is an environmental policy and sustainability professional with seven years of experience advancing circular economy and Extended Producer Responsibility (EPR) initiatives across public, private, and nonprofit sectors. She combines technical analysis, policy research, and project management to help organizations navigate emerging recycling and packaging regulations in North America and internationally. Her work spans regulatory tracking, data modeling, stakeholder engagement, and strategic implementation support for EPR programs in multiple jurisdictions. Apurupa has contributed to high-impact projects with state agencies, producer responsibility organizations, and industry coalitions, including the development of eco-modulation frameworks, compliance planning, and EPR policy analysis. She is known for her ability to translate complex data and policy information into clear, actionable insights and for maintaining strong coordination across diverse teams and partners. Apurupa holds a Master of Science in Earth, Atmospheric, and Planetary Science from Purdue University and a Bachelor of Engineering in Chemical Engineering from Ramaiah Institute of Technology.

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## PROJECT HIGHLIGHTS

### **2025 Signalfire Policy Services**

Supported Signalfire's policy consulting services through content development, project coordination, and on-demand analysis. She contributed to EPR implementation strategy in California and Oregon, conducted policy research, and developed content for the firm's monthly policy newsletter. She also provided rapid-response support for Foodservice Packaging Institute (FPI), helping track and interpret packaging-related legislation and industry developments.

### **Carton Council – 2025 Legislative & Regulatory Support**

Provided analytical and coordination support to Carton Council's policy team, assisting with legislative and regulatory tracking across multiple states. Her work included monitoring EPR and recycling-related policy developments, analyzing regulatory documents, and maintaining internal systems to support response planning. She also contributed to the development of Carton Council's policy positions and assisted with internal administrative processes related to strategic advocacy efforts.

### **Circular Action Alliance (CAA) – On-Demand Support**

Contributed research, analysis, and technical writing to support Circular Action Alliance's efforts to develop eco-modulation strategies under extended producer responsibility (EPR) frameworks. Her work included reviewing and synthesizing post-consumer resin (PCR) content policies, drafting memos and guidance documents, and collaborating with technical teams to produce detailed deliverables related to eco-modulation design. She played a key role in finalizing documentation and supporting strategic planning discussions.

### **Circular Materials – Methodology Review and Technical Support for MCD Framework**

Supported Circular Materials' review and refinement of its Material Category Definitions (MCD) methodology. She contributed to the harmonization of material reporting categories across producer responsibility organizations (PROs), participated in technical meetings, reviewed stakeholder input, and analyzed existing framework documentation. Her work included collaborative evaluation of system boundaries, conceptual design considerations for recycling systems, and contribution to evolving workstreams based on emerging project scope.

### **Interchange Recycling – Packaging EPR Compliance and Policy Strategy**

Led the development of compliance strategies for emerging Extended Producer Responsibility (EPR) packaging laws in Minnesota, Washington, Maryland, and Rhode Island. She supported Interchange Recycling with state-specific response planning, including the finalization of Minnesota's compliance plan, legal and policy analysis, and stakeholder consultation. Apurupa also contributed to advisory content and eco-modulation slide updates to support Interchange's strategic engagement in EPR implementation across jurisdictions.

### **Minnesota Pollution Control Agency – Resource Management Report Stakeholder Engagement**

Led stakeholder engagement for MPCA's Resource Management Report with a focus on reuse and extended producer responsibility. She conducted more than a dozen stakeholder interviews across industry, NGOs, and government representatives, coordinating outreach, scheduling, and documentation. Apurupa also contributed to an environmental justice-focused consultation session, supporting inclusive data gathering for policy development. Her work included preparing interview materials, tracking feedback, and synthesizing stakeholder insights to inform state-level materials management strategy.

### **Confidential Client – National Packaging Recycling Policy Support**

Contributed to ongoing policy advisory services for a confidential client focused on improving packaging recycling systems. Her work included research and strategy development on Responsible End Market (REM) criteria, participation in weekly planning and stakeholder coordination meetings, and preparation of materials to support state and local government engagement. Apurupa supported ideation on regulatory frameworks and synthesized insights from policy roundtables to inform future guidance.

## **EXPERIENCE**

- The Recycling Partnership – Senior Manager, Plastics Recycling Engineer (10.2023 – 1. 2025)
- International Forum on Environment, Sustainability & Technology, Program Associate - Waste Management (9.2020 – 1.2023)
- Council on Energy, Environment and Water – Research Analyst (5.2018 – 3.2020)

## **EDUCATION/CERTIFICATION**

### **Purdue University, West Lafayette, Indiana**

Master of Science in Earth, Atmosphere, and Planetary Science

### **Ramaiah Institute of Technology, Bangalore, India**

Bachelor of Engineering, Chemical Engineering

# Garth Hickle

**SIGNALFIRE GROUP MANAGING PARTNER**

**GARTH@HICKLE.COM**

**Operates Out Of St. Paul, Minnesota**



Garth Hickle is Signalfire Group partner and an associate senior consultant at RRS with over 35 years of experience and expertise in environmental policy, product policy, product stewardship, recycling, producer responsibility, product certification, eco-labels, materials management, sustainable consumption and production, and circular economy. He led the Minnesota Pollution Control Agency product stewardship program for 15 years and served as the MPCA technical lead on product stewardship at the legislature. He was lead author of the Minnesota solid waste policy report and contributed to the pollution prevention evaluation report. He represented MPCA in international and national initiatives and symposia on product stewardship, recycling policy, and sustainable materials management. Dr. Hickle is also a senior lecturer in bioproducts and biosystems engineering at the University of Minnesota.

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## PROJECT HIGHLIGHTS

### **Multi-Client Confidential Engagement – Signalfire Policy Services**

Contributed strategic insight and policy analysis as part of a cross-functional team producing a national newsletter that tracked developments in EPR and recycling legislation across the U.S. He developed and reviewed presentations and written materials for state-level hearings (e.g., New Jersey, Minnesota), providing expert commentary on packaging and needs assessment bills. His work involved qualitative legislative analysis, distillation of complex policy language, and communication with multiple client stakeholders. This role required strong synthesis of legislative trends, deep subject-matter expertise in EPR, and a collaborative, multi-client coordination approach to ensure timely and relevant policy intelligence.

### **Carton Council – Legislative and Regulatory Analysis for Extended Producer Responsibility (EPR) Programs**

Conducted comprehensive tracking and analysis of state and federal legislative and regulatory developments related to packaging EPR and post-consumer recycled (PCR) content standards. His work included preparing detailed bill summaries (e.g., NJ and RI legislation), interpreting complex statutory language, and supporting policy calls with industry stakeholders. Garth also contributed to implementation support by reviewing regulatory proposals and documenting PCR requirements. This work required in-depth policy expertise, strategic communication skills, and the ability to translate nuanced regulatory shifts into actionable insights for client decision-making.

### **Circular Polymers – Regulatory Support for New York Carpet EPR Rulemaking**

Led the drafting and review of regulatory language for the implementation of New York's carpet extended producer responsibility (EPR) program. His work included developing comments on proposed regulations, coordinating with legal and industry stakeholders, and participating in meetings with the New York Department of Environmental Conservation (DEC). He supported the client's engagement strategy through stakeholder calls, position letter drafting, and direct regulatory analysis, ensuring alignment with state policy goals and program requirements.

### **Coalition for High-Performance Recycling – Legislative Campaign Support for Washington EPR Bill**

Provided strategic legislative support for CHPR's campaign to advance extended producer responsibility (EPR) legislation in Washington State. He drafted and revised bill language, created supporting documents, and coordinated closely with stakeholders including CHPR representatives, NWPSC, and distributors. Garth facilitated

and participated in weekly campaign meetings, legislative hearings, and subcommittee sessions, offering detailed analysis and edits to proposed policy language. His work played a key role in preparing legislative summaries, responding to stakeholder feedback, and aligning policy proposals with campaign goals across Washington and other states

#### **Multi-Stakeholder Coalition - EPR and DRS Policy Strategy**

Supported the EPR and Recycling Refunds Coalition through in-depth policy analysis, legislative drafting, and coalition coordination. He developed and refined key provisions for an extended producer responsibility (EPR) and deposit refund system (DRS) model bill, engaging in regular collaboration with stakeholders and internal teams. Garth led the drafting of policy language and strategic documents to support implementation pathways, facilitated coalition meetings, and provided detailed guidance during Washington state legislative planning. His work helped align policy recommendations across coalition members, focusing on practical implementation strategies and multi-state legislative harmonization.

#### **Interchange - Packaging EPR Policy Planning and Implementation Support**

Provided policy guidance and strategic input for Interchange Recycling's response to emerging packaging EPR laws. He contributed to the development of tailored state response plans and reviewed and refined presentations, MOUs, and regulatory summaries. His work involved stakeholder engagement through advisory board meetings and calls with implementation partners, as well as in-depth research and analysis of state-specific EPR requirements. Garth helped translate legislative and regulatory developments into actionable strategies and communication materials for internal and external stakeholders.

#### **Niagara County, New York - Solar Panel Law Implementation & Enforcement Support**

Supported Niagara County in the rollout and enforcement of its solar panel decommissioning and recycling law. He participated in monthly calls to review sustainability and enforcement plans, provided ongoing feedback on program documentation, and advised on best practices for solar waste management. His work contributed to refining plan review procedures and evaluating early-stage program performance.

#### **Extended Producer Responsibility Implementation & Policy Communications – Colorado and National Scope**

As part of the Signalfire Policy Services team, Garth supported the rollout of Colorado's EPR program, participating in advisory board and stakeholder rulemaking meetings. He contributed to policy research, webinar engagement, and inter-organizational coordination across multiple states. Additionally, he played a lead role in drafting and reviewing national newsletters that synthesized key developments across EPR programs, offering strategic insights for government and industry audiences. His work bridged quantitative policy tracking with narrative policy analysis and communication.

#### **Regional Materials Management Organization - Packaging EPR Study**

Researched Extended Producer Responsibility for Packaging and Printed Paper in the US, developed a briefing paper on the current state of play with regard to EPR for PPP in the US generally, and in key states, with a focus on stakeholder perspectives and their evolution (if any) over time.

#### **Consumer Technology Association (CTA) - State E-Scrap Audit Program**

Audited the e-scrap EPR programs in New Jersey, Connecticut, and Maine. Developed an audit protocol to guide activities in each of the three states. Included both desk audit of records on origin and destination of materials, followed by field visits to key facilities.

#### **Global Food and Beverage Company Foundation - Global Recycling and Ocean Plastics Planning**

Assessed recycling systems and consumer recycling behavior in key global markets. Identified and developed recommendations for general funding areas relevant to the markets.

### **EXPERIENCE**

- Signalfire Group - 2021-Present; Partner
- Resource Recycling Systems - 2018-Present: Associate Senior Consultant
- Independent Consultant; 2017-Present
- Minnesota Pollution Control Agency - 2001-2017: Product Stewardship Team Leader

- Minnesota Office of Environmental Assistance - 1996-2001: Senior Policy Analyst
- Minnesota Public Interest Research Group - Resource Conservation Advocate, 1993-1994; Program Advocate, 1991-1993
- Minnesota State Senate - Legislative Page, 1989-1990

## ACADEMIC APPOINTMENTS

### University Of Minnesota

Visiting Scholar, 2017- Present

Institute On The Environment, University Minnesota

### University Of Minnesota

Senior Lecturer, 2009-present

## EDUCATION/CERTIFICATION

### Erasmus University, Rotterdam, The Netherlands

Doctor Of Philosophy In Cleaner Production, Cleaner Products, Industrial Ecology And Sustainability

### Hamline University St. Paul, Minnesota

Master Of Arts In Public Administration

### Vermont Law School, Royalton, Vermont

Master Of Studies In Environmental Law And Policy

### The College Of Wooster, Wooster, Ohio

Bachelor of Arts, History

## SELECTED PRESENTATIONS

- Sustainable Packaging Coalition, January 2022
- Conference on Canadian Stewardship, Vancouver, Canada, November 2019
- International Solid Waste Association, Bilbao, Spain, October 2019
- Efficient WEEE Recycling, Munich, Germany, June 2018
- 18th International Electronics Recycling Congress IERC, Salzburg, Austria, January 2018
- International Electronics Management Network 7<sup>th</sup> Annual Workshop, Jakarta, Indonesia, October 2016
- International Solid Waste Association, Baltimore, Maryland, September 2017
- International Society for Industrial Ecology, Chicago, Illinois, June 2017
- International Electronics Management Network 6<sup>th</sup> Annual Workshop, Kuala Lumpur, Malaysia, October 2016
- RDN Latin American ISWA Beacon Conference on Extended Producer Responsibility, Buenos Aires, Argentina, April 2016
- International Electronics Management Network 5<sup>th</sup> Annual Workshop, Bogota, Colombia, September 2015
- International Workshop on Extended Producer Responsibility for Waste Electrical and Electronic Equipment, Beijing, China, May 2015

## PUBLICATIONS

### BOOK CHAPTERS

Hickle, Garth T.(2009) "The Changing Landscape: Laws and Regulations." In *Packaging Sustainability: Tools, Systems and Strategies for Innovative Package Design*, edited by Wendy Jedlicka. J. Wiley & Sons.

### REFEREED ARTICLES

1. Hickle, G.T. (2015). Extending the boundaries: an assessment of the integration of extended producer responsibility within corporate social responsibility. *Business Strategy and the Environment*.

2. Hickle, G. T. (2014). An examination of governance within extended producer responsibility policy regimes in North America. *Resources, Conservation and Recycling*, 92, 55-65.
3. Hickle, G. T. (2014). Moving beyond the “patchwork:” a review of strategies to promote consistency for extended producer responsibility policy in the US. *Journal of Cleaner Production*, 64, 266-276.
4. Hickle, G. T. (2013). Comparative analysis of extended producer responsibility policy in the United States and Canada. *Journal of Industrial Ecology*, 17(2), 249-261.

#### **OTHER ARTICLES**

1. Hickle, G. (2010). Embracing the “blue box” stewardship model: A framework for enhanced recycling in the United States. *Environmental Quality Management*, 19(4), 21-28.
2. Hickle, G. (2007). Promoting product stewardship with eco-labels, certification programs, and product standards. *Environmental Quality Management*, 16(3), 1-9.
3. Hickle, G.T. (2007). [What's in a Policy?](#) Key Considerations for a Future Producer Responsibility Policy. *Packaging Design Magazine*. 5(10), 28.

#### **TECHNICAL REPORTS**

1. Solid Waste Policy Report. St. Paul: Minnesota Pollution Control Agency, 2012 (lead author).
2. Product Stewardship Recommendations Report. St. Paul: Minnesota Pollution Control Agency, 2009 (lead author).

#### **ASSOCIATION WORK/VOLUNTEERISM**

##### **SUSTAINABLE ELECTRONICS RECYCLING INITIATIVE**

*2014-present: Member, Board of Directors*

##### **AMERIPEN**

*2011-2017: Member, Technical Advisory Group*

##### **GLOBAL PRODUCT STEWARDSHIP COUNCIL**

*2008-present: Member, Board of Directors*

##### **ELECTRONICS RECYCLING COORDINATION CLEARINGHOUSE**

*2011-2017: Member, Executive Committee*

##### **ASSOCIATION OF STATE AND TERRITORIAL SOLID WASTE MANAGEMENT OFFICIALS**

*2010-2012: Chair, Sustainability Subcommittee*

# Isabelle Borkowski

**SIGNALFIRE AND RRS CONSULTANT**

**IBORKOWSKI@RECYCLE.COM**

**Operates out of Boulder, Colorado**



Isabelle is a highly skilled consultant specializing in recycling market research, policy analysis, and stakeholder engagement. Since joining RRS in 2021, she has built a robust portfolio, managing diverse projects across environmental sustainability, extended producer responsibility (EPR) legislation, and recycling infrastructure. Isabelle excels in synthesizing complex data into actionable insights, creating detailed policy matrices, and designing effective presentations and spreadsheets. Her expertise spans U.S. and global markets, having worked on projects ranging from policy landscape analyses for international retailers to EPR implementation support for packaging industries. Isabelle's educational background in environmental and public policy, coupled with her hands-on experience in analyzing and visualizing evolving recycling and packaging policies, demonstrates her dedication to advancing sustainable practices.

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## PROJECT HIGHLIGHTS

### **Multi-Funder Policy Analysis and Tracking – Signalfire Policy Services**

Supports a coordinated, multi-client policy analysis and implementation effort spanning producer responsibility initiatives across United States. Her work includes real-time legislative tracking, synthesis of state and federal policy developments, and preparation of strategic updates for clients. She contributes to the production of monthly policy newsletters and organizes deliverables that support informed decision-making across stakeholder groups. Through this engagement, Isabelle applies both quantitative legislative analysis and qualitative synthesis to support implementation of complex systems change in solid waste policy, while collaborating with a multidisciplinary team of policy analysts, program managers, and communications staff.

### **International Retailer – Landscape Policy Analysis**

Prepared policy landscape presentation including purpose, goals, history, trends, and forecasts for seven policy categories. Provided research assistance for EPR playbook presentation including breaking down each extended producer responsibility for paper and packaging products law into its key components for comparison across states & identifying most favorable alternatives of each component to help the client develop model legislation and a lobbying framework.

### **Northwest Product Stewardship Council – Policy Research and Support**

Analyzed the four enacted extended producer responsibility for paper and packaging products US laws for definitions, exclusions, and exemptions. Drafted and designed four extended producer responsibility for paper and packaging products producer responsibility decision trees/flow charts. Drafted and designed two summary matrices of extended producer responsibility for paper and packaging products producer and product exemptions.

### **Carton Council – Legislative and Policy Planning**

Project manages the Carton Council Policy Committee. Convenes weekly meetings to keep committee members up to date on high-priority legislative proposals and recommend and support strategic opportunities for engagement. Designed and maintains custom online policy tracking resource. Conducts threat analysis for each individual policy and develops policy position statements and decision trees to inform scope of influence. Conducted outreach as part of the Carton Council North America's initiatives to improve recycling policy and infrastructure for cartons. Engaged with stakeholders to analyze proposed and enacted policies across various categories and developed a comprehensive policy landscape analysis deck.

### **Circular Polymers – Carpet EPR Legislation Support**

Developed complete bill summary of New York state extended producer responsibility for carpet law and amendment. Developed complete timeline of implementation and requirements for recycling, post-consumer content, labeling and more.

#### **Niagara County, New York - Implementation of Local Solar Panel EPR Law**

Administrative project manager for project, including coordinating client-team meetings, taking notes, managing team action items, following up on research questions.

#### **Confidential Client – Recyclability Labeling & EPR Impact Analysis**

Isabelle supported a confidential federal agency in assessing the potential impacts of recyclability labeling and extended producer responsibility (EPR) programs across North America. She conducted research on Canadian and U.S. EPR implementation, synthesized regulatory and policy data, and contributed to interim and final reports. Isabelle produced policy maps, data visualizations, and Excel-based tools to support the analysis, applying both qualitative and quantitative methods. Her work showcased a strong ability to translate complex data into actionable insights and to collaborate across a multidisciplinary team to inform national-scale circular economy strategies.

#### **EPR and Recycling Refunds Coalition – Strategy, Facilitation, and Data Support**

Isabelle played a central role supporting a national coalition of organizations advancing extended producer responsibility (EPR) and deposit refund system (DRS) policies. Her work included managing coalition logistics, maintaining internal communications, and facilitating stakeholder coordination. She developed state prioritization frameworks, designed and formatted policy briefing materials and presentations, and supported cross-functional team meetings. Isabelle applied both qualitative and quantitative methods, including data visualization and comparative DRS policy analysis, to inform strategic planning. This project highlights her experience supporting multidisciplinary teams to align messaging, track deliverables, and support implementation of circular economy policy initiatives.

#### **Confidential Client – Packaging Policy Support**

Isabelle supported the development and refinement of state-specific Extended Producer Responsibility (EPR) response plans as part of a national packaging policy initiative. Her responsibilities included copyediting and designing policy presentations and Q&A materials for stakeholders in Maine, Maryland, Minnesota, Vermont, and Washington. She also contributed to state-by-state bill summaries, implementation timeline development, and research support on topics such as eco-modulation. Isabelle's work demonstrated strong attention to policy detail, effective visual communication, and the ability to coordinate complex materials across diverse jurisdictions. Her role emphasized cross-team collaboration and the application of qualitative policy analysis.

#### **PAST EXPERIENCE**

- Loyola School of Environmental Sustainability - Communications Intern, Public Relations Specialist (2020 – 2022)
- Plant Chicago - Small Business Intern (2021)

#### **EDUCATION/CERTIFICATION**

##### **Loyola University Chicago, Illinois**

Master of Public Policy

##### **Loyola University Chicago, Illinois**

Bachelor of Arts; Environmental Policy