State of Oregon Department of Environmental Quality

Revised Rule Concepts 5: Market Share and Modified Market Share

Plastic Pollution and Recycling Modernization Act (SB 582, 2001) Rulemaking Advisory Committee Meeting 2 of 5, Rulemaking 1

Summary

Statute directs the Environmental Quality Commission to establish a method for calculating "market share" in rule. Market share can be defined in many different ways. DEQ seeks additional feedback on proposed methods to calculate market share during the Sept. 28, 2022 Rulemaking Advisory Committee meeting.

DEQ proposes that a weight-based approach (either weight alone or weight multiplied by financial burden) is most feasible and a best match for "market share" as used in global Extended Producer Responsibility programs. After considering feedback from RAC members on July 20, DEQ proposes the following additional options for consideration:

- Establish a weight-based approach to calculate "market share" in rule. This would be used to identify the largest 25 producers and to establish the 10% Producer Responsibility Organization (PRO) market share threshold; and
- Establish in rule the term "modified market share," to be calculated using a financial burden approach. This would be used to allocate financial obligations among multiple PROs.

Background

ORS 459A.869 of the Plastic Pollution and Recycling Modernization Act ("Act") requires the Environmental Quality Commission to establish by rule "methods for calculating market share." The Act requires periodic evaluation of "market share" for two reasons: a) to identify the largest 25 producers, and b) to ensure that no PRO has a membership with a combined market share of less than 10 percent. A concept similar to combined market share could also be used to allocate financial obligations between multiple PROs; however, the Act does not use the term "market share" in that context.

During RAC meeting #1 (July 20, 2022) of Rulemaking 1 for the Act, DEQ presented two options for calculating market share: a) weight and b) weight multiplied by material-specific unit factors for financial burden ("financial burden"). After that meeting DEQ conducted research and consulted with individual RAC members, and others, knowledgeable about producer responsibility organization (PRO) fees to evaluate potential impacts of each option. This memo describes additional options for calculating market share.

Uses for market share

The Act stipulates that the market share of individual producers should be used to identify the 25 "large producers" and that all PROs must maintain at least a 10% market share to operate in Oregon's system. At the July 20 RAC meeting, DEQ proposed that PRO market share also form the basis to allocate financial obligations between multiple PROs. ORS 459A.869(9)(b)(B) directs EQC to establish by rule

standards and requirements for coordination plans and coordination between producer responsibility organizations.

Based on feedback from RAC members, additional discussions and review of statute, DEQ proposes to calculate "market share", as the term is used in the Act, on the basis of weight alone.

However, RAC members expressed particular interest in how different methods would impact allocation of financial obligations, which is the focus of the remainder of this memo. To confirm, the Act does not require "market share" to be used to allocate financial obligations between multiple PROs, but it does direct the commission to establish standards for coordination. To distinguish between "market share" as the term is used in statute and the allocation of financial obligations, DEQ proposes to define in rule a new term: "modified market share".

Considerations for evaluating methods of calculating "modified market share"

DEQ suggests the following additional considerations for evaluating weight and financial burden to calculate modified market share:

- Alignment: Seek an approach where producer financial burden is similar in either a multi-PRO landscape or a single PRO system.
- Financial burden unit factor: Develop a unit factor source to apply the financial burden method. Embedded considerations include accuracy, feasibility, circularity, inter-PRO dynamics, and appropriateness for use in Oregon's system.

Following is an analysis of how these two considerations apply to methods for calculating modified market share.

Alignment

To understand which of the two proposed methods would lead to the most aligned result (i.e., with producers paying similar amounts as they would have paid in a system with a single PRO), it is necessary to consider how producer membership fees are to be calculated per statute.

Per ORS 459A.884(2), an individual producer's contribution to cover PRO costs is calculated by weight (total amount of each material sold) multiplied by material-specific unit factor (the base fee rate).

In a single-PRO scenario, to set its fee schedule, the PRO would:
1. Estimate system-wide costs to the PRO.
2. Combine these costs with material-specific weight data received from its producer members (or projections/estimates) and information about the relative commodity values and costs of collecting, recycling, and expanding service for different materials.
3. Establish its material-specific base rates to generate adequate revenue from member producers to cover total costs and meet the requirements of ORS 459A.884(3)—namely that base rates are proportional to the financial burdens of individual materials on the PRO.
4. Then define eco-modulation formulas per criteria indicated in ORS 459A.884(4) that may result in individual producers paying fees that are higher or lower than the base fees, as a result of their individual choices involving material selection, impact disclosure, etc.

In a multi-PRO scenario, all of the steps described above would be taken within each PRO and would also factor in PRO modified market share. Each PRO would:

1. Multiply their modified market share by the estimate of total system-wide costs (which could be generated annually by the coordination body) to produce an estimate of their individual system-wide financial burden for the year.
2. Proceed with setting base rates and then apply eco-modulation formulas to produce membership fee schedules, as described above.

See Appendix A for mathematical representations of how system costs are calculated and apportioned to individual producers in single-PRO and multi-PRO systems.

Appendix B compares weight and financial burden methods to calculate modified market share. In the simplified example provided in Appendix B, the financial burden approach is the more aligned of the two methods, as long as the PROs' material-specific base rates and the material-specific financial burden unit factors used in the modified market share calculation both reflect relative financial burden of individual materials on the waste collection and recycling system.

Financial Burden Unit Factor

As indicated above, the accuracy of the financial burden unit factors used in the modified market share calculation is an important consideration in applying the financial burden approach: they should accurately reflect the relative financial burden of individual materials on the PRO's obligations. Additionally, it needs to be feasible to generate these factors on an annual basis, the factors should not introduce a source of mathematical circularity, they should be appropriate for use in Oregon's system, and they should not create unfavorable dynamics among PROs. Options for sourcing the financial burden unit factors can be compared with one another through the lens of these criteria.

Four potential sources of financial burden unit factors are:

1) Use the PROs' own annual base rates as the unit factors, generating a weighted average across the PROs for each material,
2) Use PRO base rates from another EPR system in the region, such as Recycle BC's base rates for British Columbia,
3) Establish in rule fixed, material-specific factors representative of their relative burdens on Oregon's waste collection and recycling system, or
4) Hire an outside expert or consultancy to annually develop a materials index that represents the up-to-date relative financial burden of materials on Oregon's waste collection and recycling system.

Following is a summary of pros and cons for each of these sources for financial burden unit factors. Appendix C includes a deeper analysis of these pros and cons.

Choice of Financial Burden Unit Factor		
Unit Factor Source	Pros	Cons
1) Oregon PROs' own annual base rates	Accurate, feasible, Oregon-appropriate	Need to use the previous year's data, which impacts accuracy (but this is not uncommon in financial systems), PRO accounting tied together if averaging across PRO base rates
2) Recycle BC base rates	Feasible, relatively accurate	Not specific/appropriate to Oregon
3) Factors fixed in rule	Feasible, transparent for PROs	Accuracy limited by fixed nature of factors
4) Independent consultant index	Accurate, Oregon-appropriate	Feasibility (extra annual burden on system)

One final consideration is that the four methods above could be combined in a hybrid approach. This might be necessary depending on the choice of method, as Oregon-specific data will be limited in year one. For example, sources 2 (Canadian province such as BC), 3 (fixed numbers), or 4 (consultant study) could be used for the purposes of calculating modified market share during year one, and then in subsequent years modified market share could be calculated using source 1 (Oregon PRO fee schedules) but relying on the prior years' published fee schedules in order to avoid circularity problems.

Appendix A. Calculating costs for individual producers in single-PRO and multi-PRO systems

Below, PROs' processes for attributing total EPR system costs (T) to individual producers (p) are represented as mathematical formulas, with one-PRO and multi-PRO scenarios indicated. Under an "aligned" approach to calculating modified market share, producers (1, 2…x) would bear similar financial burdens in a one-PRO as in a multi-PRO system.

ONE PRO

$$T = \sum_{p=1}^{x} \sum_{m=1}^{y} (W_{p,m} \times U_m)$$

Total system cost T is covered by aggregate producer fees that consist of weight (W) of product sold by producer (p) and material (m) multiplied by the material-specific base rate, which is a material-specific unit factor (Um), summed across all producers 1, 2…x and all materials 1, 2…y.

MULTI-PRO

OPTION A. WEIGHT-BASED

$$\left(\frac{\sum_{p=1}^{x} \sum_{m=1}^{y} (W_{R,p,m})}{\sum_{R=a}^{z} \sum_{p=1}^{x} \sum_{m=1}^{y} (W_{R,p,m})} \right) T = \sum_{p=1}^{x} \sum_{m=1}^{y} (W_{R,p,m} \times U_m)$$

OPTION B. FINANCIAL BURDEN

$$\left(\frac{\sum_{p=1}^{x} \sum_{m=1}^{y} (W_{R,p,m} \times U_m^*)}{\sum_{R=a}^{z} \sum_{p=1}^{x} \sum_{m=1}^{y} (W_{R,p,m} \times U_m^*)} \right) T = \sum_{p=1}^{x} \sum_{m=1}^{y} (W_{R,p,m} \times U_m)$$

In a multi-PRO system, the right-hand side of the equation remains the same (the approach within a PRO to cover its portion of system costs). On the left-hand side, total system cost T is multiplied by a ratio representing the market share of a PRO (R) to yield the portion of system costs that that PRO is responsible for. In the weight-based approach to calculating market share, weight of product sold across all producers and materials in a given PRO is summed and divided by the weight of all product sold across all producers and materials in all PROs (a, b…z). In the financial burden approach, product weights are multiplied by a material-specific unit factor (shown here as U*m to distinguish it from the base rate in a given PRO's fee schedule) before summing across all producers and materials and dividing across all producers and materials in the system.

Appendix B. Calculating modified market share in single-PRO and multi-PRO systems

This appendix compares weight and financial burden methods to calculate modified market share.

Below, the simplified example from the July 20 presentation on market share (slides 44-46) is expanded upon to explore which of the two methods would yield the most "aligned" result (with "aligned" meaning that individual producers would pay similar costs in single-PRO and multi-PRO systems).

Within that example, five producers belong to two PROs and produce, in varying amounts, widgets and beanbags (Table 1). Two scenarios were compared in this example, one in which market share is calculated by weight and a second in which it is calculated by financial burden. Now we add to that existing example a comparative, third scenario in which the five producers all belong to one PRO, the only one in the system (Figure 1). How do the fees borne by each producer compare under these three scenarios?
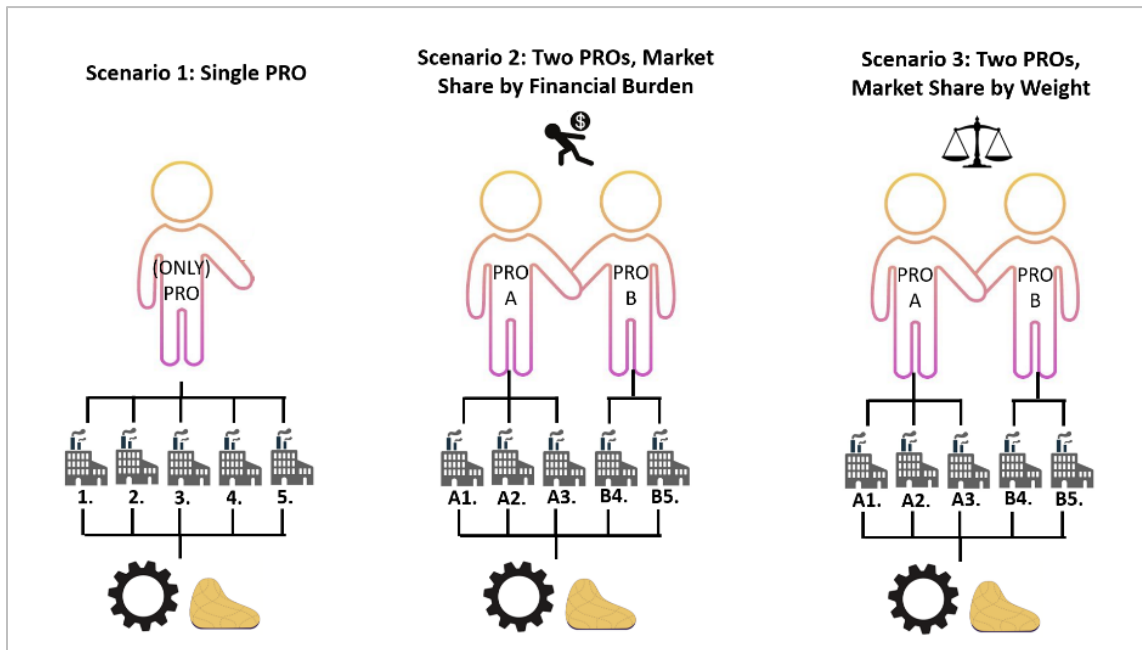

Figure 1: The simplified example presented to the RAC on July 20 is expanded here to encompass a single-PRO scenario and the producer fee-setting process within PROs.

Table 1: Production of widgets and beanbags by producer and PRO.
For the scenario with only one PRO, the production amounts shown in the table do not change.

Producer	PRO A			PRO B		
	1	2	3	4	5	Total
Widgets (kg)	10	50	5	10	20	95
Beanbags (kg)	10	10	0	50	0	70

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Subtotal (kg)	20	60	5	60	20	165
PRO total (kg)	85			80		165

Beanbags have 10 times the financial burden on the recycling system as widgets do, and this is represented in (hypothetically) consultant Jane Smith's most recent material indexing of Oregonian waste collection and recycling costs, where widgets have an index value of "1" and beanbags a value of "10." In the scenario with only one PRO, the PRO generates sufficient revenue to cover the system cost of $79.50 by charging producers $0.10 for a kilogram of widgets and $1 for a kilogram of beanbags. The resultant producer fees are shown in Table 2.

In the multi-PRO financial burden method scenario, Jane Smith's material index is used to calculate modified market share proportions for the two PROs' overall financial obligations: PRO A is responsible for 33% of total system costs and PRO B is responsible for 67%. Fee schedules for the two PROs can remain at the same amounts per material as in the single-PRO scenario and will cover the system cost of $79.50. Contributions per producer also prove to be identical to the single-PRO scenario.

In the multi-PRO weight method scenario, the modified market share proportions for the two PROs are considerably closer to one another (52% for PRO A vs. 48% for PRO B). The fee schedules from the previous scenarios will not cover the total system cost, and the PROs must adopt considerably different base fee rates from one another to maintain an even financial burden between the two materials. The resultant producer fees for both multi-PRO scenarios are shown alongside the single PRO results in Table 2. While the single-PRO and multi-PRO financial burden scenarios demonstrate alignment, in the weight scenario the fees for producers that make most widgets go up, while those of the producer that makes predominantly beanbags (producer 4) go down. Some of the changes are significant, with 25-56% increases or decreases in individual producer fees (Figure 2).

Table 2: Fees paid by producers under each of the three scenarios. The fees hold at the same amount per producer as in a single-PRO system when the financial burden approach is used to calculate modified market share but deviate by as much as 56% per producer when the weight approach is used.

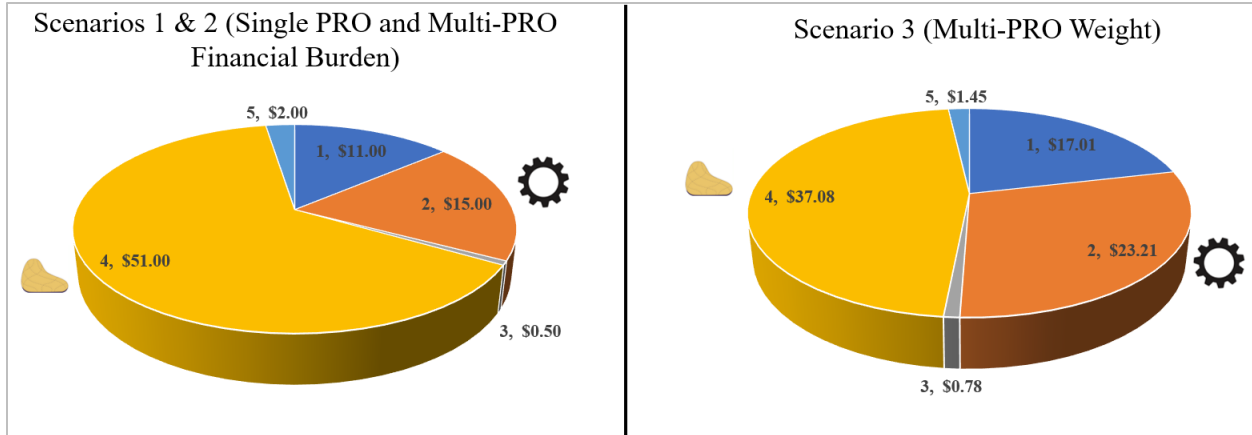| Scenario:	1. Single-PRO	2. Multi-PRO, Financial Burden		3. Multi-PRO, Weight	
		PRO A	**PRO B**	**PRO A**	**PRO B**
Base Fees per kg:	Widgets: $0.10 Beanbags: $1	Widgets: $0.10 Beanbags: $1	Widgets: $0.10 Beanbags: $1	Widgets: $0.16 Beanbags: $1.55	Widgets: $0.07 Beanbags: $0.73
Producer 1	$11	$11		$17.01	
Producer 2	$15	$15		$23.21	
Producer 3	$0.50	$0.50		$0.78	
Producer 4	$51		$51		$37.08
Producer 5	$2		$2		$1.45

Figure 2: Pie chart visualization of fees per producer in the single-PRO and multi-PRO financial burden scenarios (left chart) compared with the multi-PRO weight scenario (right chart). The largest producer widgets, producer #2, is indicated with the widget icon, as is the largest producer of beanbags, producer #4. The weight method for calculation of market share increases fees for the widget producer and decreases fees for the beanbag maker.

Note: This is a simplified example in which a 100% accurate estimate of the financial burden per material exists, and the estimates of the independent consultant and within the PROs match each other. This allows the individual producer contributions to add up exactly to the total system cost and the producer costs under the single-PRO and multi-PRO financial burden scenarios to match one another exactly. In this simplified example, producer base fees are furthermore entirely determined by the need to maintain a 1:10 cost ratio between the two materials and to add up to the total system cost. In the real world of many more producers, materials, and costs, in which financial burden estimates will be more complex and 100% accuracy cannot be expected. Instead, PROs will use their flexibility in the setting of the base rate amounts to ensure that total costs are covered (there is flexibility but it is limited by the statutory requirements of ORS 459A.884).

Conclusion

DEQ summarized pros and cons for two methods of calculating market share.

Financial Burden Method	
Pros	Cons
- Limits cross-subsidization among materials - Best aligned with single-PRO scenario	- More complex than weight-based approach

Weight Method

Pros	Cons
- Simplest method to apply	- May result in cross-subsidization among materials - Producers may pay substantially different fees in single- and multi-PRO scenarios

Appendix C. Pros and cons: financial burden unit factor options

This appendix summarizes the pros and cons of four different options for financial burden unit factors.

1. Using the PROs' own annual base rates should be a relatively accurate, feasible, and Oregon-appropriate approach, as the PROs are operating under Oregon's statutory requirement to set base rates proportional to product-specific financial burden in the Oregon context and are accountable to their producer members.
   - However, if the base rates from the current year are used, this introduces a problem, as modified market share determines PRO financial obligation, which influences PRO base rates. If those same base rates are used to calculate modified market share, the operation is circular. To avoid this, PRO base rates are to be used, they could be drawn from the prior year, with weight taken from the current year.
   - One other concern with this approach is that averaging among PRO fee schedules would tie PROs' accounting together and result in their holding some influence over each others' fee schedules, an area through which PROs traditionally compete to attract producer members.

2. Adopting Recycle BC's base rates as Oregon's financial burden unit factors appears a feasible approach without circularity problems or unfavorable dynamics among PROs.
   - Appropriateness of using British Columbia's numbers in Oregon's system is a question, however—on the one hand, the regions are close to one another and share many recycling markets. On the other hand, the two locations are in separate countries and have different waste management systems, which could result in material-specific differences in financial burden, as could the different obligations placed upon producers by EPR regulations in British Columbia compared with those of Oregon's Act.
   - In particular, Recycle BC is obligated to pay for all elements of the recycling system, including collection. In contrast, PROs in Oregon are responsible only for certain elements of the system, including processing costs, contamination removal, and depot collections of special materials.

3. The use of fixed factors set in rule appears feasible, Oregon-appropriate, and without particular problem in terms of PRO dynamics, but accuracy would be questionable over time due to the fixed nature of the factors.
   - Material commodity values are an important input into material-specific financial burden, and these values fluctuate over time. Factors fixed in rule would not be able to fluctuate along with them.

4. Hiring an outside expert or consultancy to develop a materials index would resolve the accuracy problem of the fixed factors' inability to fluctuate, because the index could be updated annually or on some other periodic basis.
   - Development of such an index is part of Ontario's new approach to allocating EPR system costs across multiple PROs.

- The main drawback of this approach is one of feasibility, as preparation of the index would be an annual additional financial burden on the system (which PROs would need to pay for) and would create additional administrative burdens on DEQ.

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