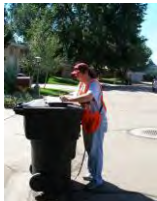


METRICS:



What Is Practical, What is Useful, Where are Metrics Going? – and What is PRR??

Nebraska SWANA Conference
9/27/18



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Pieces previously given as CAFR webinar, 8/29/18

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OUTLINE

- Why & What Should We Measure?
- Pros & Cons of Existing Metrics
- New Metric – Advantages & Calculation
- Examples / Case Studies

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About

Estab. 1994
Certified WBE

SERA

Research & Consulting in Solid Waste, Resource Economics, & Sustainability

Staff:



SERA By the Numbers...

Projects: 325+
Publications/Articles:
➢ 140 SW
➢ 150 Energy / sustainability

www.serainc.com



DATA COLLECTION MODELS
Benchmarking
CASE STUDIES
SWMP PLANS *strategies*
EVALUATION
PAYT & FUNDING
Food / Organics Policy *Best Practices*

Awards / Honors: National Lifetime Achievement Awards from:
➢ SWANA
➢ National Recycling Coalition
➢ Journal of SW & Technology
➢ State Award: CAFR

MEASUREMENT / METRICS

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WHY SHOULD WE MEASURE?

- ❑ Old adages are true → What is measured improves...
- ❑ Evaluate to inform decision-making and assure (public) funds are being well-spent
- ❑ Track & compare because a number alone is not meaningful.

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WHAT SHOULD WE MEASURE? MEASURE BEST REFLECTION OF OUR GOALS



See Skumatz [Resource Recycling](#) Article 2016

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THE DIFFICULTIES: REFLECTING PROGRESS → IN A WAY THAT...



Source: Skumatz / SERA Research

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WANT METRICS THAT...

- ❑ Reflect & attribute progress
- ❑ Inform decision-making
 - Are Prospective
- ❑ Reflect goals that are often beyond tons

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PERHAPS UPSTREAM EFFECTS - FROM LIFE CYCLE ANALYSIS WORK

Upstream Production Savings - Long-haul Breakeven Distances		In trips to the Moon
Aluminum		
Plastics (LDPE&PET)		
Steel		
Paper (News, Cardboard, Office Paper)		

Excludes direct market prices

Source: Adapted from Allaway, O.



PERHAPS EMBEDDED ENERGY FROM RECYCLABLES VS. VIRGIN MATERIALS



ISRI Fact Sheet 20



PERHAPS SIMPLE REFLECTION OF GHG

Waste Reduction Model (WARM) - Inputs

Use this worksheet to describe the baseline and alternative waste management scenarios that you want to compare. The blue shaded areas indicate where you need to enter information.

- Describe the baseline generation and management for the waste materials listed below. If the material is not generated in your community or you do not want to analyze it, leave it blank or enter 0. Make sure that the total quantity generated equals the total quantity managed.
- Describe the alternative management scenario for the waste materials generated in the facility. Any increases in generation should be entered in the Source Reduction column. Make sure that the total quantity generated equals the total quantity managed.

Material	Baseline				Alternative		Source Reduction				Total		
	Recycled	Landfilled	Composted	Other	Recycled	Other	Reduced	Recycled	Landfilled	Composted	Other	Generated	Managed
Household Waste													
Manufacturing Scrap													
Other Waste													
Copper Wire													
Styrofoam													
HDPE													
LDPE													
PET													
LDPE													
PS													
PP													
PVC													

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PROS & CONS OF EXISTING ON-GOING METRICS

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BASIC CLASSES OF TON-BASED PERFORMANCE METRICS AND INPUT DATA

- Program diversion / recovery $((R+C)/(R+C+D))$
 - Recycling, composting, diversion, recovery rate- traditional
 - Rate or per capita
 - Inputs: tons & disposal by program
- Per Capita (Generation or recy, etc) $((R+C+D)/pop)$
 - Inputs: tons for disposal & programs
- Landfill (or disposal) diverted $(D_{current} / D_{baseyear})$
 - Inputs: Disposed tons from your community assembled from all sources, all disposal sites for latest year. Compare to a baseline number
- Capture rate (percent of divertable material recovered) $(R_{recycled} / R_{generated})$, by material(s)
 - Inputs: tons of material recovered & disposed (comp)

Source: Skumatz SERA 2013

R=recy; C=compost; D=disposal



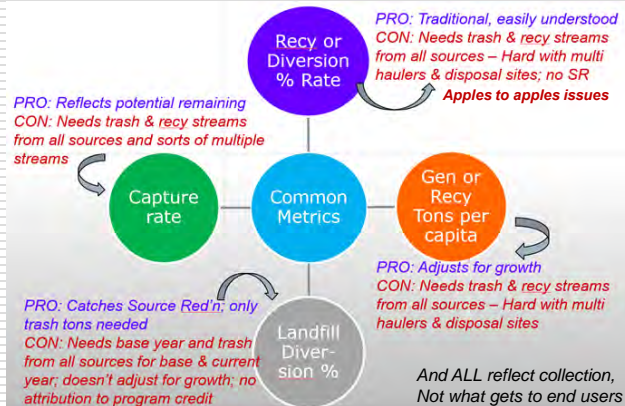
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PRACTICAL NATIONAL ISSUES: DATA AND TRANSPARENCY

- Data Availability in some states / areas (like CO)
 - Fragmented haulers
 - Relatively few contracts / franchises or municipal collection services
 - Routes cross city lines / estimations & attribution
 - Private landfills / disposal sites
 - Little authority (invoked); "estimates"
 - Costs and authority affect data availability
 - ... and that's just even talking residential! Commercial even more complicated / fragmented
 - Double counting issues (vs. Oregon's complex system)
- National: substantial data collection / software development efforts for storing data – much effort
- Transparency issues
 - Definitions VARY: hard to get to applies to apples

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TRADITIONAL TON-BASED METRICS



Source: Skumatz / SERA Research



METRICS: KEY STRENGTHS & WEAKNESSES

Metrics apply to recycling & organics

Metric	Major Pros	Major Cons	Data Needs
Diversion rate	Understandable Attrib to program(s) Traditional	No SR Varies with econ. What's included?	Multiple streams - Tons for programs & disposal***
Diversion/capita	Simple Program attribution	No SR What's included?	Tons for programs*
Generation /cap	Good comparisons	No pgm attrib alone Varies with econ.	Tons for programs & disposal***
Landfill diversion	Addresses SR	Complex BaseYear No pgm attribution Multiple haulers & facilities Varies with econ	Tons disposed*** & tons disposed in base year***
Capture rate	Program attribution	No SR What's included? Waste comp data	Tons for programs (mat!)* & waste comp

* Refers to relative difficulty of obtaining data in poor-tracking states; Multiple haulers, cross borders, estimations
Some, but less, econ effect in program tons.

Source: Skumatz SERA 2014



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ACTIONABLE INFO & PROGRESS

- I'm a recycling manager... 30% recycling rate-Yay!
- What does 30% say about how I'm doing?
 - I'm good – I beat other cities & improved over last year, but What should I do next?
 - Have I caught all the recycling and need to go to the next stream (e.g. yard waste/food scraps)?
 - Which recyclables remain? Have I captured max value from these collections before I start a new one?
- Oooh, and City X (or Seattle, or SF) is XX%.
 - Am I worse / better? Where? Will I ever clarify what they do and don't count?
- The 30% figure doesn't provide much "next step" guidance

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ACTIONABLE INFO & PROGRESS

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TON-BASED PERFORMANCE METRICS



NONE TELL US WHAT TO DO NEXT & NONE REFLECTS WHAT WE'VE ASKED PEOPLE TO DO!
(and they reflect collection, not end-market use)

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IMPROVED METRIC –
PRR / PERCENT
RECOVERABLES REMAINING

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WHAT CAN WORK?

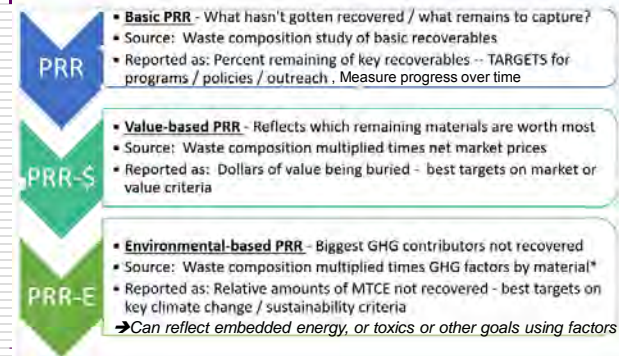
- We were working on projects in several states around the nation... Very different situations.
 - What is practical in very different locations? What do we always have? What data can we get, compare?
 - Back to basics.
 - One stream we have access to
 - What is the behavior we want to measure? What do we ask people to do? What can reflect our multiple goals?
 - Informational / actionable
- > Sort the trash and ID if recoverables remain.
 Reflects Behavior; immune to economy; immune to waste stream
 Shows what to hit next – what remains
- Can add sort of recyclables / organics to get capture

Source: Skumatz SERA 2014

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PRR: MATCHES TO 3 TYPES OF GOALS EASILY-ASSESS PROGRESS, PRIORITIES & NEXT STEPS



Source: Skumatz / SERA Research

Can examine stream for problem / target materials

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HOW PRR3 WORKS / THREE PART METRIC

- "PRR-Basic" is based on a simplified Waste Composition Study
- Easy to identify differences by neighborhood, etc.
- Directly reflects the behavior requested – take things OUT Of TRASH
- Easy data - No need to track down total tonnages from various haulers, landfills. No mandatory reporting.
- Not expensive - Doesn't require a sort into dozens of materials categories – simpler sort is sufficient
- Can reflect multiple goals with same data

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HOW PRR3 WORKS

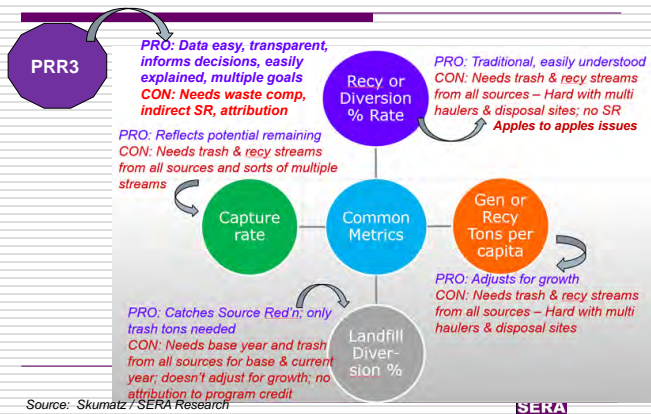


- Flexible tracking protocols can be designed –
 - On-going or annually
 - From trucks, facilities, cans
 - Residential & Commercial
 - Multiple samples for statistics: accuracy needed depends
- Transparent, easily compared over time and between cities
- Tells you what is NOT working and what IS! Provides Targets for Next Steps for programs, policies, outreach
- Three simple variations provide flexibility and robustness, -- reflecting multiple, next generation goals.

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METRICS



KEY STRENGTHS & WEAKNESSES FOR "PRR"

Metric	Major Pros	Major Cons	Data Needs
Diversion rate	Simple to understand Attribution to program(s) Traditional	No SR Varies with econ. What's included?	Tons for programs & disposal***
Diversion/capita	Simple Program attribution	No SR What's included?	Tons for programs*
Generation /cap	Good comparisons	No pgm attrib alone Varies with econ.	Tons for programs & disposal***
Landfill diversion	Addresses SR	Complex BaseYear No pgm attribution Multiple haulers, fac. Varies with econ	Tons disposed*** & tons disposed in base year***
Capture rate	Program attribution	No SR What's included? Waste comp data	Tons for programs (mat'l)* & waste comp
PRR – (Pct Recoverables remaining)	One stream: Simple comparisons Detailed guidance on next steps Reasonable data to get	Needs waste comp No SR / limited Attribution to specific programs	Waste comp** (with associated sampling)

** Refers to relative difficulty of obtaining data broadly

Source: Skumatz / SERA Research

PRR PERFORMANCE ON CRITERIA

Criteria	Criteria
Reflects goals	<ul style="list-style-type: none"> Program progress: measures behavior(s) asked Easily sector-based info: (info for goals)
Compare over time	<ul style="list-style-type: none"> Immune to economics, waste stream changes; Changes in materials affect performance: stability
Compare to other towns	<ul style="list-style-type: none"> Region with similar list: Your list elsewhere; Simple "standard" list?*
Low Cost	<ul style="list-style-type: none"> One stream sort Don't need 30+ categories, so affordable?
Multiple haulers / facilities	<ul style="list-style-type: none"> Data col'n, authority Can-based sample
Supports next steps / causal	<ul style="list-style-type: none"> DIRECT and powerful for guiding programs

Source: Skumatz SERA 2014

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SOUTHEAST CLIENT – PRR METRICS FOR PRIORITIES & GOAL-SETTING

	Res. %	Value	GHG	ICI %	Value	GHG
YW & Food	33%	\$ -	-33	15%	\$ -	-15
Fines	23%	\$ -	0	10%	\$ -	0
Composable paper / other paper	9%	\$ 801	-6	10%	\$ 882	-7
C&D	8%	\$ -	-5	19%	\$ -	-12
Other organics	4%	\$ (39)	-4		\$ -	0
Aluminum	3%	\$ 5,115	0	3%	\$ 4,495	0
OCC uncoated	3%	\$ 688	-1	12%	\$ 2,553	-4
Glass Bottles & Jars	3%	\$ 78	-1		\$ -	0
Composite plastics		\$ -	0	3%	\$ 1,088	0
C&I Film		\$ -	0	3%	\$ 1,131	0

PRR= 51% Residential; 43% ICI
 Targets – Red are top 3 by PRR metric (except ICI value)

Source: Skumatz / SERA Research

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EXAMPLES OF "NEXT STEP ADVICE" FOR CLIENTS FROM PRR

- City Goal setting – 10% PRR goal set, with 30% remaining materials baseline
- ID'd big materials (organics, etc.)
- Found "clusters" of lagging neighborhoods
- Recycling rate not that high but **not** much recyclable material in trash – indicated next target is organics despite just moderate recycling rate. **Would have wasted time getting materials that weren't there / available.**
- ID'd targets for education & program refinements
- For one state (Colorado) we found Millions \$/yr of potential value buried – even in accessible areas of state
- GHG targets did NOT match ton target



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PLUS CONSIDER IMPROVING TRADITIONAL METRICS



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IMPROVING TRADITIONAL TONNAGE-BASED METRICS

- Collected vs. actually processed / sold / used:
 - Sold is better reflection
 - Need MRFs / markets - May have difficulties with reporting authorities
 - Worth considering
- Data Collection
 - Authorities, double counting – haulers plus facilities... vs. complex Oregon Model
 - Tip: try collecting info businesses already collect for their business – **they'll be more likely to report it and be consistent; less "estimation"**



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IMPROVING TRADITIONAL TONNAGE-BASED METRICS

- Definitions are not comparable – adopt standards?
- Measuring source reduction:
 - Driver behind the Landfill-based metrics and some of per-capita generation metrics
 - Track per-capita generation as an indicator
 - Research that used 3 methods on PAYT – complicated
- EPA protocols addressing some of these issues, but not all
- Have set up reporting forms, computations, protocols, reports, metrics for multiple communities / counties / states



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SUMMARY

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CONSIDER MULTIPLE METRICS - COMPLEMENTARY

- The cost is data collection – minimize that!
 - **After that, it is just Excel...**
 - If program and disposal tons easily tracked, certainly keep tracking and calculate traditional metrics, and program ton changes – helps with attribution!
 - BUT get more meaning and use by using PRR with it.
 - Generation per capita if possible is strong
- **Not all metrics need to be “published”**
 - Pick some that appeal to council, citizens
 - Each metric provides program staff with useful information
- We weight program guidance and data availability / accuracy heavily – **minimize cost / max info (not “data”)**
- Pick PRR plus another that fills in its weaknesses

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SUMMARY / CONCLUSIONS

- Traditional metrics
 - **Don’t reflect broader goals**
 - Have data **coll’n** issues (authority & \$), not transparent
 - Retrospective, not prospective – **need “next steps” to be useful**
 - Do provide attribution information
 - Focus on collection, not sold, and need improvements
- PRR3–simple, accessible data: 3 metrics in 1
 - Authority, attribution, clear, measuring right thing: sectoral easy
 - Measure goals beyond tons (incl. ghg)
 - Design for affordability
 - Works in areas without good data reporting;
 - Only indirect attribution to programs
 - Guide Action / Next steps
- PRR core metric; add 1-2 to broaden, address weaknesses
- Reflect goals: provide INFORMATION not just DATA

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QUESTIONS?

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