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**SERA**

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**Abbreviated Qualifications in Solid Waste Consulting**

**Skumatz Economic Research Associates (SERA)**

SERA works in program design and evaluation in recycling / solid waste management, energy efficiency, and sustainability. The firm (a WBE) was established in 1990 and in that time, SERA has conducted more than 200 project assignments in the US and internationally, and has published extensively on our project research.  Our staff includes economists and analysts with experience in evaluation, planning, program assessment, surveys and statistics, quantitative research, and policy analysis. A list of projects in the key areas related to this project is provided below. SERA is based in Colorado, and has presented the results of our research in 150 papers in trade journals, refereed journals, and national and international conference proceedings. ***SERA in brief****: WBE, established 1990, S-Corp since 1995, 6 employees, Offices in the Boulder and Seattle areas, 310 projects, 270+ publications, presentations at more than 100 conferences,* [*www.serainc.com*](http://www.serainc.com)*,* ***Principal / Contact****: Dr. Lisa A. Skumatz, 303/494-1178,* [*skumatz@serainc.com*](mailto:skumatz@serainc.com) *Relevant Projects include:*

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| **Pay as you Throw/PAYT studies & rates** EPA 10, EPA 9, EPA headquarters, States of Ohio, California, Illinois, Iowa, Wyoming; Asheville NC, Seattle, Arlington County VA, Loveland CO, Fort Collins CO, Chittenden Solid Waste Management District VT, King County WA, Sunrise FL, Vail CO, Eagle County CO, Largo FL, Knox County TN, Cincinnati OH, Anchorage AK, Jackson Hole WY, Pasadena CA, West Jordan UT, Chandler AZ, many others  **Rate studies – Residential** Boulder CO, Asheville NC, Anchorage AK, Jackson Hole WY, Summit County CO, Porterville CA, San Jose, Santa Clarita CA, Berkeley CA, West Jordan UT, Austin TX, Kauai HI, Arlington County VA, Sacramento & County CA, Cincinnati OH, Pasadena CA, Seattle WA, Chandler AZ, many others  **Rate studies – Commercial & facility** Island County WA, Kitsap County, Santa Barbara CA, Seattle WA, Portland Metro OR, Morgan Hill / Gilroy CA, UC-Boulder, San Jose CA, Largo FL, others  **Comprehensive / Zero Waste / Sustainability Plans including commercial and residential** State of CO, State of CT, Anchorage AK, Boulder County CO, Boulder CO, Mesa County CO, El Paso County, Westminster CO, Salt Lake City UT, Minnesota SWMCB, Pitkin County CO, Alameda County CA, Jackson Hole, others  **Program impacts / quantitative evaluation / performance / best practices / benchmarking** EPA, Mass OEOA, NSDA, Steel Recycling, National Recycling Coalition, NEMA / TRC, Coalition of 15 cities / counties in CA, State of NC, State of MN, Oregon WPLG, Arlington County VA, Chittenden Solid Waste Management District VT, King County WA, Alameda StopWaste CA, Seattle WA, Westminster CO, Boulder CO, Boulder County CO, many others  **Commercial sector studies** Minnesota SWMCB (three projects), Santa Barbara, Mecklenburg County NC, Alameda County StopWaste, San Jose, Anchorage, Ecocycle, Boulder, Washington County OR, Snohomish County OR, Metro Vancouver BC, others  **Detailed forecasting / modeling / waste stream analysis** Seattle WA, State of CT, Alameda StopWaste CA (multiple assignments), Boulder CO (multiple), Snohomish County WA (2 assignments), Pitkin County CO, Mesa County CO, Kitsap County WA, Thurston County WA, Boulder County, Portland Metro OR (multiple projects), Chittenden SWMD VT, Arlington County VA, Oregon WPLG, Metro Vancouver BC, San Jose CA, Honolulu HI, Oregon, Austin TX, private client (multiple) many others.  **Education, behavioral, and social marketing program analysis** Iowa DNR, Colorado CDPHE, CIEE – California Institute for Energy and Environment, Center for Environmental Technology / CET, Tompkins County NY, Alliance to Save Energy, Resource Recycling, Boulder County, Alameda StopWaste, NW Regional Technical Forum, others  **Commercial surveys / interviews / on-sites** Mecklenburg County NC, Santa Barbara, City and County of Denver, Minnesota SWMCB, Westminster CO, Boulder, Boulder County, Pitkin County, Mesa County, Superior CO, Seattle, California DTSC/NEMA, Vail CO, Edgewater CO, Anchorage, Oregon DEQ, Washington County OR, State of Wyoming, Product Stewardship Institute, others  **Residential surveys / interviews** Westminster CO, Boulder, Boulder County, Asheville NC, Pitkin County, Mesa County, Superior CO, Edgewater CO, Fort Collins, Longmont CO, California DTSC, Santa Clarita CA, West Jordan UT, Anchorage, many others.  **Yard waste, composting, food waste studies** EPA, Boulder, Longmont CO, Arlington County VA, Chittenden, VT, Dept of Energy, Seattle, Santa Barbara, King County, Boulder County, Anchorage, private client.  **Single stream studies** AF&PA, Vancouver BC, private client (multiple), Longmont, others. | **Leading Communities / Best Practices** Metro Vancouver BC (three projects), Lethbridge AB, Alameda StopWaste (two projects), Colorado CDPHE (two projects), King County WA, City/County San Francisco, Minnesota SWMCB, Colorado , EPA5, EPA9, Private Clients (three).  **Funding alternatives** Portland Metro, Alameda Stopwaste CA, Washington CWC, Denver CO, Akron OH, Seattle WA,  **Job creation / “green jobs”**: Colorado CDPHE, CAFR, EPA headquarters, EPA 9, Boulder County CO, Arlington County VA, Chittenden County VT  **GHG / Environmental / emissions impact estimation** Seattle, Colorado CDPHE, Boulder County, EPA, Larimer County, Loveland  **Transfer station studies** Portland Metro OR (2 projects), Largo FL, Seattle WA, private client, Anchorage AK, Pitkin County CO  **Hazardous waste analyses** Portland Metro OR, Seattle WA, Seattle/King County WA, Alameda Stopwaste CA, California DTSC  **Product stewardship / ADFs:** NEMA, California DTSC, Product Stewardship Institute, Alameda StopWaste, Boulder, Boulder County, Reason Foundation, private client  **Facilitation, Public Meetings** Colorado National Guard, State of CO, Colorado CDPHE (2 projects), Fort Collins CO, Westminster CO, Anchorage, Jackson Hole WY, Santa Clarita CA, Massachusetts EOEA, Pitkin County CO, other.  **Workshops / Webinars / Manuals / Train the Trainer / Facilitations** EPA headquarters, EPA10, EPA 9, EPA8, EPA5, States of California, Ohio, Wyoming, Iowa, Colorado CDPHE, Coalition of Northeastern Governors / CONEG, Southern States Energy Board, Ball, Canadian MOE, Boulder County, Massachusetts OEOA, ABA, others  **Source reduction measurement / hard to measure effects** Alameda Stopwaste, Seattle, Portland Metro, Iowa DNR, EPA headquarters, NSDA, State of MN, California DTSC / NEMA  **Service / franchise / contract options, RFPs, Ordinances** Littleton CO, Golden CO, Edgewater CO, Sheridan CO, Denver CO, Boulder County, Boulder, Louisville CO, Broomfield CO, Easttown PA, West Jordan UT, Waukesha County WI.  **Waste sorts / set out surveys** Broomfield, Boulder, Longmont CO, Boulder County, Fort Collins, Superior, San Francisco, UC-Boulder, Snohomish County, Cincinnati, Anchorage, Gainesville, Alachua County, Oak Park, others.  **Testimony / Legislative support** King County, Colorado E-waste Task Force, Toronto Ontario, Commonwealth of Massachusetts, Iowa DNR, State of California, GA legislature, FL legislature, WUTC, ALEC, NCSL  **Hauler / Collection / PAYT Studies** USEPA, Edgewater CO, Lethbridge AB, Westminster CO, AF&PA, private client, State of CO, State of CT, Alameda StopWaste, El Paso County CO, Minnesota SWMCB.  **Markets Analysis** State of CT, Loveland/Fort Collins, Portland Metro OR (multiple projects), Anchorage, Ecocycle, City of Boulder, Boulder County, Alameda County, UC-Boulder, AF&PA, NYSERDA, King County WA, Honolulu, Bonneville Power Administration, Western Disposal  **Water Evaluation** Seattle, Ashland OR, State of OR, California AWWA  **Air Quality** Houston-Galveston / Reason Foundation  **Energy Program Design and Evaluation** more than 100 assignments on this topic, not included in solid waste total. |

***Brief Staff Biographies***

**Dr. Lisa Skumatz** brings more than 34 years of experience in solid waste policy and program design, evaluation, and modeling. For 24 years, Dr. Skumatz has been Principal of SERA, a research and consulting firm that specializes in solid waste and resource conservation work. Lisa is well respected as the leading researcher in PAYT. She has studied PAYT programs since the mid 1980s, and has conducted much-cited quantitative work on the topic. She has provided assistance to hundreds of communities on PAYT, and conducted feasibility, rate, or implementation studies for well more than 100 communities across North America. She is widely known for her “data focus” in solid waste. She gathers real-world data and analyzes it to identify defensible and transferable lessons about program performance, costs, appropriateness, and best practices. Her focus is “best practices” and quantitative policy and program work to identify effective and cost-effective sustainability initiatives at the local, regional, national, and international level. She assembled and maintains the largest database of community data (more than 1000 communities), a database she has updated every 2-4 years since 1994. Lisa and her work are widely respected. Her extensive expertise in policy and program analysis in recycling / solid waste has been recognized in the US and internationally – reflected in her project assignments but also in two National-level “Lifetime Achievement…” awards and appointments/elections to numerous boards and panels. She has published 150 papers and articles. Lisa brings a mix of practical and forward-thinking solutions, backed by proven quantitative skills, creativity, and problem identifying-and-solving capabilities. She brings real-world data to all her work, and has the robustness of background to understand and frame the issues from the range of relevant perspectives.

**Ms. Dawn BeMent** is a research analyst with SERA, with more than 9 years of experience. On dozens of projects she has conducted detailed surveys or interviews with city / county staff, state officials, stakeholders, businesses, facility owners, schools, and many others to identify key data on PAYT, programs, tonnages, costs, and implementation issues related to solid waste strategies with a focus on identifying program impacts, successful designs, costs, and “best practices”. She has conducted thousands of surveys and interviews with households and businesses on current practices, attitudes regarding solid waste and recycling, program preferences, and “willingness to pay” for program and service changes. She has conducted both quantitative surveys and detailed case study research for solid waste agencies, and other clients. She is a skilled interviewer, with excellent capabilities obtaining cooperation for a wide range of projects. She conducted recent work assessing the feedstock risks for a biomass plant, reviewing the local regulations, estimating tonnages, reviewing local prices and competitors, and myriad other factors for a capital entity. She is currently finishing two major projects gathering data from more than 2,000 businesses and households in two states to examine mercury thermostat volumes and disposal behaviors. She managed SERA’s latest inventory of PAYT communities across the US. She conducted interview of businesses and schools in Minnesota on two recent projects, examining their recycling activities, decision-making, costs, and other information. She has conducted projects in California, Minnesota, Colorado, New York, Vermont, Washington, Oregon, Virginia, Nevada, Arizona, and a great deal of nationwide work (EPA, nationwide PAYT counts, food scraps program inventory nationwide, etc.). Her strengths include attention to detail, an understanding of how the information will be used, and appropriate follow-up on complex analytical issues. Ms. BeMent has written many case studies, performed data analysis and contributed to many papers.

**Ms. Dana D’Souza** is a research analyst with SERA and has more than 7 years of detailed experience with data collection and interviews on solid waste topics with SERA. She has conducted program review, case study, and benchmarking interviews with solid waste program staff across the country, including data on program design, costs, infrastructure, and diversion. She has collected data on the wide variety of recycling and solid waste programs across the US – including recycling, yard waste, source reduction, electronics, single stream recycling, education / outreach programs, and others. Dana manages SERA’s periodic nationwide community surveys – gathering data from more than 1000 communities nationwide on programs, demographics, costs, facilities, and tonnages. Dana managed two recent SERA projects assessing regional compost markets in two different states, interviewing more than 100 stakeholders to assess facility / processing capacity (current and future), prices / tip fees, products and their prices, beneficiation steps being used, and much more information. She conducted work examining and comparing performance for two dozen communities in a leading county in the US as part of a “5 year plan” evaluation. She has conducted surveys to identify recycling behaviors and practices for businesses in Minnesota, Canada, and North Carolina. She conducted interviews with dozens of stakeholders as well as resident businesses and multifamily households in a northwest community to assess an innovative downtown recycling initiative. These data have been used to identify cutting edge programs and provide key data on the factors affecting program performance.

Other experienced SERA staff that may assist with this project include Marcia Harris and John Shepherd.

**Resumes and Publications**

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| **LISA A. SKUMATZ, Ph.D., Principal, SERA**  Principal  Skumatz Economic Research Associates, Inc. (SERA)  762 Eldorado Drive, Superior, CO 80027  Voice: 303/494-1178 email: [skumatz@serainc.com](mailto:skumatz@serainc.com) | LSkumatz |

**WORK HISTORY**

1994-Present - Principal, Skumatz Economic Research Associates, Inc., (consulting), Superior, CO

1998-Present - President, The Econservation Institute (Non-profit), Superior, CO, USA

1990-1994 - Vice President, NW Division, Synergic Resources Corporation (consulting), Seattle WA

1987-1990 - Research Economist, Seattle Solid Waste Utility (trash / recycling), Seattle, WA

1985-1987 - Research Economist, Pacific Gas & Electric Company (energy utility), San Francisco

1980-1985 - Energy Research Economist, Battelle Pacific Northwest Laboratories, Richland, WA

1978-1980 - Fellowship / Economist with Departments of Commerce / Bureau of Labor Statistics and Health, Education, and Welfare (now DHHS), Washington DC.

Previous - Teaching Assistant and Research Assistant, The Johns Hopkins University, Baltimore

Paid Intern - Ralph Nader’s Public Interest Research Group, Washington DC

Other - Town Trustee, Town of Superior, CO 2004-2014

**EDUCATION**

Ph.D. Economics, The Johns Hopkins University, Baltimore, MD (econometrics)

M.A. Economics, The Johns Hopkins University, Baltimore, MD

B.A. Economics, The University of Wisconsin-Madison, Madison, WI

Sustainability Leadership and Implementation Certification, University of Denver and Natural Capitalism, 2011

**RESPONSIBILITIES, ACCOMPLISHMENTS, AND CAPABILITIES**

Dr. Skumatz brings more than 32 years of experience in solid waste policy and program design, evaluation, and modeling. For 21 years, Dr. Skumatz has been Principal of SERA, a research and consulting firm that specializes in solid waste and resource conservation work. SERA’s business focus includes “best practices” and quantitative policy and program work to identify effective and cost-effective sustainability initiatives at the local, regional, national, and international level. Her extensive expertise in policy and program analysis in recycling / solid waste has been recognized in the US and internationally – reflected in her project assignments but also in three “Lifetime Achievement…” awards and appointments/elections to numerous boards and panels. She has published 150 papers and articles. Lisa brings a mix of practical and forward-thinking solutions, backed by proven quantitative skills, creativity, and problem identifying-and-solving capabilities. She brings real-world data to all her work, and has the robustness of background to understand and frame the issues from the range of relevant perspectives.

**PAYT**: Dr. Skumatz is the international authority on Pay As You Throw (PAYT), an incentive-based strategy for increasing recycling. Her solid waste clients include a wide range of communities and counties across North America, as well as the major US, Canadian, and UK solid waste authorities. She works with clients to develop practical, tailored PAYT options suited to their situation. These assignments include feasibility, design, implementation, and rates work for communities. For state and national agencies, she has conducted workshops, developed toolkits, websites, white papers, sample ordinances and legislation, frequently-asked-questions, rate models, and other research to assist communities in implementing PAYT. She has also provided testimony for state legislatures and others on PAYT. Her work demonstrating that PAYT and curbside recycling are more cost-effective and quicker than leading energy efficiency strategies to deliver GHG reductions (with similar job-creation effects) has changed the role of solid waste strategies in sustainability plans for communities across the US.

* **Projects include work for**: EPA (headquarters and Regions 8, 9, and 10); States of PA, IL, IA, WY, OH, CA, GA; UK’s WRAP; University in Santiago, Chile; Local Government Commission; ICMA; Maui County (HI); GVRD / Metro Vancouver, BC; Snohomish County, WA; Knox County, TN; Anchorage, AK; Sacramento County, CA; Cincinnati, OH; Gilroy, CA; Morgan Hill, CA, Orange County, CA; Berkeley, CA; San Francisco, CA; Ventura, CA; Oak Park, IL; Sunrise, FL; Largo, FL; Ft. Wayne, IN; Victoria, CRD, BC; and many others.

**Policy Work:** Dr. Skumatz’s policy work includes development of solid waste strategy at the national level (EPA / PAYT; UK’s WRAP); state level (IA, WA, CO, MA, OR, CA, and others), and sustainability work (for cities and counties in CA, CO, and elsewhere). Dr. Skumatz conducted statistical work to analyze the performance and cost impacts of single stream recycling for clients including AF&PA, Waste Management and private clients, a non-profit, Boulder County CO, Fort Collins CO, and others. She collected data from communities, MRFs and mills, and conducted detailed analyses to identify the tradeoffs, strengths, and weaknesses compared to dual stream programs, Dr. Skumatz helped establish recycling goals and supporting portfolios, policies, and associated funding; worked with stakeholders / task forces / legislators to achieve adoption and buy-in; and provided numerous briefings in association with these assignments. She estimated cost per MTCE for various energy and recycling strategies to guide national and local policy on climate change (used in CO, OR, many cities, and requested by Obama’s Transition Team). She has been a leader in national PAYT policy, and advised the UK (and specifically London) on PAYT. She assessed the performance of California’s AB939 legislation (costs and intended / unintended impacts) and recommended measurement, policy, and other changes. For the State of Colorado (and other states) she developed solid waste policy, measurement, and legislative recommendations, worked on the State’s Task Force to develop legislative policy for electronics waste, and developed a statewide “vision” for solid waste and recycling going into the future. For California, she developed key input for legislation on product stewardship at the State level. For a county in Colorado, she developed revised “green” commercial (and residential) building codes. She has also drafted ordinances and legislation on solid waste initiatives. She has developed sustainability, energy, solid waste, water, and air quality initiatives, policy and funding work at the local level for numerous clients.

* **Selected Clients include**: EPA, UK-WRAP, Colorado CDPHE, Boulder County, consortium of 15 California cities and counties, AF&PA, City of Seattle, Seattle/King County, Steel Recycling Institute, National Soft Drink Association, American Beverage Association, Fort Collins CO, Boulder County CO, SCE, CPUC, CIEE, and many others.

**Program Evaluation / Analyses, Impacts, and Data:** Lisa’s work has focused on evaluation of policy and strategy alternatives in solid waste management. She specializes in bringing specialized evaluation methods, including control groups / experimental design, multivariate statistical approaches, and other methods to provide defensible results and program attribution to her work. Most of her evaluation work is designed to support decision-making (at the community, state, or national level) about the development, design, refinement, and funding of policy and program / strategy options. She has specialized in gathering and analyzing data from “in the field” programs, assessing data from more than 1,000 communities to identify (using statistical models) what works best and in what types of situations. Her publications on quantitative program and policy performance are the most requested articles by the field’s trade journals, and her workshops and presentations are highly attended. She has conducted policy work analyzing PAYT, food scraps and organics, zero waste, education and social marketing, electronics waste, recycling legislation, single stream, economic alternatives to flow control, product stewardship and ADFs, funding alternatives, mandates and bans, rate and incentives design (residential, commercial, trash, programs), measurement / tracking alternatives, construction and demolition and wood waste, and many other topics. She has analyzed the incremental diversion and cost associated with more than three dozen recycling, and composting strategies, and used the work to craft best practices and identify “outlier” communities. In both the solid waste and energy fields, Dr. Skumatz has pioneered methods that are now “protocol” in multiple states.

* **Projects include work for**: States of RI, MA, NC, MN, CO; EPA (federal and Regions 5 and 9); 15 cities / counties in California, Metro Vancouver, BC; Westminster, CO, Boulder, CO; MN SWMCB, Seattle, WA; Porterville, CA; Gainesville, FL; Largo, FL; West Jordan, UT; Portland Metro, OR; Santa Clarita, CA; King County, WA; Akron, OH; Berkeley, CA; Santa Barbara, CA; Austin, TX; associations (NEMA, PSI, APC, NSDA, SRI), CA DTSC, non-profits (Reason Foundation), private clients, and others.

**Modeling and Integrated / ZW Plans**: She has developed “zero waste” and “solid waste management” plans for communities and counties in the US. She uses information on community waste composition, tonnage levels, sectors, and other data to identify the most cost-effective portfolio of programs, incentives, and policies toward waste diversion and effective waste management – and estimates the cost to the city/county/state client and (cost and often rates) to the residential and commercial generators affected by the programs. SERA incorporates estimates of the avoided GHG and jobs / economic development for many of these clients. She has conducted state-level plan and goal development work for Massachusetts, Colorado, Oregon, Washington, and Iowa, and dozens of similar projects for Counties and municipalities across the US and Canada. She has developed a comprehensive solid waste forecasting and program analysis model that is “tailorable” for communities, which streamlines data collection and analysis of successful program / policy alternatives.

* **Selected Clients include**: Colorado CDPHE, Oregon WPLG, Massachusetts OEOA, Iowa DNR, EPA Headquarters and Regions 5 / 9 / 10; Alameda StopWaste, CA; Boulder County, City of Boulder, Eagle County, CO; UK-WRAP; Metro Vancouver, BC; Seattle Public Utilities, WA; Consortium of 15 Cities / Counties in CA; Anchorage AK; Pitkin County, CO; Mesa County, CO; Westminster, CO; Fort Collins, CO; Snohomish County, WA; and many other cities / counties.

**Funding, Incentives, and Rates**: Dr. Skumatz has conducted funding options analysis and recommendations work for zero waste, sustainability, solid waste, hazardous waste, energy, and other integrated planning work at the Federal and State level (Colorado, Washington, Iowa, Massachusetts, and Oregon) and for many counties and cities. She has assessed / developed options for funding programs and facilities, capital and operations / maintenance costs from more than 50 different types of sources including legislative initiatives, surcharges and deposits (toxics, landfills, and product stewardship), incentives, fines, rates, bonding, and others. The options include self-funding options that provide incentives (e.g. PAYT, commercial rates, program rates, etc.), and supporting this work, she is a skilled rates economist with expertise in examining cost of service / revenue requirement and incorporating rate designs that meet incentive, sufficiency, and other goals. She has conducted extensive work on Advanced Disposal Fees (ADFs) and extended producer responsibility (EPR) and their suitability at the local, county, state, and other levels – and has examined options for more than two dozen “problem” or opportunity materials. She has conducted rate studies for solid waste agencies across the US, including detailed work examining reactions to changes in rate structures and incentives associated with residential, commercial, and disposal facility fees and policies. She has evaluated rates, real time pricing, and incentive scenarios (including three sets of state-level regulator-imposed incentive approaches for investor-owned utilities). She has conducted innovative work on this topic across the US and Canada.

* **Selected Clients include**: Colorado CDPHE; Boulder County, CO; Alameda StopWaste, CA; King County, WA; Seattle, WA; US EPA; State of Massachusetts OEOA; Iowa DNR; Oregon WPLG; Clean Washington Center, WA; Metro Vancouver, BC; Mesa County, CO; Anchorage, AK; Pitkin County, CO; City/County of Denver, CO; San Jose, CA; San Francisco, CA; Santa Barbara, CA; Chandler, AZ, and many other cities / counties / authorities.

**Surveys, Market Research, and Data Collection:** Dr. Skumatzhas extensive experience in all phases of detailed survey design, statistics, and analysis for research and program evaluation purposes. She has conducted statistical surveys using random or stratified random approaches to collect data from households, businesses, program agencies, and communities. These surveys have been used to gather data from communities on solid waste programs and facilities, costs, and local information to analyze program options. She has conducted thousands of residential and commercial surveys to gather data on attitudes (including self-efficacy), behaviors, awareness, demographics, willingness-to-pay, program preferences, and other data for solid waste plans. She has conducted in-depth interview work with stakeholders and market actors on market issues, costs, capacity, program and policy strengths and weaknesses, and many other topics. She has conducted and analyzed validation surveys, determining the accuracy and consistency of phone, on-site, and mail surveys for particular types of questions; developed complex sampling designs; and is highly skilled in identification and treatment of survey bias and weighting and imputation methods (including refereed journal paper on the topic). She has conducted statistical and modeling work for solid waste projects, using standard questions and data, as well as more complex analyses like regression analysis, principal components, logit, hazard analyses / measure lifetime analyses, logit modeling from card rankings, and other methods. Recent large-scale statistical surveys include work on the number, types, and lifetimes of mercury-containing thermostats in States around the US in support of goal-setting for industry.

* Clients include Seattle WA, Mecklenburg County NC, Metro Vancouver BC, States of NY / ME / IL / CA / RI, Oregon DEQ, Boulder CO, Boulder County CO, Edgewater CO, Oak Park IL, Anchorage AK, Pitkin County CO, Tukwila WA, and many others.

**Tonnage Forecasts, Set Outs, and Waste Characterization Analyses:** Forecasting:Dr. Skumatz, an economist / econometrician, has been conducting work forecasting solid waste tonnage for rate studies and comprehensive / zero waste plans since 1987. She brought enhanced forecasting techniques from the energy field, demonstrating the improvements that could be provided by using time series other regression approaches with economic drivers. This method supports “what if” scenario analyses based on changes in underlying economic conditions, demographic changes, etc. She has conducted very detailed work of this nature for state and local clients as well as EPA. For several clients, she developed waste-shed forecasts using census block group information and a travel time model to identify tonnage flows to existing and new / potential facilities. For communities without waste information for the C&I side, she also developed a user-friendly model designed to allow the community to “tailor” a commercial / industrial waste composition and tonnage forecast based on their local economic conditions, business employment, and other factors. For simpler projects, she had used traditional methods that engineering firms often rely on, based on per-capita generation or disposal / diversion figures, with growth factors related to population or business or sectoral projections. Waste Compositions and Set Out Surveys: Lisa has also conducted scores of statistical waste characterization studies to gather data on recycling and trash streams constituents, and designed and conducted scores of set out surveys for communities considering solid waste changes. She has conducted residential, commercial, multi-family, and C&D waste sorts, and used the data for program targeting; modeling for new PAYT, organics, or recycling programs; or as part of comprehensive plan assignments. She has used surveys to collect data for hard-to-measure impacts, including behaviors, decision-making, and attribution of changes to programs and educational efforts, and measured the impact of education on behavior changes and program impacts.

* Clients include Seattle WA, Snohomish County WA, Metro Vancouver BC, State of OR, State of MA, and State of CO, Anchorage AK, Pitkin County CO, Boulder CO, Boulder County CO, Tukwila WA, USEPA, and many others.

**Market Analyses**: Dr. Skumatz has conducted detailed studies of market potential and existing markets for many solid waste streams. This work includes analyses of compost markets and processing capacity (existing, near, and longer-term), food waste processing capacity, markets for C&D materials, and analyses of the markets – traded off with transportation costs – for all common recycled materials. Market impacts from single stream were also assessed. The work involved surveys / interviews with existing market actors, capacity modeling, modeling of market prices and cost / benefit assessment for new or expanding programs.

* Clients include King County WA, AF&PA, Portland Metro OR, Boulder County CO, Honolulu HI, Chittenden County VT, and others.

**Sustainability, Economic Development, “Green” Jobs, GHG Impacts:** Dr. Skumatz has worked to examine the relationship between environmental sustainability, program impacts, costs, and performance. She has conducted work examining the cost-effectiveness of dozens of solid waste and energy initiatives to compare cost per Metric Ton of Carbon Equivalent (MTCE) diverted by various programs, and assessed relative performance on timing, retention, risk, job creation/ economic development, “authority”, funding, and other criteria to assist communities and authorities in crafting strong, well-integrated, implementable sustainability plans. She has brought the case for balanced portfolios to energy and solid waste policy-makers across the US. Some of her work was used by the Obama Transition team. She has helped develop models to measure and compare performance metrics for sustainability initiatives undertaken by communities and programs in California and across the US. Using input-output modeling, Dr. Skumatz and SERA staff have measured the net job creation impact of “green” initiatives including: energy efficiency programs, recycling and organics programs, food waste programs, recycling incentive programs, and other “green jobs” assignments.

* **Selected Clients include**: Colorado CDPHE, EPA, PG&E, Xcel Energy, SDG&E, Boulder County, ACEEE, among others.

**MEMBERSHIPS, APPOINTMENTS, AND HONORS**

Dr. Skumatz has received three Lifetime Achievement Awards for her work in solid waste measurement and policy analysis, at the international level (International Solid Waste Association of North America); national level (National Recycling Coalition) and state level (Colorado). She currently or previously has served on the Boards of the National Recycling Coalition (NRC, 12+ years on board), Solid Waste Association of North America (SWANA, Board of Colorado Chapter 2 years); Colorado’s Task Force on Electronics Waste, two state recycling association boards (CO, WA), the Executive Board of the Colorado Municipal League (government), and several county and regional recycling commissions. She was appointed to the “Harvard 2000” panel to identify market-based initiatives for environmental issues. She is a member of several professional energy, economics, and resource economist associations.

**PUBLICATIONS, PRESENTATIONS, AND WORKSHOPS - US AND INTERNATIONAL**

Her work has included assignments in most of the 50 states, across Canada, the UK, Japan, Chile, and New Zealand. She has presented papers (including keynotes) on solid waste, sustainability, or energy issues at more than 70 national conferences, 7 international conferences, more than 150 state and regional venues, and numerous academic conferences, and has prepared more than 100 conference papers or white-papers. Dr. Skumatz has given well over 100 US workshops / webinars for states and agencies. She has more than 125 publications in solid waste (100+ more in energy), including work in peer-reviewed journals (*Waste Management; Solid Waste and Technology*), trade journals (*Resource Recycling*, *Biocycle*, others) and conference proceedings. She has appeared in the national “popular” press (*Wall Street Journal*, *New York Times*, *Consumer Reports, Kiplinger Financial,* *“Parade Magazine” Sunday newspaper insert*) and TV (*Fox Business News*, *Good Morning America*), and many local / regional radio stations and newspapers across the US. Dr. Skumatz has been an invited guest lecturer at Yale University, Brown University, Keio University (Tokyo), University of Wisconsin, University of Washington, Denver University, and elsewhere.

**Skumatz Publications in Solid Waste**

*Dr. Skumatz has more than 120 publications in solid waste (trade journals, conference papers, peer-reviewed publications). Skumatz is sole author or principal author for each.*

**1. PAYT / Variable Rates / Garbage by the Pound**

1. “PAYT Tracking & Research at the National Level –Latest Update on Impacts, Costs, Multi-Family, Drop-off, Commercial, Small Hauler, and GHG Issues”, Paper for Proceedings of the Global Waste Management Symposium (GWMS), Phoenix, September 2012, With Juri Freeman.
2. “Recycling Incentive Alternatives: Results of an Analysis of Performance, Pros, and Cons of RecycleBank™, Recycling Credits, and Pay As You Throw (PAYT)” Resource Recycling, February & March 2011)
3. Pay As You Throw Now: Increase Recycling and Decrease Greenhouse Gases, Quickly, Fairly, and Cost-Effectively, APWA Reporter, March/2010
4. PAYT in the US: Implementation, Impacts, and Experience” Waste Management Journal, Elselvior Publications, 2008.
5. “Solid Waste and Recycling – PAYT and Options for Cost-Effective Integrated Waste Management”, Chapter 9 of “Breath of Fresh Air, Canada 2008.
6. What can our town do to increase recycling…NOW? SERA White Paper, 4/2008
7. Pay As You Throw, Municipalities (Colorado Municipal League), 4/2008
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