Curriculum Vitae for Eric Arthur Bridgwater

Current position: Independent Consultant
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Key areas of expertise

- Waste composition and material flows
- Collection systems optimisation
- Reuse systems
- Food waste prevention & recycling
- Household Waste Recycling Centres
- Financial modelling

Key skills

- Primary & secondary research
- Business case development
- Project management
- Data analysis and modelling
- Waste collection options appraisals
- Waste reduction and reuse
- Training & workshop facilitation
- Business development & tender writing

Personal Profile

I have 20 years' experience in the waste and resource efficiency sector and have contributed to the delivery of over 200 research and consultancy projects, typically as a project manager or director. I have contributed extensively to defining best practice in recycling collection systems in the UK, as well as developing the evidence base for waste policy, including work on modelling national composition estimates for municipal waste. This is complimented by my experience on numerous projects to optimise collection systems (kerbside, HWRC, bring banks, commercial collections), including material flow and financial modelling, business case development, logistics, market assessments, waste treatment options and innovative approaches to moving towards more circular management of waste. I have carried out projects for a wide range of clients, including local authorities, central governments (including in Europe), private waste companies, businesses and industry bodies, as well as working extensively with WRAP and Defra. Prior to working as an environmental consultant, I had a successful career as an account manager and technical translator at a translation agency and I have good working knowledge of Swedish, Norwegian, Danish and Spanish. I am also an accomplished musician and play blues and jazz piano in several bands.

Major Achievements

- **Produced national municipal waste composition estimates** for WRAP in 2019 (most comprehensive estimates ever to be produced), and for Defra (estimates for England 2010/11 and 2006/07).

- **Co-authored the WRAP HWRC Guidance and the National Assessment of Civic Amenity Sites** setting out comprehensive best practice for the management of Household Waste Recycling Centres, including extensive surveys (over 200 sites), data analysis and case studies.

- **Produced numerous food waste and dry recycling collection business cases** mostly for local authorities, to identify options with optimal environmental and economic benefits.

- **Provided extensive advice on implementing reuse systems** including developing business cases, market assessment, identifying innovative practices; including contributing to WRAP's Reuse How To guides and research to estimate the extent of reuse occurring through online portals.

- **Worked with the Latvian and Spanish Environment Ministries** to identify policy measures and interventions to assist in meeting EU Waste Framework Directive targets.

Professional Membership

Chartered Member of the Institute of Wastes Management

Qualifications

1984 - 1988	**BA (Hons) Scandinavian Studies**, University of Hull (Class 2:1)
1986 - 1987	**Diploma in Political Science**, University Karlstad, Sweden (Distinction)

Relevant Appointments

Relevant project examples are included for each appointment listed.

2017 to 2019   Principal Consultant, Eunomia Research & Consulting Ltd

WRAP - National Composition Estimates for Municipal Waste in the UK 2017 (published 2020) Eric project managed the production of the most comprehensive set of composition estimates ever produced for municipal waste in the UK. Compositional datasets for various municipal waste and recycling streams were sourced and analysed in order to model a national composition. Stratification by socio-economic and geographic factors was carried out, to adjust for where the complied datasets were not representative at a national level. The estimates will be invaluable in assisting modelling work for WRAP and other bodies in relation to the implementation of the Resources and Waste Strategy for England.

WRAP – Northern Ireland HWRC Review (2018) Eric acted as project manager and technical lead for a strategic review of HWRCs in Northern Ireland. Around half of the sites in Northern Ireland (46 HWRCs) were reviewed, and all 11 local authorities in Northern Ireland were included. Site specific improvement recommendations were identified from each review, including predicted performance improvement, waste flow modelling and an outline estimate of financial costs/benefits arising from the implementation of recommended improvements; and modelling results were also produced at a national level. Strategic issues affecting Northern Ireland HWRCs were identified, including an assessment of issues around commercial waste inputs and controls, and residual waste restrictions. A spatial analysis was carried out to assess provision of HWRCs across Northern Ireland. Findings were presented and discussed at a workshop attended by all 11 Northern Ireland authorities.

WRAP – Commercial and Industrial Waste Bring Site and HWRC Guidance update, (2018) Eric provided technical advice for a project involving the redesigning and rewriting WRAP's Commercial and Industrial bring site guidance, with a focus on issues around acceptance of business waste at HWRCs. The updated guide and incorporated a significant amount of more recent data and case study information, which was presented in a more concise and easy to reference manner. Eric provided technical advice on HWRC issues and the presentation of best practice recommendations in the updated guidance.

Ministry of the Environment, Finland National Collections Modelling (2018) The project provided technical advice for the modelling of the development of Finland's national municipal waste collections system to achieve EU CE Package future targets under various scenarios. Eric provided technical support including attending a workshop in Helsinki with key associates and stakeholders.

Local Government Association, Waste Framework Modelling (2017) Eric project managed a review of different mechanisms for measuring the performance of municipal waste collection systems (recycling rates, residual waste targets, carbon-based targets, other measures of environmental impact). An options appraisal of the reviewed methods was carried out and the findings presented to LGA board members.

Carmarthenshire County Council, Waste Treatment and Disposal Contract Commissioning Options (2017-2018) Eunomia acted as technical lead for a consortium providing advice to Carmarthenshire County Council to identify a preferred commissioning option for its waste treatment and disposal contract. As project manager, Eric oversaw the development of an options appraisal and business plan for the identified procurement option; and assisting the council through the political process for identifying and implementing a preferred procurement option.

DG Environment, European Commission, Early Warning Mechanism (2017) This study carried out an assessment of which countries are considered to be at risk of non-compliance with the EC's 2020 targets for recycling and reuse. Workshops were carried out with the relevant ministries in each country, and other key stakeholders, to identify measures currently in place or planned. For those countries considered to be at risk of non-compliance, further work was undertaken to develop policy and other intervention measures to reduce the risk of the targets being missed. Eric provided technical support for work with the Spanish and Latvian ministries, including workshops with the respective ministries to develop policy and intervention recommendations.

2009 to 2017   Principal Consultant, Resource Futures Ltd

Various clients: HWRC, Waste Transfer Station and bring sites technical advice (2009-2017). Eric acted as project manager and/or technical lead for 38 projects providing advice on the optimisation of Household Waste Recycling Centres, often with an element of support for Waste Transfer Station and bring sites included. The projects typically included onsite survey of sites, identifying operational efficiencies, design improvements, upgrades of infrastructure, improvement of site policy and management of staff, behaviour change and communications, review of contracts, market assessments, business cases for improvement options, and presenting key findings to officers and members. Types of work undertaken have included staff training, spatial analysis and site rationalisation options, impacts of changes of kerbside service on HWRCs and bring banks, re-use systems (including practical trials) and design recommendations for new sites.

Various clients: Kerbside collections technical advice (2009-2017). Eric has acted as project manager or project director on 12 kerbside collections optimisation projects, mainly for WRAP, ZWS and LWARB. These projects assessed the logistics of various collections options, the modelling of material flows, producing business cases (including partnership working with other authorities) and producing recommendations for the preferred option.

WRAP, Data Analysis Support (2013-2017) Eric project managed the compilation and analysis of several key national datasets for the municipal waste sector, including updating key assumptions used by WRAP in its Kerbside Assessment Tool and other work, in relation to composition of material reported as co-mingled recycling in WasteDataFlow, bulk densities of various recyclates, a UK wide geo- and socio-demographic metric for local authorities, an updated ready reckoner for food waste yields and understanding of the effects of introducing charging on garden waste yields. Eric oversaw analyses of recycling performance in different housing types in the UK, and carried out statistical analysis of factors affecting kerbside recycling yields to feed into WRAP's Route Map project.

WRAP, HWRC Guidance and National Directory (2012-2017) Eric project managed the production of WRAP's best practice guidance for the management of Household Waste Recycling Centres. Extensive case studies were compiled and a working group with industry representatives was consulted. An easy to use and easy to reference guide was produced and published by WRAP. Additionally an annual national directory of HWRC performance was produced, providing a national HWRC performance benchmarking tool, as well as demonstrating national trends in HWRC performance.

Confidential client, Review of Municipal and Commercial Waste Composition Data (2016-2017) Eric advised on the compilation of UK waste composition data for a confidential client based in the United States, with a particular focus on understanding mixed commercial waste and its moisture content.

Bath and North East Somerset Council, Waste Strategy and Data Analysis Support (2009-2017) Eric was involved in the delivery of six projects for Bath and North East Somerset Council to assist the development of waste strategy and data management. Eric carried out waste arisings and carbon benefits modelling on behalf of Bath and North East Somerset council, to assist them in assessing various future collection system scenarios, including accounting for the carbon benefits of recycling (in relation to landfill).

WRAP, Household Food and Drinks Waste (2010-2017) Eric played a key role in producing national household food waste arisings estimates for WRAP in their Household Food and Drink Waste in the UK project. This programme of work encompassed seven separate projects, the most significant being the Data Synthesis reports supporting arisings estimates for 2012, 2014 and 2015. This was a continuation of work Eric carried out with WRAP in 2011, producing estimates to assist WRAP in monitoring progress against food waste reduction targets in WRAP's 2008-11 business plan. He also produced national household waste and recycling estimates for textiles and plastics for WRAP, as part of the same programme of work.

WRAP, Quantification of Food Surplus and Waste in the Supply Chain (2015-16) Eric provided technical support and reviewed outputs of a study investigating food surplus and food waste in the UK grocery supply chain. A key finding of the work was that a combination of preventing food waste being generated, redistribution of food surplus and diverting surplus to animal feed could lead to a 42% reduction in avoidable food waste, saving UK businesses millions of pounds a year.

Telford & Wrekin Council, Waste Planning Review (2014-15) A waste evidence plan was produced for Telford and Wrekin Council, to assist with the authority's formal planning process. This included analysis of Waste Data Interrogator data, predictive mass flow modelling for all waste arisings in the authority, accounting for projected changes in housing stock and planned commercial developments, alongside an assessment of current and planned waste management and processing capacity.

WRAP, Re-use How To Guides (2014) Eric contributed to the HWRC section of WRAP's Re-use How To Guides, including reuse performance benchmarks, predictive modelling of material flows for different reuse scenarios, operational considerations and describing different approaches partnership working.

WRAP, Impact of Communications (2014) The project reviewed of monitoring data from WRAP funded projects, including from the Behavioural Change Local Fund, to assess the impact of communications interventions on recycling collection yields. Statistical analysis of the data found some evidence for quantifying the scale of impact.

WRAP, Belfast waste strategy review (2013) Eric reviewed Belfast City Council's waste strategy, to help the authority understand whether their recycling rate targets were achievable within the timescales set out in their Zero Waste Action Plan, and proposed additional measures to help achieve the target.

WRAP, HWRC toolkit (2013) Eric carried out statistical analysis of an extensive database of HWRC site assessment database to produce a model for predicting the effects of different types of site improvement on recycling performance. He oversaw the incorporation of this model into a user friendly Excel toolkit, that included outline estimates of resource and cost implications for different types of improvements, and the HWRC Toolkit was made available on WRAP's HWRC Guidance web page.

Defra, National Municipal Waste Compositional Estimates for England in 2010/11 (2012) National compositional estimates for local authority collected waste in England were produced for the baseline 2010/11. This included all collection streams (kerbside, HWRC, bulky waste, street sweepings, bring sites, local authority collected commercial waste, etc), with separate estimates for residual and recycling. These estimates were compared with the previous 2006/07 estimates, to identify trends and significant changes in national waste composition profiles for the two periods. The compositional dataset produced from this work has become a standard reference in the industry and has been applied in countless studies and analyses carried out by waste management practitioners in England.

WRAP, National Bulky Waste Composition Review (2012) For this study, detailed surveys of bulky waste delivered to HWRCs, or collected through bulky waste collections, were carried out across a number of authorities in the UK. Eric lead on analysing and modelling the results, in order to produce national estimates for bulky waste arisings, including an assessment of the proportion of each product type assessed to be reusable.

Zero Waste Scotland, Clyde Valley Food Waste Collections Options Appraisals (2011-12) Eric managed the development of options appraisals and business cases for implementing food waste collections for five local authorities in Scotland in the Clyde Valley region on behalf of Zero Waste Scotland.

London Organising Committee for the Olympic Games, Waste Flow Modelling for the Olympic & Paralympic Games (2008-2012) Eric has developed models to predict waste flows and materials recovery options for the London Olympics, on behalf of the London Organising Committee of the Olympic Games (LOCOG). These assisting LOCOG in commissioning waste management at the Games. A review of the model's performance after the Games found that it had predicted material flows with close to 100% accuracy.

WRAP, Wales Kerbside Collection Study (2010) Led by Eunomia, this work aimed to obtain a greater understanding of the relative merits of the options available for the collection and sorting of dry materials across local authorities in Wales. Analysis was carried out at a local authority level, covering kerbside sort, co-mingled schemes and partially co-mingled schemes, to determine the financial, environmental and social costs of each approach. Eric undertook the waste flow modelling for each of the collection and sorting approaches to feed into the overall cost-benefit analysis.

WRAP, Environmental Impact of Online Exchange (2010) Eric project directed an assessment of the impacts of Online Exchange (such as Ebay, Gumtree, B2B portals, etc) on diversion of materials to reuse / prolonging the consumption life of items; and associated environmental impacts.

WRAP, Kerbside Dry Recycling Performance Benchmarks (2010) Eric project managed the delivery of WRAP's Analysis of Kerbside Dry Recycling Performance in the UK 2008/09 study, which has produced an extensive array of performance benchmarks, as well as a statistically robust model for explaining how different factors affect kerbside dry recycling performance.

Oxfordshire Waste Partnership, Oxfordshire Waste Prevention Strategy (2009) Eric carried out waste arisings modelling for the Oxfordshire Waste Partnership for various collection system scenarios, with a focus on the impacts of waste prevention strategies and reuse.

WRAP, Evaluation of WRAP Separate Food Waste Collection Trials (2009) Eric provided extensive technical support for the evaluation of WRAP supported food waste collection trials, carried out in 19 local authorities across the UK during 2007-08. A wide range of data was collated and analysed to investigate which factors were significant in affecting food waste yields across the trials and to draw out practical lessons for the separate collection of food waste by local authorities.

2002 to 2008   Senior Consultant, Resource Futures Ltd

Defra, National Municipal Waste Compositional Estimates for England 2006/07 (2008) The project involved an in-depth review of all municipal waste compositional evidence in the UK and producing the most robust estimates to date of the composition of municipal waste streams in England.

WRAP, Bulk Density Study (2007-2008) Eric collated and evaluated all currently available information on the bulk density of materials in different containment systems.

Recycling Action Yorkshire, Plastics Feedstock Market Assessment (2008) Eric project directed a market assessment of commercial, industrial and agricultural plastics feedstock in Yorkshire.

WRAP, Materials Recycling Facility Quality Testing (2008) Eric contributed to WRAP's MRF Material Testing Development project, including the evaluation and analysis of MRF input and output material compositional datasets, and presenting proposed materials testing protocols to key industry representatives.

Recycling Action Yorkshire, Barnsley Health Trust Review (2008) Eric developed a dynamic model for Barnsley NHS trust (on behalf of Recycling Action Yorkshire) which identifies the financial costs/savings of developing waste management and recycling systems, whilst taking account of ongoing hospital expansion and wastes generated by different ward and patient types.

East Midlands Development Agency, Third Sector Capacity Building (2007) Eric project managed the mapping third sector involvement in recycling/reuse in the East Midlands; workshops and consultation with the third sector and key stakeholders; developing strategies for expanding the involvement of social enterprises in the recycling and reuse of commercial and industrial waste in the region.

WRAP and ECT Recycling, Commercial Food Waste Collections Trial (2007) Eric project directed the delivery support and performance monitoring of trial commercial food waste collections in Bristol and Bath.

Furniture Reuse Network and Defra, Bulky Basics: Financial Modelling (2006) Eric analysed the costs/benefits of increasing recycling/reuse derived from the household bulky waste stream. This involved the financial modelling of a complex range of factors affecting bulky waste recycling/reuse economics, drawing on practical case study examples.

Defra, HWRC Technical Support for the Local Authority Support Unit (2004-05) Eric acted as technical lead for an extensive programme of HWRC support to 16 local authorities, including site improvement and/or redevelopment plans, mechanisms dealing with cross-boundary usage issues, HWRC staff training schemes and design of HWRC management contracts.

Defra, Assessment of the Capacity of Civic Amenity Sites to Collect WEEE (2004) Eric authored an influential study assessing the national capacity of Household Waste Recycling Centres to collect WEEE, including case studies, material flow projections and cost estimates.

SITA Environmental Trust, Royal Borough of Kensington and Chelsea Garden Waste Collection Trials (2002-2004) Eric project managed the roll-out, delivery and monitoring of a collection trial aimed at gardened properties in Kensington and Chelsea.

Biffaward, National Assessment of Civic Amenity Sites (2002-2004) Eric was a key contributor to the National Assessment of Civic Amenity Sites (NACAS) report, the most comprehensive research project into HWRC (Household Waste Recycling Centre) site good practice carried out in the UK. As co-author of this report, Eric was involved in developing research methodologies, organising on-site surveying, modelling for HWRC improvements and resource requirements, and writing up significant sections of the NACAS Report and Toolkit, which was then published as guidance for local authorities. The NACAS project was the overall winner of the Biffaward Awards in 2004, and the project's impact assessment estimated that it has indirectly resulted in the additional diversion of at least 1% per annum of the UK's household waste from disposal, through encouraging and enabling improvements in HWRC management practice in the industry.

2001 to 2002   Project Researcher, Network Recycling Ltd

Biffaward, Trade Waste Input to Civic Amenity Sites (2001-2002) Eric managed a programme of onsite surveys to assess levels of trade abuse at 11 HWRCs, the most extensive research programme of its type. Case studies on managing unauthorised trade inputs at HWRCs were produced, and guidance developed on optimising the management of trade inputs. An assessment of the national environmental and economic impacts of trade abuse on HWRCs was produced. Findings were presented at a national conference.

1990 to 2001   Translation Manager, Sally Walker Language Services Ltd

Eric managed the translation of commercial and technical documents for a wide range of clients, and account managed some of the company's key clients (including SAAB and Environment Agency Wales). He also translated extensively from Swedish, Norwegian and Danish into English.