

| YEAR | TITLE | AUTHOR | JOURNAL | ANALYSIS METHOD | TOPIC | ACCOUNTING SYSTEM | COMPILATION METHOD | FRAMEWORK | DATA SOURCE | INDICATORS | BOUNDARIES OF ANALYSIS |
|------|--|---|--|------------------------------------|---|--|----------------------|-----------|--|--|--|
| 2009 | A review of recent multi-region input-output models used for consumption-based emission and resource accounting | T.Wiedmann | Ecological Economics | / | Overview of recent MRIO models and possible further developments | / | / | / | Previous researches | / | / |
| 2016 | Assessing carbon dioxide emission reduction potentials of improved manufacturing processes using multiregional input output frameworks | H.Ward, M.Burger, Y.Chang, P.Furstmann, S. Neugebauer | Journal of Cleaner Production | LCA HLCA | A multi-step evaluation framework building on multi-regional input-output data to estimate macroeconomic impacts of new process technologies | / | / | MRIO | Statistisches Bundesamt, Airbus S.A.S., Bavaria Schweisstechnik, German Steel Tube Association, Previous researches | CO2 emission reduction Monetary flow difference | Germany, Europe |
| 2017 | Assessing carbon footprints of cities under limited information | J.Fry, M.Lenzen, Y.Jin, T.Baynes, T.Wiedmann, G.Chen, A.Geschke | Journal of Cleaner Production | Miyazawa's partitioned inverse | Simulate different levels of data availability and then calculate the carbon footprint of each case by applying Leontief's demand-pull approach | / | Cross-Entropy Method | MRIO | Wang at al. database (2017) | CF | Beijing, Chongqing, Shanghai, Tianjin; China |
| 2017 | Assessing the urban carbon footprint: An overview | M.Lombardi, E.Laiola, C.Tricase, R.Rana | Environmental Impact Assessment Review | / | Overview of accounting methods and model selection | / | / | / | Previous researches | / | / |
| 2012 | Articulating atrans-boundary infrastructure supply chain greenhouse gas emission footprint for cities: Mathematical relationships and policy relevance | A.Chavez, A. Ramaswami | Energy Policy | EIOA | Comparison of policy relevance and derivation of mathematical relationships between approaches for GHG emissions accounting for cities | Purely-Geographic Inventory Trans-Boundary Community-Wide Infrastructure Footprint Consumption Based Footprint | / | SRIO | US Census, Local Utility billing data, Regional Water Utility, Consumer Expenditure Survey, IMPLAN database | CF CF in community supply/exports of electricity, fuels and services vs community GDP | Denver, Routt, Sarasota; U.S. |
| 2018 | Representing and visualizing data uncertainty in input-output life cycle assessment models | X.Chen, W.M.Griffin, H.S.Mathews | Resources, Conservation & Recycling | Modified range method | Consider a wide range of data to estimate the uncertainty of estimated energy consumption | / | / | IO-LCA | 2002 Standard Use Table, U.S. Department of Energy surveys, U.S. Census Bureau, MECS, CBECS | Energy consumption per sector Separated fuel consumption Energy intensity | U.S. |
| 2017 | Identify sectors' role on the embedded CO2 transfer networks through China's regional trade | Z.Wang, C.Xiao, B.Niu, L.Deng, Y.Liu | Ecological Indicators | Network Analysis | A framework for combining multi-regional input-output analysis and network indicators to assess the interregional CO2 flows in China | / | / | MRIO | China Emission Accounts Database (CEAD), China's 2010 MRIO table from Liu | Control Index Dependence Index Hub Index Authority Index | 8 Regions of China |
| 2018 | Toward urban environmental sustainability: The carbon footprint of Foggia's municipality | M.Lombardi, E.Laiola, C.Tricase, R.Rana | Journal of Cleaner Production | Urban Carbon Footprint methodology | Application of Urban Carbon Footprint and the Relative Carbon Footprint to evaluate an urban action plan according to the UE policies | Territorial Accounting System | / | / | E-distribuzione SpA, Comune di Foggia, AMGAS SpA, ACI, ISPRA | Relative Carbon Footprint CF Energy consumption per sector | Foggia, Italy |
| 2013 | Using hybrid method to evaluate carbon footprint of Xiamen City, China | J.Lin, Y.Liu, F.Meng, S.Cui, L.Xu | Energy Policy | LCA | Use of a hybrid approach to assess the CF of Xiamen City, to take into account scope 1,2 and 3 emissions | / | / | IO-LCA | Yearbook of Xiamen Special Economic Zone, China Energy Statistical Yearbook, Xiamen's Energy Balance Table, Departmental Surveys | CF CF by sector Energy use emissions by sectors Non-energy use emissions by sectors Embodied emissions of urban key imported materials | Xiamen City, China |

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| 2012 | A universal model for mobility and migration patterns | F.Simini, M.C. Gonzalez, A.Maritan, A.L.Barabási | Nature | / | A stochastic process capturing local mobility decisions that helps us analytically derive mobility fluxes | / | Radiation model Gravity model | / | US census 2000 | Impact of the radiation model on the six limitations of the gravity model | U.S. |
| 2015 | Sustainable Urban Metabolism | S.Chen, B.Chen | Encyclopedia of Environmental Managment | / | Overview of principles to assess SUM | / | / | / | Previous researches | / | / |
| 2018 | Consumption-based greenhouse gas emissions accounting with capital stock change highlights dynamics of fast-developing countries | Z.Chen, M.Lenzen, T.Wiedmann, J.Meng, Z.Liu, S.Ohshita, B.Chen | Nature Communications | EIOA | Development of a dynamic model to incorporate capital stock change in consumption-based accounting | Dynamic CBA | / | MRIO | WIOD | Dynamic CF CF per capita | World |
| 2018 | China's low-carbon economic transition: Provincial analysis from 2002 to 2012 | X.Yan, J.Ge, Y.Lei, H.Duo | Science of the Total Environment | EIOA | Appling MRIO analysis to filter the Low Carbon Economy (LCE) provinces | / | / | MRIO | China Energy Statistics Yearbooks; Chinese Academy of Sciences Virtual Economy and Data Science Research Center; China Emission Accounts and Datasets | CO2 emissions | China |
| 2018 | Environmentally-extended input-output simulation for analyzing production-based and consumption-based industrial greenhouse gas mitigation policies | L.Liu, G.Huang, B.Baetz, K.Zhang | Applied Energy | EIOA | CB and PB industrial GHG emission calculation to find optimal mitigation policies | Production-based accounting Consumption-based accounting | / | SRIO | Statistics Canada, NIR, ECCC | CO2 emissions | Canada |
| 2018 | Does consistency with detailed national data matter for calculating carbon footprints with global multi-regional input-output tables? A comparative analysis for Belgium based on a structural decomposition | C.Hambÿe, B.Hertveldt, B.Michel | Journal of Economic Structures | Structural Decomposition Analysis | Comparison between CF calculated with original and adapted MRIO of Belgium | / | / | MRIO | WIOD, UpdateSUT project of the Belgian Federal Planning Bureau (FPB) | CF CF embodied in trade Leontief effect difference Final demand effect difference | Belgium |
| 2018 | Implementing exogenous scenarios in a global MRIO model for the estimation of future environmental footprints | K.S.Wiebe, E.L.Bjelle, J.Többen, R.Wood | Journal of Economic Structures | Econometric Analysis | Implementing existing climate change scenarios in MRIO models | / | / | MRIO | EXIOBASE, IEA, IMF | Macro-economic indicators Expected decrease in CO2 emissions | World |
| 2013 | Reducing carbon emissions in China: Industrial structural upgrade based on system dynamics | G.Mao, X.Dai, Y.Wang, J.Guo, X.Cheng, D.Fang, X.Song, Y.He, P.Zhao | Energy Strategy Reviews | Econometric Analysis | Calculating IICs and ICECs of all industries and building a system dynamics model to simulate three scenarios | / | / | SRIO | China's National Bureau of Statistics, China Energy Statistical Yearbook, IPCC Guidelines for National GHG Inventories | Industrial Influence Coefficients (IICs) Industrial Carbon Emission Coefficients (ICECs) GDP growth Total Carbon Emissions | China |
| 2018 | How external trade reshapes air pollutants emission profile of an urban economy: A case study of Macao | J.Lia, M.Shia, P.Cai, B.A.G.Camposc, X.Song, B.Chen, Q.Y.H.Chen | Ecological Indicators | Econometric Analysis | Evolution investigation of air pollutants emissions embodied in external trade based on the multi-regional input-output analysis | / | / | MRIO | Eora database, Macao statistics yearbook | TEE (total embodied emissions) | Macao |
| 2007 | Development of the Interregional I/O Based LCA Method Considering Region-Specifics of Indirect Effects in Regional Evaluation | I.Yi, N.Itsubo, Y.Inaba, K.Matsumoto | The International Journal of Life Cycle Assessment | Life Cycle Region-specific Assessment Method | Observe the effects of 4 environmental burdens (CO2, NOx, SOx, SPM) to human health using a new site-specific LCA method | / | Entropy Maximizing model | IRIO | Census Data from Regional Databases | CO2, NOx, SOx, SPM emissions | Japan |

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| 2015 | The Concept of City Carbon Maps | T.Wiedmann, G.Chen, J.Barrett | Journal of Industrial Ecology | EIOA | Introduction of "city carbon map" which shows local, regional, national, and global origins and destinations of flows of embodied emissions | City Carbon Map approach | Flegg's Location Quotients | MRIO | Australian Bureau of Statistics, IELab database, Australian Greenhouse Emissions Information System, EORA database | CF CF per capita | Melbourne, Australia |
| 2018 | Carbon and water footprint accounts of Italy: A Multi-Region Input-Output approach | Y.Alia, R.Pretaroli, C. Succi, F.Severini | Renewable and Sustainable Energy Reviews | EIOA | Analysis of the CO2 emissions and the water use embodied in international trade in Italy | Production-based accounting Consumption-based accounting | / | MRIO | WIOD, Istat | Carbon footprint Water footprint | Italy |
| 2008 | Polluting my neighbours: linking environmental accounts to a multi-regional input-output model for Italy, methodology and first results | P.Renato, B.Simone | IHOME conference in Seville | EIOA | Estimating the impact of economic activities at regional and multiregional level on the environment for year 2001 | / | / | MRIO | IRPET, Istat | GHG | Italy |
| 2016 | Exergy Life Cycle Assessment of electricity production from Waste-to-Energy technology: A Hybrid Input-Output approach | M.V.Rocco, A.Di Lucchio, E.Colombo | Applied Energy | Exergy Life Cycle Assessment | The Hybrid Input-Output model is here adopted for the analysis of a Waste-to-Energy (WtE) power plant currently operating in the Italian context | / | / | Hybrid-IO | IEA, Ecoinvent | Embodied exergy | Italy |
| 2018 | Integrating Sustainability Into City-level CO2 Accounting: Social Consumption Pattern and Income Distribution | J.Tian, C.Andrade, J. Lumberas, D.Guan, F. Wang, H.Liao | Ecological Economics | Hypothetical Extraction Method | Calculate CO2 emissions arising from the social consumption pattern and income distribution, and to explore economic drivers behind CO2 variations | / | / | SRIO | Beijing Municipal Bureau of Statistics | CO2 emissions | Beijing, China |
| 2013 | The relative carbon footprint of cities | N.Da Schio, K.F.Brekke | Villes & territoires | RCF Disaggregation | The three dimensions of influence on the Relative Carbon Footprint | / | / | / | MCT, SVMA, DEAT | CF CF per capita CF per GDP | São Paulo, Brazil Cape Town, South Africa |
| 2018 | Urban carbon flow and structure analysis in a multi-scales economy | F.Meng, G.Liu, Y.Hu, M.Su, Z.Yang | Energy Policy | EIOA | Trace the carbon flow of Beijing in a multi-scales economic system from production and consumption perspectives | Consumption Based Accounting | / | MRIO | WIOD, China's Provincial Energy Statistics, China Agriculture Yearbook, e National Greenhouse Gas Inventory, IPCC | Carbon flow | Beijing, China |
| 2018 | Material dependence of national energy development plans: The case for Turkey and United Kingdom | M.Kucukvar, N.C.Onat, M.A.Haider | Journal of Cleaner Production | Material Flow Analysis | Investigation of material footprints of Turkey's and UK's national energy development plans | / | ARIMA forecasting | MRIO | EXIOBASE, United Nations Commodity Trade | Material footprint | Turkey United Kingdom |
| 2018 | Interregional carbon flows of China | C.Duan, B.Chen, K. Feng, Z.Liu, T.Hayat, A.Alsaedi, B.Ahmad | Applied Energy | Ecological Network Analysis | Assessment of carbon flows within China and identification of key regions and sectors in the context of spatial heterogeneity for effective carbon mitigation | / | / | MRIO | National Statistics Bureau, China Emission Accounts and Databases (CEADs) | CO2 emissions Carbon Flow Control Index Dependence Index | China |
| 2016 | A methodological proposal for the construction of a regional input-output matrix using a bottom-up approach and its statistical assessment | N.E.A.Sanéna, J.M.S. Gamboa | Investigacion Economica | Spatial Linkages Analysis | Construction of a RIO matrix by means of a bottom-up perspective instead of a top-down approach and their main differences and similarities | / | Spatial Economic Functional Units Approach RAS Method | MRIO | National Input-Output Matrix, Anuario Estadístico y Geografía de Sonora, Mexico en cifras | BL-FL | Sonora, Mexico |

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| 2018 | Flow analysis of the carbon metabolic processes in Beijing using carbon imbalance and external dependence indices | J.Li, Y.Zhang, N.Liu, B.D.Fath, Y.Hao | Journal of Cleaner Production | Material Flow Analysis | Analysis of the dynamic changes in the carbon metabolism and the structural characteristics of material utilization | / | / | Material Flow Accounting | Beijing statistical yearbook, China Energy Statistics Yearbook, China Rural Statistical Yearbook, China Environmental Statistics Yearbook, China Plastics Industry Yearbook | Carbon imbalance index (CII) Carbon external dependence index (CEDI) | Beijing, China |
| 2016 | Where do islands put their waste? A material flow and carbon footprint analysis of municipal waste management in the Maltese Islands | M.Camilleri-Fenech, J.Oliver-Sola, R.Farreny, X.Gabarrell | Journal of Cleaner Production | Material Flow Analysis | Waste management on small islands | / | First Order Decay Method | Material Flow Accounting | Malta Environment and Planning Authority (MEPA), WasteServ Malta Ltd | Material flow Carbon footprint | Malta |
| 2018 | Carbon footprint assessment for the waste management sector: A comparative analysis of China and Japan | L.Sun, Y.Hijioka, T.Fujita, Z.Li, M.Fujii | Frontiers in Energy | Hybrid LCA | Evaluation of the carbon footprint of the waste management sector to identify direct and indirect carbon emissions | / | / | IO-LCA | China Statistical Yearbook, Ministry of Environment of Japan | Carbon footprint | China and Japan |
| 2017 | Developing a city-centric global multiregional input-output model (CCG-MRIO) to evaluate urban carbon footprints | J.Lin, Y.Hu, X.Zhao, L.Shi, J.Kang | Energy Policy | EIOA | Assessment of the carbon footprints of urban consumption in the global supply chain with details of regional and specific flows | Consumption Based Accounting | Gravity Model Ordinary Least-Squares Method RAS Method | MRIO | Beijing Municipal Statistical Yearbook, National Energy Statistical Yearbook, Google Earth, Municipal Statistics Bureau, WIOD database | CF CF by sector Carbon Flow Carbon Balance | Beijing, China |
| 2017 | Integrating Urban Metabolism, Material Flow Analysis and Life Cycle Assessment in the environmental evaluation of Santiago de Compostela | F.García-Guaita, S.González-García, P.Villanueva-Rey, M.T.Moreira, G.Fejoo | Sustainable Cities and Society | Material Flow Analysis | Provide an environmental impacts account with highly disaggregated results to develop environmental strategy plan for a city | / | / | LCA | National Statistics Institute | Environmental indicators | Santiago de Compostela, Spain |
| 2016 | Urban carbon transformations: unravelling spatial and inter-sectoral linkages for key city industries based on multi-region input-output analysis | G.Chen, M.Hadjikakou, T.Wiedmann | Journal of Cleaner Production | Spatial Linkages Analysis | Importance of promoting mitigation measures both within and outside of the city | Consumption Based Accounting | FLQ | MRIO | Australian Bureau of Statistics, AGEIS | CF EEL-EEE BL-FL CBM-CFM | Sydney and Melbourne, Australia |
| 2016 | Comparing a territorial-based and a consumption-based approach to assess the local and global environmental performance of cities | A.Athanassiadis, M.Christis, P.Bouillard, A.Vercalsteren, R.H.Crawford, A.Z.Khan | Journal of Cleaner Production | EIOA Environmental Flow Analysis | Analysis of TB and CB approach to estimate both direct and embodied resource use and pollution flows for the case of Brussels Capital Region | Territorial Based Accounting Consumption Based Accounting | / | MRIO | Environmental Administration of Brussel | Imports & Exports in Raw Material Equivalents CO2 Emissions Material Flow Water Flow | Brussel Capital Region, Belgium |
| 2015 | Emergy evaluation for a low-carbon industrial park | D.Fang, B.Chen, T.Hayat, A.Alsaedi | Journal of Cleaner Production | Emergy analysis | Identification of the input-output structure and embodied carbon emission flows of the industrial park using a carbon accounting framework based on emergy | / | / | SRIO | Beijing Statistical Yearbook | Embodied carbon emission Emergy indicators | Beijing, China |
| 2014 | Consumption based CO2 accounting of China's megacities: the case of Beijing, Tianjin, Shanghai and Chongqing | K.Feng, K.Hubacek, L.Sun, Z.Liu | Ecological Indicators | EIOA | Focus on the spatial distribution of production activities leading to CO2 emissions across China as a consequence of final consumption in four Chinese mega cities | Consumption Based Accounting | / | MRIO | MRIO table constructed and compiled by Liu, China's provincial energy statistics, IPCC reference approach, China Energy Statistical Yearbook | CF CF per capita CF vs GDP Emissions Embodied in trade | Beijing, Tianjin, Shanghai, Chongqing, China |

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| 2011 | Carbon footprint evaluation at industrial park level: A hybrid life cycle assessment approach | H.Dong, Y.Geng, F.Xi, T.Fujita | Energy Policy | Hybrid LCA | Finding an appropriate method on evaluating the carbon footprint of one industrial park | / | / | IO-LCA | Statistical Bureau of SETDZ, National Statistical Bureau | CF CF per capita | Shenyang Economic and Technological Development Zone (SETDZ), China |
| 2009 | Methodology for inventorying greenhouse gas emissions from global cities | C.Kennedy, J. Steinberger, B.Gasson, Y.Hansen, T.Hillman, M.Havranek, D.Pataki, A.Phdungsilp, A. Ramaswami, G.Villalba Mendez | Energy Policy | LCA | Description of the methodology and data used to determine greenhouse gas (GHG) emissions attributable to ten cities or city-regions | / | / | IPCC accounting method | National Statistics Institutes | GHG | Los Angeles County, Denver City and County, Greater Toronto, New York City, Greater London, Geneva Canton, Greater Prague, Barcelona, Cape Town and Bangkok |
| 2009 | Material Flow Accounting in an Irish City-Region 1992-2002 | D.Browne, B.O'Regan, R.Moles | Journal of Cleaner Production | Material Flow Analysis | Measurement of raw material inputs and waste flows in order to analyse their decoupling with economic growth | / | / | Material Flow Accounting | National and international institutes | TMC (total material consumption) TMI (total material input) TMO (total material output) | Limerick City, Ireland |
| 2014 | Input-Output Modeling for Urban Energy Consumption in Beijing: Dynamics and Comparison | L.Zhang, Q.Hu, F.Zhang | Plos One | EIOA | Analysis of the energy flows for the entire city of Beijing and its 30 economic sectors over the past twenty years of rapid urbanization | / | / | SRIO | 9 input-output tables from 1987 to 2007 compiled by the Beijing Statistical Bureau, EBT of the Beijing Statistics Yearbook | Variations of total energy consumption Energy Intensity CF Influence Coefficient IC Response Coefficient RC | Beijing, China |
| 2015 | Structural Decomposition Analysis of Carbon Emissions and Policy Recommendations for Energy Sustainability in Xinjiang | C.Wang, F.Wang | Sustainability | Structural Decomposition Analysis | Uncover the driving forces for the increment in energy-related carbon dioxide emissions in Xinjiang from both production and final demands perspectives from 1997 to 2007 | / | / | SRIO | IPCC Guidelines for NGHGI, Xianjiang Statistical Yearbook | CO2 Emissions vs: Carbon Emission Intensity Production structure Consumption structure Per capita GDP Population size | Xinjiang, China |
| 2017 | Urban Metabolism of Three Cities in Jing-Jin-Ji Urban Agglomeration, China: Using the MuSIASEM Approach | X.Wang, S.Wu, S.Li | Sustainability | Multiscale integrated analysis of societal and ecosystem metabolism (MuSIASEM) method | Analysing the socio-economic system and ecosystem using the urban metabolism approach | / | / | Societal and ecosystem metabolism | Statistical yearbooks of Beijing, Tianjin, Tangshan | Specific indexes | Beijing, Tianjin, Tangshan; China |
| 2010 | A Carbon Footprint Time Series of the UK—Results from a Multi-Region Input–Output Model | T.Wiedmann, R.Wood, J.Minz, M.Lenzen | Economic Systems Research | EIOA | Detailed sectoral and country-specific trade data for the UK and economic and environmental data are integrated in a UK-specific MRIO model. This was subsequently used to calculate a time series of national carbon footprints for the UK from 1992 to 2004 | Consumption Based Accounting | KRAS Technique | MRIO | UK Office for National Statistics, Eurostat, Netherlands Environmental Assessment Agency, OECD Statistics, UN Statistics, HM Revenue & Customs, International Energy Agency | CF EEI-EEE | United Kingdom |
| 2013 | Analysis of energy embodied in the international trade of UK | X.Tang, S.Snowden, M.Hook | Energy Policy | EIOA | Amount of fossil energy embodied in UK's imports and exports and how it is distributed into country's sectors | / | / | SRIO | UK Office for National Statistics, UK National Accounts, UK Balance of Payments, BP, World Bank | Embodied fossil energy imports and exports Embodied fossil energy intensity per sector | United Kingdom |

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| 2014 | Urban sustainability assessment of Taiwan based on data envelopment analysis | W.Yang, Y.Lee, J.Hu | Renewable and Sustainable Energy Reviews | Modified Slack-based Data Envelopment Analysis | Comparing the aggregated urban efficiency of Taiwan's 22 administrative regions and identifying adjustments and targets | / | / | Newman's Extended Urban Metabolism | Urban and Regional Development Statistics, Municipal Governments Data Base, Environmental Statistics | Total-Factor Energy Efficiency TFEE Urban Efficiency Energy Consumption per sector | Taiwan |
| 2016 | Analysis of the ecological relationships of urban carbon metabolism based on the eight nodes spatial network model | L.Xia, Y.Zhang, Q.Wu, L.Liu | Journal of Cleaner Production | Ecological Network Analysis (ENA) | Identification of the negative relationships affecting urban development and creation a theoretical basis for adjustment of carbon management activity | / | / | Spatial network model | National and urban statistical yearbooks | Ecological relationships | Beijing, China |
| 2011 | Network Environ Perspective for Urban Metabolism and Carbon Emissions: A Case Study of Vienna, Austria | S.Chen, B.Chen | Environmental Science & Technology | Network Environ Analysis (NEA) Network Utility Analysis (NUA) Network Control Analysis (NCA) | Analysis of urban metabolism with a system-oriented technique known as Network Environ Analysis (NEA) | / | / | Urban Metabolic Network | Ad hoc investigations | Network-based environmental indicators | Vienna, Austria |
| 2013 | Quantification of urban metabolism through coupling with the life cycle assessment framework: Concept development and case study | B.Goldstein, M.Birkved, M.Quitau, M. Hauschild | Environmental research letters | LCA | Introducing and explaining the power of a new hybrid UM methods to analysis five global cities | / | / | UM-LCA model | International, national and regional institutes | Environmental indeces (GWP, FE, PMF, ALO) | Beijing, China Cape Town, South Africa Hong Kong London, United Kingdom Toronto, Canada |
| 2008 | Hybrid Energy-LCA (HEML) based metabolic evaluation of urban residential areas: The case of Beijing, China | D.Li, R.Wang | Ecological Complexity | Urban Metabolism Evaluation | Metabolic evaluation for better understanding the trends in urban environmental changes | / | / | Hybrid Energy-LCA (HEML) | Beijing Municipal Statistical Yearbook | Energy margin of environmental impact Household empower URA environmental load ratio URA waste ratio Gross household emissions | Tian Tongyuan (TTY), Beijing, China |
| 2013 | Analysis of the energy metabolism of urban socio-economic sectors and the associated carbon footprints: Model development and a case study for Beijing | Y.Zhang, H.Zheng, B. D.Fath | Energy Policy | Ecological Network Analysis | Analyzing urban energy metabolism and carbon footprint to provide basic data for target carbon emission reductions | / | / | Urban Embodied Energy Metabolic Network Model | Beijing Statistical Yearbook, China Energy Statistical Yearbook | Embodied Energy Consumption per sector Embodied Energy Consumption Intensity CF CF by sector CF Intensity | Beijing, China |
| 2007 | CO2 emissions and intersectoral linkages: the case of Spain | M.A.Tarancon, P. del Rio | Energy Policy | Sensitivity Analysis | Identifying the most relevant structural coefficients and the corresponding economic transactions whose minimal variations lead to the highest changes in sectoral CO2 emissions | / | / | SRIO | National Statistical Office, INE, SCA | CO2 Emissions by sector Elasticities by sector | Spain |

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| 2014 | Development of a spatially explicit network model of urban metabolism and analysis of the distribution of ecological relationships: case study of Beijing, China | Y.Zhang, L.Xia, B.D.Fath, Z.Yang, X.Yin, M.Su, G.Liu, Y.Li | Journal of Cleaner Production | Ecological Network Analysis | Development of a spatially explicit model of carbon transfers between regions of an urban area | / | / | Spatial network model | Beijing Statistical Yearbook, China Energy Statistical Yearbook | Carbon Metabolic Flows Mutualism index (M) Land use and cover change (LUCC) | Beijing, China |
| 2012 | Process-based investigation of cross-boundary environmental pressure from urban household consumption | D.Yang, Y.Lin, L.Gao, Y.Sun, R.Wanga, G.Zhang | Energy Policy | Emergy analysis | Investigation about the environmental pressure generated by household consumption in Xiamen | Spatial and process-based accounting | / | EMA-CFA method | Ad hoc survey, Xiamen Statistical Yearbook, other local institutions | Emergy indicators Carbon footprint (CF) | Xiamen Island, China |
| 2010 | Environmentally Extended Input-Output Analysis of the UK Economy: Key Sector Analysis | S.E.Shmelev | QEH Working Paper Series | EIOA Novel Approach to Imprecise Assessment and Decision Environment (NAIADE) | A detailed analysis of the structural physical links in the economy with the use of an environmental key-sector analysis | / | / | SRIO | UK Office for National Statistics, MOSUS project | Forward & Backward Linkages Physical Flows CO2 Forward & Backward Linkages Degree of Sustainability | United Kingdom |
| 2015 | Estimating inter-regional trade flows in China: A sector-specific statistical model | W.Liu, X.Li, H.Liu, Z.Tang, D.Guan | Journal of Geographical Sciences | Sensitivity Analysis to estimate relevant statistical parameters | Estimate inter-regional trade flows by addressing the competitive and cooperative relations between industries as well as spatial dependence | / | Sector Specific Spatial Model | MRIO | National Bureau of Statistics, Ministry of Transport, | Statistical validations indicators | China |
| 2017 | Dynamic input-output analysis for energy metabolism system in the Province of Guangdong, China | M.Zhai, G.Huang, L.Liu, S.Su | Journal of Cleaner Production | Ecological network analysis Network control analysis (NCA) Network utility analysis (NUA) | Comprehensive and balanced understanding of urban energy consumption by integrating various accounting perspectives | / | / | SRIO | Guangdong Statistical Yearbook, China Statistical Yearbook | Specific indexes Ecological relationships | Province of Guangdong, China |
| 2016 | The Driving Forces of Changes in CO2 Emissions in China: A Structural Decomposition Analysis | B.Xiao, D.Niu, X.Guo | Energies | Structural Decomposition Analysis | Exploring the main drivers of CO2 emissions in China using structural decomposition analysis based on constant price and non-comparative input-output tables | / | / | SRIO | China's National Bureau of Statistics, China Statistical Yearbook, China Energy Statistical Yearbook, IPCC Guidelines for National GHG Inventories, National Information Center | CO2 Emissions Energy Intensity Final Demand Effect Energy Structure Effect Leontief Effect Consumption Expansion Effect | China |
| 2015 | Emergy analysis and assessment for a high-end industrial park | D.Fang, B.Chen | Energy Procedia | Emergy analysis | Emergy-based evaluation framework to identify the input-output of the high-end industrial park | / | / | SRIO | Beijing Statistical Yearbook | Emergy indicators | High-end industrial park, Beijing, China |
| 2015 | Analysis and decomposition of energy consumption in the Chilean industry | E.Duran, C.Aravena, R.Aguilar | Energy Policy | Logarithmic Mean Divisia Index LMDI-I | Quantify the impact of diverse driving factors on energy consumption and determine whether there are differences in energy intensity across firms | / | / | Index Decomposition Analysis IDA | Chilean Annual National Industrial Survey, Ministry of Energy, Chilean Central Bank | Intensity Effect Structural Effect Activity Effect Energy Consumption by sector Energy Intensity | Chile |

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| 2014 | Drivers of Greenhouse gases emissions in the Baltic States: a structural decomposition analysis | J.Brizga, K.Feng, K. Hubacek | Ecological Economics | Structural Decomposition Analysis | Use of structural decomposition analysis to identify the drivers of change for CO ₂ e emissions in the Baltic States between 1995 and 2009 | / | / | SRIO | National GHG Inventories, WIOD, Eurostat | CO ₂ emissions Emission Intensity Population Effect Emission Intensity Effect Structure Effect | Estonia, Latvia, Lithuania |
| 2013 | Building Eora: A Multi-region Input–Output Database at High Country and Sector Resolution | M.Lenzen, D.Moran, K. Kanemoto, A.Geschke | Economic Systems Research | / | Create a MRIO account that represents all countries at a detailed sectoral level, allows continuous updating with information on data reliability, and contains a historical time series | / | KRAS Technique | MRIO | National statistical offices, Eurostat, IDE-JETRO, OECD, UNSD, UN, small number of tailor-based data sets | Indicators to evaluate reliability of each element | World |
| 2012 | A nonsurvey multiregional input–output estimation allowing cross-hauling: partitioning two regions into three or more parts | S.Nakano, K.Nishimura | The Annals of Regional Science | / | Evaluate multiregional industrial waste disposal and landfill attributed to consumption in the city of Nagoya | / | Gravity Ratios | MRIO | MIAC, APG, MAFF, METI, MOE | Exogenous change Δf , propagation effects Δx , waste generation coefficient G , overall effects in industrial wastes ΔW | Nagoya, Japan |
| 2014 | Multi-regional input–output analysis for China’s regional CH ₄ emissions | B.Zhang, J.Li, B.Peng | Frontiers of Earth Science | EIOA | An interprovincial input–output embodiment analysis of China’s regional CH ₄ emissions in 2007 | Consumption Based Accounting Production Based Accounting | / | MRIO | China Statistical Yearbook and previous researches | CH ₄ emissions embodied in final demand in terms of consumption, investment, imports and exports by region and sector | China |
| 2015 | Constructing a Time Series of Nested Multiregion Input-Output Tables | Y.Wang, A.Geschke, M. Lenzen | International Regional Science Review | / | Construct a time series of MRIO tables for the Chinese economy between 1997 and 2011, distinguishing each of the 30 provinces and 135 industry sectors for each province, and linking each province with 185 world countries | / | KRAS Technique | MRIO | National Bureau of Statistics of China, Eora database, State Information Center, previous researches | CO ₂ Multipliers Income Multipliers | China |
| 2007 | A multi-regional environmental input-output model to quantify embodied material flows | S.Giljum, C.Lutz, A. Jungnitz | GWS mbH | Material Flow Analysis | Construct a MRIO model with a monetary core extended by a dataset on material inputs in physical units to estimate indirect material flow of traded products | / | / | MRIO | OECD IOT, OECD BTD, OECs ITCS, UN COMTRADE, IMF, SERI, Eurostat, IEA, US EIA, FAO, USGS, BGR | / | World |
| 2012 | Regionalization of national input-output tables: empirical evidence on the use of the FLQ formula | J.Kowalewski | Regional Studies | / | the value of the exponent δ when using Flegg’s location quotient (FLQ) formula and an extended formula (SFLQ) is introduced allowing for variation in δ by industry | / | Specific Flegg’s Location Quotients SFLQ | SRIO | Federal Statistical Office of Germany, State Office of Statistics, Sozialproduktsberechnung, Gütertransportstatistike, German Employment Agency | Indicators to evaluate reliability of each element | Baden-Wuerttemberg, Germany |
| 2015 | Assessment of Urban Transportation Metabolism from Life Cycle Perspective: A Multi-method Study | F.Meng, G.Liu, Z.Yang, Y.Hao, S.Ulgati | Energy Procedia | Life Cycle Analysis | Creating a framework to examine the environmental sustainability of urban public transportation systems | / | / | Urban Transportation Metabolism (UTM) | Xiamen Statistical Yearbook | Environmental sustainability indicators | Xiamen city in Fujian Province, China |
| 2016 | Sustainability and Chinese Urban Settlements: Extending the Metabolism Model of Emery Evaluation | L.Gao, S.Cui, D.Yang, L.Tang, J.Vause, L. Xiao, X.Li, L.Shi | Sustainability | Emery and Exergy Analysis | Evaluating settlement metabolism and sustainability using a combination of emery analysis and sustainability indicators | / | / | Material Flow Accounting | Literature and survey | Sustainability indices | Xiamen, China |

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|------|---|--|---|---|--|---|--------------------------------------|--------------------------------|---|---|--|
| 2013 | Carbon footprints of cities and other human settlements in the UK | J.Minx, G.Baiocchi, T. Wiedmann, J.Barrett, K. Feng, K.Hubacek | Environmental Research Letters | Hybrid EIOA General Additive Model GAM | Estimating the carbon footprints of cities and other human settlements in the UK explicitly linking global supply chains to local consumption activities and associated lifestyles | Consumption Based Accounting | Survey-based method | MRIO | Office for National Statistics, MOSAIC dataset, UK Department for Environment, Food and Rural Affairs, AEA Technologies, DECC, Met Office | CF CF per capita Carbon Flow | 434 municipalities in the United Kingdom |
| 2017 | Spatial analysis of the ecological relationships of urban carbon metabolism based on an 18 nodes network model | L.Xia, Y.Liu, X.Wang, X.Tian, Q.Wu, Y. Zhang, G.Liu, Y.Hao | Journal of Cleaner Production | Ecological Network Analysis | Using the ecological network method to analyze the structure of the ecological relationships and summarize the key metabolic functions | / | / | Spatial network model | China Statistical Yearbook and previous researches | Ecological relationships Carbon Flows Land use and cover change (LUCC) | Beijing, China |
| 2013 | Ecological network analysis of an urban metabolic system based on input–output tables: Model development and case study for Beijing | Y.Zhang, H.Zheng, B. D.Fath, H.Liu, Z.Yang, G.Liu, M.Su | Science of the Total Environment | Ecological Network Analysis | Studing the functional relationships and hierarchy of the urban metabolic processes | / | / | SRIO | Beijing Statistical Yearbook, Beijing Water Resources Bulletin, China Mining Statistical Yearbook | Ecological relationship and hierachy | Beijing, China |
| 2014 | Structure decomposition analysis for energy-related GHG emission in Beijing: Urban metabolism and hierarchical structure | X.H.Xia, Y.Hub, A. Alsaedi, T.Hayat, X.D. Wu, G.Q.Chen | Ecological Informatics | Structural Decomposition Analysis | Clarifying, by structural decomposition analysis, the reasons behind increment of GHG emission in Beijing with the latest data | / | / | SRIO | Beijing Municipal Bureau of Statistics, Beijing statistical yearbook, China energy statistical yearbooks | Change in energy-related GHG emissions | Beijing, China |
| 2016 | An Urban Metabolism and Carbon Footprint Analysis of the Jing–Jin–Ji Regional Agglomeration | H.Zheng, B.D.Fath, Y. Zhang | Journal of Industrial Ecology | Ecological Network Analysis | Calculation of the embodied energy consumption and the energy-related carbon footprints of five sectors in three regions | Direct and Indirect Energy Consumption Accounting | / | MRIO | Beijing Municipal Bureau of Statistics, China energy statistical yearbook, IPCC | Carbon Footprint Energy Efficiency Energy flow's relationships | Beijing–Tianjin–Hebei region (Jing–Jin–Ji region), China |
| 2017 | Reducing Urban Greenhouse Gas Footprints | P.Pichler, T.Zwickel, A. Chavez, T.Kretschmer, J.Seddon, H.Weisz | Scientific Reports | Hybrid EIOA | Comparison of GHG footprints for four cities (Berlin, Delhi, Mexico City, New York) highlighting the importance of upstream emissions in urban household consumption | Consumption Based Accounting | Survey-based method | MRIO | Local GHG emission inventories, World Bank, Federal Environmental Agency | CF CF per capita CF by sector Upstream Household GHG Emissions | Berlin, Germany Delhi, India Mexico City, Mexico New York, U.S. |
| 2009 | Greenhouse Gas Emission Footprints and Energy Use Benchmarks for Eight U.S. Cities | T.Hillman, A. Ramaswami | Environmental Science & Technology | LCA | A hybrid life cycle-based trans-boundary greenhouse gas (GHG) emissions footprint is elucidated at the city-scale | Demand-centered accounting | / | Hybrid LCA-based GHG inventory | National LCA database, regional and local statistical istitutes | CF CF by sector CF per capita | U.S. |
| 2018 | Regional embodied carbon emissions and their transfer characteristics in China | D.Zhou, X.Zhou, Q.Xu, F.Wu, Q.Wang, D.Zha | Structural Change and Economic Dynamics | Structural Decomposition Analysis | Estimate the China's regional ECEs during 2002–2012 and investigate how they transferred through major regions and key industries; analysis of the driving factors of changes in China's regional ECEs | / | / | MRIO | China Statistical Yearbooks, UN, China Energy Statistical Yearbooks, IPCC Guidelines, previous researches | Direct Carbon Emissions EEE-EEL Carbon Transfer (NCE) Carbon Transfer Tendency Industrial Carbon Transfer Path SDA Indicators (Structural-Technological-Scale Effects) | China |
| 2017 | Value-Added-Based Accounting of CO2 Emissions: A Multi-Regional Input-Output Approach | H.Liu, X.Fan | Sustainability | EIOA | Accounting of anthropogenic CO2 emissions within the context of the economic benefit principle | Value-added Based Accounting | Improved Gravity Model RAS Method | MRIO | OECD Ddatabases, Eora MRIO Database, World Bank, WDI, | CO2 Emissions Emission Intensity Carbon Flow | 77 countries |

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|------|--|-----------------------------------|--|--------------------------------|---|------------------------------|--|-------------|---|--|---------------------------------|
| 2017 | Emergy network analysis of Chinese sectoral ecological sustainability | X.Sun, H.An | Journal of Cleaner Production | Emergy Network Analysis | Update the Chinese sectoral emergy assessment, identify key sectors in the Chinese ecological network, analyze the impact of network indicators on sectoral emergy performance | / | / | SRIO | National Bureau of Statistics of China, National Environmental Accounting Database (NEAD) | Emergy indicators Sectoral centrality | China |
| 2011 | Regional input-output modelling in Germany: The case of North Rhine-Westphalia | T.Kronenberg, J.Tobben | MPRA | / | Describing the process of constructing a RIOT by applying the CHARM method on the basis of regional and national employment data | / | CHARM Method | Hybrid SRIO | National and Regional Statistical Offices | Comparison between import shares and output multipliers on the regional and the national level as well as between results from a nonsurvey estimation procedure with CHARM and the hybrid approach | North Rhine-Westphalia, Germany |
| 2012 | Input-Output Scenario Analysis – Using constrained optimisation to integrate dynamic model outputs | T.Wiedmann, A. Geschke, M.Lenzen | International Input-Output Association | / | Generate historic and future time series of environmentally extended multi-state input-output tables of the Australian economy, integrating scenarios variables as data constraints | Consumption Based Accounting | KRAS Technique | MRIO | Australian National Accounts, Australian Bureau of Statistics, NIAM, ESM, LUTO, previous researches | / | Australia |
| 2013 | Multiregional Input-Output Model for the Evaluation of Spanish Water Flows | I.Cazcarro, R.Duarte, J. S.Choliz | Environmental Science & Technology | Material (water) Flow Analysis | Construction of a MRIO for Spain to evaluate the pressures on the water resources, virtual water flows and water footprints of the regions, and the water impact of trade relationships within Spain and abroad | / | / | MRIO | Regional Statistical Institute, National Statistics Institute, OECD, Water Satellite Accounts | Spanish water stress Virtual Water (VW) Water Footprint (WF) WF/GDP WF/population per region | Spain |
| 2015 | Evaluating the FLQ and AFLQ formulae for estimating regional input coefficients: empirical evidence for the province of Córdoba, Argentina | A.Flegg, A.Mastrorardi, C.Romero | Economic Systems Research | / | This paper uses survey-based data for the Argentinian province of Córdoba to conduct an empirical test of the performance of the FLQ and AFLQ formulae for estimating regional input coefficients, output multipliers and imports | / | FLQ AFLQ | SRIO | Centro de Estudios Bonaerenses, Instituto Nacional de Estadísticas y Censos, Ministerio de Economía de Córdoba | Mean Squared Error, Standard Deviation, Standardized Total Percentage Error, Weighted Mean Absolute Error, Output Multipliers Accuracy | Argentina |
| 2015 | Construction of a multi-regional input-output table for Nagoya metropolitan area, Japan | M.Yamada | Journal of Economic Structures | / | Use the IOTs for three prefectures to recompile them into one MRIOT for the Tokai Region covering those prefectures | / | Gravity-RAS method | MRIO | Kansai Institute for Social and Economic Research, Tohoku Region Advancement Center, Chubu Regional Institute for Social and Economic Research | Average Propagation Lengths | Nagoya, Tokai, Japan |
| 2018 | Regional input–output tables and trade flows: an integrated and interregional non-survey approach | R.Boero, B.K.Edwards, M.K.Rivera | Regional Studies | / | Presents a method that integrates the estimation of regional input–output tables and trade flows across regions | / | Three different transports costs-based trade flow models and a gravity model | MRIO | US Bureau of Economic Analysis, North American Industrial Classification System, EUROSTAT, US Bureau of Labor, Center for Transportation Analysis of Oak Ridge National Laboratory, Commodity Flow Survey, The Office of Financial Management | Average State Level Trade Flows, R ² , Multipliers | Washington, U.S. |

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|------|---|------------------------|---------------------------|-----------------|---|-------------------|--|-----------|-------------------------------|--|----------------------------|
| 2015 | Construction of Multi-Regional Input-Output Tables Using the Charm Method | J.Tobben, T.Kronenberg | Economic Systems Research | / | Extension of CHARM for the construction of bi- and multi-regional IO tables | / | Extended CHARM (Cross-Hauling Adjusted Regionalization Method) | MRIO | Eurostat, previous researches | Weighted Average Percentage Error WAPE | Baden-Württemberg, Germany |