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Department of Environmental and Resource Engineering
Circularity & Environmental Impact
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Profile

The effects of unsustainable development on our climate are unarguably one of the biggest global challenges of our times. Yet, the devastating impacts of decades of carbon-based economy and mass-consumption extend far beyond the purely environmental impacts of climate change. We have witnessed unsustainable exploitation of resources and land, with irreversible and devastating impacts on environment, biodiversity, our health and our communities. We have also seen these impacts affecting disproportionately marginalized sectors of our societies. The concepts of **sustainable development** and **life-cycle thinking** were born decades ago, but acceptance and actual implementation of these concepts and their learnings has so far been slower than the multiple consequences of fast technological development.

Today we are at an extremely important turning point. In the light of global climate awareness, which now more than ever is reaching the public opinion, governments worldwide are fostering a "green and sustainable transition", for example decarbonizing energy and transport sectors, and promoting circular economy models for resources. "Green" thus differs than previous practices, and is implicitly sustainable. However, we have already seen how transitions can potentially trigger devastating effects, for example land use change and deforestation from first generation biofuels, resource depletion from mining for chemicals for our batteries, and potential exposure from chemicals in recycled materials. Moreover, "green transition" in developed countries can still unequally affect less affluent and developed counties in the world. **My ultimate aim as an environmental engineer, researcher and educator is to foster truly sustainable transition. My means are my research in sustainability assessment, application of my research in societally relevant projects, communication of my research to society and long-term impact thanks to education of younger generations in sustainable use of our resources.** My fields of research are:

Life cycle assessment (LCA) applied to waste management technologies and emerging technologies and systems

Uncertainty analysis, scenario analysis and global sensitivity analysis

Future scenario analysis

Carbon capture and storage

Carbon capture and utilization

Waste incineration

Employment

Associate Professor

Department of Environmental and Resource Engineering
Technical University of Denmark
Kgs. Lyngby, Denmark
2 Apr 2013 → present

Circularity & Environmental Impact

Technical University of Denmark
Kgs. Lyngby, Denmark
31 Aug 2022 → present

Research outputs

Life cycle assessment of alternative biogas utilisations, including carbon capture and storage or utilisation
Varling, A. S., Christensen, T. H. & Bisinella, V., 2023, In: Waste Management. 157, p. 168-179 12 p.

Climate Change Impact of the Development in Household Waste Management in China

Zhao, Y., Chang, H., Liu, X., Bisinella, V. & Christensen, T. H., 2022, In: *Environmental Science and Technology*. 56, 12, p. 8993-9002 10 p.

Environmental assessment of amending the Amager Bakke incineration plant in Copenhagen with carbon capture and storage

Bisinella, V., Nedenskov, J., Riber, C., Hulgaard, T. & Christensen, T. H., 2022, In: *Waste Management and Research*. 40, 1, p. 79-95 17 p.

Life cycle assessment of air-pollution-control residues from waste incineration in Europe: Importance of composition, technology and long-term leaching

Maresca, A., Bisinella, V. & Astrup, T. F., 2022, In: *Waste Management*. 144, p. 336-348 13 p.

Climate change impacts of introducing carbon capture and utilisation (CCU) in waste incineration

Christensen, T. H. & Bisinella, V., 2021, In: *Waste Management*. 126, p. 754-770

Environmental assessment of carbon capture and storage (CCS) as a post-treatment technology in waste incineration

Bisinella, V., Hulgaard, T., Riber, C., Damgaard, A. & Christensen, T. H., 2021, In: *Waste Management*. 128, p. 99-113

Environmental Profile of NO_x Reduction by a Photocatalytic Surface Coating and a Vehicle Catalytic Converter

Bisinella, V., Dahl, L., Jensen, H., Mikkelsen, T. N. & Christensen, T. H., 2021, In: *Journal of Environmental Protection*. 12, 9

Future scenarios and life cycle assessment: systematic review and recommendations

Bisinella, V., Christensen, T. H. & Astrup, T. F., 2021, In: *International Journal of Life Cycle Assessment*. 26, p. 2143-2170 28 p.

Introducing Carbon Capture and Storage (CCS) in Waste Incineration

Bisinella, V., Hulgaard, T., Riber, C., Damgaard, A. & Christensen, T. H., 2021, *Proceedings SARDINIA2021*. CISA Publisher

Application of LCA modelling in integrated waste management

Christensen, T. H., Damgaard, A., Levis, J., Zhao, Y., Björklund, A., Arena, U., Barlaz, M. A., Starostina, V., Boldrin, A., Astrup, T. F. & Bisinella, V., 2020, In: *Waste Management*. 118, p. 313-322

Feeding or energy purposes? Quantifying the environmental impact of alternative uses of biomass residues

Hede Fjellander, O., Nørgaard, D. S., Jensen, P. R. & Bisinella, V., 2019. 5 p.

Life Cycle Assessment of the management of industrial textile waste in Northern Italy: Factors influencing sustainability

Spadavecchia, E., Damgaard, A. & Bisinella, V., 2019. 6 p.

Material flow analysis and life cycle assessment of danish household waste - factors of importance

Takou, V., Bisinella, V., Damgaard, A. & Astrup, T. F., 2019, *Proceedings SARDINIA 2019*. CISA Publisher, 8 p.

Combined uncertainty and scenario analysis within Life Cycle Assessment of waste management systems

Bisinella, V., Conradsen, K., Christensen, T. H. & Astrup, T. F., 2018, *SETAC Europe 28th Annual Meeting - abstract book*. Brussels, Belgium: Society of Environmental Toxicology and Chemistry, p. 5-5 15

Life Cycle Assessment of biorefineries: how robust are the results?

Bisinella, V., Conradsen, K., Christensen, T. H. & Astrup, T. F., 2018, *Sustain Conference 2018: Creating Technology for a Sustainable Society*. C. M. & K. M. (eds.). Lyngby, Denmark: Technical University of Denmark, 1 p.

Life Cycle Assessment of grocery carrier bags

Bisinella, V. (ed.), Albizzati, P. F. (ed.), Astrup, T. F. (ed.) & Damgaard, A. (ed.), 2018, København Ø: Danish Environmental Protection Agency. 143 p. (Miljøprojekter; No. 1985).

Life Cycle Assessment of management options for beverage packaging waste

Bisinella, V. (ed.), Albizzati, P. F. (ed.), Astrup, T. F. (ed.) & Damgaard, A. (ed.), 2018, København Ø: Danish Ministry of Environment and Food. 132 p.

Decision making within waste management: combined uncertainty and scenario analysis for the life cycle assessment of a danish case study

Bisinella, V., Conradsen, K., Christensen, T. H. & Astrup, T. F., 2017. 1 p.

Erratum to: A global approach for sparse representation of uncertainty in Life Cycle Assessments of waste management systems

Bisinella, V., Conradsen, K., Christensen, T. H. & Astrup, T. F., 2017, In: International Journal of Life Cycle Assessment. 22, 5, p. 839-839 1 p.

Future scenario analysis within waste management and life cycle assessment of waste management solutions

Bisinella, V., Christensen, T. H. & Astrup, T. F., 2017. 1 p.

Future scenario development within life cycle assessment of waste management systems

Bisinella, V., 2017, Kgs. Lyngby: Department of Environmental Engineering, Technical University of Denmark (DTU). 60 p.

Importance of waste composition for Life Cycle Assessment of waste management solutions

Bisinella, V., Götzke, R., Conradsen, K., Damgaard, A., Christensen, T. H. & Astrup, T. F., 2017, In: Journal of Cleaner Production. 164, p. 1180-1191

What type of shopping bag to use? Perspectives on the functionality and recycling of polymers

Damgaard, A. & Bisinella, V., 2017, *Book of Abstracts Sustain 2017*. Kgs. Lyngby, Denmark: Technical University of Denmark, 1 p. Sustain Abstract P-4

A global approach for sparse representation of uncertainty in Life Cycle Assessments of waste management systems

Bisinella, V., Conradsen, K., Christensen, T. H. & Astrup, T. F., 2016, In: International Journal of Life Cycle Assessment. 21, 3, p. 378-394

Quantifying uncertainty in sustainability assessments: from feedstock to end-of-life

Bisinella, V., Conradsen, K., Damgaard, A., Christensen, T. H. & Astrup, T. F., 2015, *Book of Abstracts. DTU's Sustain Conference 2015*. Technical University of Denmark, 1 p. A-14

Recent LCA Developments In Waste Management

Christensen, T. H., Astrup, T. F., Brogaard, L. K-S., Bisinella, V. & Damgaard, A., 2015, *Proceedings Sardinia 2015, 15th International Waste Management and Landfill Symposium*. Cagliari, Italy: CISA Publisher, 8 p.

Understanding uncertainty propagation in life cycle assessments of waste management systems

Bisinella, V., Conradsen, K., Christensen, T. H. & Astrup, T. F., 2015, *Proceedings Sardinia 2015, 15th International Waste Management and Landfill Symposium*. Cagliari, Italy: CISA Publisher, 8 p.

EASETECH Energy: Life Cycle Assessment of current and future Danish power systems

Turconi, R., Damgaard, A., Bisinella, V. & Astrup, T. F., 2013. 7 p.

Activities

LCA's role in sustainable transition. Application to carbon capture, storage and utilization

Valentina Bisinella (Guest lecturer)

8 Feb 2023

Life Cycle Assessment of the management of industrial textile waste in Northern Italy: Factors influencing sustainability

Valentina Bisinella (Speaker)

4 Oct 2019

Feeding or energy purposes? Quantifying the environmental impact of alternative uses of biomass residues

Valentina Bisinella (Speaker)

30 Sep 2019

Development and interpretation of future scenarios in Life Cycle Assessment

Valentina Bisinella (Speaker)

9 Jul 2019

Life Cycle Assessment of biorefineries: how robust are the results?

Valentina Bisinella (Speaker)

Dec 2018

Future scenario analysis within waste management and LCA of waste management systems

Valentina Bisinella (Speaker)

Jun 2018

Quantification of uncertainty in LCAs of waste management systems: Methods and future challenges

Valentina Bisinella (Speaker)

Jun 2018

Combined uncertainty and scenario analysis within Life Cycle Assessment of waste management systems

Valentina Bisinella (Speaker)

May 2018

Decision making within waste management: combined uncertainty and scenario analysis for the life cycle assessment of a danish case study

Valentina Bisinella (Speaker)

Oct 2017

Future scenario analysis within waste management and life cycle assessment of waste management solutions

Valentina Bisinella (Speaker)

Oct 2017

The International Journal of Life Cycle Assessment (Journal)

Valentina Bisinella (Reviewer)

2016 → ...

Waste Management (Journal)

Valentina Bisinella (Reviewer)

2016 → ...

DTU Sustain Conference 2015

Valentina Bisinella (Speaker)

17 Dec 2015

Sardinia 2015 - 15th International Waste Management and Landfill Symposium

Valentina Bisinella (Speaker)

5 Oct 2015 → 9 Oct 2015

Prizes

Course of the Year, Bioresources, DTU Environment

Bisinella, Valentina (Recipient), 2020

Teacher of the Year, Technical University of Denmark

Bisinella, Valentina (Recipient), 2020

Awards

Future Scenario Analysis in Solid Waste Management

Bisinella, V., Astrup, T. F., Christensen, T. H., Boldrin, A., Brandão, M. M. R. & Guyonnet, D.
Technical University of Denmark

01/07/2013 → 05/12/2017

Projects

Future Scenario Analysis in Solid Waste Management

Bisinella, V., Astrup, T. F., Christensen, T. H., Boldrin, A., Guyonnet, D. & Brandão, M. M. R.
Technical University of Denmark

01/07/2013 → 05/12/2017

LCA modelling of emerging waste management technologies and systems

Varling, A. S., Christensen, T. H. & Bisinella, V.

01/05/2022 → 30/04/2025