



Advancing sustainable solutions: an interdisciplinary and collaborative research agenda



A B S T R A C T

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Sustainable solutions are needed to drive a profound industrial and societal transformation towards a sustainable, low-carbon, resilient, equitable and prosperous future. This Special Volume of the Journal of Cleaner Production addresses possibilities and drivers for change by focusing on strategies for sustainable solutions with the underlying purpose of defining an interdisciplinary and collaborative research agenda for the next 10 years. Based on over 20 articles from around the world, we identify 10 key areas for targeted research and action, which are underpinned by 5 themes on sustainable solutions, including consumption governance and lifestyles, cities and buildings, business management and practice, international and national policies, and education and learning. The main message of this Special Volume is that we need creative, robust and audacious strategies in governance, management and education to catalyse and mainstream sustainable development across scales and sectors.

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1. Introduction

A profound industrial and societal transformation is a precondition for a sustainable, low-carbon, resilient, equitable and prosperous future (McCormick et al., 2013; Gaziulusoy et al., 2016; Voytenko et al., 2016b). This demands creative, robust and audacious strategies in governance, management and education, which address governmental policies, business models, visionary plans and concrete actions (Trencher et al., 2014a; Mont et al., 2016). We need to work at the nexus of industry, government, academia, NGOs and across societies in interdisciplinary, collaborative and empowering ways. We need to continue to synthesise insights from economic theory and practice, natural sciences, engineering, geography and political science, as well as organisational, legal and behavioural studies. We need to integrate knowledge and experiences from across disciplines and sectors to change from *business-as-usual* to sustainable solutions. In academia, we need to work in collaboration with partners outside research, including from industry, government, and NGOs (Rodhe et al., 2016; Trencher et al., 2014b). We need to actively engage in collaborative research projects and platforms, case studies and action research, living labs and interactive exchanges (Voytenko et al., 2016b). We need to go beyond *research-as-usual*.

This Special Volume (SV) of the Journal of Cleaner Production (JCLP) addresses possibilities and drivers for change by focusing on strategies for sustainable solutions with the underlying purpose of defining an interdisciplinary and collaborative research agenda for the next 10 years. The contributions in this SV build on articles and knowledge about sustainable solutions from the JCLP and relevant sources. This SV aims to contribute to the Sustainable Development Solutions Network that mobilizes scientific and technical

expertise in support of sustainable development problem solving as well as Future Earth, which is an international research initiative designed to develop knowledge for responding effectively and robustly to the risks and opportunities of global environmental change and for supporting transformations towards global sustainability over the coming 10 years. We build on efforts by the International Social Science Council in its report on Transformative Cornerstones of Social Science Research for Global Change, which defines key priorities for research on sustainable solutions. We also hope to support research and action on the Sustainable Development Goals developed through the UN.

2. Strategies for sustainable solutions

Strategies are not merely formal plans or abstract visions. We interpret strategies as frameworks to guide concrete actions and real processes leading to transformative changes at niche, local, national and global scales. This SV concentrates on the need to envision and implement strategies for sustainable solutions through a diversity of activities in governance, management and education. Specifically, we highlight the following 5 themes: 1) Strategies for sustainable consumption and lifestyles – making equitable and sustainable living a reality; 2) Strategies for sustainable cities and buildings – catalysing sustainable urban and regional transitions; 3) Strategies for sustainable business management and practice – shaping business models and approaches; and 4) Strategies for international and national policy interventions – supporting the sustainable transformation of global and national economies. Furthermore, as a cross-cutting activity, we highlight that 5) continuous learning and education are crucial for the implementation of visionary strategies for sustainable solutions.

2.1. Consumption governance and lifestyles

In this SV, we advance knowledge on consumption governance, lifestyles and behaviour change. This theme builds on knowledge about barriers and drivers for sustainable consumption and lifestyles to investigate sustainable consumption policies, behavioural economics and market responses to policy intervention, the sharing and prosumer economy, as well as visions, pathways and scenarios for sustainable consumption.

2.2. Cities and buildings

In this theme, we contribute to knowledge on urban governance, experimentation and innovation. We need to go beyond traditional urban planning by including tools such as visions, collaborative dialogues, urban living labs, financing models, local regulations and public procurement for urban transition processes.

2.3. Business and management practices

This SV contributes to knowledge on sustainable business management and practice. Based on the conviction that the transition towards sustainability will require both changes in business practice and institutional context, we highlight the need for research on sustainable business models, management approaches to support industry transitions, corporate sustainability strategies, and the nexus of corporate action, standards and public policy.

2.4. International and national policies

In this theme, we advance knowledge on policy instruments, developed and implemented by governments and international authorities. We clearly need to bridge the gap between science and policy, and we therefore need to develop methodologies and analytical approaches that can provide new insights in areas such as the green economy, low-carbon technologies and mitigation strategies, resource and product policy and a circular economy.

2.5. Education and learning

It is imperative to recognise that learning and education on sustainable solutions connects and underpins transformative processes. This SV highlights learning activities in a diversity of areas and how ICT and mobile connectivity are changing the playing field for education. There are immense opportunities to spread knowledge and promote interactive learning across the world through massive and mobile education.

3. Research agenda for sustainable solutions

This SV brings together over 20 articles on sustainable solutions (see Table 1). Based on the articles, we highlight 10 key areas for targeted research and action, including: Alternative models of consumption; Mobility management and sustainable travel behaviour; Urban living labs; Renovation of existing buildings; Virtual meetings; Business models for distributed renewable energy; Extended producer responsibility; Green growth and environmental objectives; Sustainability change agents; and Massive and mobile education. This SV utilises knowledge and examples from around the world.

3.1. Alternative models of consumption

The transition to more sustainable production and consumption patterns requires changes in mainstream business models (Mont et al., 2016; Santamaria et al., 2016). These are typically based on linear production processes and the throwaway mentality as well as complexly interlinked with cultural values, social status, identity and other symbolic aspects of socio-economic paradigms (Santamaria et al., 2016). Alternative business models are often based on ideas of circular flows of products and materials, in both production and consumption phases. Alternative modes of consumption include models for extending the lives of products (e.g. through reselling of second-hand goods), access-based consumption (e.g. renting and leasing), and collaborative consumption (e.g. sharing platforms). Engaging consumers is crucial in the success of these models (Mont et al., 2016). Furthermore, symbolic aspects of sustainable consumption and the role of urban consumption and footprint reduction are important to investigate further (Khan and Hansson, 2016; Santamaria et al., 2016).

3.2. Mobility management and sustainable travel behaviour

Changing attitudes and social norms is needed to support new ways of implementing technical solutions and new behaviours and lifestyles. Mobility management campaigns can contribute to changing mindsets, but to date these campaigns have not been recognized as important parts of strategic transport policy plans (Hiselius and Rosqvist, 2016). To make these campaigns more effective, activities need to focus on social motivation and normalizing sustainable transport behaviour and explicitly express holistic views regarding climate effects. Most importantly, however, the effectiveness can be increased through more strategic and systematic campaigns, which can require national coordination (Hiselius and Rosqvist, 2016). Mobility management and sustainable transport are pivotal to sustainable development (Silva Cruz and Katz-Gerro, 2016).

Table 1
Themes and topics on sustainable solutions.

Themes	Topics
Consumption governance and lifestyles	Consumer attitudes (Mont et al., 2016); Sustainable consumption (Santamaria et al., 2016); Mobility management campaigns (Hiselius and Rosqvist, 2016; Silva Cruz and Katz-Gerro, 2016); Earth hour city challenge (Khan and Borgstrom-Hansson, 2016)
Cities and buildings	Urban living labs (Voytenko et al., 2016b); Transdisciplinary research (Gaziulusoy et al., 2016); Passive house concept (Kiss, 2016); Eco-city development (Hu et al., 2016); Sustainable building renovation (Pombo et al., 2016)
Business and management practices	Virtual meetings (Arnfolk et al., 2016; Voytenko et al., 2016a); Renewable energy and business models (Strupeit and Palm, 2016); Energy strategy (Peck and Parker, 2016); Eco-design standards (Dalhammar, 2016)
International and national policies	Extended Producer Responsibility (Richter, 2016); Green growth (Sonnenschein and Mundaca, 2016); National environmental objectives (Emmelin and Cherp, 2016); Bioeconomy (Hennig et al., 2016); Fossil fuel sector (Biggs, 2016)
Education and learning	Sustainability change agents (Rodhe et al., 2016); Mobile global education (Chin and Jacobsson, 2016); Massive open online courses (Leire et al., 2016)

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