ABSTRACT: While corporate sustainability management research in universities has contributed to a greater understanding of sustainability, its current form has limited capacity to make a meaningful impact outside of academia. When it comes to the structures and concepts on which corporate sustainability management research is built, previous research has focused on inadequate principles and has been driven by a system that neglects solutions for real-world problems. This paper identifies four critical challenges that need to be addressed to reach the point of linking corporate sustainability management research with science and industry. This article argues that the normative foundation of universities together with the need for practical outcomes can drive corporate sustainability management research to bridge the gap between science and businesses. Consequently, this paper proposes four practical solutions which can help to build a bridge between science and businesses and offer the opportunity to develop long-term, participatory, solution-oriented projects as platforms for the next generation of corporate sustainability management researchers to engage in real-world problems and approaches in the field.

I. INTRODUCTION

The role of corporate sustainability management has been recognized as one of the key factors to address global ecological and environmental challenges from a business perspective (Herrmann and Guenther, 2017; Lee and Saen, 2012). As such, corporate sustainability management is not only responsible to manage stakeholder expectations, but also to manage the business contributions to sustainable development (Breitbarth, Schaltegger and Mahon, 2018; Lee, 2012; Schaltegger et al., 2013). In particular, an adequate account of corporate sustainability management has to fulfil two purposes (see DesJardins, 1998): First, it has to critically review and eliminate business decisions that lead to ecological and environmental damage in the short- and long-term perspective. Second, it needs to present feasible solutions for management that can influence corporate policies and procedures. However, the first point has been all too easily neglected by industry, while the second point has been overlooked by academia or may be driven by self-centered calls that align poorly with practitioners’ environmental sense- and decision-making (Schwering, 2010, Jickling and Wals, 2008).

Although businesses - on the one hand - seem to be increasingly aware of their unsustainable practices, their behaviour often points to the contrary. Among other authors, Preston (2017), partner at PriceWaterhouseCoopers (PwC) for Sustainability...
ity and Climate Change, summarizes the status quo of corporate sustainability management by indicating that for most companies, sustainability is still seen as an “add-on or a nice-to-have” (p.1). He argues further that sustainability seems to be not in the DNA of most senior executives. For example, although sustainability balanced scorecards are often used in corporate practice, decisions are still mainly financially based and big business lacks sustainability innovation as well as actionable initiatives for truly sustainable practices and outcomes (Narayanan and Adams, 2017; Preston, 2017).

Sustainability scientists - on the other hand - have drawn a very precise picture of sustainability and climate change challenges and raised awareness on many levels, diffusing it to a higher level of public and political attention (Ansari et al., 2013). But a critical review of the achievements and challenges in sustainability science, leading to the question: ‘what sustainability problems have we solved over the last decade?’, the field must, beyond the best of intentions, confront the reality of failure. Although scientists have (co-)developed tools such as lifecycle assessments - similarly to the industry - there is a lack of widely accepted and feasible recommendations and initiatives for true change towards sustainable practices and outcomes for the industry (Van der Leeuw et al., 2012; Dobrovnik et al., 2018; Herold and Lee, 2017).

Against this background and based on our own dual industry-academia work experience, we argue that university or academic corporate sustainability management research can indeed represent a link between sustainability science and the industry. That is, because corporate sustainability management research does not only consider or integrate a scientific perspective, but can also provide appropriate tools to measure and manage environmental issues (Burritt et al., 2002; Guenther et al., 2007; Van Marrewijk, 2003; Lee and Herold, 2016) as well as represent a “perspective with regard to decision-making and implementation” (Schaltegger et al., 2013, p.227). Given the current economic and ecological realities, it seems important to integrate or link the fields of science and that of industry.

Our argument is that academic corporate sustainability management research can help to address corporate sustainability risks, but is in its current form limited to make a meaningful impact. Presently, a widely-shared viewpoint is that “management approaches published in the academic literature may not necessarily be useful and applied in corporate practice” (Windolph et al., 2014, p.379), illustrating the topical academia-practice gap (see Bartuneck and Rynes, 2014; Bansal et al., 2012; Baumgartner, 2011; Christ, Burritt, Guthrie and Evans, 2018; Cohen, 2007; Ferguson, 2005). An academia-practice gap is largely based on institutional (i.e. organizational objectives and requirements), communicative (i.e. ‘jargon’ and differing cultures and means of sharing knowledge) and philosophical/epistemological differences (i.e. what is acceptable knowledge and its contextualization) (Ferguson 2005). Van der Leeuw et al. (2012, p.118) point the finger at universities by stating that “academia suffers from anachronistic pedagogy, inertia, and disciplinary insularity and isolation” and it seems that “academics have little experience, expertise, or incentive to conduct participatory research that significantly contributes to real world solutions.”

Against this backdrop, academic corporate sustainability management researchers are confronted with two essential questions: First, what is the way forward for sustainability management academics, considering that research can provide valuable but not sufficient contributions to solving truly sustainability challenges in companies? And second, recognizing this dilemma, how can academia contribute to solving sustainability challenges and what are the necessary changes in personal attitudes and institutional structures to support these efforts?
To find answers to these questions, this paper provides a critical review of sustainability management research in universities. In particular, we argue that academic corporate sustainability management research faces four major challenges: a) a misguided interpretation of sustainable development, i.e. sustainable development is often confused with ‘green growth’, b) low managerial relevance of academic research, i.e. it often does not meet the expectations outside academia, c) low accessibility of academic research, i.e. research is rather isolated due to mistaken incentives, and d) lack of transdisciplinary influences on sustainability research, i.e. academic research neglects relevant external stakeholders.

It needs to be emphasized that our intent is not to denigrate sustainability management research, far from it. Research and publishing in peer-journals is important because it allows to share academic understanding(s) of management practices and different approaches to sustainability research. Our argument, however, is that this function is of less societal importance than influencing policy and industry in a way to enable and empower key agents to actually solving and mitigating sustainability problems. Academia in this field must address the important issues and find ways to reward all the activities that go into developing and implement solution strategies, not ‘just’ publishing and acquiring research funding. Consequently, a few models of performance-based research evaluation and funding systems in OECD countries move towards a focus on impact rather than conventional scientific ideas of judging research quality and performance (New Zealand Ministry of Education, undated). A focus on the concept of ‘impact’ – as vaguely and difficult to track it might be in its current state of development – also challenges traditional views of relating academia/understanding and practice/use to each other (e.g. Stoke, 1997). In this context, the aim of this paper is to identify the challenges in corporate sustainability management research and provide feasible solutions that address those challenges. In particular, this paper discusses and focuses on environmental sustainability challenges, as all economic activities ultimately derive from the productive capacity of the earth.

The remainder of this paper is structured as follows. First, we review the challenges in and for corporate sustainability management research and provide a synopsis of the relevant arguments this topic has generated in the literature. Each challenge is discussed and we highlight and explain the constructs and barriers that contribute to the prevention of truly sustainable practices. After the challenges have been identified and discussed, we sketch solutions that can help to position corporate sustainability management research as link between the industry and science. Finally, concluding reflections and possible directions for further research are presented.

II. REVIEW OF THE CHALLENGES

Challenges in academic research and establishing a link between science and industry has been subject of numerous articles and reviews (e.g. Bansal et al., 2012; Bartunek and Rynes, 2014; Christ et al. 2018; Cohen, 2007; Ferguson 2005; Stoke, 1997; Tucker and Parker, 2014). But although this previous work reinforces in general the points from above, the specific issue of corporate sustainability management research is neglected in the current discussion. We argue that in order to reach the point of linking corporate sustainability management research with science and industry, four critical challenges need to be addressed: First, we argue that corporate sustainability management research is neglecting the ‘original’ sustainable development approach and rather focuses on making unsustainable behaviour only less unsustainable. Second, it is argued that academic sustainability management research is isolated and rather inaccessible for the industry due to peculiarities in academic language and an incentive-driven focus on theory and meth-
odology. Third, based on the many years of our own experience in the industry, it appears that academic research in the field of sustainability management in its current form is not relevant for practitioners due to its backwards looking nature and its limited managerial recommendations. Fourth and last, we claim that in order to provide feasible solutions, a move from specialization to a more transdisciplinary approach is needed. The next sections provide an overview about the four challenges.

**Challenge 1: The confusion of ‘sustainable development’ with ‘green growth’**

Often, academics as well as practitioners in the industry, confuse the terms ‘sustainable development’ with ‘green growth’. In general, sustainability can be understood in a way that it addresses a wide range of environmental and ecological issues (Schaltegger and Burritt, 2015; Glavič and Lukman, 2007; Herold et al., 2016). ‘Sustainable development’, however, extends this view to “meet the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.8). If companies accept this as a principle limiting business activities, then companies would have an obligation to avoid harming the ecosphere, understood as the interdependent community of living organisms and their non-living physical environment. Corporate activity would be considered as harming the ecosphere when it uses resources at unsustainable rates or creates wastes that cannot be absorbed by the ecosystem (DesJardins, 1998).

Instead, from a corporate perspective, sustainability or sustainable development is usually interpreted and based on the underlying growth model of the concept of ‘green growth’ (e.g. Wals and Jickling, 2002). This view has also been adopted by the majority of corporate sustainability management researchers, who mainly deal with the question how unsustainable business practices become less unsustainable rather than how to create truly sustainable practices, thus neglecting - or even ignoring - the future generations’ needs (Baumgartner, 2011; DesJardins, 1998). The principle of ‘green growth’ assumes that GDP growth can occur without further damaging the environment, or, in other words, increased consumption and increased production can be ‘neutral’ or ecological harmless. Paech (2013) argues that growth in GDP not only always leads to growth in manufacturing of physical goods, but at the same time to an increase of income for - at least for parts of - the population, which in turn leads to incremental consumption. Both, production as well as consumption, need natural resources or damage the environment. Thus, the view that ‘green growth’ can lead to environmental neutral behaviour, “rests on a serious environmental, and ethical, mistake” (DesJardins, 1998, p.826).

Even if production or intra-company processes become less unsustainable, which is the main focus of most academic sustainability research, the consumption of goods still contains parts of fossil energy or other natural resources. Given the hypothetical case that production becomes ecological neutral, studies show consumption will still occur and, for example may lead to even more rising demands due to the ‘rebound effect’ (Binswanger, 2001; Hu and Poliakov, 2015). If an increase in renewable energy is not related to the same decrease in fossil energy, the price for electricity decreases, leading to a rising demand (Wang et al., 2014). Moreover, efficiency driven cost savings from houses, cars or heat lead to increasing mobility or increased consumption.

In fact, ‘green growth’ will always lead to incremental depletion of fossil energy or other natural resources (Paech, 2013). Consequently, in order to avoid harming the ecosphere under the premise of ‘sustainable development’, GDP growth must at least be neutral. For academic research, this would mean to examine business practices and provide sustainable solutions under the premise of constrained
ecological realities (DesJardins, 1998). So far, the majority of research in corporate sustainability management fails to do that.

We argue therefore that academic sustainability management research should promote a different model of corporate sustainability management research, thus to change ‘the rules of the game’ and transform corporate activities from unrestricted growth to development. Sustainable development is significantly different from sustainable or ‘green’ growth, as Daly (1997, p.267-268) argues:

“To grow means to increase naturally in size by the addition of material through assimilation or accreditation. To develop means to expand or realize the potentialities of, to bring gradually to a fuller, greater, or better state. When something grows it gets bigger. When something develops, it gets different. The earth ecosystem develops (evolves), but it does not grow. Its subsystem, the economy, must eventually stop growing, but can continue to develop. The term ‘sustainable development’ therefore make sense for the economy, but only if it is understood as ‘development without growth’.”

This is challenge number one: In order to truly work on solutions that prevent further environmental damage stemming from exploitation, the term ‘sustainable development’ needs to be framed appropriately both from academics and industry practitioners and incorporated in business research and decisions.

**Challenge 2: Increase relevance and impact of academic sustainability management research**

In order to function as a link between sustainability science and the industry, academic research needs to increase the relevance of their research to the outside world, in particular to the industry. So far, professionals in the industry regard academic sustainability management research and its findings as rather irrelevant to their needs (e.g. Baumgartner, 2011; Cohen, 2007). According to Varadarajan (2003, p.368) relevance is “a function of the extent to which the research focuses on factors that managers can influence and examines effects that are of interest to managers.” Thus, professionals and managers in the industry are interested in new insights and new business approaches for sustainability. However, it seems that the majority of researchers wait for data or change within firms and then ‘report’ on it, leading to a lengthy process of examination.

The challenges of the above-mentioned approach are threefold: First, research is by nature backwards looking, i.e. it tends to focus and confirm familiar practices. Second, there is a time-lag in academic research, i.e. while academic research and publishing is a rather lengthy process, the industry wants information fast. Third, the (managerial) contributions are seldom ‘new’, i.e. it mostly confirms the obvious or is outdated.

With regard to the first point, research often focuses on the organizational or corporate level, i.e. it is analysing existing companies and their variations of existing sustainability practices. Through this analysis of existing sustainability practices in combination with backwards-looking research, academia significantly reduces the opportunity to lead future practice and develop innovative sustainable solutions for companies (Pagell and Shevchenko, 2014). For example, studies on green sourcing build on previous work in certifi-
cation and supplier development (Klassen & Vachon, 2003; Herold, 2018) and ethical procurement (Carter & Jennings, 2004) can be traced back to the work of Deming (1986), limiting research to confirming the role of familiar practices. Moreover, academic research takes years from the conceptualization phase to the actual publication, while decision-makers in the industry have incentives that favour short-term benefits, i.e. results should produce applicable findings within weeks or, cynically spoken, certainly between annual appraisals (Bansal et al., 2012). Thus, when the academic research is finished, the data might be outdated and then it is not even granted that the academic paper will be accepted for publication. Pace is institutionally different since practitioners prefer fast and pragmatic progress mainly driven by urgent demands, while researchers are happy to take the time to meander over their results in order to make sure they are academically robust (Ferguson 2005).

Moreover, academics may argue that they address ‘managerial implications’ in their journal articles, but it is highly unlikely that practitioners wade through an academic article to find the ‘golden nugget’. Against this background it is not surprising when McKinnon (2013, p.16) states that academic researchers “give too little thought to the managerial and public policy relevance of their work”. Often, the managerial implications are simply recommendations of already existing knowledge without specific solutions to pressing problems, as stated by Das (2003, p.26): “Put simply, researchers make very little effort to acquire even a modicum of appreciation of the real-world managerial environment. The results can sometimes be seen in plainly vapid observations about managers and their milieu.”

As a consequence, practitioners, should they perceive a need for external advice, generally seek it from industry specialists and from people they view as credible and who have specific knowledge about problems they face in their organizations. In fact, surveys among practitioners show that the main source of information for decision-making is the internet, followed by trade journals and magazines – academic peer-reviewed papers rank a distant last (e.g. McKenzie et al., 2002; Van der Leeuw et al., 2012). From a university perspective, it often seems that academics are saying, ‘Pay attention to what I do because I know what is important,’ rather than asking, ‘How can I use my significant (academic) talents to help company managers to implement sustainability practices?’

That is the second challenge: The industry views academic sustainability management research as currently irrelevant for the industry because it takes too long, is backward looking and only analyses existing practices without creating valuable and applicable solutions or recommendations, thus academics need to find ways to expose their research to other relevant audiences.

Challenge 3: Increase approachability of academic corporate sustainability management research

The third challenge is to increase the approachability of academic sustainability management research to a wider audience. Academic research articles in general, but also in corporate sustainability management research, seem to be rather isolated, i.e. journal articles are more or less only circulated within the academic community. That is, because academics generally do not write in a style that motivates practitioners to read their articles. It seems that academic journals are often written in such complex language that access is effectively only open to those who have the time and motivation to learn a specialised vocabulary. As practitioners are not trained to read or interpret academic articles, these journal articles have become largely indecipherable to the outside world (Ankers...
and Brennan, 2002; Starkey and Madan, 2001; Herold and Lee, 2018). In fact, academic research has become over time more specialised and the methods and language of academics have narrowed due to the universities incentive system. Confirming this view, Ferguson (2005) further argues that academic researchers do not have any incentives “to spend their time and energy (re-)articulating their ideas for practitioners” (p.48).

One main criteria for funding as well as for hiring and promoting academics is to publish in top academic journals (Pagell et al., 2008). These journals demand that published papers must conform to very high standards of ‘rigour’. Rigour is defined very largely in terms of quantitative measures of validity and reliability. Therefore, academic researchers feel compelled to produce work that satisfies the quantitative criteria for validity and reliability (McKinnon, 2013). However, sustainable development implies the concept of change which is usually related to specific contexts of sustainability phenomena and the idea of innovative ideas for change. Quantitative studies are likely to overlook these innovations as radical ideas get averaged away in a large sample or will be eliminated as outliers (Pagell and Shevchenko, 2014). Thus, research that is high on ‘quantitative’ rigour but is decontextualized, focusing completely on abstract concepts, carries little meaning for sustainability managers. For academic researchers, who focus on qualitative research, it is less likely to be published in the highest profile academic journals because it deviates from the norms of ‘rigour’ (Brennan, 2004).

Moreover, journals containing conceptual papers, often written in abstruse, inaccessible language, tend to get higher ratings than those reporting empirical results that may be of greater practical relevance to the business world (McKinnon, 2013). In particular in top-tier journals, theory is favoured over practice. It seems to be the case that the type of research output that is viewed by academics as being of the highest quality, is the type of research that is viewed by practitioners as being of the least interest. Not surprisingly, research with an over-reliance on theory and a high level of abstraction leads to the virtual exclusion of practitioner utility, i.e. it is very unlikely that a practitioner will find anything that can be used (Bennis and O”Toole, 2005). Confronted with this situation and to fit into the current system, sustainability researchers have no choice but to pursue to publish in higher rated journals, although their papers may appear peripheral to the main themes for practitioners, thus “the journal ranking system is encouraging a retreat into ivory towers where business academics impress each other with their erudition” (McKinnon, 2013, p.16).

That is challenge number three: It seems that practitioners do not have the desire to read academic research, and academic researchers do not have the desire or incentives to make their articles approachable for non-academics, thus a change in university incentives could help to bridge the gap between academia and industry.

**Challenge 4: Paving the way from specialisation to transdisciplinary research**

It seems that corporate sustainability management research has not tackled complexity as a characteristic challenge in the quest for sustainable development; but rather responded to sustainability challenges with specialisation (Hadorn et al., 2006). Specialisation has advantages: it allows to analyse complex problems in depth, by splitting the problem into sub-problems and investigate these sub-problems by experts with specific knowledge. Moreover, specialisation has triggered a better understanding of the different and multidimensional partial aspects of sustainability. In many respects sustainability problems and solutions are unique and require the development of unique approaches; however, when other disciplines provide valuable
tools for problem-solving, there is no need to reinvent the wheel (Wiek et al., 2011).

In particular, corporate sustainability management research, as part of the sustainability concept or the sustainable development principle, is a problem-driven and solution-oriented field that derives its integrity from a holistic approach to problems that are multifaceted and dynamic. This environment is increasingly complex and not bound by traditional disciplines, as stated by Schaltegger et al. (2013), “as no single actor can win the race against unsustainability” (p.217). As such, a focus on disciplinary specialisation fails to create a sufficient understanding of system dynamics and solutions as well as neglects a setting in which partial knowledge can be integrated (Schaltegger et al., 2013). Complex sustainability challenges cannot be solved by following one particular perspective or discipline, it requires the integration of multiple views with expert knowledge. This approach goes beyond the focus on one discipline and calls for integration among disciplines and individuals to create the necessary knowledge to solve the problem (Holm et al., 2013; Klein, 2014; Gray, 2010).

As a consequence, corporate sustainability management research (and, arguably, education) needs to understand and adopt the knowledge and the methods from other disciplines, not just those generally associated with sustainability. Wiek et al. (2011) suggest that “recognizing and learning from different ways of knowing and valuing” (p.9-10) is essential to sustainability problem-solving, and every discipline has its own set of important questions to pursue and its own standards for producing acceptable knowledge. In line with other scholars (e.g. Fraser et al., 2009; Kemp et al., 2007; Mertens, 2008), Wiek et al. (2011) suggest that although academic research is “commonly associated with disciplines such as ecology, environmental sciences, and geography with sustainability” (p.11), the contribution of other disciplines such as intervention research, evaluation and program planning, transition research, and transformative research and evaluation can help to assess values implicit in sustainability practice that practitioners would otherwise be unaware of.

Corporate sustainability management research, in this respect, need to be able to ‘scan’ disciplines for theoretical and methodological input that is relevant to the problem they are tackling and the solutions they are crafting. The tension as well as the different world-views and problem-solving approaches between disciplines are integral not only to sustainability transitions, but provide also a chance to reconceptualise its own discipline to make them more socially relevant, and see the formation of transacademic teams as a source of creativity (Wiek et al., 2012; Wiek et al., 2011).

This is challenge number four: so far, corporate sustainability management research lacks transdisciplinary influences, thus expanding the network and include relevant external stakeholder from other disciplines increases the chances to make a meaningful impact.

### III. WAY(S) FORWARD

In the following section, we will present ways to tackle those challenges. This will not only require changes in areas such as university incentives as well as academic and industry behaviour, but also how the principle of sustainable development is communicated. Our argument is that corporate sustainability management research should not close these gaps, but rather act as a bridge due to the inherent paradoxes between science and industry (Bansal et al., 2012). The majority of the ‘bridges’ that are proposed focus more on feasible recommendations to ‘close ranks’ between academia and industry, but we also argue that a mentality change with regard to the perception of the principle of sustainable development is needed. Therefore, while a mentality change rather asks for a radical change,
most of the proposed recommendations can be regarded as evolutionary change, i.e. we hope that our proposals complement existing norms, methods and incentives. Change, however, either in evolutionary or in revolutionary form, starts by asking different questions – that is, to reconsider the position of universities in society and to be critical of the role of corporate sustainability management research with regards to industry engagement. We are convinced that academic research provides a potential source of ideas and innovation (Anderson et al., 2014), but it needs to work more closely to proof its applicability, or as O’Driscoll and Murray (1998, p.409) states: “Scientific enquiry is a journey, not an endpoint. The ultimate validity of a theory is its usefulness in practice.” The following sections discusses the proposed recommendations to bridge the gap between science and industry.

**Bridge 1: Integrating the ‘sustainable development’ perspective into corporate sustainability management**

The main argument for ‘sustainable developments’ and against ‘green growth’ is that businesses currently use natural resources at unsustainable rates and thereby ignoring the interests of future generations. From a business perspective, one could argue that sustainable development might be a moral goal, but the main responsibility of businesses is to provide goods chosen by consumers through the legitimate means of markets and law. It can be therefore argued that common goods and ethical responsibilities, such as for sustainable behaviour, lie with society and government as a whole, not necessarily and immediately businesses in particular.

However, we argue that a ‘moral minimum’ applies to corporate management and thus ethical responsibilities cannot be denied by businesses. Given the finite resources of this planet and assuming the principle of sustainable development, the underlying economic model of businesses needs to be connected to ecology (DesJardins, 1998). As such, corporate sustainability management academics should integrate and communicate the view that business decisions, at least partially, are linked to ecological and environmental harm. As a consequence, academic research must not allow businesses to deny responsibility for the results of those decisions by claiming that they were merely “responding to the demands of the market”. The quest for corporate sustainability management research is to incorporate ecological constraints as part of the ‘rules of the game’, and thus convince businesses to share the ethical responsibilities derived from the sustainable development principle.

But how to do that? The idea of sustainable development could be incorporated into the value systems or logics within businesses by considering natural resources as capital. For businesses, the use of capital natural resources and compensation of the ecosystems should be equal to the maximum sustainable yield from the invested capital without depleting the investment itself. In this sustainable economic model, businesses would live off the interest rather than the capital. As such, this ‘economic development’ is not a zero-sum game and can satisfy both ‘present and future needs’.

In particular, this move towards development is based on three principles: First, renewable resources should be used at a rate where the system is able to restore itself. This principle points mainly to the industries of agriculture and forestry. A good example is the Brazilian Amazon forest, which has lost almost 20 per cent in the last 40 years, mainly to cattle ranching. It is worth remembering that the Amazon is vital to the wider world due the production of oxygen and the absorption of carbon dioxide (Butler, 2016). But any business that uses plant, animal, air and water resources (i.e. most businesses) must ensure that these resources are being used at sustainable rates. Failure to do so would require reparation for these harms.
Second, non-renewable resources can be used only at the rate at which alternatives are developed or the loss of opportunities is compensated, representing the principle of ‘neutral growth’. Industries that rely on non-renewable resources, ranging from wilderness areas to fossil fuels, would have to compensate future generations for the loss of these resources by insuring that these future generations have equal opportunities for using these or similar resources. For example, the aviation sector targets carbon neutral growth from 2020, i.e. holding emissions at the 2020 level and then reducing them at the same time down to 50% of 2005 levels by 2050 (IATA, 2016).

Third, wastes and emissions should not be generated at rates that exceed the capacity of the ecosystem to assimilate them. For example, the use of recycled materials in production, the production of goods that can be recycled and recycling by-products of production would be clear responsibilities. While these three proposals seem to call rather for a radical change and are probably hard to implement in corporate practice, institutional and stakeholder pressures have already led to changes in corporate reporting and measurement. For instance, ‘Integrated Reporting’ (IR) is increasingly adopted by companies, providing a greater context for performance data and decision making more long-term. In other words, IR reflects the broad and longer-term consequences of the decisions companies make in order to create value. And although these changes are a first step in the right direction, an academic influence could be the next step to regain a holistic understanding of true sustainable development and initiate change on a corporate level.

**Bridge 2: Making corporate sustainability management research relevant**

A key indicator of effectiveness is the tangible, demonstrable, real-world impact academic research achieves. We suggest that academic researcher seek proactively guidance and direction from practitioners and move out of their comfort zone. Current reward systems, however, provide little incentive for academics to conduct, for example, participatory research that significantly contributes to real-world solutions. Rewards from universities, especially tenure, are predicated on publications and the success of research grant applications (Yarime et al., 2012). For example, we experienced that grants from public research bodies are perceived more prestigious than money from private organizations and charities. In addition, complicating the focus on publications is that journals open to the publication of embedded, participatory, and action-oriented work often have lower impact factors. It seems that universities have failed to produce the leadership and vision required to make substantial change.

Moreover, we argued that universities remain so inertial because the professoriate remains in familiar and comfortable patterns. This is human nature, but denudes academics of the energy and passion needed for change. In order to bridge the gap between academic research and the industry, we suggest that academic researchers and managers need to proactively collaborate, i.e. visiting each other’s conferences or organize mutual get-togethers. In addition, academic researchers could seek direction for research questions from practitioners according to their immediate needs and pressures (rather than imposing research problems on perceived managerial problems) before their research is conducted as well as guidance for the write-up of their results after results are obtained.

These efforts are not only limited to academic researchers, but can be extended to publishers of academic journals. Academic journals could ask
for practitioner views and require a section on practitioner application in all scholarly articles. Moreover, practitioner reviewers could be included as reviewers for all blind-peer-reviewed submissions to academic journals. Another point could be that academic journals (or their publishers) could send press releases about sustainability-related articles— as soon as they are accepted for publication— to editors and journalists at practitioner magazines. The press releases should highlight the golden nuggets for practice to maximize the likelihood of the magazines including the information in stories.

Overall, an inclusion of ‘practical’ publications in their incentive structure for promotion and awarding any other media output that helps to disseminate academic research to wider audience and will contribute to greater understanding and acceptance of university research within communities and the general public. Already, Emerald Publishing scans its hundreds of management journals relevant implications for senior managers out of the cutting-edge research and publishes 2-3 page long ‘briefings’ based on traditional academic articles. They are prepared by an independent writer who adds their own impartial comments and places the arguments in context. According to the publisher, Strategic Direction offers CEOs advantages by briefing them on the key ideas and major issues affecting business today. Yet, the matter that needs to be overcome is not only ‘translating’ research articles into managerial text, but also distributing it accordingly.

**Bridge 3: Increasing collaboration and accessibility to sustainability management research**

In order to increase collaboration and accessibility, we argue that the exchange between scientist, researchers and practitioners need to be increased. At the same time, universities need to adapt their incentive structure, i.e. reward practical contributions - apart from research funding. On the one hand, academics may join practitioner organizations and networks and attend practitioner conferences and local practitioner events to interface with practitioners on a regular basis. On the other hand, senior and executive practitioners should be encouraged to attend academic conferences to begin to interact with the academic community on their “turf” and to learn not only about what they research but also about what motivates them to research certain topics. Or industry or business associations and academic organisations may work together to facilitate these dialogues. A good example, for instance, is the collaboration between the ‘Environmental Management Accounting Network (EMAN)’ and the ‘World Business Council of Sustainable Development (WBCSD)’ where practitioners and academics meet to discuss sustainability challenges.

In addition, we argue that in order to promote change in universities, the incentive structure for academics needs to be changed. For instance, practitioners read what they consider to be ‘research’ without always understanding that it may not be scientific and may therefore not be solid evidence upon which to base important decisions. Academics could change that by writing about their research in media outlets and promoting their research to a broader community. The Conversation is an outlet that seeks to source from the research community and delivered direct to the public by providing editorial support for every publication, which have to be of a certain length only (claim: “Academic rigour, journalistic flair”). Universities might also create a new journal/magazine in partnership with a practitioner organization that is of interest to practitioners and includes research-based knowledge.
Bridge 4: Moving from specialization to transdisciplinary research in corporate sustainability management

In order to work on real world solutions, a move from disciplinary research to transdisciplinary research is needed. Disciplinary research will not be sufficient, as the traditional academic research process alone seldom lead to real world solutions. Recent research (e.g. Hadorn et al., 2006; Jahn et al., 2012) propose that sustainable challenges can be better solved through effective use of scientific results by decision-makers which can enabled through transdisciplinary research; that is, through greater involvement of external stakeholders in the research process. The integration of external stakeholders in the process, essentially an expert-lay distinction, may grant corporate sustainability management research access to contributions and complementary expertise - rigorous research methods and technical expertise from sustainability scientists, system access and meaningful connections to real-world problems from managers (Jensen et al., 1999). Research will often be most useful, and the results most accepted by users, if priorities are shaped with the active involvement of potential users or through multiple-directional flows of information between scientists, managers and researchers (Wiek et al., 2011).

This transdisciplinary research approach can be described as a structured and intense exchange between academics and external stakeholders (Jahn et al., 2012; Lang et al., 2012). However, one of the most important aspects of transdisciplinary research is that it is often based on real world phenomena, which is an essential requirement for the concept of sustainable development (Schaltegger et al., 2013). As such, transdisciplinary research transforms the way how research questions are formed, as they may be more likely emerge from practical needs and there may enhance the validity of the knowledge obtained as well as its real-world usefulness (Jensen et al., 1999). This approach has major implications on the methodology of how to conduct research: Effective sustainability research cannot be embarrassed or apologetic about research approaches that balance and equally emphasize the credibility of academic and stakeholder views. It is argued that external stakeholders can serve as a ‘watchdog’ to ensure that the chosen study are able to generate knowledge that holds meanings for both researchers and practitioners despite their different epistemological positions. To cope more effectively with the issues of credibility, researchers need to begin with different end points in mind as they design future sustainability studies according the parameters of feasibility, flexibility and palatability to develop knowledge that is actionable and relevant in practice.

IV. CONCLUSION

Sustainable development is a complex process with the vision to change our society by using natural resources at sustainable rates. This process of change to truly sustainable behaviour has both normative and practical implications and require a consensus between science and businesses what is to be sustained and how to sustain it. But although science has drawn a very precise and urgent picture of sustainability challenges, it seems businesses see sustainability practices still as ‘add-on’ instead of a core performing. Our argument is that the normative foundation together with the need for practical outcomes represents an opportunity for corporate sustainability management research to bridge the gap between science and businesses to translate scientific methodologies into feasible industry recommendations.

Academia and industry should acknowledge that capturing, communicating and accepting knowledge is relative to its respective context.
Science can only be comprehended... as one category of possible knowledge, as long as knowledge is not equated effusively with the absolute knowledge of a great philosophy or blindly with the self-understanding of the actual business of research (Habermas 1971, p. 4).

Academic corporate sustainability management research has helped companies to become more sustainable, but the question how to create truly sustainable companies - under the premise of sustainable development to “meet the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.8) - remains unanswered. Our argument is that current academic research in the field of corporate sustainability management is limited to make a meaningful impact, in particular due to four major challenges: a) a misguided interpretation of sustainable development, b) low accessibility of academic research, c) low relevance of academic research, and d) lack of transdisciplinary influences on sustainability research.

Our article discussed these challenges and contributed by sketching recommendations for each of these challenges. First, businesses and academics often confuse sustainable development with green growth, but any growth measured in GDP contributes to the deterioration of natural resources. Under the premise of sustainable development, corporate sustainability management activities need to transform the economic model and integrate moral limits into their value systems to reflect the constrained ecological realities. Second, the current system of academic structures does not promote activities for researchers to leave their comfort zone, but rather to remain in familiar and comfortable patterns. A proactive behaviour to find out the practitioners’ needs and pressures before conducting the research would be a first step to increase the relevance and to make a real-world impact. Third, the existing university incentive system does not reward collaborations to work on real-world solutions. In order to make a meaningful contribution, not only academics and managers need to proactively seek each other’s advice, but universities need to provide leadership and create a supporting incentive environment that enables academics to contribute to real-world solutions. Fourth, so far, the majority of academic research seems is limited to the university view, but sustainability problems are concerned with many different disciplines and interactions of high complexity. Therefore, academic sustainability management research has to integrate traditional disciplines as well as transdisciplinary research programs.

These proposed recommendations can thus help to build a bridge between science and businesses and offer the opportunity to develop long-term, participatory, solution oriented projects as platforms for the next generation of corporate sustainability management researcher to engage in real-world problems and approaches in the field. As these proposed recommendations represent both evolutionary and revolutionary approaches, future research could define the threshold for the use of natural resources that companies can use under ecological constraints - that is, a breakdown of field-level environmental impacts to firm-level actions in order to ‘live off the interest rather than the capital.’ Moreover, future research may adopt the university perspective and examine the implications of incentive change in universities and/or present case studies that show the success or failure of such change.
V. REFERENCES


Hu, J. and Poliakov, E. (2015), Quantifying the direct and indirect rebound effects for consumers as a response to energy-saving technologies in the EU-27, TNO.


