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Guest Editorial: Moving from Good Intentions to Measurable Sustainability Results

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Editors' Comments

Guest Editorial: Moving from Good Intentions to Measurable Sustainability Results

There is a tide in the affairs of humans, which taken at the flood, leads to sustainability[1]

The tide has turned for renewables. Their adoption was once premised on the need to reduce carbon emissions in order to contain global warming to less than 2° Celsius above pre-industrial levels. Failure to meet this goal will have devastating effects on natural ecosystems and human livelihoods. Currently, renewables, mainly in the form of solar and wind, are not only the cheapest forms of energy (Figure 1), they are also the most plentiful. Using today's solar and wind technology, the earth could capture at least 6,700 PWh[2] per year, over 100 times the current global energy demand. To supply the world with its energy needs using only solar panels would require 450,000 km2, about 0.3% of the world's land. In the U.S. alone, fossil fuels currently require 126,000 km2, about 1.3% of the country.[3]

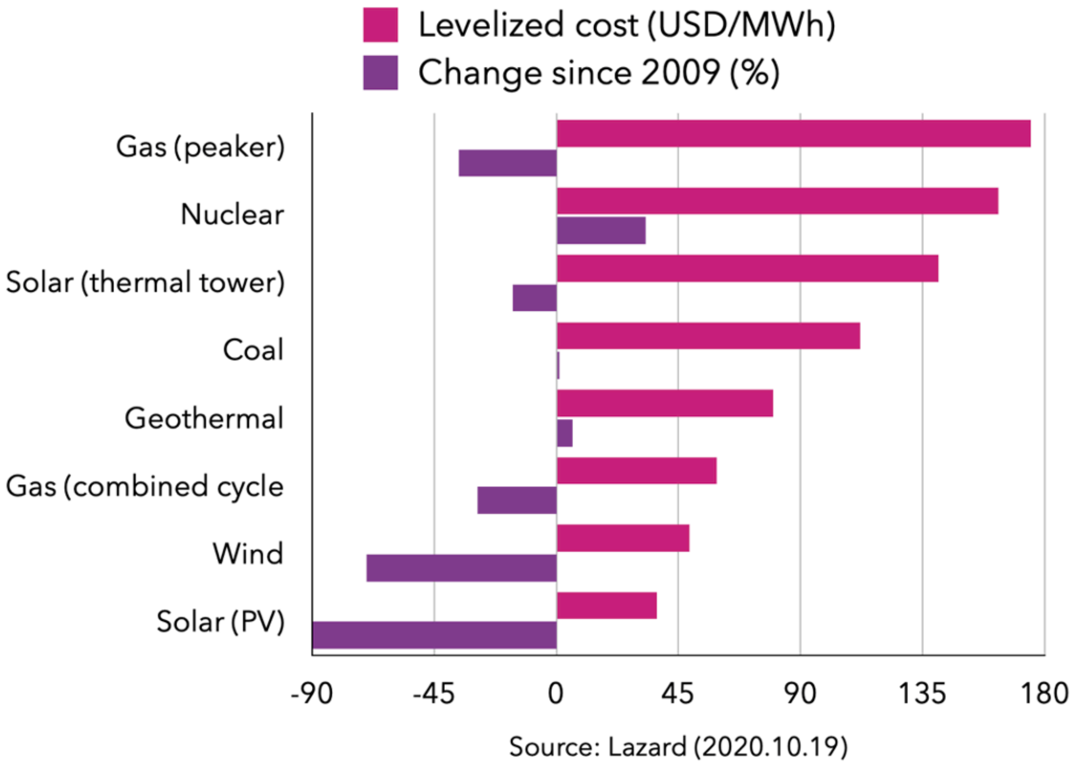
Although the tide has turned, alternatives to fossil fuels do not yet flow freely, largely because of obstructions created by fossil fuel-dependent industries and other vested interests opposing decarbonization. Furthermore, too many politicians are either ideologically constrained from recognizing the existential threat of climate change or reluctant to implement policies that foster structural transformations of production, consumption, transportation, finance and energy systems.[4,5] It is essential that IS scholars elevate their engagement with the scientific and business communities to help bolster the case for creating a more sustainable society through renewable energy, cleaner air, less waste, and more circular material flows.

Compared to Covid-19,[6] the climate and environmental crises are vastly different—as is the needed response. The impact of climate change and environmental degradation appears slowly and affects a public good, the environment. The cause-and-effect relationships related to climate change are complex and nonlinear. The effectiveness of interventions in any complex system is difficult to measure because of the many alternative attributable forces. Yet we cannot solve global climate change without significant interventions and lifestyle changes. Much of the intervention attention has been focused on engineering-driven research involving, for example, solar panels and wind turbines, whereas information-driven innovations have received scant recognition, even by IS scholars.

Shifting to a renewable energy society has been described as the digital transformation of the decade because managing the intermittency of supply and demand to maintain grid stability is an information-intensive problem.[7] This offers a great opportunity to build on existing IS research to comprehensively explore practical IS solutions for enabling the shift toward more efficient and renewable energy systems.[8] For instance, big data analytics and artificial intelligence can play crucial roles in integrating and analyzing the continuous flow from generation to consumption of high-dimensional and multi-type data from a myriad of networked devices. Aligning the interests of heterogeneous actors and optimizing systems subject to environmental and economic constraints require novel insights from IS practitioners in terms of governing and

1 Inspired by William Shakespeare, *Julius Caesar*, Act 4, Scene 3.
2 Peta is the prefix for 10^{15}.
3 https://carbontracker.org/reports/the-skys-the-limit-solar-wind/
4 McKibben, B. "Renewable Energy is Suddenly Startlingly Cheap," *New Yorker*, April 28, 2021, available at https://www.newyorker.com/news/annals-of-a-warming-planet/renewable-energy-is-suddenly-startlingly-cheap
5 For example, on April 28, the Australian Federal Government announced it would fund a gas-fired electricity plant "to prevent electricity prices from rising," despite industry experts pointing out the abundance of cheaper market alternatives coming onto the market (https://www.theguardian.com/environment/2021/apr/30/australian-energy-board-chair-says-gas-fired-power-plant-in-hunter-valley-doesnt-stack-up)
6 Watson, R., Ives, B. and Piccoli, G. "Guest Editorial: Practice-Oriented Research Contributions in the Covid-19 Forged New Normal," *MIS Quarterly Executive* (19:2), May 2020, pp. v-viii.
7 Watson, R. T., Ketter, W., Recker, J., & Seidel, S. (2020). "Transitioning to Intermittent Energy: The Critical Digital Transformation of the Decade," December 2020, available at https://ssrn.com/abstract=3737738 SSRN 3737738.
8 Such as Ketter, W., Peters, M., Collins, J. and Gupta, A. *"A Multiagent Competitive Gaming Platform to Address Societal Challenges," MIS Quarterly*, (40:2), June 2016, pp. 447-460.

Figure 1: The Levelized Cost of Various Means of Generating Electricity



managing joint data and IS resources, software and data infrastructures for AI/ML-based diagnosis and prognosis, and IS-enabled business model innovations such as sharing platforms, recommendation agents, servitization and digital nudging.

Examples of such IS innovations include Volkswagen's work on an IS that enables using electric cars as mobile power banks to store excess renewable energy, allowing consumers to benefit from free charging. Another IS-based eco-innovation triggered a major shift in one chemical company's strategy when it allowed the firm to differentiate itself from its competitors through improved product transparency and supply chain sustainability.[9] Increasingly, environmental sustainability will depend on novel IS solutions that allow companies to create differential value. Managers responsible for enabling the shift to more sustainable operations and strategies will rely on persuasive applicable knowledge to guide their actions on managerial and technical levels, such as managing big data, edge and cloud computing, security, siloed data, joint ventures, adoption, and platform ecosystems. Our field has much to contribute to support IS practitioners in solving these challenges in order to make a discernable impact on climate change and environmental degradation.

IS and IT Distinction

We expect that MISQE submissions focused on environmental sustainability will draw a clear distinction between IS and IT, as recommended by the current editor-in-chief of *MIS Quarterly Executive*.[10] We assert that IT is about the hardware and software bought from a vendor. Although IT energy efficiency and the reduction of electronic waste are key ecological issues and are important areas for scholarly activity, the type of contributions we seek should focus specifically on information systems.

9 Henkel, C., Seidler, A-R., Kranz, J. and Fiedler, M. "How to Become a Sustainability Leader? The Role of IS Affordances in Enabling and Triggering Sustainability Transformations," *Proceedings of the International Conference on Information Systems*, December 2017, available at https://aisel.aisnet.org/icis2017/IT-and-Social/Presentations/15/.

10 Piccoli, G. *Information Systems for Managers* (4th ed.), Prospect Press, 2008.

IS concerns the systems that an organization creates by combining people, procedures, organizational structures, and IT (i.e., hardware and software). An IS-centric perspective extends to all aspects of the organization. Information systems can enable a firm to, for example, increase its energy and resource efficiency, raise capital productivity to do more with less, and design more eco-sustainable products.[11] In other words, organizations need to buy Green IT so they can make an environmentally sustainable difference with Green IS.

Environmental impacts of IT and IS

The use of IT by individuals, organizations, and societies has direct and indirect impacts on the environment. Because of the fast-growing and ubiquitous usage of digital devices and services, IT has become a major consumer of energy and raw materials—consider Bitcoin mining as an extreme example. Hence, major cloud services should strive to run their data centers completely with renewable energy and manufacturers could design physical products to enable a circular economy by reusing, refurbishing, remanufacturing, and recycling devices and components.[12] Beyond these (resolvable) negative environmental impacts of IT, information systems' informating, automating, and transforming capabilities must be central to the solution to decarbonize ("use renewable and less fossil energy sources") and dematerialize ("do more with less") our economies, especially in large polluting sectors such as energy, transportation, industry and agriculture.

In the major energy consuming sectors, IS can improve operational effectiveness and facilitate eco-innovation by addressing problems arising from information asymmetries, consumer habits, communication and coordination among agents. A smart energy grid, for instance, allows networked actors and components to exchange information and enable automatic adjustments to current supply and demand conditions by providing actors with appropriate incentives to change their behaviors. Putting an information layer on top of physical grids creates a digital twin that offers a digital representation of real-world entities and processes. Digital twins represent a good example of how the material and digital worlds are coalescing to become cyberphysical systems that facilitate an in-depth understanding of complex social and material interactions (descriptive), optimized and automated decision-making (predictive), and effective action (prescriptive) to enable more eco-sustainable practices. To enable this shift, insightful cases can guide IS practitioners in building, implementing, and managing different IS systems, processes, and capabilities.

What is a Contribution on Environmental Sustainability for MISQE?

MIS Quarterly Executive (MISQE) is a perfect fit for publishing high-impact, practice-oriented IS research on sustainability. It provides scholars with a platform to disseminate their research to IS leaders as well as current and future practitioners. To stand out, research must provide fresh insights and clear-cut guidance that shows readers how to solve sustainability problems with IS and stimulate actions that advance eco-efficiency and effectiveness.

As a prerequisite, authors must be conducting relevant and timely research on practical problems in environmental sustainability and should engage with practitioners to identify and anticipate their questions and examine how they can be effectively answered. All hands-on use cases that show the practical utility of using IS to enable pro-environmental innovation are welcome. Authors should also examine how IT resources and energy expenditures can be reduced.

Authors should focus on one to three concrete, preferably longitudinal case studies of organizations or industries that go beyond common knowledge and practices. *MISQE* readers will be particularly interested in learning about sustainable practices that distinguish companies from industry norms and contribute to a firm's specific sustainability agenda. A differentiating practice is one of strategic value that generates measurable outcomes rather than being an ineffective box-checking or window-dressing exercise.

11 Watson, R. T., & Boudreau, M.-C. *Energy Informatics*, Green ePress, 2011.

12 Zeiss, R., Ixmeier, A., Recker, J., Kranz, J. "Mobilizing IS Scholarship for a Circular Economy: Review, Synthesis, and Directions for Future Research," *Information Systems Journal* (31:1), January 2020, pp. 148-183.

To carve out the gist of the cases, contributions must do a deep dive into the case data to avoid superficial analysis and conventional insights. *MISQE* readers will appreciate learning about specific sustainability problems and their practical and implementable solutions. Beyond lessons learned through specific cases, readers expect recommendations that will help them address similar phenomena in different organizational or industry contexts. We encourage authors to provide actionable recommendations and personal advice that transcend a descriptive diagnosis. Although outcome-oriented green practices differ considerably across industries and companies, every paper should offer advice that is relevant to other businesses and industries while avoiding being trivial and cliche.[13]

Finally, authors should present their work in an engaging, concise, and highly readable form. Writing for a hybrid business-academic journal like *MISQE* means informing readers in an enlightening, understandable, illustrative, and maybe even entertaining way. Since *MISQE* readers are often very busy, lengthy definitions, philosophic debates or unnecessary embellishments should be avoided. Contributions should come straight to the point, be short and precise, and use convincing examples to strengthen the delivery of the core takeaways. A good diagram that captures the heart of the case can make a paper a compelling read.[14]

Sustainability is rapidly becoming vital to company survival because governments, customers and investors[15] are becoming increasingly aware of the risks associated with climate change and environmental degradation. The ESG movement is shaping investor and firm decisions and demanding that business scholars contribute tangibly.[16] Companies relying on fossil fuels and linear "cradle-to-grave" business models must adapt rapidly to zero-emission goals and circular "cradle-to-cradle" approaches. Slow and incremental changes derived from doing business as usual will not only jeopardize the future of these companies but the future of our planet. Thus, there is a great demand for practice-oriented research that spreads new ideas and spurs ingenuity by providing actionable recommendations and food for thought. This provides a great opportunity for impactful IS research because digital technologies are key enablers of decarbonization and dematerialization. But we need to act now: This is the right moment to surf the incoming tide to help create a sustainable society.

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13 The typical suggestions for a solid *MIS Quarterly Executive* contribution apply. See the following editorials: Piccoli, G. "Editors' Comments," *MIS Quarterly Executive* (18:1) March 2019, pp. iii-v; Piccoli, G. "Editor's Comments," *MIS Quarterly Executive* (18:2), June 2019, pp. iii-v; Piccoli, G. "Editors' Comments," *MIS Quarterly Executive* (18:3), September 2019, pp. iii-v; Piccoli, G. "Editors' Comments," *MIS Quarterly Executive* (19:1), March 2020, pp. iii-v.

14 For example, see Figure 1 in Watson, R. T., Wynn, D., & Boudreau, M.-C. (2005). "JBoss: The Evolution of Professional Open Source Software," *MISQ Executive*, 4(3), pp. 329-341.

15 See, for instance, the letter Larry Fink, CEO of the world's largest investment firm Blackrock, wrote to CEOs in 2020, available at https://www.blackrock.com/corporate/investor-relations/2020-larry-fink-ceo-letter.

16 https://www.ft.com/content/7e450863-c1cc-49df-9647-5a8c106b62c2