Sustainable Circular Economy in the Wood Construction Industry: A Business Opportunity Perspective

Ville-Veikko Piispanen1, Sini-Tuulia Suokas1, Kaisa Henttonen1 and Hanna Lehtimäki1

Abstract
This study aims to explore the main drivers of recognizing a circular economy business opportunity. In this multiple case study with six entrepreneurs from the wood construction industry is a relevant part of the circular economy because its essential component is a sustainable and renewable material (trees/wood) that reduces carbon emissions. This study contributes to previous research by showing that six traditional drivers influence the entrepreneur’s recognition of business opportunities: environmental conditions, social capital, prior knowledge, systematic search, cognition and entrepreneurial alertness. Moreover, they are intertwined in the complex and processual phenomenon known as business opportunity. Furthermore, for the drivers of sustainable opportunity recognition, prior knowledge on environment and altruism are critical. The recognition of opportunity is not solely based on any of the individual drivers; rather, it relies mostly on continuous interaction with the network when the entrepreneur is creating a business opportunity.

Keywords
Circular economy, sustainability, business opportunity, opportunity recognition, wood construction, entrepreneur, qualitative study

Introduction
As an economic model, the sustainable circular economy (CE) model represents a transition from the existing linear model to a sustainable approach of economic, social and environmental value creation by

1 University of Eastern Finland, Business School, Kuopio, Finland.

Corresponding author:
Ville-Veikko Piispanen, University of Eastern Finland, Business School, P.O. Box 1627, Kuopio FI-70211, Finland.
E-mail: ville-veikko.piispanen@uef.fi
closing the resource loops with new business models and strategies (Bocken et al., 2016; EMAF, 2013; Murray et al., 2017). The sustainable CE model is embraced by businesses due to the potential business opportunities it provides (EMAF, 2013), but it is also embraced among policymakers (European Commission, 2019, 2020; Geissdoerfer et al., 2017). The transition towards sustainable CE requires broadening the perspective related to the type of value it creates for companies (Patala et al., 2016) and how the transition shapes the ways in which business is conducted and value is created in society (Ranta et al., 2020). The sustainability transition provides business opportunities for sustainable companies, but simultaneously requires them to be aware of how their customers and other stakeholders perceive and evaluate sustainability and to actively engage with stakeholders to identify and influence these perspectives (Bocken et al., 2018).

Even if one ignores the different perspectives arguing that opportunities are identified (Barringer & Ireland, 2008), created or discovered (Alvarez & Barney, 2007), there is a paradox in the literature concerning entrepreneurial opportunity identification or recognition. Hanohov and Baldacchino (2018) stated that opportunity recognition is a core part of entrepreneurship and, to an even larger extent, a central part of sustainable entrepreneurship in the realms of CE. However, scholars have focused less on sustainable entrepreneurship than conventional entrepreneurship (Hanohov & Baldacchino, 2018). The drivers leading sustainable entrepreneurs to identify an entrepreneurial opportunity have only recently started to draw the attention of researchers (Hanohov & Baldacchino, 2018).

Thus, based on these arguments, our research question is: What are the drivers of CE business opportunity recognition within the wood construction industry in Finland? We aim to understand the drivers of opportunity recognition and exploration rather than the personal traits of the entrepreneurs. We focus on the wood construction industry in Finland, because it is a growing business due to the many opportunities it offers, including design opportunities, cleaner indoor air, longer building life-cycle, better sustainability, lower carbon footprint, greater energy efficiency and potential cost savings (MacGilleon, 2020; Metsälehti, 2020; Rakli, 2019). Furthermore, the Finnish government has set the goal of becoming the leading CE nation in the world. One of the aims of the CE is to decrease the carbon footprint within the context of construction. Wood construction plays a critical role in achieving this aim, as buildings act as carbon sinks (Finnish Government, 2021).

**Business Opportunity Recognition**

Prior research has identified two perspectives on opportunity. The first claims that opportunities are recognized while the other claims that they are created (Alvarez & Barney, 2007). Alvarez and Barney (2007) provided a synthesis of the two perspectives by arguing that opportunities can be created by entrepreneurs or formed by exogenous shocks. Thus, opportunity identification focuses on the ways entrepreneurs could become aware of the opportunity, that is, whether it is recognized or created (Alvarez & Barney, 2007). Barringer and Ireland (2008) suggested that opportunities are simulated either externally or internally. Internal stimulation means that an entrepreneur decides to start a venture, then searches for and identifies an opportunity and exploits it. External stimulation means that the entrepreneur identifies an opportunity in the external environment and creates a business to fulfil it. To summarize, internal stimulation refers to the creation of opportunities (internal stimuli lead an entrepreneur to create the opportunity) while external stimulation relates to identifying opportunities (environmental factors lead an entrepreneur to identify the opportunity). Thus, while entrepreneurial opportunity identification is the first step towards entrepreneurship, there is still a question about what drives or triggers the process.
Previous literature has identified six drivers for opportunity recognition: environmental conditions, social capital, prior knowledge, systematic search, cognition and entrepreneurial alertness (George et al., 2016). When entrepreneurs are creating opportunities, they interact with the surrounding environment, thus environmental conditions can influence opportunity recognition (George et al., 2016). Individuals are part of and are constantly constructing the environment; therefore, the market is a social construction created by the involved agents. Adding innovation to prior knowledge about the markets or technology creates an advantage for the opportunity process (George et al., 2016). This reflects the awareness and personality of the agent; some are more open to taking risks than others, thus gaining an advantage in terms of capitalizing on the opportunity (Baron, 2006). Furthermore, embeddedness has been found to have a strong influence on strategic opportunities and resources (George et al., 2016). Systematic search has noted that entrepreneurs’ ability, awareness and overall knowledge to utilize information channels and quickly respond to information can have an impact on their opportunity recognition (Fiet, 2007; George et al., 2016). Moreover, the changes in the surrounding environments can impact to a new opportunity discovery (Shane & Venkataraman, 2000). A systematic search is linked to prior knowledge in opportunity recognition and, thus, venture creation (Baron, 2006; Zahra et al., 2009).

Entrepreneurial alertness plays an important role as well. Scholars have found that alertness can have an effect on discovering opportunities without actively engaging in a search process (George et al., 2016). Moreover, prior research has found that entrepreneurs with a complex and adaptive mindset and strong mental capabilities can have a radical effect on the industrial and social environment (Gaglio & Katz, 2001; George et al., 2016). There is also recent emerging literature on sustainable entrepreneurship (Patzelt & Shepherd, 2011), including sustainable CE entrepreneurship. Typically, sustainable entrepreneurship and recognizing opportunities require entrepreneurs to look beyond personal economic gain (Baron & Ensley, 2006). Hence, entrepreneurs who identify opportunities that promote sustainability could be interested in slightly different aspects of their environment in comparison to entrepreneurs who recognize opportunities solely based on economic gains (Patzelt & Shepherd, 2011). Prior knowledge of the surrounding environment, as well as a positive perception of the threat of the natural and communal environment, altruism towards others and greater entrepreneurial knowledge increase the potential recognition of sustainable opportunities (Patzelt & Shepherd, 2011). That is, the more entrepreneurs view the natural or communal environment from the perspective of the economic, environmental and social aspects, the more likely they are to recognize sustainable opportunities that can have a meaningful impact on the natural, communal and market environments (Patzelt & Shepherd, 2011).

**Methodology**

In this multiple case study, the data consist of six individual interviews with entrepreneurs from the emerging wood construction industry in Finland. The study aimed to increase the understanding of opportunity recognition in the wood construction industry as a phenomenon. In this study, wood construction is viewed in the CE context because of its core element (trees/wood). That is, as a raw material, wood, is part of the biogeochemical cycles that are important for CE companies (Korhonen et al., 2018). In Finland, wood construction supports the country’s national aims to be carbon neutral by 2035, as wood acts as a carbon sink (Finnish Government, 2021; Ministry of the Environment, 2021). As the capital of Finland, Helsinki is strongly promoting wood construction in its aim to be carbon neutral by 2035 (Abell, 2021). These aims are supported by the fact that wood, and therefore, wooden buildings act as carbon sinks; thus, they help decrease the carbon emissions associated with construction (Stora Enso, 2021).
The interviews were semi-structured with categorized thematic topics, which were entrepreneurship, business opportunity, CE and business idea. The topics and questions were structured and formulated by all the authors individually, and eventually together, to increase the validity of the study’s findings. The interviews were conversational, informal and free flowing within the thematic topics (Eriksson & Kovalainen, 2016); moreover, anonymity was ensured for all interviewees as the wood construction industry in Finland is still very small in comparison to the more traditional construction industry. Three interviews were done face-to-face, and three interviews were done by phone between 27th of August and 4th of October 2019 and all six interviews were recorded. The interview durations were from 28 to 104 minutes.

The interviews first were transcribed and then analysed using inductive content analysis which reveal new bigger categories and patterns, and then more focused themes and activities with newly formulated, refocused or refined research questions (Eriksson & Kovalainen, 2016). After the interviews were transcribed, the next phase was to start coding. The coding was done systematically first with open coding surrounding the thematic topics; however, the coding resulted in many other categorizations. Thus, eventually 85 categories were identified within the core thematic topics. The second phase coding reduced the categorization and eventually led to more theoretically-driven themes. As the coding progressed, certain themes began to dominate. At that point six drivers—environmental conditions, social capital, prior knowledge, systematic search, cognition and entrepreneurial alertness—were chosen as the theoretical analysis framework (George et al., 2016). The coding phase was first done by one author. After the first phase coding, another author coded the data to increase the validity and reliability. Direct quotations (in italics) are marked with quotations marks and identified as interviewed person I1, I2, I3, I4, I5 and I6.

Results—Drivers for Opportunity Recognition

Regarding the research question about how entrepreneurs within the CE in the wood construction industry recognize business opportunities, the results show that six drivers play a crucial role. Moreover, these drivers are intertwined in a complex phenomenon known as opportunity recognition (Alvarez & Barney, 2007). Prior knowledge of the surrounding environment, altruism and entrepreneurial knowledge also contribute to the opportunity recognition (Patzelt & Shepherd, 2011).

Environmental Conditions and Prior Knowledge

Based on the interview responses, entrepreneurial alertness seems to relate to personal experiences; I3 noted: ‘We kind of started anticipating [business opportunities in a new emerging and growing market]’. At this point the systematic search has begun and networks are being utilized: ‘…with whom we talked about it… [had an influence on business opportunity]’ (I1). Moreover, prior knowledge is searched for: ‘a little bit of market research [searching and gaining knowledge on markets and opportunities]’ (I1). Previous research has pointed out that almost non-beneficial ties can be more effective than strongly beneficial ties (Kontinen & Ojala, 2011). Additionally, the pre-existing networks have a positive effect on opportunity creation. While environmental conditions have encouraged the interviewees to start their business, as noted by I4 ‘…the existence of a factory and then the will… [to exploit the opportunity]’, regulations and politics carry their own weight, as noted by I2 ‘the layout’ and I6 ‘Also from the political
decision-making of the municipality [were opposing the exploitation of opportunity]. Hence, the environmental conditions need to be recognized and analysed to gain understanding of entrepreneurial operations (George et al., 2016).

**Entrepreneurial Alertness**

It is difficult to pinpoint the exact moment the opportunity was recognized; that is, did it occur before the systematic search or with the systematic the search? As I4 noted, did the recognition occur ‘…with a post-it exercise pondered what should it be [business opportunity]’. It could be that the opportunity had been recognized before, but the systemic search and new knowledge was eventually the trigger for the opportunity to transform into an entrepreneurial process. Prior knowledge is very important for discovering opportunities and strongly linked to the way in which the opportunities are recognized. Based on the results of the present study, the opportunities are discovered and systematically searched, though the distinction is not sometimes possible as reported by Corner and Ho (2010). Moreover, the greater the entrepreneurial knowledge, the greater the potential to recognize the opportunities (Patzelt & Shepherd, 2011).

**Cognition and Social Capital**

The recognized opportunities were intertwined with several drivers. Opportunities were seen because the facilities were available; I3 noted that the ‘…facilities were kind of good… [to be able to start the business eventually]’; however, I1 noted that the business itself was not clear ‘The equivalent was missing anyways [the business industry]’. I5 noted the importance of not forgetting determination and strategic thinking: ‘It was self-evident that [the wood] construction field [has a lot of opportunities now and in the near future]’. Previous literature acknowledged this and pointed out that more factors are involved in the process of recognizing opportunities. There is an opportunity confidence, where the recognition starts, as well as venture ideas and external effects. This study offers a new deeper understanding on opportunities as in the existing research the opportunity recognition is a construction of different drivers. As Suddaby et al. (2015) state the new information can be from historical and social context and the information can be gained from analysing and solving problems. Moreover, there has been evidence that psychology, demographics and beliefs matter (Shook et al., 2003). It is reported that entrepreneurs make a mental connection with the information they have when the opportunity is recognized. This underscores that cognitive processes (as well as drivers such as social capital, prior knowledge, systematic search, cognition and entrepreneurial alertness) have an impact on recognizing opportunities (Grégoire et al., 2010). Yet, understanding and knowledge of the natural/communal environment also influences the recognition of opportunities, as the entrepreneurs in this study were keen on developing an emerging and growing business with a sustainable viewpoint.

**Systematic Search**

As previously noted, entrepreneurs discover opportunities through specific drivers and these drivers interact within the opportunity recognition process. Previous literature has stated that the nexus between the actor and the non-actor, in this case the entrepreneur and the opportunity that is considered, with the
three dimensions that are new venture idea, external enablers and opportunity confidence (Davidsson, 2015). In this study, the business opportunity was researched through creation and discovery, depending on the project, as prior studies have also noted (Alvarez & Barney, 2007). However, it is evident that discovery and creation are not the only factors that play a part in opportunity recognition. When analysing this further, the noteworthy driver is what is happening in the process. Opportunities have an effect on the outcome. There is an interaction between the recognizer (the actor) and the opportunity itself; this is noted in the following comments by the interviewees: ‘The desire to realise [opportunity in wood construction]’ (I3), ‘…the encouragement of wood construction has been written in the town or city strategy…’ (I6) or ‘Wood could be used much more [in construction] in Finland’ (I5). Hence, as reported in the literature, if the entrepreneurial alertness is sensitive enough, the opportunities can be identified without a systematic search (George et al., 2016). As Patzelt and Shepherd (2011) found, knowledge about the natural/communal environment is critical for opportunity recognition and altruism is critical for doing good in relation to the economic, social and environmental aspects.

Discussion and Conclusion

The three contributions of this show that six drivers influence the recognition of CE business opportunities (George et al., 2016). First, we contribute to the existing research by showing that the drivers are intertwined in a complex and processual phenomenon known as business opportunity (Alvarez & Barney, 2007). However, when we focus on the drivers for sustainable opportunity recognition, we see that both prior knowledge (especially of surrounding environments) and altruism are critical. This is consistent with the entrepreneurs interviewed in this study that have positive views on how the wood construction industry can play a role in creating a sustainable environment. Second, the recognition of opportunity is not solely based on any of the individual drivers; rather, they are mostly in continuous interaction when the entrepreneur is creating a business opportunity. Third, this study also contributes to the understanding of the opportunity process in which the nexus between the discoverer (the actor) and the opportunity influences the recognition of the opportunity by showing that interactive, systematic recognition can result in exploitation of the opportunity in the CE context (Davidsson, 2015). Thus, the entrepreneur’s views on environmental and sustainability issues could impact the ability to recognize the business opportunity. Finally, we argue that CE encourages reflection on its added value and its role as the new economic model when businesses are creating business opportunities and considering investments in new technology, such as in the wood construction context.

The study’s findings have managerial implications. In the wood construction context, CE business opportunities represent an example of the pioneers who are building a new, constantly developing industry in Finland; thus, managers are recognizing opportunities for exploitation with knowledge about CE and the possibilities it offers. As a paradigmatic change, CE can lead managers to constantly observe and learn about the changing market and provide solutions and services. Moreover, by employing prior knowledge and understanding the sustainable environment, managers can better succeed in recognizing opportunities. The CE business opportunity recognition phenomenon entail newness and innovativeness and being a pioneer within the new economic model. Thus, CE can provide new economic, social and environmental value creation opportunities for entrepreneurs in the wood construction industry.

This study has methodological limitations as the six interviews were based on a one country, that is, Finland. The wood construction industry is growing, and the sustainability implications are evident, however, as the industry is still emerging more research is needed to understand the opportunity
recognition phenomenon of wood construction more in depth. Further research on how networks and other stakeholders have contributed to the opportunity recognition would create more profound research setting and would give more comprehensive view of the emerging industry.

Acknowledgements
The authors gratefully acknowledge the financial support from the Strategic Research Council at the Academy of Finland (decision number 320209) and Foundation for Economic Education.

Declaration of Conflicting Interests
The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

Funding
The authors received the financial support from the Strategic Research Council at the Academy of Finland (decision number 320209) and Foundation for Economic Education.

ORCID iD
Ville-Veikko Piispanen https://orcid.org/0000-0001-7731-7960

References
Abell, M. (2021). Wood construction. Sustainable Urban Development, City of Helsinki. https://www.uuttahelsinkia.fi/en/sustainable-urban-development/wood-construction
Alvarez, S. A., & Barney, J. B. (2007). Discovery and creation: Alternative theories of entrepreneurial action. Strategic Entrepreneurship Journal, 1(1–2), 11–26.
Baron, R. A. (2006). Opportunity recognition as pattern recognition: How entrepreneurs ‘connect the dots’ to identify new business opportunities. Academy of Management Perspectives, 20(1), 104–119.
Baron, R. A., & Ensley, M. D. (2006). Opportunity recognition as the detection of meaningful patterns: Evidence from comparisons of novice and experienced entrepreneurs. Management Science, 52(9), 1331–1344.
Barringer, B., & Ireland, R. (2008). Entrepreneurship: Successfully launching new ventures (2nd ed.). Pearson Prentice Hall.
Bocken, N. M., De Pauw, I., Bakker, C., & van der Grinten, B. (2016). Product design and business model strategies for a circular economy. Journal of Industrial and Production Engineering, 33(5), 308–320.
Bocken, N. M. P., Schuit, C. S., & Kraaijenhagen, C. (2018). Experimenting with a circular business model: Lessons from eight cases. Environmental Innovation and Societal Transitions, 28, 79–95. https://doi.org/10.1016/j.eist.2018.02.001
Corner, P. D., & Ho, M. (2010). How opportunities develop in social entrepreneurship. Entrepreneurship Theory and Practice, 34(4), 635–659.
Davidsson, P. (2015). Entrepreneurial opportunities and the entrepreneurship nexus: A re-conceptualization. Journal of Business Venturing, 30(5), 674–695.
Ellen MacArthur Foundation (EMAF). (2013). Towards the circular economy (Vol. 1). Isle of Wight. https://www.ellenmacarthurfoundation.org/assets/downloads/publications/Ellen-MacArthur-Foundation-Towards-the-Circular-Economy-vol.1.pdf
Eriksson, P., & Kovalainen, A. (2016). Qualitative methods in business research (2nd ed.). SAGE Publications.
European Commission. (2019). A European green deal. https://ec.europa.eu/info/node/123797
European Commission. (2020). EU circular economy action plan. https://ec.europa.eu/environment/circular-economy/
Fiet, J. O. (2007). A prescriptive analysis of search and discovery. Journal of Management Studies, 44(4), 592–611.
Finnish Government. (2021). Finland has an excellent opportunity to rebuild itself in line with the principles of sustainable development. Finnish Government. https://valtioneuvosto.fi/en/marin/government-programme/carbon-neutral-finland-that-protects-biodiversity

Gaglio, C. M., & Katz, J. A. (2001). The psychological basis of opportunity identification: Entrepreneurial alertness. Small Business Economics, 16(2), 95–111.

Geissdoerfer, M., Savaget, P., Bocken, N. M., & Hultink, E. J. (2017). The circular economy – A new sustainability paradigm? Journal of Cleaner Production, 143, 757–768. https://doi.org/10.1016/j.jclepro.2016.12.048

George, N. M., Parida, V., Lahti, T., & Wincent, J. (2016). A systematic literature review of entrepreneurial opportunity recognition: Insights on influencing factors. International Entrepreneurship and Management Journal, 12(2), 309–350.

Grégoire, D. A., Barr, P. S., & Shepherd, D. A. (2010). Cognitive processes of opportunity recognition: The role of structural alignment. Organization Science, 21(2), 413–431.

Hanohov, R., & Baldacchino, L. (2018). Opportunity recognition in sustainable entrepreneurship: An exploratory study. International Journal of Entrepreneurial Behaviour & Research, 24(2), 333–358.

Kontinen, T., & Ojala, A. (2011). International opportunity recognition among small and medium-sized family firms. Journal of Small Business Management, 49(3), 490–514.

Korhonen, J., Honkasalo, A., & Seppälä, J. (2018). Circular economy: The concept and its limitations. Ecological Economics, 143, 37–46. doi:10.1016/j.ecolecon.2017.06.041

MacGilleon, T. (2020, January 28). Betonisen kerrostalon hiilijalanjälki on jopa 75 prosenttia isompi kuin puisen [The carbon footprint of a concrete apartment building is up to 75 percent larger than that of a wooden one]. Yle. https://yle.fi/uutiset/3-11179130

Metsälehti. (2020, January 8). Ruotsalaistutkimus: Puusta talo halvemmalla kuin betonista [Swedish research: A wooden house cheaper than concrete]. https://www.metsalehti.fi/uutiset/ruotsalaistutkimus-puusta-talo-halvemmalla-kuin-betonista/#3d2367f9

Ministry of the Environment. (2021). Wood in public construction. Ministry of the Environment, Finnish Government. https://ym.fi/en/wood-in-public-construction

Murray, A., Skene, K., & Haynes, K. (2017). The circular economy: An interdisciplinary exploration of the concept and application in a global context. Journal of Business Ethics, 140(3), 369–380.

Patala, S., Jalkala, A., Keränen, J., Väisänen, S., Tuominen, V., & Soukka, R. (2016). Sustainable value propositions: Framework and implications for technology suppliers. Industrial Marketing Management, 59, 144–156. https://doi.org/10.1016/j.indmarman.2016.03.001

Patzelt, H., & Shepherd, D. (2011). Recognizing opportunities for sustainable development. Entrepreneurship Theory and Practice, 35(4), 631–652.

Rakli. (2019). Puurakentaminen-klinikankai osauskisumiari [Introductory seminar of the wood construction]
11.12.2019. https://www.rakli.fi/wp-content/uploads/2019/12/20191211-puurakentamisen-klinikankoskuoskeon|esitseistot.pdf

Ranta, V., Keränen, J., & Aarikka-Stenroos, L. (2020). How B2B suppliers articulate customer value propositions in the circular economy: Four innovation-driven value creation logics. Industrial Marketing Management, 87, 291–305. https://doi.org/10.1016/j.indmarman.2019.10.007

Shane, S., & Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. Academy of Management Review, 25(1), 217–226.

Shook, C. L., Priem, R. L., & McGee, J. E. (2003). Venture creation and the enterprising individual: A review and synthesis. Journal of Management, 29(3), 379–399.

Stora Enso. (2021). Massive wood construction. Stora Enso Oyj. https://www.storaenso.com/en/products/wood-products/massive-wood-construction

Suddaby, R., Bruton, G. D., & Si, S. X. (2015). Entrepreneurship through a qualitative lens: Insights on the construction and/or discovery of entrepreneurial opportunity. Journal of Business Venturing, 30(1), 1–10.

Zahra, S. A., Gedajlovic, E., Neubaum, D. O., & Shulman, J. M. (2009). A typology of social entrepreneurs: Motives, search processes and ethical challenges. Journal of Business Venturing, 24(5), 519–532.