

# Communicating Forest Sector Sustainability: Results from Four European Countries

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## Abstract

Communication is an important tool in maintaining legitimacy and acceptability of forest sector operations and activities, and expectations by the general public on the forest sector conduct in Europe are in general very high. Despite this, there is scarce research in cross-national contexts on how forest sector sustainability is communicated to the general public and what development areas can be identified in terms of communication content. This study applies a qualitative content analysis in four forestry-rich European countries (Austria, Finland, Germany, and Slovenia). The state of online communication of 61 companies and 19 industry associations was qualitatively analyzed in 2014 with a focus on eight core sustainability topics of interest that were identified via an international forest sector stakeholder feedback process. Our results show some great similarities, but also some interesting differences in terms of communication frequency and weight of hot topics across countries. The most frequently communicated area was economic contribution of forests (in Finland and Austria), followed by debate over forest conservation versus production (Germany) and the concept-added value of wood (in Slovenia). With the exception of Slovenia, the role of forests in combating global warming was emphasized more frequently within industry associations than among individual forest industry companies. Characteristically, current content of sustainability communication focuses on supplying factual information. Thus, there is a need for developing more targeted and bidirectional forms of stakeholder communication in the future, emphasizing also more active use of social media channels and empowering organizations to promote interactive communication and collaborative learning.

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Forests are a source of many ecological, economic, and social benefits, especially in European countries in which the forest resource base is relatively most abundant (e.g., Rämö et al. 2002). Wood is used for various purposes, such as construction material, energy carrier, boards, paper, cellulose, fibers, and chemicals. Co-products such as chips from sawmilling can be used directly on site, can be used for energy production or pellets, or can be sold to a company using the fibers for subordinated processing. However, the forest-based industry has to seek a more efficient exploitation of raw materials, new products, or even alternative product concepts (Stern et al. 2014).

The European Strategy for Sustainable Development (European Commission 2009) calls for the creation of sustainable communities able to manage and use resources efficiently and able to tap the ecological and social innovation potential of the economy. In a recent development, as reported by, for example, European Commission (2012) and Finnish Forest Industries Federation (2013), the forest industry has an increasing role in the discussion of how to adapt and mitigate impacts of climate change. With the emergence of a bio-based economy (Kleinschmit et al. 2014), the forest sector is a key player because it is

producing wood-based renewable and sustainable raw materials, biofuels, heat, and electricity as a substitute for fossil-based materials and energy. Owing to decreasing demand for paper products, there is a strong need for the European forest sector to renew its product and service portfolio and put efforts into developing new forest and wood-based innovations (Hetemäki 2014). The ultimate market demand is, however, determined by consumer

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acceptance and based on competitiveness between wood-based and alternative products and services.

Communication is an important tool in maintaining legitimacy and acceptability of forest sector operations among the general public. According to Scott (1998), organizational legitimacy is a negotiated point between the perceptions of society and an organization's decision makers regarding any issue of concern. Sustainability—consisting of three interconnected domains (ecologic, economic, social)—is a core element in the forest sector because of its dependence on natural resources. In the forest sector, achieving social license to operate can be related to concepts such as corporate responsibility, maintaining legitimacy, acceptability of operations, meeting diverse stakeholder expectations, and building trust, not only with local communities, but also along the entire supply chain (Gold et al. 2010). With continued increases of societal awareness regarding social and environmental issues, it may be expected that the forest products industry falls short of changing societal expectations about its social and environmental performance (Panwar et al. 2014). Maintaining legitimacy of the forest sector is therefore highly contingent on how sustainability is perceived, not just throughout the production chain, but also among the general public.

Public expectations of forest sector conduct are high (European Commission 2002, Ranängen and Zobel 2014). The environmental discussion within the forest sector in Europe began with concerns about emissions to water and air in the 1970s and continued to recycling, chlorine bleaching, and certification of sustainable forest management (e.g., the Programme for the Endorsement of Forest Certification and the Forest Stewardship Council) to materialize forest sector sustainability (Ranängen and Zobel 2014). The concept of corporate (social) responsibility (CR/CSR) became a more familiar approach to the European forest products industry by the mid-1990s, once publication of environmental reports became more common (Panwar et al. 2006). According to Han et al. (2013), as in the broader context of under-sustainable development, the “triple-bottom-line” model (economic, social, and environmental aspects) is currently used in the sector to conceptualize implementation of CR.

Overall, the business sector is facing increasing external pressure because issues of interest to consumers and other stakeholders are not necessarily the same as those that the organizations themselves tend to communicate about. In general, companies typically highlight their positive development and progress in terms of sustainability issues in their communications (Halme et al. 2011). Regarding sustainability communication in the forest sector, it is very clear that previous studies focused on the state of industry reporting (see Mikkilä and Toppinen 2008, Vidal and Kozak 2008, Han et al. 2013). In addition to corporate reports (including environmental reports, annual reports, CR and sustainability reports, and project reports; Li and Toppinen 2011), official Web sites of different organizations form a significant part of sustainability strategy and communication of the sector. Apart from analysis on the reporting practices, very few studies have approached the sustainability image of the sector from the external stakeholders' point of view (see, e.g., Thompson et al. 2010 for the case in North America or Hitchner et al. 2014 for a review on wood-based bioenergy). A myriad of sustainability indicators and measurement systems for assessing, for example, regional

and national sustainability of forest sector have been developed, but in general they have had more limited applicability at managerial decision making (see, e.g., Lähtinen et al. 2014).

This study contributes to the issue of sustainability communication by applying a qualitative content analysis in the case of four forestry-rich European countries (Austria, Finland, Germany, Slovenia). After widespread digitalization, the importance of sustainability-related online communication has increased in the forest sector (see Montague et al. 2016), especially among forest companies and associations, and this information will therefore form the core material of this study. According to Singh et al. (2008), a cross-cultural analysis could help identify the similarities and the differences between the peoples' perceptions of sustainability issues. In our case, while these countries are culturally similar in that they are part of the European Union, there is some geographical variation (Finland in northern Europe, Austria and Germany in central Europe, and Slovenia in southeastern Europe). At the same time, the four countries have differences in their economic development and growth—as well as cultural, historical, and political traditions—that make their comparison interesting.

In this study, online communication of 61 companies and 19 industry associations in the four case countries is qualitatively analyzed based on a two-stage research process. In the first stage, eight “core sustainability topics of interest” (TOIs) are identified from an international stakeholder feedback process (including companies and associations of the forest-based sector). In the second phase, the list of identified sustainability topics is used as a lens to analyze the content of communication. In the “Discussion and Concluding Remarks,” gaps in communication and some future research areas are identified.

## Conceptual Background

Our point of departure in this article is that the triple-bottom-line concept of sustainability (environmental, social, and economic) can be implemented at four hierarchical levels, i.e., the societal, sectoral, corporate, and product (or service) levels. First, the societal level of sustainability, which is a more extensive level of the sustainability concept, includes strategic decisions, regulations, and operations related to sustainable development on a global scale. The societal level has a high impact on the other three levels as carried through the implementation of national and international regulations and commitments, which creates limitations and incentives for societies, governments, companies, organizations, and individuals. Second, the main focus or sectoral level of sustainability, which is according to Draper (2006) a lesser used concept, is to maintain or enhance the current legitimacy or solid reputation of a sector in sustainability-related matters with the aim of improving competitiveness in relation to other sectors. Thus, the success of improving sustainability performance requires collaboration with other companies, organizations, and value-chain members in the same sector. Third, sustainability at the corporate level encompasses communicating the current state and goals of corporate social responsibility, as mentioned above. Fourth, the product level of sustainability is primarily concerned with consumers' perceptions on environmental and social sustainability of products, which has been affected by the corporate strategic decision-making process. Based on

Toppinen et al. (2013), for Finnish consumers of wood products, the safety aspects and health impacts of a product are emphasized. In wooden furniture markets, young people in Germany and Finland have been found to favor secondhand, inherited, and recycled furniture for budgetary as well as environmental and ethical reasons (Hakala et al. 2014).

According to Dawkins (2004), to produce efficient communication on sustainability issues, an organization must fulfill four of the most essential requirements. First, a clear communication strategy needs to be developed, considering which aspects of the CR program are the most suitable with the concerns of its stakeholders and company reputation. Second, communication channel, style, and content of communications that meet various expectations of the different stakeholder groups need to be designed. This includes maintaining comprehensive consistency of the company's message along with involving stakeholders when developing communication on sustainability. Third, conformity and coherence of the company's communication when coordinating sustainability messages need to be ensured. The most efficient communication may comprise embedding CR messages as part of the general stream of communication. Fourth, the company must take into account internal communication channels (e.g., product/label itself, marketing campaigns, voluntary CR reports, corporate Web site, and informal word of mouth) together with traditional communication channels.

Furthermore, Dawkins (2004) points out that the main concern companies are facing in their sustainability communication is diverse expectations of stakeholders and the companies' ability to respond to these different expectations. This calls for improving communication by developing a clear and strong communication strategy tailoring content in accordance with the image and desired reputation of the company. Based on characterization of different perspectives of sustainability communication by Morsing and Schultz (2006), three communication strategies related to CR can be pointed out: the one-way stakeholder information strategy, the stakeholder response strategy, and the stakeholder involvement strategy. The more advanced stakeholder response and involvement strategies concentrate on changing public behavior and attitudes rather than changing the company as a result of public relations. However, real two-way discussion and mutual dialogue between the company and its stakeholders only takes place in the stakeholder involvement strategy.

Halme et al. (2011, pp. 260–265) note that active communication with stakeholders, i.e., sharing common goals and views and giving stakeholders a chance to have an influence on a decision-making process, positively influences transparency in a company's overall performance. In their review, Li and Toppinen (2011) emphasize the importance of interaction between a company and its stakeholders to develop CR even further and to conserve the company's social legitimacy from possible loss by adopting CR practices. Legitimacy loss can lead, for instance, to consumer boycotts and environmental and social activism, which can negatively affect the economic performance of a company. In order to retain a company's societal legitimacy and to maximize its long-run financial viability, CR can be used as a tool for forest sector companies to reflect the concerns and needs of their stakeholders (Mikkilä and Toppinen 2008).

The Internet has become an important public relations tool and communication channel for transmitting companies' sustainability actions to different stakeholders because it allows companies to disclose information more economically and faster than other communication channels (e.g., newspapers, magazines, brochures, campaigns, television, radio; Wanderley et al. 2008, Gomez and Chalmeta 2011). In addition, the detailed up-to-date information on the Web remains available for the larger audience, and hence, Internet users are able to select which information is relevant for them (Wanderley et al. 2008). Therefore, this study focuses on online communication as available on organizational Web sites in the context of the forest sector.

## Data and Research Design

In the first stage, eight TOIs were chosen as an analytic lens based on scoping company interviews and written stakeholder feedback in individual countries; these topics were summarized in a final discussion at a joint stakeholder workshop held in Helsinki on September 22, 2014. The 1-day workshop consisted of two parts: explaining the scope of the study to foster elaboration among the 23 participants and the discussion finalizing the eight TOIs. Based on the earlier literature on forest industry corporate responsibility conduct and stakeholder perceptions (see previous sections), the initial set of eight hot topics was chosen both for stakeholder interest from the forest-based sector and also to cover a clear societal relevance toward a bio-based and sustainable economy. In addition, based on workshop discussions, sustainability of forest-based ecosystem services, including provisioning of wood-based products (Räty et al. 2016), was included. The topics are identified as follows in Figure 1: wood-based innovations (WBI), multifunctional forestry and forest ecosystem services (FES), forest conservation by [forest management and] production (CBP), forests and global warming (FGW), forests and economy (FEC), added value of wood (AVA), building with wood (BWW), and efficient use of wood (EUW). As can be seen in Figure 1, there are several topics falling under the domain of environmental sustainability (CBP, FGW, FES) only, whereas some topics had both environmental and economic dimensions (EUW), and then there were some with emphasis on both social and economic dimensions (AVA, FEC, BWW, and WBI). The primary scope of the topics could also be identified to range between four levels, from societal (global) to product level, and therefore fitted with our initial thinking on the hierarchical nature of hot topics under sustainability-related communication.

In the second stage, the sampling of data in qualitative content analysis followed aims of the purposive sampling method (Ritchie and Lewis 2003), particularly targeting information-rich cases reflecting particular features for in-depth study. First, we ensured that all relevant types of organizations from the forest sector were covered and overviewed in the potential candidates of the four countries via online screening. Second, we categorized the identified organizations with seemingly sufficient online content under four different segments; (1) large-scale international companies, (2) small- and medium-sized enterprises (SMEs, which are mostly family businesses), (3) industry associations, and (4) bioenergy producers. It is important that there is sufficient diversity within each segment to disengage impacts of the segment's feature and other factors involved. Therefore, each of the four segments contains a comprehensive range of

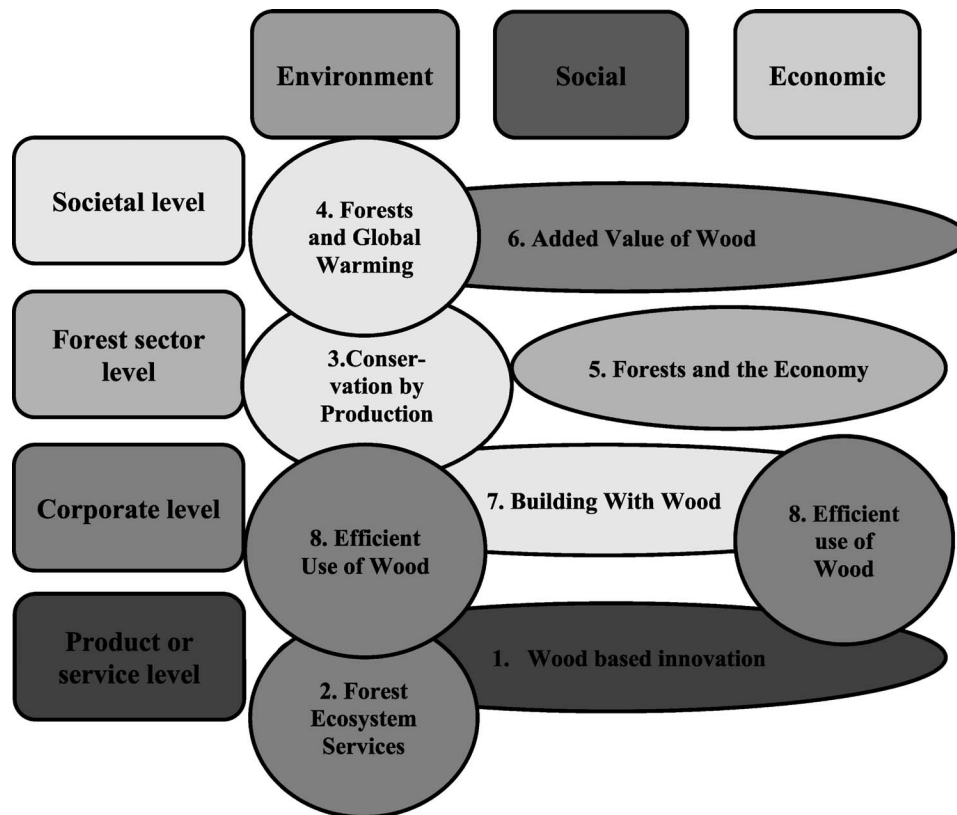


Figure 1.—Eight topics of interest and their alignment with level of analysis and dimensions of sustainability (environmental, social, and economic sustainability).

representative organizations. Ultimately, the sample of individual companies and organizations was determined for this study based on the content of information available on their Web sites in terms of sustainability communication and targeting a balanced geographic setting covering wood, pulp, and paper and bioenergy production. Instead of pictures, reports in PDF form, job advertisements, and news older than 6 months, all text and tables from the Web pages were encompassed into raw data text files.

The content analysis coding process in four countries was undertaken in three languages (German, Finnish, and Slovenian) by three researchers working in close collaboration and using software (Atlas/MaxDQA) for coding. Their coding process followed suggested patterns and stages of qualitative content analysis to improve validity of the content classification (Schreier 2012, see also Berg 2009). In this deductive form of content analysis, the coding unit consisted of either several sentences, a section, or a paragraph depending on the context. Specific quotations, tagged with a code, were composed of sections, which were separated from each other with a section break. Eventually, the length of the coded quote had no great significance to the results, because frequency counts were based on number of quotations (with some of them also used later as illustrative examples). The codes and subcategories were grouped into code families under eight TOIs. Only one code from the same code family could be chosen to avoid the risk of double coding and in order to make the coding and results more comparable between the four countries.

Our final sample was limited from the perspective of different segments and countries because of structural

differences between forest sectors in each country and availability of communication. However, we believe that communication by the included 61 companies and 19 industry associations given in Table 1 provides a rich representation of different types of forest sector activities and therefore can be helpful in order to build a coherent overall picture of the current state of communication in these countries.

## Results

### General

Table 1 gives a breakdown of data of the included organizations. The share that each of the four countries contributes to the total count is interesting and it is shown that 40 percent of the data are from Finland, followed by Germany and Slovenia (21% each) and Austria (18%). The number of analyzed units in each country is given. For example, the content of Web sites for 23 organizations was analyzed in the case of Finland, and the data for Finland are available from large-scale companies (1,255 observations, i.e., 44% of observations for Finland), followed by bioenergy producers (791, i.e., 28%), SMEs (530, i.e., 18%), and industry associations (292, i.e., 10%).

In total, our data set consists of a count of 7,090 observations regarding eight stakeholder predefined topics in the data (see Table 1), which is a sizable amount of information. Based on volume of count data, the Finnish organizations were found to score the highest number of observations, also reflecting the sophisticated stage of Finland's well-established forest-based industry. The Slovenian sample in particular was not at all representative

Table 1.—Breakdown of counted observations of topics of interest by each country and segment.<sup>a</sup>

| Country                   | No. of observations |       |                       |                     | Total |     |
|---------------------------|---------------------|-------|-----------------------|---------------------|-------|-----|
|                           | Large companies     | SMEs  | Industry associations | Bioenergy producers | No.   | %   |
| Finland ( <i>n</i> = 23)  | 1,255               | 530   | 292                   | 791                 | 2,868 | 40  |
| Germany ( <i>n</i> = 25)  | 759                 | 116   | 497                   | 102                 | 1,479 | 21  |
| Austria ( <i>n</i> = 16)  | 548                 | 133   | 440                   | 128                 | 1,249 | 18  |
| Slovenia ( <i>n</i> = 16) | 275                 | 1,198 | 21                    | 0                   | 1,494 | 21  |
| Data by segments          | 2,837               | 1,977 | 1,250                 | 1,021               | 7,090 | 100 |

<sup>a</sup> Please note double counting by country as segment 4 “Bioenergy producers” is a subsample of large-scale or small- and medium-sized enterprises (SMEs) in the case of Finland and Austria.

from the empirical data point of view because most of the observations were obtained from SMEs (80.2%), while large companies produced 18.2 percent, and only 1.2 percent was from associations. When looking at the Austrian and German samples, the low number of observations in the content of communication was somewhat surprising. Because Austria and Germany both have an advanced forest-based industry, it is surprising that the intensity of communication is less than in Slovenia, in which the forest-based sector is much smaller both in absolute and relative terms (e.g., forest area of slightly over 1 million ha in Slovenia in comparison to 20 million ha in Finland or 4 million ha in Austria; see Rämö et al. 2002). However, the observed variation in the level of communication activity might be partly related to the smaller number of included organizations in Austria (only 16 different Web sites, while 25 organizations in Germany and 23 organizations in Finland were included), a wider coding unit used (the Austrian coder marked paragraphs rather than sentences to maintain the context), and avoidance of double coding, or a stricter coding logic (i.e., researcher decisions concerning what to code and what to leave out). Therefore, some caution should be exercised in looking into the absolute numbers of topic frequency counts in Table 1. Furthermore, because bioenergy producers in the samples were partly the same companies as in the large companies category, and these data were not available for Slovenia, we decided to exclude this group from the reported results by countries.

On first glance, the state of communication efforts of the analyzed organizations in four countries strongly focused on distributing information (e.g., supplying facts or mentioning use of environmental certificates or standards). Formally, the communication in the sector seemed to lack feedback mechanisms, especially among SMEs. Thus, stakeholder expectations about tailored communication were rarely expressed in explicit terms, which makes the evaluation of the effectiveness of communication practices quite difficult. From the perspective of revealing the quality of communication, our results focusing on the frequency of communicated topics in the data can only be considered a preliminary assessment.

### Country level results

We will discuss the results based on mean frequencies by segments from different countries. Frequency of communication on selected topics is available by each segment in Table 2. Nevertheless, we would like to emphasize that direct comparison between categories in different countries should be done with caution because of the purposive sampling and content analysis process explained in the previous section.

For Finland, the highest number of counts was received on FEC (28%) and FGW (19%), as illustrated in Figure 2. More detailed results by organizational types are given in Table 2. For example, for TOI FEC, the entry number 364

Table 2.—Total and mean values of frequency counts of communicated topics by country and organizational type.

| TOIs <sup>a</sup> | Frequency of large companies |      | Frequency of SMEs |      | Frequency of associations |      |
|-------------------|------------------------------|------|-------------------|------|---------------------------|------|
|                   | Mean                         | Mean | Mean              | Mean | Mean                      | Mean |
| Finland           |                              |      |                   |      |                           |      |
| 1. WBI            | 111                          | 37   | 21                | 1    | 31                        | 6    |
| 2. FES            | 71                           | 24   | 21                | 1    | 38                        | 8    |
| 3. CBP            | 108                          | 36   | 59                | 4    | 33                        | 7    |
| 4. FGW            | 260                          | 87   | 71                | 5    | 63                        | 13   |
| 5. FEC            | 364                          | 121  | 126               | 8    | 75                        | 15   |
| 6. AVA            | 129                          | 43   | 113               | 8    | 7                         | 1    |
| 7. BWW            | 89                           | 30   | 77                | 5    | 5                         | 1    |
| 8. EUW            | 123                          | 41   | 42                | 3    | 40                        | 8    |
| Germany           |                              |      |                   |      |                           |      |
| 1. WBI            | 24                           | 2    | 1                 | 0    | 10                        | 1    |
| 2. FES            | 105                          | 11   | 0                 | 0    | 60                        | 7    |
| 3. CBP            | 212                          | 21   | 19                | 5    | 114                       | 13   |
| 4. FGW            | 47                           | 5    | 8                 | 2    | 101                       | 11   |
| 5. FEC            | 174                          | 17   | 14                | 4    | 94                        | 10   |
| 6. AVA            | 124                          | 12   | 23                | 6    | 68                        | 8    |
| 7. BWW            | 55                           | 6    | 5                 | 1    | 52                        | 6    |
| 8. EUW            | 18                           | 2    | 5                 | 1    | 44                        | 5    |
| Austria           |                              |      |                   |      |                           |      |
| 1. WBI            | 46                           | 6    | 11                | 3    | 40                        | 10   |
| 2. FES            | 38                           | 5    | 1                 | 0    | 30                        | 8    |
| 3. CBP            | 73                           | 9    | 20                | 5    | 27                        | 7    |
| 4. FGW            | 18                           | 2    | 6                 | 2    | 111                       | 28   |
| 5. FEC            | 224                          | 28   | 29                | 7    | 90                        | 23   |
| 6. AVA            | 78                           | 10   | 52                | 13   | 25                        | 6    |
| 7. BWW            | 44                           | 6    | 9                 | 2    | 69                        | 17   |
| 8. EUW            | 27                           | 3    | 5                 | 1    | 48                        | 12   |
| Slovenia          |                              |      |                   |      |                           |      |
| 1. WBI            | 25                           | 6    | 76                | 8    | 8                         | 3    |
| 2. FES            | 0                            | 0    | 1                 | 0    | 0                         | 0    |
| 3. CBP            | 67                           | 17   | 158               | 18   | 5                         | 2    |
| 4. FGW            | 17                           | 4    | 31                | 3    | 0                         | 0    |
| 5. FEC            | 24                           | 6    | 97                | 11   | 4                         | 1    |
| 6. AVA            | 69                           | 17   | 490               | 54   | 1                         | 0    |
| 7. BWW            | 11                           | 3    | 329               | 37   | 2                         | 1    |
| 8. EUW            | 62                           | 16   | 16                | 2    | 1                         | 0    |

<sup>a</sup> TOI = topics of interest; WBI = wood-based innovation; FES = forest ecosystem services; CBP = conservation by production; FGW = forests and global warming; FEC = forests and the economy; AVA = added value of wood; BWW = building with wood; EUW = efficient use of wood.

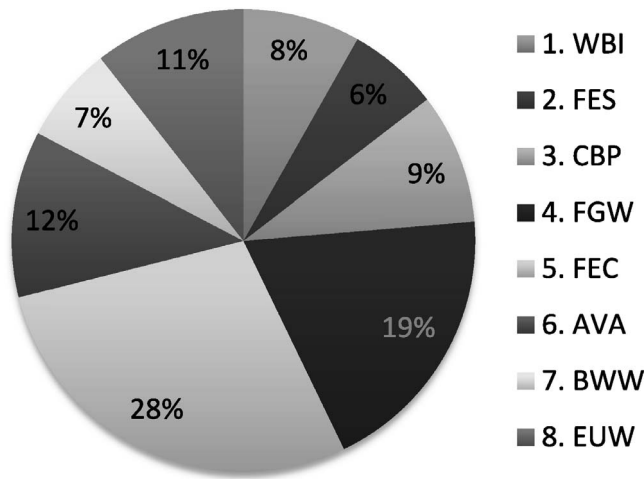


Figure 2.—Percent distributions of eight topics of interest in total, Finland (number of organizations = 23). WBI = wood-based innovation; FES = forest ecosystem services; CBP = conservation by production; FGW = forests and global warming; FEC = forests and the economy; AVA = added value of wood; BWW = building with wood; EUW = efficient use of wood. To read the pie chart, start at the top right with WBI (8%) and move clockwise.

under the group of large companies in Finland means that in total 364 observations were recorded among three large-scale companies, resulting in a mean value of 121 and the highest ranking terms of communication frequency in this segment. Inclusion of a broad range of economic, environmental, and social aspects in this category partially explains why this topic is the most commonly covered theme in sustainability-related online communication. The role of stakeholder groups such as communities, competitors, contractors, and forest owners seems important in the case of Finland, and recognizing support from the sector to the well-being of communities and society is included in communication activities, as quoted in the following example: “We generate well-being at work, in local communities, and in society at large and commit to global sustainability principles. By behaving responsibly towards our employees and society, we can improve the quality of life of our stakeholders” (Metsä Group, June 10, 2014).

Although the topic of FGW as a code is much narrower than FEC, FGW has a strong emphasis on forest sector communication. On the other hand, multifunctional FES (6%) and BWW (7%) received the lowest number of observations in sustainability communication because both themes are quite narrow. In addition, it appears that the value of ecosystem services is not yet recognized as a core communication topic, although there has been a growing interest in the subject in recent years.

In Germany, according to Figure 3, CBP is the most commonly communicated topic. It seems that an ongoing media discussion between representatives of nature conservation organizations and forestry associations unveiled a conflict regarding whether forests are actually endangered or preserved by production interventions. In this sample, forest companies and associations formulated arguments on how careful forest management can enhance vitality and diversity within forest resources and still be used for productive purposes. There is considerable

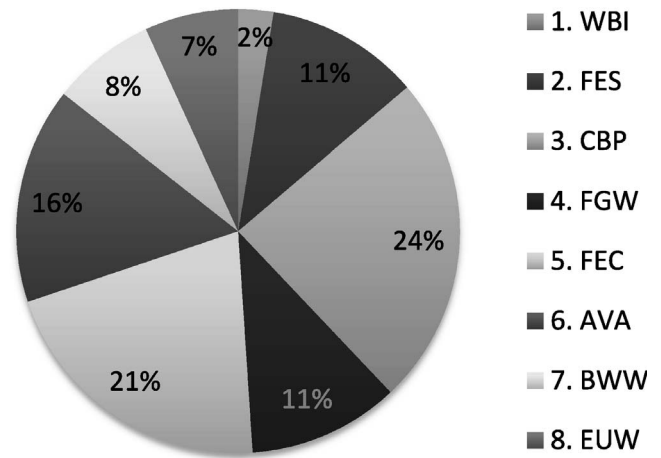


Figure 3.—Percent distributions of topics of interest in total, Germany (number of organizations = 25). For definitions of abbreviations, see the text and the legend for Figure 2. To read the pie chart, start at the top right with WBI (2%) and move clockwise.

ongoing conflict between forestry and representatives over nature conservation policies in Germany, and thus companies and associations frequently cover this topic and argue that the forest resources are carefully handled, as the following quote from one association demonstrates: “Only those who keep an eye on (possible developments in) the future will be able to preserve and secure all vital functions of the forests as a living environment and economic base. This is why for generations there have been strict sustainability requirements for forest management in Germany” (Arbeitsgemeinschaft Deutscher Waldbesitzerverbände e.V., September 18, 2014).

At the other extreme, the topic WBI was not frequently communicated in Germany. Scattered observations were mainly about research and development activities or launching of new innovative products. Part of the reason for the low frequency regarding WBI may lie within the sample focusing on primary producers and not on research-oriented or value-added organizations.

In comparing different segments in Germany, EUW had the lowest frequency count within the large companies. In the few cases detected, large companies communicated about efficient usage of their main resource or the use of wood residues for bioenergy or selling wood residues to other industries. The following quote illustrates this: “Accumulating residues (sawdust, wood chips, bark) are also sold to the processing industry” (Klausner Group, September 18, 2014). Interestingly, topics such as cascading use of wood as a resource have not been communicated by any company. Reasons for that communication strategy might be found in the companies’ strong focus on their own main product and its production process, rather than on side products and their recycling. Other topics on cascading use or efficiency in the value chain are partially quite political and therefore sensitive topics in the communication, and therefore those might not be covered in online communication.

For Austria, as shown in Figure 4, the highest level of communication concerned FEC (31%). The high frequency of FEC can be partially explained by the category itself, which covers a wide range of different aspects. The forest-

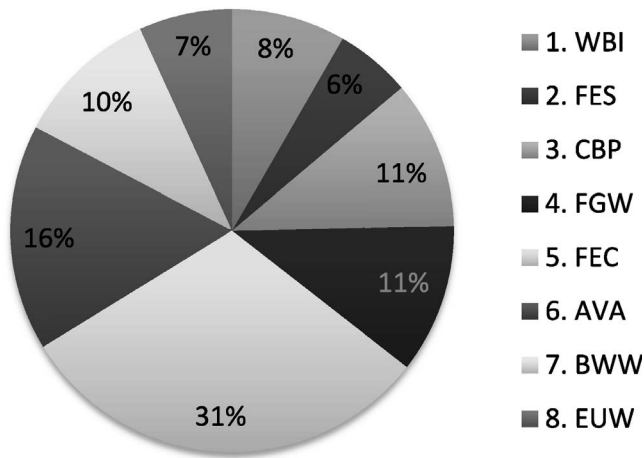


Figure 4.—Percent distributions of topics of interest in total, Austria (number of organizations = 16). For definitions of abbreviations, see the text and the legend for Figure 2. To read the pie chart, start at the top right with WBI (8%) and move clockwise.

based sector is a very important source of national income for Austria, and therefore it is natural that the sector's communication focuses on its economic contribution. The observations range from sales and investment figures to employment numbers and the amount of eco-energy feed-in: "At our production site Hallein in Tennengau, approximately 15 kilometers south of Salzburg City, we employ about 230 employees. With about 40 hectares the production area is one of the biggest industry sites in the federal state of Salzburg" (Schweighofer, October 14, 2014).

Furthermore, online communication touches on important themes, such as employment and career opportunities of the forest-based sector, importance of generating income in Austria, and social responsibilities such as fair, safe, and healthy working conditions and the social engagement of the company like "We take responsibility for the well-being and development of our employees" (Lenzing, November 14, 2014). The topic AVA (16%) scored second highest. Communication efforts were mainly clustered around various technical product characteristics, which can be explained by companies' focus on advertising their products. Next to eco-labels, wooden furniture and floors were promoted with characteristics like "natural," "strong," or "individual." Health benefits such as antibacterial characteristics resulting from essential oils stored in wood are communicated as well. The emotional and health benefits of wood products, especially concerning furniture and flooring, were emphasized, as in the following quote: "Parquet floor is a unique natural product. It creates a comfortable atmosphere and makes rooms cosier and warmer" (Weitzer, November 14, 2014).

The lowest number of observations in Austria concerned FES (6%). Thus, the Austrian forest-based sector does not yet recognize the concept of forest ecosystem services in their online communication because availability of these (especially nonmarketed) services might be taken for granted. Within different organizations, associations were found to give the highest weight in terms of communicating FGW. One explanation may be that lobbying for the positive role of forests in climate change mitigation serves the needs of different types of companies equally and therefore can be

communicated broadly to the general public. In this case, the associations appear to cover both aspects, the role of wood as a material and forests as a stand for combating global warming. Compared with the large companies and the SMEs, associations also argue that the carbon sink of forests is significantly higher when used for active forestry instead of leaving them unused for nature conservation purposes.

In Slovenia, as shown in Figure 5, most observations on TOIs of the content analysis were categorized as AVA, where communication of wood products in relation to emotion, health, and labels were included. Most of the observations were related to a subcategory of labels (47%), for example, "In addition to the CE mark, which is characterized by European standards, in Jelovica the quality of the houses is demonstrated by the RAL quality mark, which is particularly important for the sale of prefabricated houses in the German and Swiss markets" (Jelovica, November 8, 2014). The results showed that organizations communicate information about sustainability and related certifications and labels. However, it should be noted that volume of communication is based on what few specific organizations disclose: 81 percent of all AVA observations came from four wooden house manufacturers and one window producer. The health benefits of wooden houses are communicated as in the following quote: "Buildings must be designed and built in accordance with the regulations on sound protection of a building. This ensures that the noise to which the users and people around the building are exposed too, is at a level ensuring appropriate conditions for work and rest and does not threaten their health" (Marles Hiše Maribor, November 8, 2014). The many AVA observations were followed by the topic BWW, where communication of performance, image, and substitutions (comparison of wood to other materials) were emphasized. Most of the observations were related to performance (89%) of wood in construction, for example, "Raw particleboards EKONIP E1 P3 are non-load bearing panels suitable for use in moist conditions" (LESNA TIP Tovarna ivernih plošč, August 11, 2014).

The topic of interest that produced the lowest number of observations in the sample of 16 Slovenian organizations

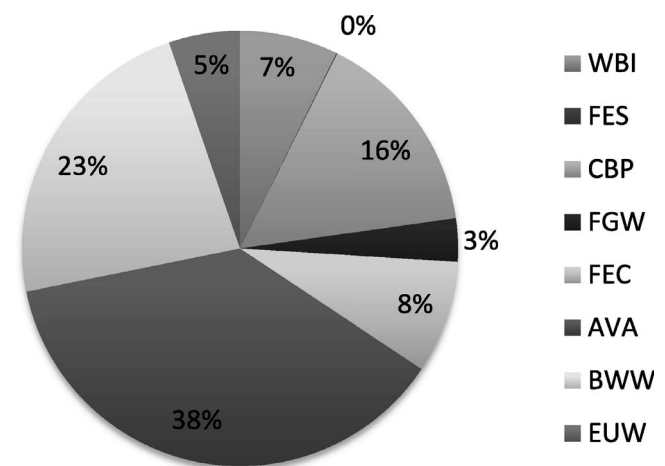


Figure 5.—Percent distributions of topics of interest in total, Slovenia (number of organizations = 16). For definitions of abbreviations, see the text and the legend for Figure 2. To read the pie chart, start at the top right with WBI (7%) and move clockwise.

was multifunctional FES. The only example was found from a forestry SME, “Our concern for forest and forest land is best reflected in the forests of the vast region of Snežnik and Javorniki, where we managed with intensive management in the last five decades to maintain plant diversity and habitat for many endangered species including large carnivores” (Gozdno gospodarstvo Postojna, August 11, 2014). The second least frequently communicated topic was FGW, including forest and carbon aspects. Here communication was related to carbon absorption and storage in forests and in the form of wood and wood-based products. However, for TOI FGW the result is not representative of the forest sector in Slovenia, because all FGW-related observations were found on the Web sites of the four actively communicating wooden house manufacturers and one window producer. Other analyzed organizations in Slovenia did not communicate these topics at all.

### Study limitations

Our analysis was limited because three different coders were employed in the data coding, and because different languages were used (i.e., Finnish, German, and Slovenian) inter-coder reliability could not be checked. While the three coders were working closely together to ensure similar coding logic and they also employed statistical software in the process, some differences between countries are still likely present in the data. In addition, some of the defined sustainability topics are clearly wider in scope than others (e.g., contribution of forests to the economy) while some other topics are much narrower by nature (such as efficient use of wood). These features inevitably influence the numeric frequency counts, which should be therefore treated as only indicative. However, because our approach was dictated in the first stage by defining the topicality of issues as identified by the forest sector stakeholder community, we saw no other way around this. Our results are of international comparative interest at this specific light and with these limitations in mind.

### Discussion and Concluding Remarks

Our results indicate some differences in communication frequency and selection of topics across countries: the most frequently communicated issue was economic contribution of forests (FEC), particularly in Finland and Austria; debate over forest conservation versus production in Germany; and added value of wood in Slovenia. In addition, the important role of forests in global warming was emphasized more frequently within industry associations than among individual forest industry companies (with the exception of Slovenia, where it was communicated by a few SMEs and not by industry associations). In our opinion, the two most future-oriented topics among the eight TOIs, WBI and FES, deserve the least weight in the data throughout different sectors and countries.

It is also interesting to compare our results on the TOIs with results of the previous corporate level analysis that focused on sustainability reports. For example, Vidal and Kozak (2008) found for the 100 largest forest companies that sustainable forest management was on average the most commonly reported topic, and the largest global companies also reported on a wider range of activities than did the smaller sized forest firms. Owing to purposive sampling and wider background differences between analyzed organizations, it was not possible to draw this conclusion from our

sample. However, we can hypothesize that sustainability reporting may be more suitable for communicating with regulators and auditors, whereas general communication toward a wide range of stakeholder groups, such as consumers, would require clearer messages that also hold more emotional appeal (see, e.g., Morsing and Schultz 2006, Joutsenvirta 2009). Such issues would seem to include, for example, forest sector contribution to solving global sustainability challenges, demand for renewable energy, or emphasizing safety and health benefits of wood material at the individual or societal level (see also Hitchner et al. 2014).

Characteristically, current content of sustainability communication appeared to have a focus on supplying factual information or referring to various certificates. Stakeholder expectations about tailored communication were rarely expressed in explicit terms, making the evaluation of the communication effectiveness difficult. In addition, the communication efforts of sample organizations focused heavily on distributing information (e.g., supplying facts or mentioning use of environmental certificates or standards) and lacked feedback mechanisms with targeted stakeholders, especially among the smaller sized wood companies. We can conclude that there is a lack of a consistent sustainability communication strategy that would encompass all participants of the forest-based sector and would stretch across national borders in Europe. This may be owing to the differences in how different types of actors position themselves in terms of sustainability issues and in terms of competitors in the markets. Therefore, there is a clear need for developing more targeted stakeholder communication activities regarding forest sector sustainability. Certain topics of interest, such as wood-based innovations or forest ecosystem services, have had less coverage, and therefore generated less awareness; these topics may require future development areas in communication. The lack of very specialized information requirements of some stakeholder groups and the increased requirements for the use of social media-based communication can also be considered as areas for further development in the future.

In conclusion, the transformation of the forest sector from a resource-intensive to a knowledge-intensive, sustainable, and resource-efficient sector within a European bioeconomy (see Kleinschmit et al. 2014) calls for development of suitable communication strategies. From this perspective, professional communicators in the forest sector should critically examine their expertise and efficacy of communicating in a wide range of topical issues. For example, is all the economic performance and value-added related communication that we see presently in Europe becoming tautological, and is it truly worth the invested money? Or should more communication efforts, especially toward the general public, be targeted on issues with a higher human interest factor?

The effectiveness of both traditional and Web-based communication between the companies and their stakeholders should be further investigated by canvassing the existing richness provided by different potential communication channels, such as the use of novel Web-based tools and online forums, traditional visitor surveys, or tailored stakeholder consultation forums. To improve effectiveness of communication, forest sector companies and associations are starting to emphasize more in-depth engagement with their key stakeholder groups in sustainability-related decision-making processes (e.g., Morsing and Schultz 2006). An example is the increased use of social media



communication in the forest sector (Haarasilta 2013, Toppinen et al. 2015, Montague et al. 2016), empowering organizations to promote more interactive communication and collaborative learning. Better understanding of these forms of communication provides great opportunities for conducting empirical forest products-related research in Europe and beyond.

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### Literature Cited

- Berg, B. 2009. An introduction to content analysis, chap. 11. *In: Qualitative Research Methods for the Social Sciences*. 7th ed. Pearson Education, Inc., Allyn & Bacon, Boston.
- Dawkins, J. 2004. Corporate responsibility: The communication challenge. *J. Commun. Manag.* 9(2):108–119.
- Draper, S. 2006. Corporate responsibility and competitiveness at the meso level. Key models for delivering sector-level corporate responsibility. *Corp. Gov.* 6(4):409–419.
- European Commission. 2009. Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. European Commission, Brussels. <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:52009DC0400:EN:NOT>. Accessed February 13, 2012.
- European Commission. 2012. Innovating for Sustainable Growth: A Bioeconomy for Europe. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. European Commission, Brussels.
- European Commission, Directorate-General for Enterprise. 2002. Perception of the wood-based industries: Qualitative study of the image of wood-based industries amongst the public in the Member States of the European Union. Final report. Office for Official Publications of the European Communities, Luxembourg. ISBN 92-894-4125-9.
- Finnish Forest Industries Federation. 2013. Responsibility at the heart of developing the bio-economy. Finnish forest industry commitments to environmental and responsibility issues. [www.forestindustries.fi/mediabank/760.pdf](http://www.forestindustries.fi/mediabank/760.pdf). Accessed May 5, 2014.
- Gold, S., S. Seuring, and P. Beske. 2010. Sustainable supply chain management and inter-organizational resources: A literature review. *Corp. Soc. Responsib. Environ. Manag.* 17(4):230–245.
- Gomez, L. M. and R. Chalmeta. 2011. Corporate responsibility in U.S. corporate websites: A pilot study. *Public Relat. Rev.* 37:93–95.
- Haarasilta, T. 2013. Social media in wood products marketing and collecting of end user driven product development ideas. Master's thesis. Department of Forest Sciences, University of Helsinki.
- Hakala, I., A. Toppinen, and M. Autio. 2014. Does country of origin matter? Qualitative analysis of young people's choice of wooden household furniture in Germany and Finland. *Scand. Forest Econ.* 45: 103–110.
- Halme, M., M. Joutsenvirta, M. Jalas, and J. Mäkinen. 2011. Vastuullinen liiketoiminta kansainvälisessä maailmassa. Gaudeamus, Helsinki.
- Han, X., E. Hansen, R. Panwar, R. Hammer, and N. Orozco. 2013. Connecting market orientation, learning orientation and corporate social responsibility implementation: Is innovativeness a mediator? *Scand. J. Forest Res.* 28(8):784–796.
- Hetemäki, L. (Ed.). 2014. Future of the European Forest-Based Sector: Structural Changes Towards Bioeconomy, What Science Can Tell Us. [http://www.efi.int/portal/virtual\\_library/publications/what\\_science\\_can\\_tell\\_us/6/](http://www.efi.int/portal/virtual_library/publications/what_science_can_tell_us/6/). Accessed November 12, 2015.
- Hitchner, S., J. Schelhas, T. Hujala, and P. Brosius. 2014. Public opinion and wood energy, chap. 2. *In: Wood Energy in Developed Economies*. F. Aguilar (Ed.). Routledge, New York. pp. 32–74.
- Joutsenvirta, M. 2009. A language perspective to environmental management and corporate responsibility. *Bus. Strategy Environ.* 18(4):240–253.
- Kleinschmit, D., B. Lindstad, B. Jellesmark Thorsen, A. Toppinen, A. Roos, and S. Baardsen. 2014. Shades of green: Social science view on forest sector in bioeconomy. *Scand. J. Forest Res.* 29(4):402–410.
- Lähtinen, K., T. Myllyviita, P. Leskinen, and S. Pitkänen. 2014. A systematic literature review on indicators to assess local sustainability of forest energy production. *Renew. Sustain. Energy Rev.* 40:1202–1216.
- Li, N. and A. Toppinen. 2011. Corporate responsibility and sustainable competitive advantage in the forest-based industry: Complementary or conflicting goals? *Forest Policy Econ.* 13(2):113–123.
- Mikkilä, M. and A. Toppinen. 2008. Corporate responsibility reporting by large pulp and paper companies. *Forest Policy Econ.* 10:500–506.
- Montague, I., K. Arano Gazal, J. Wiedenbeck, and J.-G. Shepherd. 2016. Forest products industry in a digital age: A look at e-commerce and social media. *Forest Prod. J.* 66(1/2):49–57.
- Morsing, M. and M. Schultz. 2006. Corporate social responsibility communication: Stakeholder information, response and involvement strategies. *Bus. Ethics Eur. Rev.* 15(4):323–338.
- Panwar, R., E. Hansen, and R. Kozak. 2014. Evaluating social and environmental issues by integrating the legitimacy gap with expectational gaps: An empirical assessment of the forest industry. *Bus. Soc.* 53(6):853–875.
- Panwar, R., T. Rinne, E. Hansen, and H. Juslin. 2006. Corporate responsibility: Balancing economic, environmental, and social issues in the forest products industry. *Forest Prod. J.* 56(2):4–12.
- Rämö, A., R. Toivonen, A. Toppinen, and P. Mäki. 2002. Forest sector development in Austria, Finland and Sweden during the 1970s to the 1990s. Pellervon taloudellisen tutkimuslaitoksen raportteja 182 (Pellervo Economic Research Institute Research Reports 182). Pellervon taloudellinen tutkimuslaitos PTT, Helsinki. 60 pp.
- Ranängen, H. and T. Zobel. 2014. Revisiting the 'how' of corporate social responsibility in extractive industries and forestry. *J. Cleaner Prod.* 84:299–312.
- Räty, T., A. Toppinen, A. Roos, A. Q. Nyrud, and M. Riala. 2016. Environmental policy in the Nordic wood product industry: Insights into firms' strategies and communication, business strategy and the environment. *Bus. Strategy Environ.* 25:10–27.
- Ritchie, J. and J. Lewis. 2003. *Qualitative Research Practice. A Guide for Social Science Students and Researchers*. Sage, London.
- Schreier, M. 2012. *Qualitative Content Analysis in Practice*. Sage Publications, London.
- Scott, W. 1998. *Organizations: Rational, Natural, and Open Systems*. Prentice Hall, Upper Saddle River, New Jersey.
- Singh, J., M. de los Salmones, and I. del Bosque. 2008. Understanding corporate social responsibility and product perceptions in consumer markets: A cross-cultural evaluation. *J. Bus. Ethics* 80:597–611.
- Stern, T., C. Ledl, M. Braun, F. Hesser, and P. Schwarzbauer. 2014. Biorefineries' impacts on the Austrian forest sector: A system dynamics approach. *Technol. Forecast. Soc. Change* 91:311–326.
- Thompson, D. W., R. Panwar, and E. N. Hansen. 2010. Examining social responsibility orientation gaps between society and industry executives. *Manag. Decis.* 48(1):156–171.
- Toppinen, A., K. Lähtinen, and V. Hänninen. 2015. ISO 26000 in the assessment of CSR communication quality: CEO letters and social media in the global pulp and paper industry. *Soc. Responsib. J.* 11(4):702–715.
- Toppinen, A., R. Toivonen, A. Valkeapää, and A.-K. Rämö. 2013. Consumer perceptions of environmental and social sustainability of wood products in the Finnish market. *Scand. J. Forest Res.* 28(8):775–783.
- Vidal, N. G. and R. A. Kozak. 2008. The recent evolution of corporate responsibility practices in the forestry sector. *Int. Forestry Rev.* 10(1):1–13.
- Wanderley, L. S. O., R. Lucian, F. Frache, and J. M. de Sousa Filho. 2008. CSR information disclosure on the Web: A context-based approach analysing the influence of country of origin and industry sector. *J. Bus. Ethics* 82:369–378.