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Regional policy mobilities: Shaping and reshaping bioeconomy policies in Värmland and Västerbotten, Sweden

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ABSTRACT

Interest has grown over recent years in policy programs targeting a green, bio-based economy. In the European Union, the European Commission promotes the development of bioeconomy policy and encourages the use of biomass and waste for industrial purposes. Alongside these technical dimensions, European bioeconomy policy also promotes knowledge sharing, learning from others, and so-called 'best practice'. Consequently, many European places and policymakers that have committed to developing a bio-based economy are now sharing their positive policy experiences. However, sharing 'best practice' for green economy policy programs has sometimes been described as producing oversimplified views of complex climate issues. Despite such criticisms, policymakers continue to search for and share bioeconomy policy 'best practice'. This paper explores the development of bioeconomy policy with a focus on shareability and dissemination of 'best practice' in two Swedish regions, Värmland and Västerbotten. Herein, we adopt the conceptual underpinnings of urban policy mobilities to explain green policymaking, and more specifically bioeconomy policy development on a regional scale. So far, policy mobilities research has had a primarily urban focus, whereas this paper provides valuable insights into how these processes take place within regional and more peripheral settings. Thus, we seek to understand the role of 'best practice' in the development of regional bioeconomy policies and which elements of these policies are promoted as transferable elsewhere.

1. Introduction

In recent years, several international policy programs targeting the green economy have been launched on various geographic scales (cf. OECD, 2010, EC, 2011; UNEP, 2011). A shared feature of such programs is the idea that they should provide learning opportunities and possibilities to mobilize and share so-called 'best practice' with others (cf. McCann, 2015; Andersson and Cook, 2019). Albeit a good and amicable ambition, the sharing of green policy through best practice has been criticized for producing oversimplified views of complex climate issues (Rosol et al., 2017; Temenos and McCann, 2012). Despite such criticisms, the search for 'best practice' through green economy policy programs and tools continues (cf. RFSC, 2016; EC, 2020; SymbioCity, 2020). This paper focuses on the development of policy towards a *bio-based* green economy, and specifically on a forest-based bioeconomy. Generally, the bioeconomy includes industrial activities using biomass in the production or processing of products (e.g., forestry, agriculture, and the fishing industry). According to the European Commission, it can also be understood as a larger societal transformation to a production system based on renewable materials, including waste and biomass. The European Commission connects the development of a bioeconomy to wider economic strategies of green growth and circularity as presented in Agenda 2030 and the Paris Agreement (EC, 2012; 2018).

So far, most research on bioeconomy development has focused on the ways in which bioeconomy strategies are implemented at a national scale (cf. Levidow et al., 2012; Bosman and Rotmans, 2016; Bugge et al., 2016). This is striking, because research and innovation policy related to bioeconomy strategies in the European Union (EU) are often implemented at the regional scale, with a high degree of shareability as a desired key feature (Atkinson, 2015; Atkinson and Zimmerman, 2016; Albrecht, 2019; Andersson and Cook, 2019). In addition, research focused on sharing 'best practice' in the green economy has so far mainly been limited to *urban* policy, investigating places such as Freiburg, Copenhagen, Vancouver, Singapore, etc. (Pucher and Buehler, 2008; Anderberg and Clark, 2013; McCann, 2013; Pow, 2014). This urban focus is somewhat paradoxical, as the mobilization of policy commonly

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is defined as "sociospatially produced and power-laden *inter-scalar* processes of circulating, mediating, (re)molding, and operationalizing [of] policies, policy models and policy knowledge" (McCann, 2013, 6, *authors' emphasis*). Only a few studies have addressed regional implementation of bioeconomy policies and/or how these policies are shared, translated, and implemented at the regional scale (cf. Grundel, 2018; Albrecht, 2019; Albrecht and Lukkarinen, 2020). This could perhaps be explained by the limited amount of research regarding the contribution of regional activities to sustainable development in general, especially compared to research focusing on the role of regions and regional industries in economic development (cf. Haughton and Morgan, 2008; Späth and Rohracher, 2010; Gibbs, 2018; Martin, 2020).

This paper aims to explore the development of bioeconomy policy focused on shareability and dissemination of 'best practice'. We adopt the conceptual underpinnings of urban policy mobilities (McCann, 2017; Temenos et al., 2019) to understand the development of a bioeconomy policy at the *regional* scale in two Swedish regions, Värmland and Västerbotten. In doing so, we seek to demonstrate how socio-spatial processes contribute to the development of bioeconomy policy programs within the green economy. To date, policy mobilities research has had a primarily urban focus, whereas this paper provides valuable insights into how these processes take place in regional and more peripheral settings. Thus, we are trying to understand the role of 'best practice' in the development of regional bioeconomy policies, and which elements of these policies are promoted as being transferable elsewhere.

We first present an overview of the bioeconomy as a regional policy towards a green economy, followed by an introduction to policy mobilities research and a discussion about how this will be applied to the present cases. Next, the case study regions and methods are introduced, followed by three analysis subsections. The paper ends with a concluding discussion.

2. The bioeconomy – A regional policy towards a green economy?

The term 'bioeconomy' was introduced in 1997 and soon became synonymous with strategies for developing a bio-based economy (OECD, 2005; 2006). The aim at that time was to define the bioeconomy in policy, including its technological and economical practices, but also to stimulate the use of biomass in production. Since then, bioeconomy policies have been developed along with other international strategies on green growth (cf. OECD, 2010; UNEP, 2011). These are cumulatively considered the means to meet current climate change challenges while sustaining economic growth. A shared focus of these strategies is the transformation towards a fossil-fuel-free society by supporting technological changes and innovations in new 'green' sectors. Thus, such transformations are expected to save both the economy and the environment (Davies and Mullin, 2011; Jacobs, 2012).

There is a strong emphasis in the European bioeconomy strategy on international collaboration and sharing 'best practice', both within and beyond the EU. There is also a strong focus on green growth, innovation and technological development, resource efficiency, and competition to support and stimulate economic growth and job creation in rural areas (EC, 2012) by "enabling primary producers and rural areas to benefit from these opportunities" (EC, 2018: 75). The European bioeconomy strategy is also closely linked to the overall EU strategy on smart growth, linking innovation and technological development with economic growth and development in European regions (Ramcilovic-Suominen and Pülzl, 2018). To this end, bioeconomic policies are criticized for mainly focusing on technological transformation in firms and industries rather than contributing to environmental and social sustainability (Birch et al., 2010; Kenis and Lievens, 2014; Kleinschmit et al., 2014). It has also been argued that bioeconomy is just another buzzword for the green economy, allowing old ideas to be pitched as 'new' (Pülzl et al., 2014), e.g., polishing the image of traditional industrial practices such as forestry by calling them 'green' and portraying them as sustainable (Martin et al., forthcoming). A more general critique of the European bioeconomy policy has been the lack of sectoral needs, policy coherence, sustainability, and stakeholder integration (Albrecht, 2019).

Despite lacking an overarching national bioeconomy strategy, Sweden has pushed for the development of the bioeconomy through a range of documents and strategies, drawing on both international and European policies. The 2012 *Swedish Research and Innovation Strategy for a Bio-Based Economy* was the first program introduced by a group of national research funding institutes. In that program, a Swedish bioeconomy was defined as "[…] a transition from an economy that to a large extent has been based on fossil fuels to a more resource-efficient economy based on renewable raw materials that are produced through the sustainable use of ecosystem services from land and water[1]" (Formas et al., 2012:9). This strategy impacted both research and innovation on bioeconomy activities by steering funding towards developing bioeconomies in Sweden. Even though this strategy targets more than one sector with a potential to contribute to a Swedish bioeconomy, there is a strong focus on the forest sector. This is also stated in the national *Forest Program* presented in 2018, in which a forest-based bioeconomy was highlighted as a key component of local and regional development, stating that, "the forests – our 'green gold' – will contribute to creating jobs and sustainable growth throughout the country, and to the development of a growing bioeconomy" (Regeringskansliet, 2018b:12). Hence, the Swedish bioeconomy policy is also in line with the EU bioeconomy policy mainly supporting the development of bioeconomies on the regional scale.

That fact that the Swedish bioeconomy is largely targeted through the forest industry also resonates well with the more than 100-year-old Swedish national forest management law stipulating that for each tree cut down, two more are planted (Skogsvårdsstyrelsen, 2020). The Swedish Forest Industries Federation has therefore taken a particular interest in developing and promoting a forest-based bioeconomy, stating that, "In the last 90 years, sustainable forestry has doubled the amount of wood in Sweden. Now the forest must be used to meet the high ambitions for the transition to a bioeconomy" (Skogsindustrierna, 2020). They also promote a strong regional dimension in this transition, arguing that: "Anyone who ventures outside Stockholm and goes on a journey in Sweden will soon discover that it is out in the country where the bioeconomy is happening. Several strong regional clusters in the forest-based bioeconomy are rapidly growing" (Skogsindustrierna, 2020).

Another feature of forest-based bioeconomy development in Sweden is learning from others and sharing 'best practice'. For example, the Nordic Council of Ministers identifies knowledge exchange as a prioritized activity for building a sustainable bioeconomy in the Nordic region (Nordiska ministerådet, 2018), and the Swedish Agency for Economic and Regional Growth continuously helps regional and private actors to promote and share their success stories in developing a forest-based bioeconomy (Tillväxtverket, 2020). Consequently, private actors in the forest industry collaborate with policymakers on both the national and regional scales to promote 'best practice' as part of the forest-based bioeconomy in Sweden. This theme brings us to our next topic: a summary of the growing literature on policy mobility and the mobilization of green economic policy.

3. Mobilization of regional green economy policy

Fostered in a tradition of critical urban studies, policy mobilities scholarship rests on the assumption that policy models and 'best practice' ideas are mobilized in socio-spatial contexts, meaning that social ties, networks, and power dynamics are as important as the idea itself when a best practice is identified (McCann, 2003; Temenos and McCann,

[1] Translations from Swedish to English throughout the paper are by the authors.

2013; Temenos et al., 2019;). In addition, when policy models and 'best practice' ideas are mobilized, they simultaneously mutate. For a place-specific idea or policy to be implementable elsewhere, it must be generalizable (Peck and Theodore, 2012). Through the collective efforts of policy mobilities scholarship, greater understanding has been generated regarding how and why policies move around, and how this mobilization affects the development of both policy and place (cf. Temenos and Ward, 2018, for overview).

Recently, a growing number of studies have been concerned with the dissemination of green policy (cf. Affolderbach and Schulz, 2015; McCann, 2017; Andersson and James, 2018). Within the 'reference-scapes' (McCann, 2017) of green policy, a clear hierarchy of places seen as thriving and worthy of learning from has emerged. Parallel to this development, green policymaking has emerged in the form of strategies for economic growth (Rosol et al., 2017) and regional development (Werner and Strambach, 2018). Especially with the rise of green economy ideals, the opportunity to gain economic advantages by adopting green policies has presented itself in various forms, such as green place branding (McCann, 2013; Andersson and James, 2018), public–private partnerships, green growth alliances (Wilshusen and MacDonald, 2017), and export opportunities (Adscheid and Schmitt, 2018). This has also increased pressure on local governments to adopt competitive perspectives in their environmental policymaking, which induces elements of cherry picking and entrepreneurialism in the development of green policy (Anderberg and Clark, 2013; Andersson, 2016; McCann, 2017; Andersson and James, 2018). Promoting oneself as ambitious and accomplished becomes an important part of the green policy 'referencescapes', as does referring to others while doing so (McCann, 2013; McCann, 2017).

The development of green economic policy encourages market-centric policy models, as private actors are identified as key partners for public authorities in finding solutions to environmental problems (Bok and Coe, 2017; Wilshusen and MacDonald, 2017). It also promotes an experimental approach, as it is imperative to try new things and borrow ideas from elsewhere. There is also an advantage in being 'first to market' when implementing a particular experimental policy or idea, thus creating attention in the policy community (cf. Andersson, 2016; Rosol et al., 2017; Affolderbach and Schulz, 2018). Closely linked to the development of bioeconomy policy and green growth agendas, Rosol et al. (2017) argued that combining environmental arguments and economic rationales has created a situation in which environmental policy is treated as a tool to achieve economic growth rather than being a policy goal in itself. The strong emphasis on 'best practice' and gaining a competitive edge has led to a high degree of spatial and social selectivity in how and where investments in green policy are made, creating geographically uneven development in the green economy (Rosol et al., 2017).

Springing from a critique of policy transfer that analyzed mobilization of policy solely on the national scale (cf. Dolowitz and Marsh, 2000), policy mobilities studies claim to present a more scale-sensitive approach to the dissemination of policy models and ideas to other geographic scales (Temenos and McCann, 2013; Cook, 2015). Taking this critique to heart, policy mobilities scholars have engaged primarily in developing theories and concepts for the *urban* scale (Temenos et al., 2019), while generally excluding other geographic scales (cf. Cook, 2015; Andersson, 2018). Not least in the European (i.e., EU) context, this has been surprising, as a high proportion of the policy models, strategies, and how-to schemes formulated through EU policy directly address the regional scale (Atkinson, 2015; Albrecht et al., 2017; Andersson and Cook, 2019). Herein, we adopt the conceptual underpinnings of urban policy mobilities to understand the development of green policy at the regional scale, in two cases of Swedish forest-based bioeconomy policy. In so doing, we hope to understand both the role of 'best practice' in regional bioeconomy policy development and what elements of these policies are then promoted as being transferable elsewhere.

Based on the above discussions of mobile green policy and the bioeconomy, three research questions form the structure of the remainder of this paper:

(1) How were regional bioeconomy policies in Värmland and Västerbotten developed?
(2) In what socio-spatial contexts are the bioeconomy policies in Värmland and Västerbotten shared?
(3) What features of the bioeconomy policies in Värmland and Västerbotten are portrayed as transferable to others through the sharing of 'best practice'?

4. Methods and case studies

4.1. Data collection

The empirical data analyzed herein stem from two research projects: one carried out in Värmland, by the second author, and one carried out in Västerbotten, by the first author. Although they were originally distinct and separate case studies, their respective data were collected based on similar principles of 'studying through' (cf. Cochrane and Ward, 2012; Andersson, 2015) in various social and geographic contexts, and thus made comparisons possible. A total of 20 semi-structured interviews were carried out with stakeholders in bioeconomy policymaking and industries targeted by such policies in the two regions. In addition, in the case of Värmland two workshops were arranged with a variety of stakeholders (in total 41 participants) from industry, university, civil society and local and regional authorities to discuss the regional bioeconomy. In the Västerbotten case, approximately 40 short interviews were carried out during conferences, seminars, fairs and site visits with participants and exhibitors taking part in these events. In both cases, participatory observations were made across a variety of business meetings, conferences, workshops, seminars, fairs, site visits, and study tours. These activities serve as a base for sharing, learning, and gathering information on specific policies, 'best practice', and/or policy models (Larner and Laurie, 2010). Importantly, they were conducted at various geographical scales, from the local to the regional, national, and international scale, and can thus be interpreted as both relational and territorial (Peck and Theodore, 2010). For the current analysis, this means that the two regions under study are involved in a wide range of transferring activities in their regional setting and exporting them to a larger international context. For example, annual national conferences in Sweden contribute to setting the agenda for the Swedish bioeconomy, such as the Parliament of Bioeconomy, Bioeconomic Forum, and the Forest Industries Research Agenda. This also means that rather than being independent from each other, these regions are part of the same networks that are trying to foster a forest-based bioeconomy in Sweden. In addition to the primary data collected for the two cases, a vast set of secondary sources (e.g., policy materials, brochures, newspaper materials, etc.) complemented the primary data collection. The Västerbotten case draws on data collected from 2016 to 2019 and the Värmland case from 2015 to 2019. An overview of the data can be found in Table 1.

4.2. The case study regions – Värmland and Västerbotten

Today, approximately 70 percent of Sweden's surface is covered by forest – a value that has increased annually since the early 1900s. In 2016, the overall bioeconomy represented 6 percent of the Swedish GDP and employed 7 percent of the total workforce (SCB, 2018). However, there is high estimated growth potential for the bioeconomy, especially the regional forest-based bioeconomy (Region Västerbotten, 2019) (see Fig. 1).

4.3. Värmland

Värmland is in southwestern Sweden, bordering on Norway,

Table 1
Overview of empirical data.

Data type	Respondent type	Värmland case	Västerbotten case
Semi-structured interviews	Industry representatives Policymakers Researchers	12	10
Workshops	Industry representatives Researchers Civil society policymakers	2	–
Short interviews	Industry representatives Conference participants Exhibitors Policy makers	–	40
Particpatory observations	Conferences, fairs, workshops, study visits, business meetings	14	18

Fig. 1. Geographic location of the two case study regions Värmland and Västerbotten in Sweden.
Source: Authors, via (https://mapchart.net).

covering an area of nearly 17,600 km^2. The region has a population of approximately 281,000 inhabitants across 16 municipalities. Despite its geographical relatedness to the larger Oslo region on the Norwegian side, Värmland is often described as a rural and sparsely populated part of Sweden. The region has a long history within the forest industry, especially the pulp and paper industry, dating back to the 19th century; it also includes firms involved in the entire value chain, from sawmills to companies producing bioenergy and bioplastics. Today, there are more than 200 firms and industries directly related to the forest industry, which employ more than 12,000 workers (Berlina et al., 2016), making it an important part of the regional economy and job creation.

Mobilization of a forest-based bioeconomy in Värmland targets a wide range of industries and aims to include all of society in an overall transformation towards a regional forest-based bioeconomy (Region Värmland, 2015). However, although the aim is to include civil society actors in this transformation (cf. Grundel and Dahlström, 2016), the driving actors are part of a triple helix collaboration including the regional development authority Region Värmland, the cluster organization Paper Province (founded in 1999 by firms in the pulp, paper, and machinery sector), and the regional university, Karlstad University (KAU). This has, in turn, influenced how the bioeconomy is mobilized around the supporting regional innovation system (RIS) and its triple helix actors. Over time, additional actors such as the Research Institutes of Sweden (RISE) – Sweden's research and innovation partner – and the incubator STING Bioeconomy have become active in developing the regional bioeconomy. However, although the transformation towards a bioeconomy has been proclaimed as targeting society as a whole, the development of a forest-based bioeconomy in the region has primarily contributed to a 'greening' of the traditional forest industry. It has especially focused on the potential for the forest industry to support the transformation to a more 'sustainable' future by using forest biomass instead of fossil materials, for example in the production of textiles, packaging, and bioplastics. This focus on green growth has been combined with support for research, innovations, and technological developments for processing and on side streams from the forest industry to support entrepreneurship and new business opportunities in both existing and new firms. According to the cluster organization Paper Province, "[i]nnovation and development within the forest industry are essential for maintaining competitiveness and growth and to succeed in the transformation to a fossil-free resource-efficient society" (Paper Province, 2020).

4.4. *Västerbotten*

Västerbotten is the second northernmost region in Sweden. Comprised of 15 municipalities, it stretches from the shores of the Gulf of Bothnia to the mountainous areas bordering on Norway, covering nearly 55,400 km^2. With a population of merely 270,000, the region is sparsely populated (SCB, 2019). The region's industry is primarily dependent on natural resources such as mining, agriculture, and forestry. Historically, important sawmill and forestry industries in Västerbotten have provided jobs in the coastal areas (where most sawmills are located) and in the more sparsely populated inland areas (where much of the forest grows). Drawing on these traditions in forestry and sawmilling, a regional industry producing large-scale buildings in wood has emerged during the last 20+ years.

The Västerbotten case study presents a somewhat more applied form of bioeconomy policy compared to the one from Värmland, targeting a single industry: wood building. The industrial development in large-scale timber construction and wood building has generated a separate set of policies in Västerbotten, parallel to the general discussion and strategizing on the possibilities of the entire bioeconomy (i.e., Västerbotten, 2019). Until 1994, constructing wood buildings taller than two stories was prohibited in Sweden due to fire hazard legislation. When Sweden became a member of the EU, legislation changed from naming certain building materials to stipulating functionality in the event of a fire, creating an opportunity for this industry to take form (Andersson, 2020).

Building with wood is advocated based on a spectrum of sustainability rationales. It is considered more environmentally friendly due to its ability to function as a carbon sink, being a renewable resource, and because it emits less carbon dioxide in the construction process compared with concrete and steel (Skellefteå kommun, 2014; Kellner, 2016;). From an economic rationale, the possibilities of prefabrication and speed of production are highlighted alongside job creation in rural areas, while addressing housing shortages in urban areas (DS, 2004: 1; Regeringskansliet, 2018a). Social sustainability is argued for through the lens of improved construction site environments (e.g., less noisy, more of the construction work taking place in climate regulated indoor

facilities, fewer heavy lifts) and cost-efficient production, with the potential to cater to new housing for broader socio-economic segments of the market (Andersson, 2020). In Västerbotten, the rural–urban linkages are particularly highlighted in the regional policy under the heading "let the countryside build the city", emphasizing the rural localization for production facilities and the potential for these facilities to address the housing shortages in most urban areas in Sweden. The governor of Västerbotten explained this strategy as "free regional growth policy", claiming that building more with wood creates jobs where they are most needed, i.e., in rural locations (Andersson, 2018).

Below, detailed accounts of the development and mobilization of bioeconomic policies in Värmland and Västerbotten are presented, structured along the three research questions presented above. An overview of the results is presented in Table 2.

5. How were the regional bioeconomy policies in Värmland and Västerbotten developed?

A shared feature of the bioeconomy policy developments in Värmland and Västerbotten is the mix, or as Robinson (2015) calls it, the *assemblage*, of local, regional, and national policy. There are also long-standing historical industrial traditions and relationships between industry and public authorities, connected to the forest industry, which could be categorized in terms of path dependency/creation in both regions. In Värmland, development of the forest-based bioeconomy has occurred through a combination of top-down and bottom-up activities. This has been a result of the formalization of regional partnerships in triple helix collaborations among Paper Province, the local university, and the regional authorities that began in the 2000s and led to regional consensus-based activities relating to the bioeconomy.

In Västerbotten, regional collaborations involving the industry, public authorities, and research institutions has grown organically and developed bottom-up – first locally, in a few municipalities, and later regionally – with input from some early national policies and local programs (DS, 2004: 1; Westerlund, 2012). There is a long-standing tradition of collaboration between the region's forest and timber industries. For example, the regional forestry association *Norra Skogsägarna* has worked toward a collaborative environment in the region for over 80 years, within which the wood building industry was born. Regional collaboration has also followed in the wake of *Skellefteå Snickericentral (SSC),* a joint venture formed in 1959 between woodworking and sawmilling businesses in northern Västerbotten and serves as an important organization for fostering a collaborative milieu for the timber and forest industries. A broad public–private collaboration through a regional strategy targeting wood building was not formalized until 2009, with the program Wood City 2012 (more details below).

Bioeconomy policy development in these regions has also been closely tied to project-based activities and events. In Värmland, two major projects were important for mobilizing the region's forest-based bioeconomy: The Vinnväxt initiative *Paper Province 2.0* and the development of a regional research and innovation strategy in 2015, *Värmland Research and Innovation Strategy for Smart Specialization* (VRIS3) (Region Värmland, 2015). In 2013, the project proposal *Paper Province 2.0* won the Swedish Innovation Agency – Vinnova's – program Vinnväxt, which supports innovation, growth, and economic development in Swedish regions (Vinnova, 2014). The proposal's success was mainly a result of the already well-established triple helix collaboration (Kempton, 2015) and, according to regional actors, its focus on an overall societal transformation. The proposal resulted in total funding of 130 million SEK over a 10-year period (2013–2023), jointly financed through Vinnova and the regional triple helix actors, along with national authorities located in the region (i.e., RISE and the Swedish Forest Agency). As a result of this collaboration, the actors involved in Paper Province 2.0 have been collectively dedicated to developing bioeconomy policy, supporting technological development in the field, and directing research and innovation supporting the transformation. This is also exemplified by the VRIS3, in which the forest-based bioeconomy was identified as a top regional priority along with four other policy areas. The VRIS3 also followed the logics of *Smart Specialization* (RIS3), which was initiated by the EU urging European regions to draw on their unique resources to strengthen pre-existing specializations and to set targeted and prioritized support for research and innovation to promote innovation, growth, and entrepreneurship (Aranguren and Wilson, 2013; Lopes et al., 2018). Consistent with the promotion of innovative milieus, several experimental test-beds have been established around the region, including the project LignoCity where lignin, a pulp mill byproduct, is tested to develop new products.

In Västerbotten, the projects leading to the current wood building policies have been more patchwork and ad hoc compared to the development in Värmland. Here, the projects have been much smaller, less coordinated, and with a shorter time span. One of the first modern wood building projects ever completed in Sweden was a six-story office building outside Skellefteå (the second-largest municipality in Västerbotten), named *Lotsen*. When completed in 1997, Lotsen was one of the tallest new wooden buildings in Sweden, and its glulam construction was considered experimental for the Swedish market. Following Lotsen, several other groundbreaking building projects have emerged in Västerbotten, including Sweden's (currently) longest bridge, its largest school, bus terminal, and multi-story car park, and what will soon be its tallest building (20 stories, and housing a concert hall, library, and hotel) constructed entirely of wood. Most of the region's wood construction projects have been the result of public authorities investing in public infrastructure, thus acting as both procurer and developer of planning strategies promoting more buildings in wood. As an example, in Skellefteå "approximately half of all of the new housing projects are built in wood" (interview, 2017), mostly developed through the public housing company. Following this development, private actors and property developers have taken various project initiatives such as adding wooden stories atop existing concrete buildings. This increases the property's square meters without breaking new ground, while the relatively light weight of wood makes more buildings suitable for this type of addition. Such developments are strongly supported by local and regional authorities as a strategy for sustainable densification of the region's urban areas (Skellefteå municipality, n.d.; Westerlund, 2012).

Table 2
. Overview of bioeconomy policy features in Värmland and Västerbotten.

Policy development	**Assemblage of local, national, international policy**
	Värmland: Triple helix, RIS3, Vinnväxt
	Västerbotten: National wood building policies, Wood City 2012, Municipal wood building policies
	Long-term collaborations and formalized partnerships
	Värmland: Paper Province cluster, Academy for Smart Specialization
	Västerbotten: SSC, Norra Skogsägarna, Wood City Sweden
	Project-based and research-oriented
	Värmland: Paper Province 2.0, VRIS3 with KAU, RISE, Swedish Forest Agency
	Västerbotten: Lotsen, Älvsbackabron, etc. with LTU, RISE, SLU
Policy mobilization	**Internal activities**
	Värmland: Paper Makers Night, municipal workshops
	Västerbotten: Breakfast meetings, vocational college, guidebooks
	External activities
	Värmland: study tours, conferences, national/international lobby work
	Västerbotten: wood safaris, conferences, national/international lobby work
Policy 'shareability'	**Regional collaborative traditions**
	Värmland: Build on existing networks and partnerships, collaborative approach
	Västerbotten: Openness and trust, collaborative approach
	Shared narratives and branding
	Värmland: Smart specialization à la Värmland, self-proclaimed success
	Västerbotten: Shared goals, self-proclaimed leadership, regional branding based on early adoption

In 2009, Västerbotten's public–private collaboration on wooden housing was formalized through the national program Wood City 2012, which encompasses three regions and 16 municipalities and is chaired by the appointed governor of Västerbotten. The program aimed to inspire more modern wood building in Sweden, by developing techniques, architecture, and business models for wood building (Westerlund, 2012). After its closing in 2012, a lobby organization called Wood City Sweden was formed with financial support from the Swedish Forest Industry Association and, since 2017, from the Swedish government. The aim of the lobby organization, which encompasses actors in industry, policy, and research, is to promote and share 'best practice' regarding wood building and wood building policies in Sweden and abroad. Because the governor of Västerbotten has continued as the chair for this new lobby organization, public–private collaboration in wood building in the region has continued as a subdivision within Wood City Sweden (cf. Trästad Sverige, 2018).

The role and involvement of universities and other research institutions in the region has been instrumental in the development of the two regions' bioeconomy policies. In both Värmland and Västerbotten, nationally funded research is carried out at the local universities, including KAU in Värmland, Umeå University, branches of the Swedish University of Agriculture (SLU), and Luleå Technical University (LTU) in Västerbotten , as well as through RISE, which has branches in both regions. In Värmland, the local university has a long history of research collaborations with the forest industry, especially on pulp, paper, and packaging. The university was also an important partner in the Vinnväxt application and received bioeconomy research funding through the project. Another result of the collaboration between the university and regional authorities in Värmland was the launch of the platform Academy for Smart Specialization 2016–2020. Compared with former collaborations, this research platform had clearer governance structures to steer university research towards specializing in forest-based bioeconomy (and the other specializations in VRIS3) by offering research funding opportunities. The platform was also set up to increase collaboration between regional industries, the public sector, and the university. In this way, continued research into bioeconomy has been fostered within the region.

In Västerbotten, wood building policies have also developed in tandem with ongoing research. In particular, research on timber, forest management, wood technology, and wood engineering carried out by RISE, LTU, and SLU is linked to policy development. Many experimental wood building projects (some of which are described above), have been crucial to the development of wood building policies, and are currently highlighted as flagship developments in many official policy documents. Simultaneously, most of these 'groundbreaking' projects, albeit financed through public funds, have depended heavily on collaborations between the wood building industry and the regionally located research institutions, pooling engineering know-how, technical skills, and production capacity on various projects (Skellefteå municipality, n.d.; Westerlund, 2012). For example, development of Scandinavia's longest wooden cable-stayed bridge in Skellefteå, *Älvsbackabron*, resulted from a collaboration between the local authorities, the local wood building company Martinson, and LTU.

Overall, the bioeconomy policies in Värmland and Västerbotten have developed through collaborative efforts among various actors over a relatively long timespan and have interlinked a variety of project activities. Thus, investigating the social ties between these actors is paramount for understanding how these best practice policies are mobilized and shared.

6. In what socio-spatial contexts are the Värmland and Västerbotten bioeconomy policies shared?

Various professional networks and project-related events organized by regional actors are a dominant feature of the bioeconomy policies in both Värmland and Västerbotten. These can be roughly characterized in terms of *internal* (i.e., events and networks solely directed towards regional actors) and *external* (i.e., events and networks including actors outside the region) policies. In Värmland, both the regional authorities and the cluster organization Paper Province host networking events and other social activities to promote the bioeconomy and bioeconomy policy. For internal audiences, networking and events mainly serve as means of creating consensus on issues related to the region's forest industry with wider groups of actors. Hence, the circulation of bioeconomic ideas through events, workshops, and other network activities is an important part of these ideas being implemented and their embeddedness at the local and regional scales. Paper Province arranges network activities for its members. These activities include study visits to various firms and industries in the region, including cluster lunches, seminars, workshops, learning platforms, and concepts such as "Paper Makers Nights:" a series of events that serve as a learning and exchange platform for members on issues such as 'best practice' for sustainability, circular economy, sustainable business models, etc. related to the forest-based bioeconomy. The events range from cocktail and mingle sessions to dinners or presentations by invited experts. With the additional funding from the Vinnväxt award, the number of learning activities organized by Paper Province have increased.

Paper Province has also arranged several municipality workshops aimed at spreading knowledge on bioeconomy practices in the region and involved a leading industrial actor. The workshops supported local innovation and innovation platforms and were directed at regional and local officials, firms, and industries, and the regional university, to engage civil society organizations in the participating municipalities. In many ways, these workshops can be interpreted as legitimizing and mobilizing support for a forest-based bioeconomy in the region. Workshops often began with a presentation on the meaning of a forest-based economy and the necessity of transformation towards a sustainable society. Some participating municipalities also saw the concept of bioeconomy as a potential method for promoting and marketing their own municipalities as 'green' and having environmental concerns.

In Västerbotten, breakfast meetings, educational seminars, and business events directed at actors within the region take place on a regular basis, with the aim of inspiring new developments and consolidating existing relationships and networks. Together with local authorities in Skellefteå, several companies in the wood building sector have started a vocational college to provide professional training in wood and timber construction. The college offers both shorter certification courses for already trained industry and building sector professionals, and longer, specialized high school and college programs for new students (T2 College, 2019; Yrkesakademin, 2020). Training and knowledge sharing are also offered through guidebooks, instruction manuals, and other inspirational publications from companies and groups of companies collaborating with research institutions and/or public authorities. These publications target planners, architects, builders, engineers, and other actors and groups involved in planning and producing wooden buildings and construction, both within and beyond the region.

Frequent study tours of various sizes and formats for visitors from both Sweden and abroad are organized in Västerbotten, often directed by the lobby organization Trästad Sverige. Usually organized under the umbrella concept of 'wood safaris' (Trästad Sverige, 2018; Skellefteå kommun, 2019), media representatives, researchers, planners, architects, politicians, etc. come to learn about how to plan for and build wooden constructions. These 'safaris' typically involve a bus tour to various locations, depending on the guests' interests, highlighting both completed and planned wood building projects, as well as visits to production facilities and talks by planners, architects, and builders who share their experiences with wood construction. At some sites, the tour stops so that visitors can experience construction at first hand, take photographs, and touch and smell [sic] the construction materials. The hosts for the wood safaris vary, local public officers or elected political representatives usually host study tours, although for particularly

prominent guests, such as the Swedish Minister for Housing or the King of Sweden, the governor of Västerbotten serves as the formal host.

Study visits are also common venues for communicating the features of how Värmland's forest-based bioeconomy has developed to involve external actors and networks. As such, study visit sites often include the university, different test-beds (e.g., 3D printing and lignin production), paper plants, and other industries such as the incubator STING Bioeconomy. In addition, study tours often include presentations by actors in the triple helix collaborations Paper Province 2.0, VRIS3, and the Academy for Smart Specialization. The tours target both national and international policy actors, including firms and industries, and often feature various how-to perspectives on bioeconomy practices, referring to both the ways in which regional policy is developed and the technical knowledge in regional test-beds, firms, and industry.

The bioeconomy policies in Värmland and Västerbotten are also circulated through existing networks and collaborations, both national and international, like the Bioeconomy – Regions in Collaboration and the Vanguard Initiative on Bioeconomy. Both regions have representation in Brussels, where they promote the forest industry and issues relating to the EU bioeconomy through activities such as breakfast meetings and seminars during the annual European Week of Regions and Cities (Region Värmland European Office, North Sweden European Office). In Karlstad, the national Bioekonomiriksdagen (i.e., *Parliament of Bioeconomy*) was held in 2018. This annual, peripatetic event is organized by a local/regional actor with support from the Swedish Forest Industry to discuss matters related to the bioeconomy with politicians, industry, and other actors. In 2018, Paper Province were hosting the event, focusing on as well national forest related matters as on showcasing regional examples from the forest industry in the region. In Skellefteå, international conferences on wood building have been organized (i.e., *Wood Building Summit*, *Timber Bridges conference*), where regional experiences are promoted. During the annual three-week Västerbottensdagarna (i.e., *Days of Västerbotten*) in central Stockholm, organized by Region Västerbotten, regional, national, and international actors meet to network and discuss regional growth, and a full program day is dedicated to wood building (Region Västerbotten, 2020). This brings us to the question of which elements of these bioeconomy policies actors in Värmland and Västerbotten identify as 'best practice' and are eager to share with others? This issue is discussed in the next section.

7. What features of the bioeconomy policies in Värmland and Västerbotten are portrayed as transferable to others through the sharing of 'best practice'?

A primary point regarding how to develop a successful bioeconomy policy, communicated in both Värmland and Västerbotten, is the communal effects of projects involving regional actors. In this regard, the message is simple: collaboration among various actors affects potential next steps. In Värmland, the promotion of a forest-based bioeconomy is contextualized through regional growth focused on research and innovation efforts. However, it has also been suggested that Värmland's success is due to how its bioeconomy was made a regional top priority through the triple helix collaboration, the VRIS3 strategy, and the Academy for Smart Specialization. This made bioeconomy policy a priority for a broad range of actors, while setting an agenda for regional research and innovation within the forest-based bioeconomy sector.

Coming together and connecting a broad range of sectors with a shared goal has also been a primary message communicated in Västerbotten. Here, the long-standing collaborative tradition in the sawmilling and timber industries is frequently portrayed as a key factor for success in today's wood building policies. Such collaboration, it is argued, has fostered both regional specialization in wood building and trust and openness among various actors involved, which are described as important aspects when daring to try new, experimental ideas in modern day Västerbotten. However, this experimental process is described somewhat linear rather than interactive – starting with political visions and ideas of wood building investigated and tested by local universities and research facilities, and later executed by local wood building producers (Skellefteå kommun, 2014: 12).

The other main message promoted in both Värmland and Västerbotten is the need for creating a common narrative among broad groups of regional actors. In Värmland, a self-proclaimed aspect of achieving success was that bioeconomy policy was already described as a success story during its planning phase. This has been argued to have created a common narrative among regional actors and contributed to a self-fulfilling prophecy. For example, the planning of the VRIS3 strategy aimed to make Värmland:

> *…a large scale demonstrator, to which people from all over Europe and the rest of the world come to learn about and witness the achievements possible when society, business, academia and the citizenry, women, men, girls and boys, come together for a common vision* (Region Värmland, 2015:24).

By adopting this 'extrospective' (McCann, 2013) and self-exaltation perspective in their regional bioeconomy policies, the VRIS3 and the Academy for Smart Specialization have driven both the mobilization of Värmland's policies and elements thereof.

Extrospective is also a characteristic of Västerbotten's wood building policies when they are promoted as adoptable elsewhere. The governor has argued that "promotion and use of [Västerbotten's] unique and distinguished competences in modern wood building, wood technique and machinery" together with "the broad and deep wood research" makes the region a Swedish and international frontrunner (Andersson, 2017). Similar phrasing was used in local wood building policy in Skellefteå, stating that "Skellefteå *is* Europe's leading sustainable municipality and center for modern wood building" (Skellefteå kommun, 2014:4, authors' emphasis). Regional actors from politics, industry, and research often repeat this and similarly self-declare Västerbotten as a leading region in wood building during conferences, fairs, and workshops.

A common narrative and shared ideas of success are also highlighted in policy as strategies for building and promoting a regional brand. Värmland's long history as a forest region, described earlier in this article, has also been promoted by the regional authorities as part of the regional brand. The forest is used both to attract tourists and as an important economic asset of the region's forest industry (Region Värmland, 2013b), "One of Värmland's biggest assets is the forest and the forest industry. Paper Province is an internationally award-winning cluster collaboration that gathers a wide range of companies within the pulp and paper industry in the region" (Region Värmland, 2013a:8). As early as at the beginning of the 21st century, the cluster organization worked to increase general interest in the regional forest industry and to change its 'dirty' sector image. Today, a main task is promoting a growing regional forest-based bioeconomy. An important part of this narrative is connected to the forest industry's sustainability and how the use of raw forest biomass materials in production can reduce climate impact by replacing fossil materials. In addition, drawing on the past and current experiences from the triple helix collaboration and development of the regional bioeconomy, the regional brand is closely related to the RIS. Hence, the regional authorities promote both the bioeconomy as well as the policies supporting its development, such as the VRIS3 and the Academy for Smart Specialization. Together, these practices are branded and packaged as "Smart Specialization à la Värmland," which is shared across regional study visits and national and international conferences and workshops as a best practice and "…to show and market the brand of Värmland" (interview, 2015). Hence, showcasing the positive examples regarding the Värmland bioeconomy has become an integral part of building the regional brand itself and is highlighted as an important element of the policies themselves.

The regional branding in Västerbotten has been expressed somewhat differently. Various attempts have been made to establish the region as the "Forest Kingdom Västerbotten" (Andersson, 2017), with limited

success, probably because most Swedish regions also have vast forest areas. Through the communication channels and events organized by Wood City Sweden, Västerbotten is frequently promoted as a leading wood building region by both political and private actors, and through the presidency held by the governor. However, it is really the municipality of Skellefteå that is promoted in the regional policy as the place to learn from in wood building and branding matters. Being one of the earliest adopters of wood building projects and home of many of the attractions during the 'wood safaris', Skellefteå has established a reputation as a destination to study wood building policy. In addition to being the location of various reference objects, the close collaboration among the municipality, industry, and research with regard to hosting visits and the production of glossy manuals and pamphlets contribute to a region becoming renowned for establishing a 'best practice' in wood building policy. As one of the national wood building lobbyists explained "the biggest strength of Skellefteå is that they have made wood building self-evident, creating a mindset that permeates among politicians, planners, builders and entrepreneurs" (interview, 2017).

Cumulatively, the technical features of the bioeconomy policies in Värmland and Västerbotten that are identified as generalizable and adoptable elsewhere are quite limited. Study tours and plant visits serve as sites for inspiration and dialog, basic technical specificities are handed out in guidebooks and pamphlets, but the main aspects of policies that are actively shared relate not so much to technical solutions and know-how, but rather to social organization through projects and networks and fostering regional traditions, cultures, and ways of communicating. This is not particularly unique to the development of a forest-based bioeconomy but can be applied to many different regional development policies.

8. Concluding discussion

In this paper, we set out to explore the development of regional green economy policies in two Swedish regions self-identifying as using 'best practice' in bioeconomy policy. Guided by a framework provided by the policy mobilities literature, we investigated the development of regional 'best practice' and how actors are involved in developing and sharing these policies. As previously stated, in contrast to most studies applying a policy mobilities perspective at the urban scale, this paper raises awareness of policy mobilities processes at the regional scale. The regional perspective is important not only because the EU policy for developing a bioeconomy is region specific, as noted above, but also in relation to the location of the bioeconomy itself. Most renewable resources in agriculture, fisheries, and – the focus herein – forestry, are located outside urban areas, and these industries are organized within regional structures (cf. Albrecht and Lukkarinen, 2020).

The development of bioeconomy policies in Värmland and Västerbotten seem to follow similar development paths of regional growth strategies. They are consensus-based, driven by public–private partnerships (through triple helix or other formal networks), and collaboration with research is a key feature. They also develop over time through several smaller and larger projects that are interlinked thematically and/or organizationally, connecting the same group of actors in various activities over long periods of time. The foundation of these regional policies builds on industrial activities that have long operated in the region, so they are only partly shaped in response to European and national bioeconomy policies. As such, introducing a bioeconomy perspective confers an opportunity for industrial renewal for forest-based industries, rather than pushing an environmental agenda. This follows the claims by Rosol et al. (2017) that there can be a problem when green policy becomes a tool for developing and implementing new technologies and innovations in existing industries, rather than a tool for implementing environmental policy. This also shows that there is a risk that the bioeconomy becomes just another buzzword for the green economy and, as described herein, a greening of the forest industry (Birch et al., 2010; Kenis and Lievens, 2014; Pülzl et al., 2014). In both of our cases, bioeconomy policies have been used primarily as means to increase regional economic growth and development, and environmental narratives are used as means to reach those ends.

The practices of circulation of bioeconomy policy in Värmland and Västerbotten are multiscalar. First, the regional bioeconomy policies in Värmland and Västerbotten have been simultaneously circulated and consolidated in local and regional settings. This has been done to develop new projects and competencies within the region, while at the same time shaping and forming consensus around the regional strategy. Second, there is ongoing circulation of ideas and practices to visiting peers and media representatives who come to these regions to learn about the forest-based bioeconomy through study visits and conferences. This type of circulation is important in the creation of 'referencescapes' (McCann, 2017) of regional bioeconomy policy, but also for strengthening the regions' self-identities as leaders in this policy field. Third, and in contrast to urban policy mobility (cf. Andersson and Cook, 2019), there are permanent national and international structures in which these two regions can promote and circulate their bioeconomy policies, including regional representation in the EU and national bioeconomy forums, such as to lobby for the importance of Sweden's regional and national forest industry. Cumulatively, this makes the circulation of regional bioeconomy policy not merely horizontally mobilized to other regions, but also vertically reaching local, national, and international actors.

Thus, the two cases described herein highlight how green policy implementation, such as the bioeconomy, is used and mobilized by regional actors to support local and regional development as well as regional industrial transformation. Despite a high level of technical detail forming the foundation of the two regions' policies for how to transform the regional forest sectors into a bioeconomy, surprisingly few technical details are promoted as adoptable elsewhere when the Värmland and Västerbotten bioeconomy policies are shared. Instead, the social dimensions of regional collaboration, consensus building, and branding are communicated as the key success features in both Värmland and Västerbotten. Trust that developed between regional actors over time, sharing narratives, formulating goals, and declaring the region as being successful even during the project proposal phase are all portrayed as important elements for developing new experimental activities that push existing policies forward. This emphasis on nontechnical features in the sharing of policy 'best practice' could be a consequence of policy mutation (Temenos et al., 2019), and may reflect that a high proportion of the regional bioeconomy policies in Värmland and Västerbotten are simply unsuitable for mobilization due to strongly embedded place-based features and dependencies.

In summation - as has been demonstrated in this paper - there is a lack of studies on policy mobilities addressing the ways green policy-making is developing at the regional scale. The rise of green economy ideals and the opportunity to gain economic advantages through e.g. green place branding (McCann, 2013; Andersson and James, 2018), public–private partnerships, green growth alliances (Wilshusen and MacDonald, 2017), and export opportunities (Adscheid and Schmitt, 2018) is especially present at the regional scale and is enhanced by EU and national policy addressing green growth in European regions. Thus, there is a need for more studies on regional policy mobilities showing how and where investments in green policy and green economy ideals are made and developed (Rosol et al., 2017), and how these are produced through inter-scalar processes and interactions.

CRediT authorship contribution statement

Ida Andersson: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Funding acquisition, Project administration, Visualization, Writing - original draft, Writing - review & editing. **Ida Grundel:** Data curation, Formal analysis, Investigation, Methodology, Funding acquisition, Writing - review & editing.

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