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The smart meets the conventional: Media storylines and societal frames on the energy action of housing cooperatives

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ABSTRACT

In the acceleration phase of energy transitions, the role of community and citizen action is emphasised. The role of active, smart and experimental communities and individuals adopting novel practices and technologies is often contrasted with more conventional and mundane everyday practices, which change only slowly. In this context, the role of news media is central in disseminating information, mediating confrontations, and offering a space for shared societal frames on transition. This article examines Finnish media storylines on emerging energy technologies and practices in housing cooperatives, which manage most of the apartment buildings in Finland and thus have a key role in energy transition. Focusing on 17 years of development in three mainstream media, we first identify three main phases in media discourse intensity, focus and level of detail. Next, we analyse the ten main storylines on stabilising and reconfiguring the role of housing cooperatives in energy system change. Finally, we combine these storylines with cross-cutting societal frames on governmentalizing energy communities from the perspectives of technological anticipation, saving potentials and governance interventions.

1. Introduction

Rapidly changing cities with smart-city expectations have been central energy landscapes, where abstract transition concepts and storylines become materially considered as objects of specific forms of governance and planning [14]. Especially in times of policy change, the media's role is emphasised as an actor mediating knowledge about available solutions and barriers and, more importantly, as a forum for actors to voice their contesting perspectives [21,22]. In the media, the smart city meta-narratives on restructuring urban infrastructures and repositioning citizens' capabilities to the core of transitions have also received increasing attention [15,16]. However, the media can also deepen or create polarization between different views and prolong the existing lock-ins by maintaining misunderstandings and creating false alarms [23,24], utilising less credible sources [25] or by failing to give attention to matters relevant for sustainability transition [26]. The polarized debate inhibits learning by discouraging different actors from engaging with sustainability topics.

The role of citizen energy communities – citizen-led collectives involved in energy production and consumption – has been emphasised in advancing energy transitions expanding across diverse societal areas

and spatial contexts [1–4]. First, energy communities have the potential for engaging citizens in energy system change and promoting novel distributed energy solutions, while also promoting critical and oppositional local positions that are often overlooked in the energy policy [5,6]. Second, as the transitions move from early take-off to the acceleration phase, novel user groups with locally embedded practices, capabilities and material arrangements become potential stakeholders [3,7,8]. Third, while the governance shifts, like the European Union's post-2020 energy policy framework have recently given wider prominence to energy communities, the role of energy communities in system change remains oblique, as legislative and conceptual definitions of energy communities are multiple [9–11]. The existing societal and epistemic frames of energy transitions affect how the policy initiatives and technologies are discussed and implemented [12,13], and news media has a key role in reconfiguring these community policy roles, user practices and governance dynamics.

Urban housing communities – such as housing cooperatives, associations and companies – become meaningful actors, as lay citizens jointly negotiate decisions on renovations and investments in new technologies, and in practice mediate the interface between housing infrastructure and energy network [18,20]. Housing cooperatives are a type of shared

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energy ownership, decision making and practice that is popular in many European countries, which we consider as emerging energy communities [20]. The reality of energy transitions in the existing urban infrastructure and establishing the energy communities is a much more complex venture, in which the materiality of infrastructures, predefined actor roles and long roots of unsustainable practices need to be overcome and reconfigured [18,19]. Furthermore, the decision-making in the housing cooperatives is a fragmented field involving actors both inside and outside the apartment buildings. Mainstream media can be one key societal arena motivating – or discouraging – housing cooperatives towards becoming active energy communities. Housing cooperatives are also of interest in various media sources, as they conveniently link general narratives of energy transitions and innovations with everyday experience.

In this article, we construct a longitudinal view of the mass media storylines in the energy sector from the perspective of housing cooperatives, which links the technology legitimization discourses more directly to urban developments and everyday practices. We focus on the different phases of media discussion, identifiable storylines and underlying societal dynamics of framing as an act of power that goes beyond media representations and into societal interactions [30]. Finally, we also consider the media storylines in relation to societal frames, policy cycles and the role of public policy in regime reconfiguration [31]. To guide our research, we formulated three research questions:

- i. How have the main storylines on housing cooperatives' energy roles evolved in the Finnish mainstream media?
- ii. What kind of community energy actors are the housing cooperatives based on in the public media discussion?
- iii. How are the policy developments and societal frames on the urban energy transitions (re-)produced in the mainstream media discussions?

The rest of the paper is structured into five sections. Next, we provide a deeper positioning of the housing cooperatives as energy communities and the role of media in energy transitions. In the third section we present our data and methods, and in the fourth section our main findings on different phases, storylines and frames in media discourse. In the final two sections, we discuss the energy transitions from the perspective of changing urban energy communities and the role of the media as a transition policy intermediary and conclude the paper with relevant policy suggestions.

2. Background: media and housing cooperatives in energy transition

2.1. News media in transitions

Media analysis has been used to study different actor positions related to sustainability transition developments, as well as the ways in which incumbent technologies become delegitimized and novel technologies and business models promoted in “collective sensemaking” [56–58]. The media provides an arena where the science and policy – as well as private and public views – of the energy issues collide [59]. The traditional news media, as well as novel social media platforms, can thus act as a mediator between different views, positions and experiences in relation to rapidly emerging technologies and solutions [60,61]. The media also have a crucial role in energy policy in reproducing public understanding on specific energy landscapes – both urban and rural – that have a central role in unfolding energy transitions [14,26,62]. The role of the media is particularly important in Finland, where the share of people trusting mainstream media such as key newspapers and the National Broadcasting Company is among the highest in the world [28,29]. The societal importance of news media is maintained by relatively high levels of readership as well as a diverse mix of private and public media outlets [28]. In the context of housing cooperatives and

from the perspective of residents, the media can make the novel energy technologies more familiar and approachable, bringing up the day-to-day concerns related to funding, planning and implementation as well as the expert knowledge on successful solutions and examples. On the other hand, active media discussion can ultimately delegitimise unfounded statements on the change, facilitate strategic unlearning and lead to broader societal changes [63]. Media analysis can be viewed as a means of tracing down the evolving public storylines on how the energy policy changes impact diverse actors in the housing sector, and what kinds of questions energy transitions raise in everyday practices and environments.

However, the media is not a neutral or passive presenter of these views, but there can be considerable variation regarding the topics of interest and ways to present those [64]. Furthermore, the media controls which actors gain space in specific temporal and spatial contexts related e.g., to policy changes or planning processes [65]. The messages can be actively directed to certain audiences, but interpretations by audiences are always influenced by situated and routinised resources and temporally changing societal struggles [30]. Although the interpretations created by media are important, here the focus is on agenda setting, i.e., what topics are made available for the audiences by the media. Therefore, long-term analysis of the changing media storylines opens up a view on the changing political, scientific and popular dynamics of policy changes and the role of housing cooperatives in the energy transitions.

In social sciences, operation of the media is connected to emergence, persistence and interaction of societal frames within a wider policy setting and across diverse issues (see [12,66,67]). Framing theory has been widely used in mass media studies to scrutinize how information is selected, interpreted, processed and communicated [68,69]. An effective frame links the new concepts to existing narratives that are familiar to its intended audience [70]. However, within this mediating definition, energy research refers to frames as underlying value systems [67], perceptions of an issue [12,71], or specific statements identified in data [65] depending on methodological choices. An important methodological distinction is the delineation of generic and issue-specific frames [71], i.e., a focus on generic meanings of issue or promotion of a specific view. Using frames to communicate complex issues via specific storylines makes the identified problems and proposed solutions easier to understand and places them in a context that is perceived as relevant.

2.2. Transforming housing cooperatives into energy communities

The household-level action has emerged as one of the key areas of sustainable “smart city” development because of enrolling smart meters, integrating communication technologies to other urban infrastructures [76]. In Finland, the dispersed renewable energy production technologies have spread rapidly, especially in detached houses, where heat pumps have become a commonly used technology with wide market diffusion [32,33]. In the individual houses, the novel technologies are more readily connected to the maintenance of properties, as well as to experimentative everyday practices [34]. However, the diffusion has been much slower in the apartment building stock. Recently, the issue has been prioritised on the government agenda, which includes a long-term renovation strategy for the building-stock and targeted energy subsidies housing cooperatives' deep renovation projects [35]. Therefore, it is an open question whether and how the housing cooperatives could emerge as energy communities reconfiguring the urban energy systems.

The early conceptualisations of the energy communities shared a perspective of innovative, detached and critical space enabling distancing from dominant technological and pragmatic frameworks in order to develop alternative forms of shared energy action [36,37]. Prosumerism – active citizen participation to energy production in addition to consumption – as an idealised form of political and material action has been at the core of energy community discourses [38]. However, as the energy communities have matured, definitions have

also become more multiple and nuanced. First, distinguishing energy communities to place-based or non-place-based and single-purpose or multiple-purpose initiatives based on their spatial form or technological orientation is relevant [39]. Second, their temporality in system change can be approached as a process (e.g., closed or open to new entrants) or as an outcome (e.g., private or shared collective) [40]. Finally, energy communities rarely focus solely on energy, often covering complex iteration about the meaning of being members of a community, developing alternative daily routines and sharing risks and responsibilities brought on by technologies in everyday contexts [41].

Housing cooperatives are a case of closed, place-based energy communities with the multiple purposes of bringing energy and monetary savings and improving the functioning of buildings and quality of life by commissioning collective energy investments. Potential technological assemblages depend greatly on the building and its spatial context, the needs of the inhabitants and the consulting planner, but generally range from incremental technological investments (e.g., solar panel installations) to deep renovation of housing technics (e.g., installing heat pumps and energy storage capabilities), and disconnection from urban energy networks.

Approximately two thirds of the more than 90,000 apartment buildings in Finland are tenant-owned housing cooperatives [42]. The majority of the apartment blocks were built in the 1960s and 1970s, leading to high pressure for complete renovations that offer potentials of climate saving and the introduction of novel technologies [43]. However, several general barriers have been identified to hinder housing cooperatives' capacities to engage in sustainable energy projects. First, the decision-making processes are often complex, as the tenants must reach a qualified majority on the projects that have both pragmatic and economic implications for their lives [44]. Renovations must be made regularly, but convincing actors about the feasibility of novel technologies such as alternative and experimental-sounding energy investments can be difficult. Such difficulties often become highlighted if the investment cost is relatively high and concrete examples with proven gains are missing. Second, energy is relatively high-cost for the housing cooperative, which should encourage the implementation of energy projects offering long-term savings for the tenants. However, the incentives of different actors in the complex contractual settings are rarely aligned, and the information asymmetries may create mistrust among the parties [45]. Legitimation of the projects requires inclusion of occupants with very different capacities and could benefit from a neutral mediator. Finally, the rejection of energy efficiency projects and novel technologies might relate to rather mundane and grounded everyday practices, such as subjective considerations of safety [46]. It is difficult to predict all the potential connections between new energy solutions and the deeply rooted routines, from mundane energy use by the residents to the decision-making practices in the building [22].

While the perspective of housing cooperatives raises issues of complex internal decision making, mixed incentives and trust among the tenants, the wider network of actors is also crucial for the potential transitions. Housing managers that are hired to professionally monitor the economic and technical issues in the buildings are one key actor group [20]. They can be considered as key middle actors for the management issues in the buildings and they hold much power in, for example, long-term renovation plans, timing of new investments, technical possibilities and funding options [47]. However, they often lack interest towards new sustainability solutions because of the burden of the regular maintenance tasks and lack of resources for familiarizing with new innovations, as well as a professional background emphasizing traditional, reliable and risk-averse solutions compliant with existing legislation and ordinances [48]. Another relevant group of actors are the energy service companies that develop innovative business models, such as energy performance contracting, to allow apartment buildings to go through energy renovations without taking company loans that are often an obstacle in the decision making [49]. However, from the consumer point of view, the services remain underdeveloped, as the offerings are

highly technical and difficult to compare [50,51]. Finally, the energy companies have also struggled to find suitable business models and new niches in the ongoing transitions away from combustion-based systems [52]. In essence, the publicly owned companies controlling urban energy networks are in the difficult position of trying to convince the old customers to become collaborators in their heating network monopoly [53,54].

The energy decision-making in the housing cooperatives is thus a fragmented field that involves actors inside but also far outside the apartment buildings. Moreover, the peer information and support on energy actions have been considered valuable [55]. In this context, the media is one of the central arenas for innovation diffusion and societal debate, where the development is anticipated and navigated. In addition to reporting, media can serve curating, advocating and facilitating roles regarding the knowledge claims, thus potentially becoming an important node in relation to other knowledge networks, such as peer-to-peer platforms and public counselling services [64,77].

3. Data and methods

The empirical data collection of this research focused on the publications in three media sources in Finland. The Finnish Broadcasting Company Yle is a state-funded but independently operating public broadcasting service with national and 19 regional editing offices. Helsingin Sanomat (HS) is the most widely read newspaper in Finland, focusing on both national and Helsinki metropolitan region developments. Finally, the Jyväskylä-based Keski-suomalainen (KSML) is one of the major regional newspapers, based in Central Finland and providing a more region-based angle on the issues under study. We consider the perspective of news media in order to best capture how the roles and issues of housing cooperatives on energy transitions are popularized in the societal discussions, while professional media might offer a more comprehensive view on the technical and economic sides of the topic. All three media organisations are committed to following good journalistic principles as defined by the Council of Mass Media in Finland.

The data was collected in late 2020 and updated in early 2022 by using online search engines of the HS, KSML and Yle. Different search word combinations were tested in order to capture the discussion as a whole. The testing resulted in matching the keyword "housing cooperative" (taloyhtiö in Finnish) with five topical words: "energy", "electricity", "heating", "cooling" and "lighting". The earliest hits were from 2005, so the search timeframe was set to 1.1.2005–31.12.2021. This timeframe was considered adequate to cover the whole publicly recognized discussion on the role of housing cooperatives in Finland's energy transitions, although one caveat is that the electronic databases may lack some of the material published during the early years of the sample.

The analysis was conducted in four subsequent steps following the qualitative content analysis method focusing on manifest and latent content [72]. Interpretations were made based on iterative rounds of reading and cross-checks by the two first authors until agreement was reached on unclear cases. The analysis proceeded in four main steps. First, the relevance of the articles was verified by examining the context, and items not focusing primarily on the housing and energy issues were removed. This resulted in a dataset of 312 articles over the 17-year timeframe from 2005 to 2021 (see Fig. 1).¹ The majority of the articles were published in Yle (191), while Helsingin Sanomat (90) and Keski-suomalainen (31) became more active during the last 5 years of the studied period. Second, all the selected articles were read through by one of the researchers and categorized on the basis of the main topic, sub-topics, regional coverage and main actor groups mentioned in the articles [72]. Third, common threads in the discussions were identified and the results were discussed by the author team, in order to identify

¹ The full dataset is available in [78].

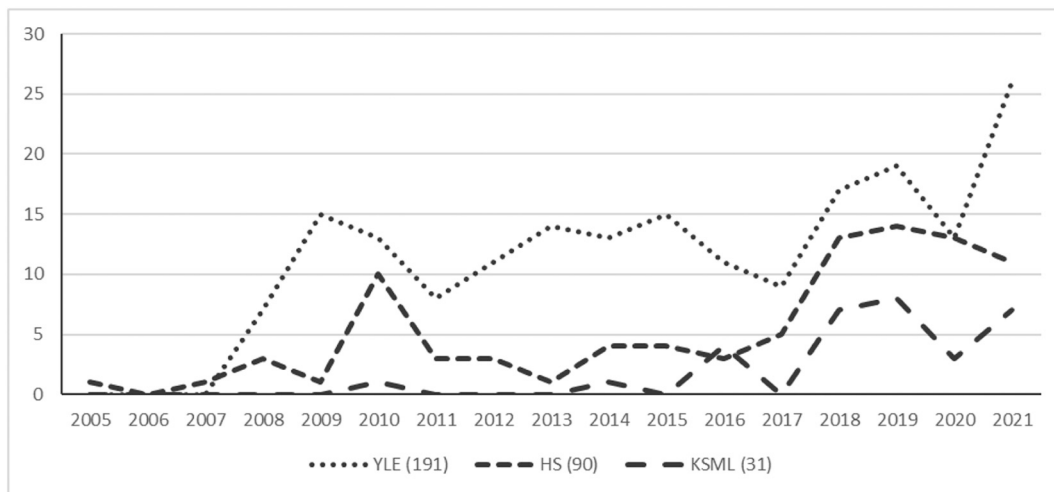


Fig. 1. Development of the media coverage in the studied news media.

topical and temporal characterization of the key phases of discussion. Finally, the main storylines were established for each phase and considered in relation to wider societal frames.

4. Results

In this section we present the main findings from the media analysis, organised in three main sections focusing on the three main phases, ten main storylines and three societal frames capturing the role of housing cooperatives in Finnish energy transitions. Fig. 2 illustrates how the three empirical analyses are connected.

4.1. Three phases of media discussion from 2005 to 2021

The first identified articles were isolated case reports on early solar photovoltaics (PV) experimentation in forerunner housing cooperatives. These forerunner articles were aimed at verifying that Finland has large potential for alternative energy technologies with little focus on non-technical aspects. Continuous media discussion started only in 2008, as the global financial crisis and rising utility tariffs coincided with renewal of the EU's energy efficiency directive. This also created

anticipation in the Finnish building energy sector regarding potentials and requirements of the energy efficiency improvements and installation of dispersed energy production. The policy-initiated phase lasted until the end of 2011, when the legislative reforms were settled and the price volatility had passed. The media storylines shifted from national dynamics to the underutilised technical and saving potentials on the urban, neighbourhood and building scales. Around 2018, media interest in the energy solutions of housing cooperatives increased significantly because of national-level incentives generating interest in energy renovations and charging of electric vehicles. These main developments constitute the three media discussion phases (Fig. 3).

The three phases also differ in terms of main topics. In the first phase, policy discussion on new administrative practices opened up critical perspectives towards increasing heating prices and the need for energy efficiency renovations. In the second phase, successful case stories on distributed solar energy and heat pump solutions became dominant, while the wider policy discussion focused mainly on the passivity of the public sector in incentivising the development. The third phase represents maturing of the media discourse, with all topics gaining more media coverage both in terms of case-based experiences and practices as well as general commentaries. Towards the end of the timeline,

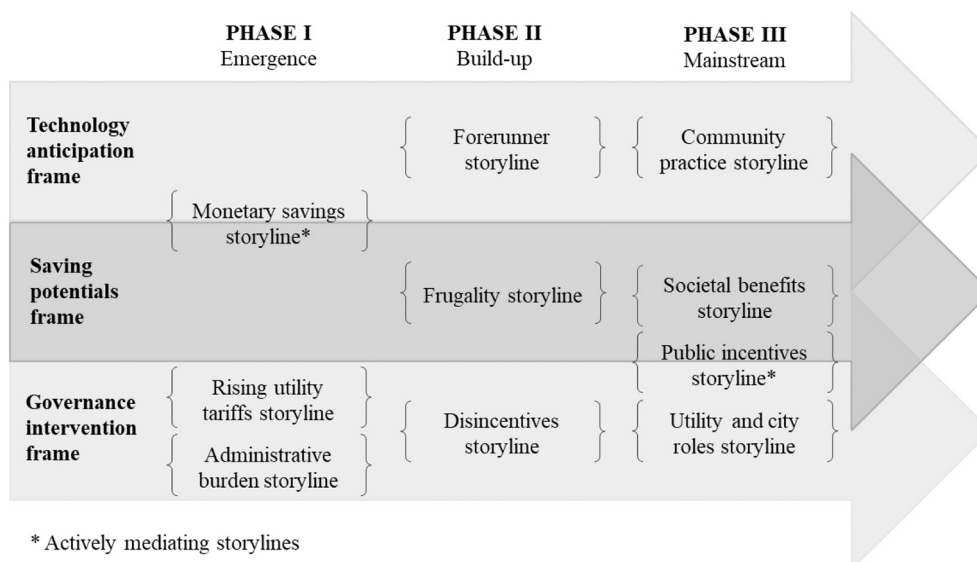


Fig. 2. Main phases, media storylines and societal frames of the energy roles of housing cooperatives.

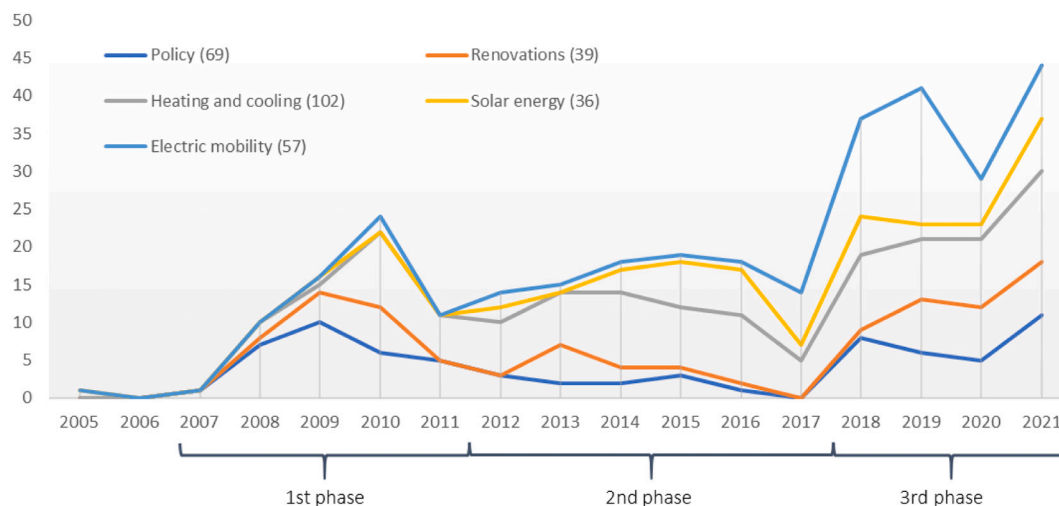


Fig. 3. The three phases and main topics identified in the media discussion.

especially electric mobility became a regular topic that significantly affected interest in other technological aspects, such as deep renovations and solar electricity systems.

Especially Yle has maintained the energy discussion in the public focus over the 17-year timeframe. Almost half (83 out of 191) of the articles were published by the regional editorial offices focusing on regionally specific topics and cases. The newspapers HS and KSMML have become more oriented towards housing cooperatives during the last phase, with revitalised policy interest. They differ from Yle in that they also publish readers' opinions, which provide more direct access to the reality in housing cooperatives. Overall, the housing cooperatives have mainly been discussed in the local and city sections of the media outlets, but there are also entries in domestic news, editorials, and in thematic sections on lifestyle and living.

4.2. Media storylines across the main phases of discussion

4.2.1. Housing cooperatives emerge as energy actors: 2007–2011

In the first phase of media discussion between 2007 and 2011, the storylines were conflicting on how to narrate housing cooperatives as energy actors. The planning of energy collective actions was discussed from the perspectives of housing cooperatives, urban energy systems and policy reforms, providing housing cooperatives with varying standpoints.

The first phase in media discussion was prompted by the storyline on *overlooked energy-saving potential* in residential buildings. An editorial of HS, published 6.7.2007, promoted energy efficiency renovations in housing cooperatives because of financial saving potentials that are not properly considered in the decision-making processes. “No less than 80% of Finnish housing cooperatives waste energy” was the title of an article in Yle on 24.9.2009. The article stated that the expenses of apartment building can be reduced by one third with relatively small changes, such as better management of the heating systems. This was echoed in brief reports by Yle (7.5.2009), stating that changes in everyday practices are an easier and faster way to achieve energy savings than renovations, and HS (28.9.2008) describing a trial in which apartments were heated to 17 °C and the residents were left to decide whether they wanted to heat their homes more. HS (7.1.2010) put pressure on housing cooperatives by describing how “homes and the built environment have a major role in mitigating climate change”. Another article (Yle 22.5.2008) estimated the energy efficiency improvement potential to be in the range of two nuclear power plants by 2020. The responsibility for energy action was placed on the boards of housing cooperatives, which should “find a common tone” and quickly start making plans for energy efficiency improvements. The undertone

of the storyline is the recognition of the overlooked potential of housing cooperatives to provide carbon emission savings.

The second storyline focuses on the effects of *rising utility tariffs*, and introduces the voice of energy companies, while also discussing motivations for housing cooperatives to participate in energy action. At the beginning of 2010, the constantly rising price of heating caused alarm in housing cooperatives especially in cities with fossil-based combined heat-and-power (CHP) networks (Yle 18.1.2010; HS 25.1.2010). This focused attention on pioneering buildings and their novel solutions, particularly related to ground-source heat pumps and solar PV systems that contributed to a reversed trend on a building scale. Many articles also reported experiences of more incremental changes, such as installation of water-saving taps (Yle 26.5.2009). At the end of 2011, HS (23.12.2011) wrote about the first housing cooperative in the inner-city area abandoning its district heating connection and switching to a ground-sourced heat pump system. The article discussed the planning and permitting challenges as well as network impacts that would in the long run increase the heating price for other customers. Furthermore, the city representatives and the heating company claimed that “the rebel housing cooperatives” undermine the functioning of the established energy network. This storyline captures the increasing space of action for the housing cooperatives, and the counter-dynamics of challenging and narrowing down of possibilities by the incumbent interests.

Finally, the third major storyline captures the policy reforms more directly than the first two by presenting the housing cooperatives as *victims of administrative burden*. This storyline dominated the discussion especially between autumn 2008 and spring 2009, when Finland's parliament presented mandatory energy certificates based on the EU energy efficiency directive renewal for all apartment buildings. The media took an active role in the discussion by providing space for critical perspectives, as the energy certificates were viewed as additional responsibility or even counterproductive instruments in several stories. For example, one housing manager interviewed by Yle (2.1.2009) admitted that the usefulness of the certificate is measured in the longer term as it might help to identify the options for saving energy in the buildings, but the manager was nevertheless critical towards the immediate impact as “energy efficiency has been evaluated in the buildings already before the certificate”. Earlier, Yle (28.9.2008) reported that the housing cooperatives have been very reluctant to compile certificates and forecasted that it might even slow down the sales of real estates. HS (12.2.2009) also echoed the depreciating tone with the title “the people looking for a new home are not interested in certificates”, although the text mentioned that the interviewed buyers simply were not yet familiar with the certificate, which had become mandatory only a couple of months earlier. The discussion extended with a less critical tone to the

long-term maintenance plans that became mandatory in July 2010. For example, Yle (12.4.2010) described how the reform had increased demand for energy services as it “forces the housing cooperatives into planning work”. The storyline reproduced the idea of energy as external to the interests of housing cooperatives, but the discussion on energy certificates subsided soon after the law was passed and the certificates became generally accepted.

4.2.2. The long build-up: 2012–2017

In the second phase, from 2012 to 2017, media attention shifted from the issues of energy and housing policies towards more explicit documenting of notable cases and highlighting positive examples. This phase can thus be described as a long build-up period, during which the energy topics become normalized in public discussion and in the perspective shifts on the level of housing cooperatives.

The first main storyline continues the monetary savings storyline by describing *housing cooperatives as forerunners* that achieve significant energy and monetary savings by experimenting with technologies and practices. Acknowledging the rising heating costs in urban energy systems, the storyline institutes the idea of “investments paying off in the end”. In an interview on Yle (8.3.2012), the chair of a housing cooperative board in the city of Tampere estimated a two-thirds drop in heating costs of the housing cooperative due to installation of a heat recovery unit. In another case, it was described how one third of the heating energy had been “blown into the air” in an apartment building in Kotka city, and how exhaust air became utilised for heating supply air and water (Yle 9.2.2014). Further, the article estimated that hundreds of old apartment buildings were about to invest in heat recovery systems in 2014. Similarly, the forerunner examples provided rather detailed estimates of savings, such as an apartment building in Vantaa halving its heating energy consumption (Yle 18.11.2016), and a newly renovated housing cooperative in Tampere reducing electricity consumption by 47 % and consumption of district heat by 61 % (Yle 21.8.2015). Cases also illustrate ease of use (e.g., Yle 11.2.2013) and hybrid and “low-tech” solutions, such as the combination of renewing outdoor lighting, sealing doors and windows, and arranging the use of sauna to allow a shortened heating period (Yle 3.3.2014). In essence, the storyline utilises concrete cases to bring flesh around the bones of the general savings narrative.

Second, the *frugality* storyline leverages the forerunner narratives and poses the less-active housing cooperatives as laggards about to face major problems. For example, Yle (16.1.2014) described how the district heating can account for even a 40 % share of the management costs in apartments, which translates directly to the living costs of residents. Another article by Yle (16.9.2014) noted how delaying the renovations has made banks hesitant about providing renovation loans – especially in areas with loss of residents – with one bank representative being quoted as saying: “the longer you linger with the renovation decisions, the more certainly you will lose”. An interviewed economist from a lobbying organization, the Finnish Real Estate Federation, raised up the “low-hanging fruits” of energy saving, such as correcting the settings of the heating system, checking the indoor temperatures in the apartments, and observing water use, highlighting the importance of collaboration between housing manager, the board of the housing cooperative, and residents, in energy saving practices (Yle 22.10.2014). Yle (14.3.2016) even accused “stingy owners” and “unskilled housing managers” of seriously impeding the energy saving actions of housing cooperatives. The tone in these articles is alarming by stating that rising energy costs, combined with the renovation debt due to delayed major renovations, threatens to significantly increase living costs in the near future.

Finally, in the storyline on *disincentives*, the articles share the focus on governance of the energy networks either on national or urban scales. Many of the novel solutions for buildings are connected to the vision of decentralized electricity and heating networks, whereas existing practices favour centralised energy production. In 2015, reports on difficulties related to selling the produced energy to networks became abundant. For housing cooperatives, it has been profitable to install only

the amount of solar PV needed to cover shared electricity use (for example in hallways), because the use of excess electricity by the residents led to added network fees and double taxation (Yle, 16.9.2016). Many of the utilities also prohibited the hybrid use of geothermal and district heating in buildings (Yle 12.10.2017), and requested high fees for network disconnection. Yle (26.2.2016) also reported how, in the words of local energy entrepreneurs, the pricing of heating led to “a rebellion against district heating”. This rebellion meant apartment buildings increasingly investing in alternative heating systems and abandoning the established heat network. However, some energy companies attempted to mediate the rift, for example by developing two-way district heating systems, where the housing cooperatives can produce and sell heat in the urban network (Yle 22.9.2016; KSML 13.12.2016). The complexity of this storyline is connected to the difficulties experienced by energy companies in maintaining their position as publicly governed service providers, as housing cooperatives become more active in their energy decisions.

4.2.3. Renewed policy focus and mainstreamed energy action: 2018–2021

As the media discourse has matured, the storylines on the technology boom have decreased, giving space for more complex issues related to decision-making practices, justice and policy implementation. Since 2018, the media emphasis has been on the motivations and implications of the national policy making on housing cooperatives. There are four identifiable storylines.

The first storyline deals with *the societal benefits* of energy investments. Several stories present more detailed reports on increasing living costs, amounts of waste energy in building stock and benefits of the energy renovations and adjustments (e.g., Yle 9.10.2018; KSML 27.1.2018; HS 18.11.2018; Yle 4.2.2020; HS 26.3.2020). Banks and finance consultants are more active stakeholders in the discussion than before, bringing saving potentials to the whole society scale by suggesting e.g., a 3–4 billion € saving potential for housing cooperatives by investments in energy technologies and renovations and 1.8 million tons of annual savings in carbon dioxide emissions in the 10 biggest cities in Finland (Yle 6.2.2018; Yle 23.3.2019). An article elaborating different contexts for ground-source heat included an estimate by one energy consultant that “one third of housing cooperatives in Helsinki could switch to ground-source heating” (HS 10.9.2018). Further, in 2020, HS reported that one of the biggest pension insurance companies in Finland would start major energy renovations in its 40 rental apartment buildings with the aim of halving the carbon emissions of the building stock by 2023, illustrating that energy renovations are also seen as profitable investments (HS 7.2.2020; see also HS 26.3.2020; KSML 12.10.2020). As monetary and climate savings discussion became rapidly generalised on a societal level, the interest of larger regime actors was aroused.

Connected to this development, the second storyline focuses on *the changing position of utilities and cities* in the urban energy governance (e.g., HS 7.9.2021; HS 27.9.2021; HS 25.10.2021; Yle 30.10.2021). An extreme case reported a small municipality closing parts of its central heating system because of several housing cooperatives switching to ground-source heat pumps (Yle 11.5.2018), while an opposing story cited the City of Espoo obstructing housing cooperatives' ground-source heat projects (HS 10.9.2019). More often, the stories report a shift in utilities' business models, such as leasing energy production technologies or investing in electric vehicle charging infrastructure (Yle 12.10.2018; KSML 16.2.2020; Yle 20.5.2020; Yle 10.7.2020). Further, the decision by Helsinki City Council to initiate a rapid phasing out of coal by 2024 was accompanied by articles that viewed housing cooperatives as important stakeholders implementing new energy visions (Yle 19.10.2020; Yle 21.12.2021). Essentially, in replacing combustion-based energy sources, housing cooperatives are viewed as important energy producers for urban energy networks (Yle 23.3.2018), and even the energy industry lobby organization called for housing cooperatives to become active heat producers (Yle 23.5.2018). Overall, the juxtaposition between utilities and housing cooperatives faded rapidly, and the

discussion shifted towards emerging systemic solutions.

On the national scale, the third storyline on *public incentives* captures the renewed policy interest in steering energy action in the existing building stock. First, the state investment support for charging infrastructure for electric vehicles is a prime example. Several reports have disseminated the bureaucratic and technical principles of incentive to the wider public and estimated that 20–25 % of housing cooperatives would make investments before 2022 (KSML 25.6.2018; Yle 21.8.2018; KSML 10.9.2018; Yle 2.10.2018; KSML 29.11.2018; Yle 17.12.2018; Yle 23.5.2019; HS 21.2.2020). Initially, the incentive did not gain the anticipated success and the media started reporting “lazy” or “timid” investments in EV charging (Yle 17.7.2019; HS 18.9.2020). Second, solar electricity is another technology that received more policy focus. Several critical articles described housing cooperatives as being “left behind the solar boom”, because the administrative barriers to the sharing of electricity micro-production within housing cooperatives persist (Yle 30.8.2018; Yle; 31.8.2018; Yle 24.10.2018; HS 22.11.2020). However, the situation changed in 2020 and 2021, with three legislative reforms and a court ruling that enabled solar energy communities for housing cooperatives (Yle 7.2.2021; Yle 7.4.2021). Finally, a new subsidy system for housing cooperative energy renovations was introduced in 2020 in order to further stimulate energy efficiency improvements and investments in dispersed energy technologies (Yle 23.7.2020; 2.11.2021). The policy has gained wide public interest, and several readers’ opinions were written by experts in the building sector, calling for extensions to the temporary subsidy designed to run only until the end of 2022 (HS 22.5.2020; HS 24.8.2020; HS 8.8.2021). More recently, the discontinuity and patchiness of the otherwise beneficial incentive system has been questioned in the media, as low budget allocations and short-term horizons are viewed with distrust and hesitancy by actors in the building sector (Yle 8.3.2021; Yle 4.11.2021).

Finally, from a more grassroots perspective, the fourth storyline discusses the *energy practices* in housing cooperatives, and especially the lack of a proactive approach. The stagnant development of EV charging infrastructure is explained in the media by issues of equality and sharing of the burden of the collective investments within the communities (Yle 3.2.2018; Yle 12.9.2019; KSML 10.2.2018; HS 24.3.2018; HS 12.5.2019; Yle 24.9.2020; 29.10.2021). The prevalence of electric cars, and increasingly of electric bicycles that have gained popularity in 2020 and 2021, also brings up new concerns related to for example the fire safety issues of charging batteries in housing cooperative’s premises (HS 27.4.2021; HS 20.7.2021; HS 19.9.2021; HS 20.9.2021), or the aesthetics of charging points (HS 28.9.2021; HS 2.10.2021). Another example of a hesitant attitude towards new technologies is reducing water consumption by individual metering, a topic that emerged prominently in the media in 2020 due to the EU directive from 2018 requiring metering-based billing of water consumption and the national legislation that followed and was accepted by the Finnish parliament in November 2020 (HS 24.2.2020; KSML 24.2.2020; HS 16.8.2020; HS 29.8.2020; HS 8.11.2020; Yle 16.11.2020; HS 27.3.2021; HS 17.7.2021). Many stories highlight the untrustworthiness and other problems with individual metering, expressing doubt concerning the meters as a solution for fairer water invoicing. Case articles also report more positively on experimenting with community energy and addressing the role of everyday practices by describing energy expert education for residents (Yle 23.20.2018), experimentation with lower room temperatures (HS 19.11.2018) and tips for “regular people” to reduce emissions in everyday environment (HS 18.1.2020; HS 16.10.2020; HS 14.8.2021). Finally, in contrast to earlier phases, the emergence of shared economy practices as collective action within the housing cooperatives (Yle 25.9.2019; HS 8.11.2020), and of collaboration between neighbouring housing cooperatives in energy action, began to gain media attention (Yle 7.1.2020; Yle 14.3.2020). Overall, by focusing on the complexities of energy practices on a community level, the media provides important nuances to the energy transition storylines and potentially helps to overcome some of the persistent challenges.

4.3. Societal frames on housing cooperatives

Having presented the media storylines across the phases, we turn next to the societal frames reproducing and reconfiguring the energy regime practices [30]. We have identified three recurring frames that constitute the ten storylines presented in this article.

First, the *technology anticipation frame* begins with early technical case reports of energy experimentation on solar PV and heat-pump technologies presented in the monetary savings storyline. As the cases became more abundant, the forerunner storyline in the second phase utilised the anticipatory perspective to promote active housing cooperatives successfully competing in the area of energy action. Often the case narratives remained straightforward and were characterised by techno-optimism. In the final phase, the success stories became less frequent, and the community practice storyline focused more on pragmatic complexities and resistances towards anticipated technology change. Furthermore, the third phase also opened a perspective towards community energy action beyond individual housing cooperatives.

Second, the *saving potentials frame* also departs from the monetary savings frame, presenting the potentials and benefits of energy investments by housing cooperatives. However, in the middle phase these savings potentials are turned into governmentalizing obligation in the frugality storyline, as the energy planning practices and future-oriented decisions are viewed as essential for a responsible housing cooperative – especially in times of constantly increasing energy costs. In the final phase, the frugality view on monetary and climate benefits becomes generalised to cover the whole of society in a societal benefits storyline. This legitimization of community energy action in building stock is also reflected in the mediating public incentives storyline, where publicly funded subsidies are considered to provide benefits on the scale of the whole of society.

Finally, the *governance intervention frame* covers the explicit policy dynamics of and preconditions for the national and urban scales. The early storylines on rising utility tariffs and administrative burden were both depicting housing cooperatives as disengaged victims of energy system dynamics. As the policy turbulence caused by the energy efficiency directive reform subsided, the vocal positions towards policies also shifted. In the disincentives storyline of the build-up phase, the main concerns were based on municipalities and cities complicating their energy action and on unbalanced legislation putting housing cooperatives into a position with little manoeuvring space, e.g., in solar energy investments. This lasting critical public debate also contributed to the mediating public incentives storyline in the mainstream phase, as well as to the storyline on the changing roles of utilities and cities.

Each frame also reveals how the way the public is constructed in the media changes as the societal discussion matures. In the technology anticipation frame, experimenters were replaced first by technology specialists and finally by lay citizens, and in the saving potentials frame first by advocacy coalitions and federations and finally by financial sector actors. In the governance intervention frame, the early commentators were mainly building sector specialists, such as housing managers and company representatives that became complemented by utility, city and ministry representatives in later storylines.

5. Discussion: redefined roles of housing cooperatives in the Finnish energy policy

The studied 17-year timeframe on media storylines offers a unique view of public perception of community energy from the perspective of housing cooperatives. As the smart city developments and the linked media discourses have matured, more thorough, research-based and detailed articles have become more common, and the topic has also gained relevance in the regional media. Over the past two years, mainstream media – especially the national broadcasting service Yle – has moved towards the position previously occupied by professional media, including detailed evaluation of tangible solutions in diverse

spatially and technically embedded contexts of housing cooperatives. The more educative role of mainstream media reflects a transition from the niche innovation phase to the diffusion of new energy solutions and practices [56,74]. Generally, the move from the early take-off phase of technologies and energy solutions to the acceleration phase, the technological anticipation shift towards diverse practices and capabilities, and the material arrangements of novel user groups were also reflected in the changing storylines [7,8].

However, the public media discussion remains ambivalent regarding what kind of energy communities the housing cooperatives might be: whether they are positioned as forerunners or barriers of emerging smart cities. In the early techno-optimistic case reports featured by the forerunner storyline, the initiative of change is on active community energy actors, while the final phase narratives emphasise the orchestrating role of active policies on urban and national scales. The emergence of governmentalization of average housing cooperatives with little previous interest in energy systems is connected to the diversity of these communities. However, the transitioning city and utility roles connect these “laggard” or “disengaged” communities to the complex dynamics of urban energy landscapes that require new forms of engagement [14,26]. Furthermore, not all the energy community decisions are primarily about energy [41]. In addition to constantly increasing energy costs for housing cooperatives, the decisions and debates on EV charging, water metering and living comfort during summer heatwaves have made the energy considerations more pressing. Therefore, rather than focusing on forerunner and change initiator narratives, the media representations of housing cooperatives' energy actions are better understood as variable forms of material participation in energy transitions [4,75].

The news media reproduces societal frames of energy communities through the storylines, as it has actively mediated the expectations towards the energy roles of housing cooperatives regarding policy making, economic development and sustainability [30]. In doing so, the media has often taken critical positions on topical policy developments but less so on market and business developments or community practices. In particular, the media reproduces the monetary savings frame, where diverse quantified statements provide mediating discourse in relation to governance interventions and technological anticipation. Despite the direct presence of foreign experiences, media activity captured in three phases reflects the European level policy cycles [31]. During the first phase, the EU energy efficiency directive caused interest and vocal criticism towards energy practices in housing cooperatives. In the second phase, the media focused mainly on case reports and narratives, as no major policy changes took place. However, these reports also created pressure for future action by detailing existing barriers and disincentives. Finally, the third phase aligns with the emergence of active reconfiguration of legislative frameworks and temporary enrolling of energy subsidies to steer community energy action.

In this paper, we have attempted to capture the media discourse on the positioning of housing cooperatives in energy transitions in full. However, there are limitations to our analysis. By emphasizing national media coverage, we were unable to capture regional variances that exist in the topic. For example, the market prices for houses and the emergence of energy services vary greatly between the regions but in our analysis, this point remained dormant [19]. Furthermore, we focused on media representations and narratives rather than on quantitative evidence of the phenomenon. This was a conscious choice, as the main market development is currently taking off and the number of completed cases remains low [50]. For future research, we recommend developing a comparative media analysis approach between the diverse country contexts, in which urban energy communities would become a core component of energy transitions, as a longitudinal view of media storylines provides a window to public discourses, most vocal stakeholder networks as well as main policy cycles.

6. Conclusion

The role of urban housing energy communities becomes central in the acceleration phase of urban energy transition when complex system reconfigurations are required to transform combustion-based centralised socio-technical systems of cities into complex assemblages of dynamic actor positions. This requires active mediation of expectations and developments, from the scales of international and national policies to the embedded contexts of cities, neighbourhoods, buildings and individual citizens – where the media plays an important mediating role. In this paper, we covered the available media dataset of 17 years and 303 stories from three Finnish mainstream news media sources in order to identify the emergence and maturing of public discussion concerning the energy roles of housing cooperatives. Energy transition in the building sector is almost solely reported as a domestic issue, and items focusing on experiences from other countries are missing altogether from our sample. In principle, the media could also provide both pragmatic and policy lessons from other country contexts. Our analysis shows that media storylines change at the times of policy reforms to accommodate more nuanced views on transition, which merits follow-up research. Furthermore, the longitudinal study reveals how techno-optimistic forerunner narratives become complemented and replaced by techno-realist practice narratives, in which the main initiative of change moves from active communities to active policymaking. Therefore, we conclude that it remains an open question whether the housing cooperatives will meet the anticipatory smart-city expectations of active community energy action in general or maintain their conventional reactive – and often disengaged – policy action.

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Data availability

I have shared the data

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