



Original research article

Institutional entrepreneurship in transforming energy systems towards sustainability: Wind energy in Finland and India

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ABSTRACT

A growing body of literature has examined the dynamics of wind energy development across different mature and emerging institutional contexts. However, so far only few have paused to reflect on the differences between developed and emerging economies. Building upon the literature on institutional entrepreneurship, this paper compares institutional strategies in wind energy development in Finland and India by using the typology of political, technical and cultural work. We highlight the role of institutional approaches in studying sustainable energy transitions in mature and emerging institutional contexts, while being sensitive to the role of heterogeneous actors in shaping institutional arrangements. Our findings offer implications for debates in the institutional entrepreneurship literature by exploring how actors shape their institutional environment in different contexts, and the extent to which emerging institutional contexts provide more opportunities for institutional entrepreneurship. Finally, this paper underscores the need for developing insights into enabling conditions for successful collective institutional entrepreneurship and for developing typologies of institutional strategies which are generalizable across both mature and emerging institutional contexts.

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1. Introduction

Achieving major transformations in energy systems towards sustainability ('sustainability transitions') is a collective goal that requires action from diverse public and private actors with different interests, influence, and levels of power [43,33,32]. A transition towards sustainability is likely to be full of conflicts and contestations between different actors, with no win-win solutions [136,81,82]; at the same time, such sustainability transitions may vary considerably in different nations according to the institutional context, which configures different needs, priorities, imaginaries and levels of capabilities [75]. Despite this fact, comparative studies of sustainable energy transitions across different contexts are still limited, posing a challenge to drawing cohesive insights [115]. In particular, our paper responds to the recent debates suggesting that emerging institutional contexts found in emerging economies with a lack of well-functioning legal and regulatory systems, and high levels of risk and uncertainty are host to substantially more opportunities for strategic action for challenging

institutional arrangements by actors when compared to institutional contexts found in mature economies [125,83].

Our aim in this paper is to empirically illustrate the differences in institutional strategies directed at transforming the incumbent energy system, and to contribute towards cross-cultural comparative research on sustainable energy transitions [118,113]. Recent studies have indicated the need for comparing and contrasting sustainable energy transitions in different institutional contexts. For instance, China faces challenges for sustainable energy transition due to presence of homogenous institutional arrangements, restricted policy discourse and less pluralistic decision making processes often dominated by the central government. Chinese NGOs have often faced difficulties in policy design and deliberation due to the direct involvement of state government in policy decision making. The institutional context in China is very different from Germany, which has taken radical steps for institutional transformation of energy systems. Therefore, studies have emphasized that institutional context often shapes direction and pace of sustainable energy transition, including the opportunities for institutional experimentation [113].

Building upon these debates, our paper compares wind energy in Finland and India. Particularly, our paper tries to explore the dynamics of sustainability transitions by focusing on differences and similarities in the ways in which actors collectively engage

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in institutional change for mainstreaming wind energy development in Finland and India. We focus on wind energy due to its major potential in transforming the incumbent energy systems based on fossil fuels in both countries, which currently rely mostly on large-scale, centralized energy production based on fossil energy sources. In this paper, we classify Finland as a mature institutional context due to its formal regulatory framework, well-developed nationwide infrastructure, low GDP growth rate, high human development index, and low level of corruption. Emerging economies, such as India, are characterized by several factors, such as high GDP growth rate, rapid industrialization, economic liberalization, and strong influence of government and state owned firms. These economies also experience less developed regulatory and government infrastructure, lack of transparency, long bureaucratic delays, culture of corruption, and significant trade barriers. Furthermore, institutional strategies for transforming institutional arrangements in mature institutional contexts might not be suitable for emerging institutional contexts [66,83].

The key research question we explore is: *What are the differences in the ways in which actors have collectively engaged in shaping the institutional context for wind energy development in Finland and India?*

This paper empirically highlights the development of wind energy in Finland and India in response to competing narratives, priorities and interests of diverse actors struggling for legitimising wind energy as a reliable source of energy. In order to do so, the paper mobilizes insights from the institutional entrepreneurship literature to empirically illustrate the differences in institutional strategies in mature and emerging contexts, which have caught only a limited amount of attention from scholars working on institutional entrepreneurship so far [2,83]. Finland and India have diverse priorities as well as challenges concerning wind energy development. Finland has acknowledged climate change as an important issue in policy making by drafting climate strategies, such as the National Climate and Energy Strategy. Nevertheless, Finland has not aimed at moving beyond the minimum EU targets, and further barriers have emerged due to its lack of political will and commitment [67]. India has acknowledged the climate change mitigation strategies under the National Action Plan on Climate Change (NAPCC) in order to address multiple concerns, such as continuously increasing energy needs, energy security, energy access for poverty reduction, and long-term development and economic growth [29]. India's energy policy has been driven by the needs for energy security due to the increasing demand-supply gap, industrialization-led growth, creation of a domestic industry, energy access and job creation [50]. Furthermore, climate change mitigation in India has to be balanced with competing policy priorities such as chronic energy shortages, persistently high levels of poverty and the high proportion of rural and urban population with no or limited access to electricity. Nonetheless, wind energy is currently rather small in the overall energy mixes of the two countries, in which the bulk of energy originates from coal, hydro and nuclear energy sources.

We note that there are major political, social, economic, cultural and size differences between India and Finland, which make such a comparison both interesting and challenging. Whilst we do not aim to generalize the results from our two-cases to all emerging and mature contexts, our paper tries to illustrate the opportunities and challenges for institutional entrepreneurship by considering India and Finland as relevant examples of emerging and mature institutional contexts. We also agree that there are several mature and emerging economies within the same geographical regions like Asia and EU, it might be difficult to develop generalized insights which are applicable to all mature and emerging institutional contexts. This article therefore seeks to draw lessons from the two different cases in terms of similarities and differences in institu-

tional entrepreneurship rather than directly comparing them in terms of success and failures. Rather, we use a comparative idiographic case study methodology [139] in order to find relevant patterns in the two cases to understand observed differences and similarities between them through interpretative analysis.

The paper is structured as follows. In Section 2 we present the theoretical framework, building on relevant debates in the institutional entrepreneurship literature. Section 3 describes our research methods; this is followed, in chapter 4, by a summary of the key findings of the study, with an overview of wind energy development in Finland and India. Section 5 compares Finland and India by showing similarities and differences between the two contexts. The paper ends with discussion and conclusions in Section 6.

2. Theoretical background

A key aspect in the institutional entrepreneurship literature is how actors change institutional arrangements while also being constrained by them. Existing research has suggested that formal and informal institutional arrangements constrain the actions of actors and shape their decision making process but actors also shape their institutional environment and the constraints imposed by it. The literature on 'institutional entrepreneurship' has looked into the paradox of embedded agency, which focuses on the manner in which socially embedded actors who create institutional change in spite of being constrained by the existing institutional arrangements [10]. Institutional entrepreneurship involves a range of actors such as firms, industry associations and advocacy groups. The literature suggests that actors are configured by their institutional environment, which they also try to reshape, for instance, by influencing policy and regulatory decision-making processes [41,22]. Consequently, actors are engaged in an ongoing struggle to challenge institutional arrangements through their creative efforts [11]. A range of actors—such as labour unions, political action committees, environmental and public interest groups, trade associations, ad-hoc associations, lobbyists, foundations and think tanks—are involved in shaping their institutional context [9]. Institutional strategies include, among others, cultivating and maintaining relationships with decision makers, lobbying to secure resources and political support, providing information during regulatory hearings and using media to politically highlight individual concerns [23,52].

Studies have also shown that actors such as firms contribute to implementing desired policy and regulations by influencing regulatory agencies by taking part in regulatory hearings for implementing new legislations and devoting substantial resources to lobbying. Furthermore, firms are involved in developing regular and personal contact with policy makers and also engage in influencing policy debates through media outlets, advertising and using press conferences to influence decision makers [38]. Further, key actors such as governments are likely to have more influence on regulations, firms would have more influence on technological standards, and NGOs are likely to have more influence on popular discourses around environmental values [15]. Also, institutional entrepreneurship is argued to be an act of experimentation and improvisation, in which success is not always guaranteed and contestations in the process can be expected; it involves adapting to unanticipated developments and improvising actions in order to face ongoing uncertainties [71]. Actors may imagine a certain sequence of action for transforming institutional arrangements but their efforts might be seldom realized due to inherent roadblocks emerging in the process [44].

A central argument is that institutional transformation is accomplished through distributed and uncoordinated actions of dispersed actors with different resources, justification principles, conflicting world views, and abilities to collaborate, compete and contest

with each other for transformation of institutional arrangements [26]. Institutional transformation occurs as a result of efforts of a large number of uncoordinated actors acting in collaboration and contestation with each other and their change efforts accumulating over a period of time. The institutional entrepreneurship literature emphasises 'distributed agency' and collective action, which argues that institutional change is accomplished through distributed and un-coordinated actions of dispersed actors with different resources, justification principles, conflicting world views who collaborate, compete and contest with each other for supporting institutional change [3,48].

According to the collective action perspective, institutional processes are predominantly shaped by actors collectively despite divergent interests and conflicts between them and new institutional arrangements emerge as a result of political negotiation between heterogeneous actors. The literature also emphasizes the role of conflicts between proponents and opponents of change and new institutional arrangements emerging as a result of conflicts between different groups of actors with diverse levels of power [19,49]. A variety of actors with different levels of power are involved in co-operating and competing with each other while transforming institutional arrangements. Thus, changing institutional contexts includes both collective and contested actions [62]. Furthermore, a proposed solution that is beneficial and novel for one group of actors might have negative consequences for another group of actors. Therefore transitions towards sustainability are also likely to be full of conflicts and contestations between different actors with no win-win solutions [44,128].

The notion of institutional work aims at the role of individual and collective actors in creating, maintaining and disrupting institutional arrangements, and focuses on the manner in which distributed and un-coordinated actors shape institutional context [73]. Studying institutional work implies paying close empirical attention to the unfolding efforts of diverse actors for transforming institutional arrangements while acting in conflict with each other. Accordingly, the notion of institutional work highlights the fact that actors may not be always in a position to challenge institutional arrangements through clear strategic actions but initiate change through a trial and error learning process and creative improvisations [145]. This conceptualization is effective in overcoming the simplistic 'heroic' notion of individual entrepreneurial actors changing entire institutional systems, because it traces complex relationships between meso-level institutions and networks on the one hand and micro-level strategies from actors on the other hand [90,61,142].

Moreover, studies have also emphasized the need for exploring different strategies used by actors in different institutional contexts as institutional entrepreneurship is shaped by the institutional context [9]. Institutional contexts vary on a number of dimensions such as cultural, political, economic and social. The institutional context in developing countries often exhibits lack of a well defined legal system, enforcement of property rights, inconsistent infrastructure, political and economic instability, rent seeking activities, bribery, and corruption [77]. Existing accounts have suggested that institutional context puts limitations on the strategic actions of governments, firms or interest groups, but at the same time enable them to take specific actions. This variation in strategic actions of actors across contexts is due to the differences in nation-specific institutional arrangements [14,35,57]. Furthermore, actors need to adapt their institutional strategies and explore new opportunities based on an assessment of the constraints imposed by the institutional environment [121,58]. Recent research has emphasized studying institutional entrepreneurship in different contexts as insights developed from mature institutional contexts might not be relevant for emerging institutional contexts. In the next section we discuss institutional entrepreneurship in emerging institutional

context and the extent to which emerging institutional contexts offer more opportunities for institutional entrepreneurship.

2.1. Institutional entrepreneurship in emerging institutional contexts

Existing research has largely centred on the study of institutional entrepreneurship in the developed world by emphasizing the role of powerful actors and elites. However, a few studies have looked into institutional dynamics in emerging economies by emphasizing the role of weaker actors who are often marginalized [79,80]. Scholars have identified that emerging economies face institutional voids due to limited enforcement of property rights, limited legal arrangements and less formal market infrastructure. Further, emerging institutional contexts are characterized by rather weakly enforced and less stabilized institutional arrangements compared to mature institutional contexts [80,83]. An important characteristic of emerging institutional contexts is that they lack credible legal frameworks, and economic transactions are governed by informal and personalized exchanges [137,24]. Emerging economies face several barriers, such as ineffectual rule of law, government corruption, exploitation of public resources, limited enforcement of law and inequitable systems of justice [1,18]. In many emerging institutional contexts, the rules of the game and the institutional arrangements are often not stable and continuously changing. Therefore organizations have to develop flexibility in their institutional strategies in response to institutional conditions in emerging contexts [87].

Studies have indicated that in the context of emerging economies actors mobilize change through entrepreneurial bricolage for resolving complex social problems. Institutional constraints in these contexts both force and enable the actors to develop improvisation capabilities, leading actors to develop innovative solutions when seeking opportunities within the constrained institutional environment [27,66,86]. Actors in emerging institutional contexts often use a combination of limited resources, improvisation and pragmatic action to navigate complex institutional environment in these contexts and develop novel solutions for resolving complex social problems [98].

A number of studies have suggested different kind of institutional strategies which actors mobilize in emerging institutional contexts. For instance, Carney et al. [20] describe distinct institutional strategies such as filling institutional voids, retarding institutional innovation and institutional escape despite the uncertainties present in the institutional environment. Tracey and Philips [125] suggest three distinct strategies such as reducing institutional uncertainty, resolving institutional voids and constraints, and adapting solutions from other institutional contexts. Furthermore, Barin-Cruz et al. [7] describe institutional strategies such as bridging global and local partners, securing operations, and mobilizing solidarity for mobilizing change. Additionally, Marquis and Raynard [83] discuss three distinct strategies relevant for emerging institutional conditions, such as relational, infrastructure building, and socio-cultural bridging.

Moreover, institutional entrepreneurship in emerging contexts is likely to involve a different set of skills than those associated with institutional entrepreneurship in mature institutional contexts. This is due to the weakly entrenched nature of institutional arrangements and high degree of institutional uncertainty in emerging institutional contexts [125,83]. A key aspect of institutional entrepreneurship in the emerging institutional contexts is the capacity of actors to build new networks and alliances, legitimate new sets of practices and overcome difficulties associated with institutionalization. Furthermore, the institutional uncertainty and weakly entrenched nature of institutional arrangements

creates more opportunities for institutional entrepreneurship in emerging institutional contexts [125].

Nevertheless, limited empirical evidence currently exists on the extent to which institutional strategies are similar or different in mature and emerging institutional contexts. Our paper responds to the calls for more nuanced approaches for understanding these differences and similarities since identifying them is a starting point for comparative research in organizational research [2,141]. More broadly, understanding similarities and differences between institutional entrepreneurship in different contexts is also crucial for understanding the successful and the less successful institutionalization as well as the enabling conditions for collective institutional entrepreneurship. By drawing together insights from institutional entrepreneurship literature, extensive data consisting of secondary data sources and semi-structured interviews, we answer our research question by empirically illustrating the similarities and differences in institutional strategies in mature and emerging institutional contexts. The next section presents the research method used for the study followed by case descriptions based on the theoretical conceptualization in Section 2.

3. Research method

The exploratory nature of our research calls for a qualitative approach based on a case study, which we developed for the analysis of wind energy development in Finland and India. Qualitative case studies are useful for studying the emergence of innovations and industries, as well as for understanding interactions between organizations and broader historical, political and economic contexts [37]. Qualitative case study approach offers further benefits, such as being open-ended, flexible and allowing the use of rich data for the purposes of exploratory analysis; it also offers distinct advantages in capturing the interpretations, motives and lived experiences of actors [46]. Additionally, qualitative approaches are useful in capturing the richness of diverse institutional contexts through in-depth interviews, field visits and participant observations, when focusing on the way actors adapt their strategies according to constraints in their institutional environment [83].

3.1. Research context

Studies on wind energy development have often focussed on success stories and leading countries, such as Denmark, Germany, U.S.A., and China. In particular, a sizeable body of literature on the successful Danish wind energy transition has demonstrated how inputs from heterogeneous actors such as regulators, producers, test stations, and users contributed to the successful development of wind energy [42,65]. Accounts on wind energy using an institutional entrepreneurship perspective have demonstrated the collective and contested action between government, grass root movements, environmental activists, civil society groups, political groups, states, and innovative firms in influencing wind energy development [65]. A range of existing studies have demonstrated the role of social movements which have significant impact on regulatory and policy decision making process by pressurizing utilities to adopt wind energy through demonstrations, filing lawsuits and litigations, educating and mobilizing customers, lobbying in various countries such as U.S.A. and Germany (e.g. [112,132,128,25]). For instance some studies have also focused on creation of a well-functioning sectoral system of innovation for wind energy in countries such as Denmark, India, Germany, and China (e.g. [70,74,17]). However, comparative investigations between emerging and mature institutional contexts have still received limited attention in the existing literature.

The EU countries, such as Denmark, Germany, Spain, the United Kingdom, Italy and France have significantly increased the share of wind energy in their national energy mixes. Nonetheless, the pace of wind energy development in Finland, measured by per capita wind energy capacity, has been one of the slowest in the EU [101]. In the Asian context, countries such as China and India were able to develop their own wind energy industry through a careful mix of industrial policies and development of indigenous capabilities. In such context, the countries have relied on transnational linkages from leading EU nations in wind energy, such as Germany and Denmark. Over the years, India has transformed into one of the largest investors in wind energy outside developed nations but is still behind China in terms of global competitiveness. Furthermore, development of wind energy in India has been erratic despite India being an early entrant in the global wind industry. Throughout the time, wind energy installations in India have experienced considerable slowdown and greater volatility when compared to China [123].

We selected India and Finland in the first place also due to the ease of data access, which allowed us to collect in-depth qualitative data and arrive at a better understanding of the subtle dynamics around the development of wind energy. Our case study choice is also driven by empirical reasons, namely access to rich primary data, such as first hand interviews with relevant experts, practical realities of data collection and familiarity of researchers with the institutional contexts in the two countries. In terms of deployment, India achieved 21,692 MW of installed wind capacity at the beginning of 2014 [89]. By contrast, Finland, which has been a laggard in the EU context, reached 447 MW of installed wind capacity at the end of 2013 [133]. Fig. 1 depicts wind energy capacity installed in India and Finland relative to the total electricity installed capacity (right vertical axis) and yearly percentage change (left vertical axis). Despite the relatively large difference in percentage shares of wind capacities in the countries' total installed capacities (3% and 8% in Finland and India in 2013, respectively), both countries have experienced similar growth rates.

In our study Finland, with almost one hundred years of independence, a parliamentary democracy, legal authority, and open market system, is classified as a mature institutional context. In Finland, energy supply has been dominated by nuclear, hydropower, coal, natural gas and biomass energy. Especially bioenergy has been on the political agenda since the 1970s and has received considerable political support with the aim of increasing energy self-sufficiency and promoting security of supply. The framing of bioenergy has been based on centralised, large-scale energy production from the by-products of the incumbent forest industry [88,101]. Finland has many energy intensive industries, such as paper and pulp, metal, and chemical industries which have contributed to high per capita energy use. Finland also has high-energy consumption per capita compared to other European countries due to the cold climate, structure of Finnish energy industries as well as high standards of living [78,6,104]. Furthermore, the share of wind energy in the total electricity consumption in Finland is limited and the growth of new wind energy installations has been lagging behind other EU nations [129,5]. Finland is also an interesting example of a country where, despite of many technological advances, the deployment of new renewable electricity technologies has been delayed. Furthermore, it is among the smallest wind energy producers in the EU despite its favourable geographical conditions for wind energy production, such as low population density, large land size, and long coast lines [51].

India is classified as an emerging context for its ongoing political, social and economic transformations and developing energy infrastructure. India's energy sector is facing several challenges, such as misbalance between demand and supply, persistent energy shortages, weak financial position of energy utilities, high-transmission

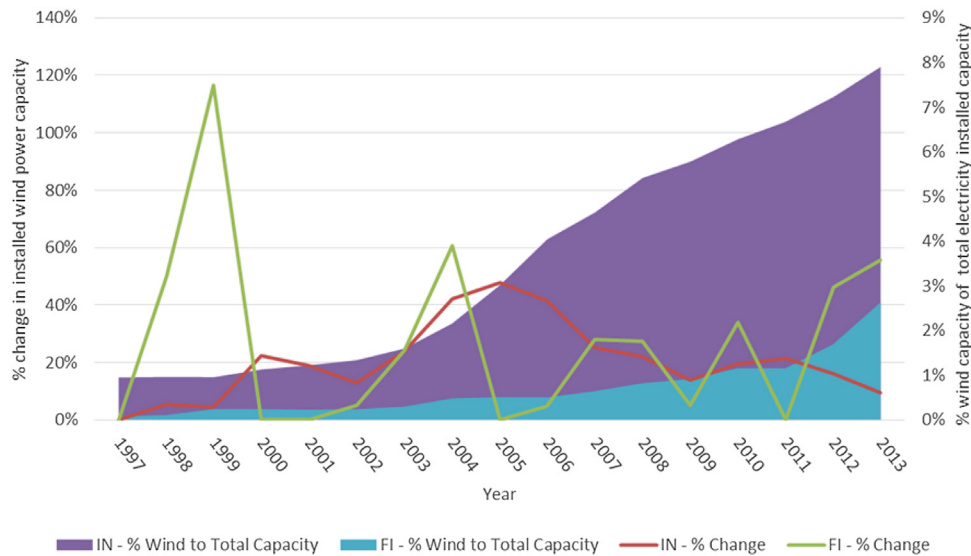


Fig. 1. Wind energy capacity in India and Finland.

and distribution losses and poor institutional infrastructure [40]. Wind energy recently received a political support through the National Wind Mission, which aims at meeting India's energy security, climate change and industrialization concerns [21,69]. Despite promising developments, the share of renewable energy is still low in the overall energy mix of India (see Fig. 1). Despite the recent introduction of the National Wind Energy Mission in India, it is still difficult to expect long-term policy and regulatory support for wind energy in the country.

Previous studies have used the World Bank's Gross National Income (GNI) per capita (per year) and the United Nations Development Program's (UNDP) human development index (HDI) to classify countries into emerging (developing) and mature (developed and industrialized) [30]. We utilize the World Bank data and compare Finland and India, as well as the regions to which they belong to, along five categories relevant for this study—population, economy, business, and energy (see Table 1).

From geographical perspective, India belongs to South Asia region, which includes Afghanistan, Pakistan, Bangladesh, Maldives, Sri Lanka, Bhutan and Nepal. India's 1.3 billion population takes a major share of the region's total population. Finland belongs to the region of Europe & Central Asia, which includes countries such as Turkey, Russian Federation, Serbia, and the EU member states. According to income levels, India is a lower middle income country (2014 GNI per capita \$12,735 or less) whereas Finland is a high income OECD country (2014 GNI per capita \$12,736 or more). Because Europe & Central Asia region includes both developing and developed countries, we deem more representative to compare Finland with the rest of high income OECD countries, and India with countries of South Asia, where the economic variations are not so pronounced.

In slight contrast to the rest of high income OECD countries, Finland has in recent years experienced stagnating or shrinking economic growth (negative GDP per capita growth), and foreign capital outflow (negative foreign direct investment). Indian (South Asian) economy has been steadily growing and the business environment has been improving (e.g. reducing time and costs of starting a business). Finland is a service and trade oriented country whereas Indian economy has a pronounced agriculture sector. The development gap between India (South Asia) and Finland (high income OECD) is demonstrated on energy intensity, such as CO₂ emissions and energy use (kg of oil equivalent per capita). The former country (group) is approximately ten times less energy

intensive than the latter. With respect to energy sources in electricity production, India relies more heavily on fossil fuels than Finland, which benefits from favourable hydro power conditions.

From energy generation perspective, Finland and India are interesting cases because generation is dominated by fossil fuels, hydro, and nuclear energy, and wind energy plays only a marginal role the overall energy mix. In both countries, wind energy development is largely driven by energy security concerns and long-term targets, namely energy independence, job creation and long-term economic benefits. At the same time, the national energy strategies have often been dominated by an economic rationale for low-cost fuels such as coal and nuclear energy. The main narratives for supporting wind energy in the countries relate to long-term climate change targets, energy security, low energy prices, job creation, domestic industry growth, competitiveness, export potential, equitable energy access, and justified use of public resources. Particularly wind energy development in these countries has been driven by ever increasing energy consumption, energy independence and security, and long term economic benefits.

3.2. Data sources

The study draws from both primary and secondary data sources. The secondary data includes policy and strategy documents (available from the websites of relevant government agencies), regulatory and policy documents, journal articles, presentations (for example, discussions by experts during conferences and workshops), conference proceedings, reports from industry associations, newspaper articles, media reports, industry reports, company websites, consulting publications and trade magazines. The newspaper articles served as an important source for complementing insights from interviews and other secondary data sources. The availability of publicly accessible data made it possible to gather a large quantity of data on wind energy in both cases. We engaged in a snowball procedure by finding new data sources until we reached a stage where we had no new information and possessed sufficient data to develop case summaries.

The data collection period was focused on 2010–2014, emphasizing contemporary developments in the field rather than historical issues. For this study, we adopted a flexible approach for conducting qualitative research. First, we echo Barley's (2010: 779) suggestion that familiarity of researchers with the institutional context is an advantage. We had native researchers from

Table 1
Comparative development indicators for India (South Asia) and Finland (OECD).

Indicator		India	South Asia	Finland	High income OECD
Population	Population, total in 2014 (millions)	1295,3	1721,0	5,5	1070,0
	Urban population (% of total) in 2014	32	33	84	81
	Rural population (% of total population) in 2014	68	67	16	19
	Population density (people per sq. km of land area) in 2014	436	361	18	34
	Life expectancy at birth, total (years) in 2013	66	67	81	81
Economy	School enrolment, tertiary (% gross) in 2013	25	21	92	76
	GDP per capita (current US\$) in 2014	1596	1515	49,541	43,619
	GDP per capita growth (annual%) in 2014	6	6	−1	1
	Adjusted net national income per capita (current US\$) in 2014	1249	1219	39,875	36,008
	Inflation, GDP deflator (annual %) in 2014	4	5	1	1
	Trade (% of GDP) in 2014	50	48	75	55
	Foreign direct investment, net inflows (% of GDP) in 2013	2	2	−2	2
	Internet users (per 100 people) in 2014	18	17	92	78
Business	Time required to start a business (days) in 2014	28	16	14	9
	Cost of business start-up procedures (% of GNI per capita) in 2014	12	15	1	4
	Agriculture, value added (% of GDP) in 2014	17	18	3	2
	Patent applications, residents & non-residents in 2013 (% of population)	0,003	0,003	0,032	0,124
Energy	Services, etc., value added (% of GDP) in 2014	53	53	71	75
	Energy use (kg of oil equivalent per capita) in 2012	624	565	6151	4668
	CO ₂ Emissions (metric tons per capita) in 2011	2	1	10	11
	Electric power transmission and distribution losses (% of output) in 2012	17	17	4	6
	Electricity production from oil, gas and coal sources (% of total) in 2012	81	80	21	60
	Electricity production from renewable sources, excluding hydroelectric (% of total) in 2012	4	4	17	8
	Electricity production from nuclear sources (% of total) in 2012	3	3	33	19
	Electricity production from hydroelectric sources (% of total) in 2012	11	13	24	13
Time required to get electricity (days) in 2014	105	146	42	82	

Source: The World Bank.

the respective countries carrying out field research in Finland and India; this reduced problems such as language barriers and difficulties in conducting research in an unfamiliar institutional context. Being native to the contexts helped us in using personal and professional networks to obtain access to experts for interviews, as well as in better understanding the national institutional context. This also helped in contextualizing our research, as we were able to capture wind energy development by paying attention to unique institutional conditions both in Finland and India. The data collection was done independently in Finland and India by the first two authors, with the aim of looking at the institutionalization of wind energy.

Our primary data source constitutes of 26 semi-structured interviews with influential wind energy stakeholders in India and Finland. Interviews were critical for gaining a comprehensive understanding of the motives that guided key actors while influencing institutional arrangements and creating support for wind energy. An important aspect of the interviews included interviewing influential experts who were well informed about wind energy development in Finland and India. The selected interviewees were engaged in wind energy development and represented regulatory agencies, industry associations, policy makers, wind energy firms, policy think tanks, government bodies and academic experts, along with representatives of other organizations and civil society members. The interviewees were at senior level in their respective organizations and had considerable experience in wind energy sector in Finland and India. The dataset includes 26 interviewees with 4 interviewees representing wind energy firms, 3 representing civil society groups, 3 representing universities and academic research institutions, 2 representing wind industry associations, 2 representing regulatory agencies and other interviewees belonging to other classifications. New participants for interviews were identified using the 'snowball' technique in order to meet additional experts. Since Finland is relatively behind the most-developed nations in the deployment of wind energy, our study presents relatively fewer primary interviews from Finland. With continuous deployment and experience with wind energy in Finland, further studies will benefit from an increased number of expert interviews,

which may provide further first-hand evidence and greater in-depth analysis. Furthermore, even though all the interviewees with different levels of expertise on wind energy development (e.g. policy design, regulation, lobbying and advocacy, manufacturing and decision making) gave a very rich overview of wind energy development in the two countries, there were limitations in terms of interviewing additional experts, such as suppliers of energy equipment in wind energy value chain, financing agencies, ordinary citizens and farmers. However, whenever possible we attempted to fill the gaps due to the lack of firsthand accounts from other important actors and by consulting the secondary data sources.

Our goal was to uncover the ways in which actors use distinct strategies for supporting innovations by developing new practices, emphasizing new values, shaping regulatory frameworks and markets in negotiation with other actors, in order to support sustainability transitions [43]. An interview protocol was prepared for conducting the interviews in a way that allowed flexibility for conducting interviews. The loosely structured interview guide helped in gathering insights from the interviewees and ensure that important themes were captured in detail. The open-ended interviews lasted between 30 and 60 min, depending on the range of issues discussed during the interview.

The interviews focused on understanding the concrete activities in which the actors were engaged in with respect to wind energy development, such as barriers faced and ways to overcome them, or taking risks and mobilizing political support for their causes. Overall, our expert interviews provided an informed perspective on the institutional constraints in the two countries, as well as on the actions taken by them to challenge the constraints in the wind energy sector. The use of semi-structured interviews allowed the use of multiple sources of evidence and was useful in getting a broader perspective on wind energy development in the two nations.

Most interviewees could provide a 'helicopter-view' of the field, due to their significant experience in policy and regulatory processes with respect to wind energy in Finland and India. The majority of interviews were recorded and summarized for case analysis. Due to the confidentiality issues, some interviews were

Table 2
Overview of interviewees from Finland and India.

Interview	Type of organization	Position	Country
1	Legal firm—wind energy sector	Senior attorney	FI
2	University	Professor	FI
3	Transmission system operator	Manager	FI
4	Environmental organization	Energy campaigner	FI
5	Wind farm developer	Chief executive officer	FI
6	Wind energy firm	Managing director	FI
7	Wind energy firm	Project manager	FI
8	Wind energy firm	Managing director	FI
9	Wind energy association (Indian wind power association)	Secretary general	IN
10	Wind energy association (Indian wind turbine manufacturer's association)	Secretary general	IN
11	Wind energy firm	General manager	IN
12	Wind energy research institute	Director	IN
13	Advocacy organization	Director	IN
14	Consultancy firm—energy & infrastructure	Director	IN
15	Civil society organization	Group coordinator	IN
16	Civil society organization	Convener	IN
17	Civil society organization	Trustee	IN
18	University	Professor	IN
19	State electricity regulatory commission	Engineering director	IN
20	Renewable energy institution	Director	IN
21	State energy coordination cell	Member secretary	IN
22	State renewable energy nodal agency (Andhra Pradesh)	Deputy general manager	IN
23	State renewable energy agency (Tamil Nadu)	Deputy general manager	IN
24	State electricity transmission corporation	Chief engineer	IN
25	State electricity distribution corporation	Senior engineer	IN
26	Business newspaper—renewable energy	Chief of bureau	IN

not recorded. An essential limitation was related to the insights from the interviews providing only a snapshot of wind energy development in Finland and India over a period of time when the interviews were conducted. During the course of our research, we took a number of measures to ensure that we were, as far as possible, obtaining reliable data to inform our research question. Table 2 provides an overview of the interviewees.

By drawing on extensive data consisting of secondary data sources and semi-structured interviews, we empirically illustrate the similarities and differences in institutional strategies in mature and emerging institutional contexts, and answer our key research question. Perkmann and Spicer [96] distinguished between political, technical and cultural work aimed at influencing regulative, cognitive and normative dimensions of institutional arrangements.

Political work refers to the efforts of various actors to influence the development of rules, property rights and regulations, and is directed at influencing the development of rules and regulations. Political work is aimed at regulative dimension of institutional arrangements. Political work includes activities such as advocating new practices, developing new alliances and coalitions, aligning other actors towards common interests, and developing new rules and regulations [96]. Political work is generally performed by actors such as politicians, governmental organizations, regulatory agencies, professional agencies, industry associations, trade unions, lobbyists, unions and advocacy organizations.

Technical work involves creation and development of new institutional forms, crafting new categorizations, creating linkages with existing institutionalized practices, and educating actors. Technical work involves development of new mental models, standards, benchmarking principles, and shared world views [95,96]. Technical work is aimed at cognitive cultural dimension of institutional arrangements. Technical work is generally performed by actors with technocratic competences, such as government departments, professional organizations, consultancy organizations, firms, research institutions, universities, standards organizations, independent think tanks, scientists, consultants, and professional associations [96].

Cultural work focuses on institutional diffusion and the creation of legitimacy by framing the new institutional arrangement in ways

that appeal to wider audiences and wider cultural values. Cultural work is aimed at normative dimension of institutional arrangements. Cultural work also refers to symbolic actions undertaken to ensure that emerging institutional arrangements fit with the broader social beliefs [95,96]. Cultural work is performed by actors such as media, public relation experts, advertising agencies, social movements, consumer groups, civil society, professional associations, public intellectuals and ordinary citizens [96].

We used a classification scheme to structure and understand the political, technical and cultural work performed by different interviewees (see Table 3). For example, the advocacy and lobbying work by industry associations for favourable policies was coded as political work; the actions of civil society groups, such as highlighting social and aesthetic issues or resisting profit motives of wind energy firms, were considered cultural work. We were sensitive to the fact that most actors' initiatives did not result in rapid institutional changes, as such changes often take considerable time. Hence, we distinguished impactful actions in transforming institutional arrangements from failed efforts. This conceptualization also highlights the multiple actions of different actors involved in building political networks, underscores the necessary technical capabilities, and culturally frames innovations in different institutional contexts.

3.3. Data analysis

The first step in our data analysis involved developing narratives of wind energy development in each country for the period 2010–2014. We gathered our field notes, summarized interviews and encapsulated secondary data in order to develop a deeper understanding of wind energy development in Finland and India. We also complemented these accounts with quotes from expert interviewees in order to enrich our data with personal stories and insights. In the second step, we used content analysis to map instances of political, technical and cultural work, which allowed us to identify patterns within the data [34,148]. Building upon the interpretive research tradition, we gave emphasis to interviewees' views, opinions and experiences in order to comprehend the institutional work performed by them. We were sensitive to the

Table 3
Classification according to the literature and empirical illustration.

	Concept definition ^a	Empirical examples	Illustrative quotes
Political work	Advocacy and lobbying; formal petitioning and negotiation with influential actors; monitoring of compliance and legislation; networking; drafting new legislations and administrative guidelines; enforcement through regulation	Setting guidelines for grid connectivity and wind energy scheduling; making amendments in the regulations for supporting wind energy	<i>“Such a small-scale energy production does not fit into the picture of some people who are making decisions.”</i> (Academic, Finland)
Technical work	Development of plans and publications; harmonization of standards, classification systems and rules; research, training and educational programs; provision of expertise for drafting legislation (i.e. academics, expert groups, consultants); exchange of knowledge through discussion in platforms (e.g. industry conferences, public forums, site visits, joint working groups)	Advocacy via techno-economic studies; focus on indigenous R&D and improvement of industry competitiveness; wind energy assessments; design, testing and wind turbine certifications; grid integration of wind energy	<i>“The grid was not planned in such a manner. The proper planning of the grid has to take place. They have to concentrate managerially and technically to solve the grid-related problems.”</i> (Academic, India)
Cultural work	Mobilization of public discourse and rhetoric (e.g. such as discourse around climate change, energy security, energy poverty, green jobs, green industry creation, environmental benefits); scenario and vision building; propagation of professional norms and ideologies	Raising concerns about impacts on local livelihood and flora and fauna; dissemination of information for support or opposition of wind energy; raising concerns against information asymmetry and rent-seeking practices	<i>“There is some sort of suspicion from the consumers. It is not a transparent process. There is no transparent way land is allocated to wind farm developers. There is no transparency in capital costs [...]. Due to lack of transparency there are doubts over the ways in which wind energy is being promoted.”</i> (Civil society representative, India)

^a Based on Refs. [72,96,108].

experiences of actors, as they were engaged in their actions for the transformation of dominant institutional arrangements [73]. During the data analysis, we were also sensitive to conflicts between the different actors, such as power dynamics between regulatory agencies, firms and civil society groups.

Existing accounts have suggested that a range of actors pursue political, technical and cultural work for institutionalizing novel innovations with the possibility of multiple actors engaging in similar work. However, certain actors possess specific skills and participate within their particular domains and perform specific kinds of institutional work. While a specific actor might engage in political, technical and cultural work simultaneously, we limit our analysis to few actors engaged in specific forms of institutional work as this would broaden the scope of analysis. For example, if an industry association filed a petition before the regulatory agencies, we considered it as case of political work. The advocacy and lobbying work of industry associations for favourable policies and regulations was similarly classified as political work. The actions of civil society groups in highlighting social and aesthetic issues and in resisting profit motives of wind energy firms were classified as cultural work. In our case narrative, we did not focus on highlighting political, technical and cultural work performed by a particular actor as there are several actors which were involved in performing political, technical and cultural work.

We looked for alternative interpretations of data whenever required, and our analysis involved iterating between theoretical concepts and data for highlighting our contribution [126]. We then compared and contrasted the narratives on wind energy development in Finland and India. To compare the cases, we first identified differences in the two countries by focusing on actions of different actors being constrained and enabled by the dominant institutional arrangements in the two contexts [134]. However, we did not explicitly examine the form of institutional work (political, technical or cultural) that is more prevalent or influential in both the institutional contexts. To compare the two cases, we engaged in data reanalysis, focusing on the differences between political, technical and cultural work in the two contexts. We then jointly

compared and crosschecked the interpretations of the differences in institutional strategies. Throughout the data analysis, we took measures to ensure the trustworthiness of our research procedures, by jointly reviewing accounts from Finland as well as India multiple times. Differences in interpretations were resolved through author discussions and data revisits until the authors reached common ground and ambiguities were clarified.

4. Findings

This section synthesizes our main findings by discussing political, technical and cultural work in Finland and India. The purpose of this section is not to provide an exhaustive description of wind energy development in Finland and India, for which limited space is available and which have been published elsewhere [114,62]. Instead, we specifically focus on the identification of cultural, political and technical work in each country.

4.1. Wind energy in Finland

4.1.1. Political work in Finland

From a political work perspective, until the early 1990s, Finland's energy system has historically been under the control of state monopolies. In the Finnish energy sector few core group of actors have had considerable political support in terms of influencing energy decision making. The core group of actors such as Ministry of Employment and the Economy, Ministry of Finance and Ministry of Environment influencing Finnish energy policy making is quite small with strong informal relationships between them. This has also resulted in a situation where implementation of renewable energy sources will remain in hands of influential actors with limited opportunities for new actors to shape energy policy making [53,107,111]. In Finland, the historical intertwining of state and energy-intensive industries (mining, chemicals, pulp and paper) via a quasi-state ownership has tied together the interests of energy incumbents and political elites. After market liberalization and unbundling, an important concern has been to keep

energy prices low, in order to protect the interests of the industry and taxpayers in Finland [67,111]. Energy and economic policies have been adjusted to serve the interests of the industry, mainly to ensure that industry had sufficient supply of energy at a reasonable price [107]. In Finland an important concern has been related to openness of the policy decision making process as although the policy process has been formally open in terms of making suggestions. Final decision making on major energy issues has often been influenced through closed negotiations between few powerful elite actors [102]. Despite the EU's political influence and power, Finnish energy policy has been driven by national ministries, large energy producing companies, the Confederation of Finnish Industries (EK) and the Technical Research Centre of Finland (VTT) [107,88]. This was highlighted by one of the expert interviewees:

“The energy policy in Finland has been such that we are investing in very big power plants. And somehow political decision makers seem not to bring renewable energy in Finland [. . .]. And the new players are, for example, the wind farm owners and investors, who are disturbing the existing market. Of course they are, [. . .]. It is said that Finland is not a corrupted country, but the corruption [. . .] style is different. It is more polite, it is somehow polished, and it looks like very legal, like brothers are making decisions together. In Finland it is called hyvä veli—järjestelmä—a good brotherhood system. Maybe something like that is also involved, it is in every country, and also in Finland. And somehow the counter force against this energy cluster is missing in Finland. Somebody who would change the game.” (Academic, Finland)

The Ministry of Environment has also taken a central role in setting up a working group of experts that addressed one of the largest current obstacles in wind energy institutionalization in Finland: wind farm noise regulation (Interview 6). The members of the working group included individuals from ministries (Environment; Economy and Employment; Finance; Social Affairs; and Health) and associations (the Association of Finnish Local and Regional Authorities; Finnish Energy Industries (ET); the Finnish Association for Nature Conservation (FANC); and the Finnish Wind Power Association (TVKY)). Additional experts came from the Finnish Institute of Occupational Health, VTT (Technical Research Centre of Finland), the financial group Taaleritehdas and the consulting companies Pöyry and Aula Research. Despite the working group's propositions, the lack of cooperation among regional governments, municipalities and ministries has resulted in slow wind energy development in Finland (Interview 1).

Particular for the Finnish political work is the so-called 'hyvä veli –järjestelmä': a form of cronyism where influential decisions on national energy strategies are formed without taking inputs from newcomers such as wind farm developers (Interview 2). Even though general industry associations in Finland have been active in lobbying for renewable energy, they have become weaker due to heterogeneity of interests, and there are very few issues where all associations have acted collectively [107]. A peculiar case in Finland has been limited independent renewable energy lobbying groups for wind energy in Finland; all boards of wind power associations have members from the nuclear energy and combined heat and power (CHP) industries (Interview 1). Members of the wind energy associations Finnish–Swedish Wind Energy Association (Vindkraft-förening r.f.) and Wind Energy Association (Tuulivoimayhdistys) in Finland have taken several initiatives for mobilizing support for consumer oriented wind energy generation by advocating to Ministry of Employment and Economy and presenting proposal for new legislations. Their arguments have been centred on increasing renewable energy generation, supporting wind technology development and improving employment opportunities in the wind energy sector. Furthermore the members of wind energy associ-

ations have had limited influence on wind energy policy making as they have been invited to comment on reports and suggest new proposals in public hearings but given limited opportunities for participating in actual decision making process [102].

4.1.2. Technical work in Finland

From a technical work perspective, the Finnish government has actively supported the growth of the domestic wind turbine industry in order to generate export income and jobs. The support is often channelled for research and development of specialized wind turbine components, in order to raise Finland's competitive advantage in international markets [125,122]. Wind energy has been also seen as a potential industry for export market in Finland despite the low share of wind energy in the overall energy mix [130]. Technological development has been very important for the growth of wind energy in Finland, with R&D focusing on arctic innovations (such as design blade technology to fit cold, icing and sea conditions in the Arctic region) and important components such as wind power gears, frequency convertors, inverters, generators, gearboxes, models of generators, blade materials, steel plates for towers, and large castings [144,54,64,55]. For instance, one of the existing challenges for wind turbines is blade freezing in Finland. Due to specific geographical conditions such as cold weather in Finland, research and development has focused on developing blade heating system and foundation structures for wind turbines operating under icy and cold conditions [5]. Moreover, technological progress is to be supported by government programs for new technologies that are suitable for Baltic–Arctic conditions (Interview 7).

The transmission system operator (TSO) in Finland is responsible for advising municipalities in creating wind farm zones, developing transmission infrastructure for wind power, ensuring the overall functioning of the electricity market, developing grid codes and setting the grid access fees [8]. In Finland, regions with high wind potential have lacked access to grids due to low population density, resulting in limited chances of investment recovery for the grid operators. Furthermore, connection procedures to the grid depend very much on informal negotiations and talks between grid and plant operators, which also pose challenges for grid operators ([124]; Interview 2). Furthermore municipal companies in Finland acting as network operators in Finland have often seen distributed energy generation as a threat to the existing energy system, threat to the grid stability and considered it is a loss making proposition due to their inability to cover costs of distribution network [104].

Consultants have been influential in policy circles due to the long-term connections with the government, for whom they often produce information according to clients' interests [85]. Pöyry and Ramboll have two important wind energy consultancies in Finland offering different services and project development for wind energy projects [56]. For instance, influential consultant Lauri Tarasti was hired by the Ministry of Employment and the Economy (TEM) in 2012 to assess the opportunities, challenges and barriers in the Finnish wind sector.

4.1.3. Cultural work in Finland

With respect to cultural work, the Finnish Association for Nature Conservation (FANC) established a certification system for wind energy [16]. International environmental organizations and social movements such as Greenpeace Nordic, Friends of the Earth Finland, WWF (World Wide Fund for Nature) Finland, The Finnish Association for Nature Conservation (SLL), the Finnish Nature League, and the Finnish Society for Nature and Environment (NoM) have actively supported renewable energy [146]. The same association was also involved in granting the eco-label 'Norppa' for electricity produced from renewable energy sources; it also suggested excluding travel, leisure and nesting areas during spatial planning for wind energy [36]. The organization Totuus

tuulivoimasta ('Truth about wind power') has often criticized the teulivoimasta practices for wind turbine sites, the placement of turbines and aesthetic issues due to a negative impact on the natural landscape [131]. The World Wide Fund for Nature (WWF) raised concerns on the effects of offshore wind energy and its eventual impact on the natural flora and fauna [68].

Members of environmental associations have been considered for decision making but their actual impact on energy policy decision making has been marginal. The role of the Finnish environmental protection associations has also been limited when compared to similar organizations in Scandinavia, Great Britain, the Netherlands, and Germany [107]. There have been several discussions in Finland about negative environmental impact of wind turbines. For instance wind turbines have been considered to be interfering with development of airports and military aviation, tourism industry and ordinary citizens opposing wind turbines as they affect their day to day habitat. Furthermore enhancing local acceptance, developing efficient local planning systems and reducing complicated bureaucratic procedures with respect to environmental impact assessment of wind turbines have been considered important issues [60,84]. Some of these concerns were illustrated by one of the interviewees:

"People don't want the windmills very near their summer cottages. It is a visual change and I think they are afraid of the noise. [...] the issue is that people believe that the effects are going to be much stronger than they in reality are. This is a new phenomenon in Finland and it's quite unfamiliar, there are not many people in Finland who have seen those working. I think it is quite surprising how people oppose those. Even if you make studies about the projects, and show how the noise pollution is going to be, they don't believe those results."(Attorney, Finland)

Issues such as visual impact and impact on wildlife (such as the collision risk for birds and bats) have become prominent in Finland while planning the siting of wind turbines [94]. Unlike Germany and Denmark, one important reason for this lower local acceptance has been the lack of incentives for local ownership in Finland, and a lack of institutionalized mechanisms for involving local people from the early stages of the planning process. Local involvement often leads to benefits in the form of shorter handling times and speedier administrative processes [47].

Local communities have become more accustomed to the use of their rights of appeal during the public consultations of wind farm projects (that is, of commenting on approved zone plans) (Interview 6; Interview 8). However, unlike the situation in other Scandinavian countries, the impact of Finnish civil society groups on energy policy making is marginal. Despite the frequent public hearings, consultations and meetings, the public's views have not been highly influential (Interview 4). This issue is highlighted by one of the expert interviewees:

"We are often invited to the governmental hearings and writing statements. And we would like to increase our own lobby work. Make it a little bit more stable, not appearing only when some decision is coming up."(Energy activist, Finland)

Landscape and aesthetic issues have been given adequate importance in Finland and considered significant environmental drawback of wind energy. Frequent conflicts have occurred due to reduced tourism opportunities and real estate value. Furthermore, limited availability of land and suitable areas for construction of wind farms raised new problems [131]. Likewise, there have been conflicts in the coastal region of Finland due to presence of vacation homes, holiday residences, and summer cabins whose owners have objected to presence of turbines in their vicinity [124].

Consumers and civic associations have faced considerable difficulties in getting access to elite Finnish policy circles. Although these groups have been consulted for important decisions on wind energy debates, their influence in decision making has often matched the consultation process. These organizations have had limited influence in changing policy and regulatory decisions in Finland and often have adjusted their advocacy strategies to the Finnish consensual political culture [106,107]. Ordinary citizens and consumer organizations in Finland have been more interested in prices of electricity than environmental issues or renewable energy promotion. Though these groups are invited to present their views in public hearings, meetings, and consultations, rarely have opinions of the civil and environmental organizations been taken seriously for energy policy decision making process [131,110]. Some of the major reasons behind reluctant public attitude towards wind energy include lack of demonstration and experience towards wind power, ambiguous stance of the public administration, and variations in individual preferences (Interview 7). Furthermore there have been limited strategies to enhance public support for wind energy or increase consumer owned wind mill cooperatives. Consumers have also been excluded from ownership of large wind mill parks in Finland thereby limiting influence from consumers [102].

4.2. Wind energy in India

4.2.1. Political work in India

From the political work perspective, the Ministry of New and Renewable Energy (MNRE) and the Indian Renewable Energy and Development Agency (IREDA) have played an important role in shaping policy debates and legitimizing wind energy in India [12]. While federal policies and regulations by the national government shape the broader renewable agenda in India, state-level policies and regulations are very essential for on-ground implementation of renewable energy in India. National level government agencies have often faced co-ordination issues with the State Nodal Agencies (SNAs), mainly in the following: channeling central government subsidies to Indian states, initiating suitable policies at the state level, executing demonstration projects, carrying out technical and resource assessments and providing assistance to project developers (Interview 22, Interview 23). In India, the private sector mobilized financial resources for wind energy development with small scale investors such as textile mills and investors with high tax liabilities investing in wind energy [123]. The Ministry of New and Renewable Energy has lacked the political, administrative and financial authority to make essential decisions in shaping the future of renewable energy in India. The recommendations of MNRE are not binding to the Ministry of Power (MOP), and it is not mandated to include them in decision-making processes [93,97].

The MNES (subsequently renamed again as the Ministry of New and Renewable Energy, MNRE) created a niche for renewables by working with the Ministry of Power for mainstreaming wind energy and mandating that state governments take a greater role in the promotion of renewable energy technologies [21]. Until 2014, the dominant view within the Government of India was that the wind energy sector had become mature and did not need additional policy and regulatory support. This was remarked by some expert interviewees, as seen below:

"The future development of wind energy in India requires political will and strong legislative backing." (Wind energy advocate, India)

"What the planners and thinkers think [...] 'you know that wind industry is all useless [...] that these fellows produce power when

we do not want; when we want they are not able to produce power.” (Wind energy association representative, India)

However, this perception has recently changed, and the government launched the National Wind Energy Mission for the long-term development of wind energy in India, with the involvement of all important stakeholders [40].

Regulatory agencies in India, such as the Central Electricity Regulatory Commission (CERC), the State Electricity Regulatory Commissions (SERC's), and the Forum of Regulators (FOR) have tried to balance the conflicting interests of consumers, civil society groups, wind turbine manufacturers, energy utilities and other concerned groups by conducting public hearings (Interview 19; [28]). Financially bankrupt energy utilities have been reluctant in investing in transmission and evacuation infrastructure for wind energy, because they have often considered wind energy as unreliable due to its inherent intermittency, or at best, as a backup energy source. Due to their poor financial status, utilities have caused significant financial losses to wind developers by not meeting payment obligations imposed by the state electricity regulatory commission (Interview 24; Interview 25; [63]).

In particular, the state energy utilities have avoided meeting their Renewable Purchase Obligations (RPO) and the terms of Power Purchase Agreements (PPA) by using their financial burden as a justification. Some interviewees argued that the real problem is not the financial situation of the state energy utilities, but the political interference they suffer from regional political parties, as they have often resorted to populist practices such as vast subsidies for free electricity and the distribution of unmetered agricultural pump sets to farmers during elections (Interview 18; Interview 22; [21]). In a number of cases, the decisions of the regulatory agencies have been challenged by state energy utilities by going to State High Court and to the Appellate Tribunal for Electricity, based in New Delhi. According to some interviewees, the judiciary as such has also played an important role in resolving disputes between the wind energy stakeholders (Interview, 18; Interview 19).

In the Indian context, lobbying has a negative connotation and does not have a legal status like in other countries. Nevertheless, actors adopt various advocacy measures for shaping decision-making processes [92]. Wind energy firms and industry associations have generally used five major forms of advocacy: (1) utilizing formal procedures (meeting concerned ministers and policy makers, requesting supportive policies and regulations by writing letters and appeals); (2) presenting detailed clarifications and amendments in existing regulations and policies during public hearings organized by regulatory agencies; (3) discussing critical policy and regulatory issues in public forums; (4) engaging in debates and discussions in roundtable forums and working groups; and 5) raising awareness through media. On the one hand, large wind energy firms in India (such as Suzlon, Vestas India, Gamesa India and Enercon) have appointed dedicated regulatory and policy officers, who keep track of various policies and regulations while advocating for favorable regulations on wind energy, although their efforts are limited to business interests of individual firms. On the other hand, smaller wind energy firms have relied on industry associations for advocating and raising their concerns (Interview 9; Interview 10; Interview 11). Media organizations have played an important role in highlighting the concerns of the industry before the government and policy makers (Interview 26).

Over the years, voluntary wind industry associations, such as the Indian Wind Power Association (IWPA), the Indian Wind Turbine Manufacturers Association (IWTMA) and the Indian Wind Energy Association (InWEA)— have become particularly influential regarding the political work in India. These associations are representing the collective interests of the wind industry before policy makers and regulatory agencies (Interview 9; [116]). For

instance, IWTMA put in dedicated efforts to reintroduce two critical incentives withdrawn by the government in 2012: AD (accelerated depreciation) and GBI (generation-based incentive). The association has systematically disseminated concerns in the media and stressed the need for incentives and for a long-term vision of wind energy in India (Interview 10). To put momentum behind these efforts, in August of 2012 the three industry associations formed the Indian Wind Energy Alliance to collectively represent the interests of the Indian wind industry before policy makers during the MNRE roundtable on wind energy. However, the Wind Independent Power Producer's Association (WIPPA), which was formed in 2013, actively opposed the reintroduction of these support mechanisms and instead argued for an alternative—competitive bidding for wind energy—, also highlighting the need for strictly enforcing renewable purchase obligations (RPOs) [100]. The lack of collective action among the industry associations has caused difficulties to national planners, policy makers and regulatory agencies in understanding the common concerns and major barriers of the wind industry in India.

4.2.2. Technical work in India

With respect to technical work, India has always had a weaker position when compared to other countries. After series of failures, the Indian government developed a national certification program for wind turbines, learning from international testing and certification standards, in which CWET (Centre for Wind Energy Technology) played an instrumental role [76]. There has been a limited focus on new product development and a lack of adequate investments in R&D by the Indian wind turbine manufacturers, who have mostly relied on foreign technology, placing relatively limited focus on indigenous research and development (Interview 12; Interview 20). When wind turbines were first introduced in India with technological assistance from EU, the focus was more on looking at feasibility of the technology and creation of long term domestic capabilities in order to attract potential investors. However despite promising developments and assistance from EU, there has been a lag between India and EU with respect to spending on domestic research and development on wind energy technologies and India still behind global frontier of technological development in wind energy. Furthermore, there has been less emphasis on indigenous R&D suitable for lower wind speeds and higher mean temperature conditions in India [40,123]. Such lack of adequate research and development was highlighted as a concern by one of the expert interviewees:

“As a developing country our R&D input is for namesake [. . .]. We are mostly working on foreign ideas, intellectual property rights [. . .]. Design, drawings come from elsewhere. Main intelligence comes from elsewhere. We only produce using our cheap engineering labor. That has been the status of development in the wind sector.” (Wind energy expert, India)

Although India has distinct advantages in terms of its low manufacturing costs of wind turbines, challenges still exist with respect to wind turbine design capabilities in low wind speed conditions, reliance on technological know-how from European manufacturers, and overreliance on imported wind turbine components. This results in a lack of indigenous capabilities [135,99]. In recent years, consultancy organizations have become influential in advising policy makers, government bodies and regulatory agencies in India. These organizations have played a crucial role in carrying out techno-economic studies, providing a research base for decision making, disseminating knowledge through public platforms and publications, as well as advocating for suitable policies and regulations (Interview 13; Interview 14).

4.2.3. Cultural work in India

With respect to cultural work, the rapid development of wind energy in India also had negative impacts. For instance, the installation of wind turbines affected the livelihood of local people, flora and fauna. Additional concerns include visual and aesthetic impacts on surrounding areas, noise from wind turbines, health impacts, and the marginalization of local residents [39]. Land acquisition for wind energy projects has become a tedious process, which is further escalated by corruption and political influences from rural elites and local political leaders [45]. The procedures for changing the status of land from agriculture, forest and tribal to land that is suitable for wind energy projects have been wearisome, often requiring multiple levels of clearances at different administrative levels, leading to project delays [13].

Wind energy project developers in India have largely benefited from the rapid development of wind energy industry without properly compensating the local communities through meeting the promises of job creation or land revenue. This has sparked tensions and conflicts between wind firms and local communities. The developers have often not paid adequate attention to the consultation process with the local population, village panchayat, and local Gram-Sabha before initiating wind energy projects [13]. Moreover, the wind industry has suggested loosening the environmental norms even further for environmental impact assessments, arguing that the current norms are not compulsory even for the large-scale coal power plants [40]. On the one hand, developers discuss whether villagers have the adequate expertise and capacity to judge the local impacts of wind energy projects [109,119]; on the other hand, developers face unanticipated challenges concerning organized crime, such as the theft of wind turbine components [127].

Not many civil society groups have exclusively supported wind energy in India. Provisions in the Electricity Act of 2003 allowed civil society members to shape energy policies through cooperative engagement with regulatory agencies; such engagement could be in the form of raising concerns in public hearings or presenting concerns in committees. Civil society groups have pointed to information asymmetry between firms and state government during the feed-in tariff determination process, which could lead to the misuse of public subsidies. These issues were highlighted by expert interviewees:

“There is some sort of suspicion from the consumers. It is not a transparent process. There is no transparent way land is allocated to wind farm developers. There is no transparency in capital costs [...]. Due to lack of transparency there are doubts over the ways in which wind energy is being promoted.” (Civil society representative, India)

“At least there needs to be a competitive bidding process for renewable energy projects [...] so that it will bring out the real costs of renewable energy projects. then in several cases we will start observing that those projects are anyway becoming competitive with conventional projects.” (Civil society representative)

Other issues brought to the public attention by civil society groups include inadequate procedures for monitoring actual performance of wind energy projects, lack of consultation of affected rural and tribal communities during project planning, malpractices associated with land acquisition in rural and forest areas, and rent-seeking practices of wind energy firms (Interview 15; Interview 16; [59]). Participatory avenues (such as public hearings, stakeholder forums and working groups) have only created limited opportunities for public input and consultation. This is mainly due to the policy makers' and regulatory agencies' lack of serious consideration towards views of civil society actors [91,103,147]. In the Indian context, the voices of poor have often been marginalized and

instead business elites and urban middle class have dominated the energy debates. An essential concern also has been related to the justice issues occurring while implementing projects on the ground which have also resulted in marginalizing the interests of local people [120]. Even though participatory meetings have been conducted before implementing renewable energy projects on ground, environmental and social impact assessment of projects have not been given adequate importance. For instance, the local population and affected communities have not been adequately involved in decision making and other relevant processes. Also, the concerns of affected groups, such as rural people, pastoralists, nomads, tribes, small farmers, and other socio-culturally marginalized members, such as those belonging to lower caste, have been ignored [138].

5. Differences and similarities between Finland and India

We sought to explain the differences in the ways in which actors have collectively engaged in shaping the institutional context for wind energy development in Finland and India using concepts from the institutional entrepreneurship literature while applying concepts of political, technical, and cultural work as proposed by Perkmann and Spicer [96]. Whereas previous studies have focused on institutional entrepreneurship by emphasizing few actor groups, such as elite and powerful actors, fringe actors or activists in the form of social movements, our study instead looks at actions of multiple and un-coordinated actors engaged in collective institutional entrepreneurship without essentially focussing on a type of actor group [95,96]. Our account demonstrates the constraints experienced by actors in transforming institutional arrangements and highlights the resistance towards collective action. By studying institutionalization of wind energy, our study identifies a number of actors pursuing individual agendas while being in direct conflict with actors in the same or adjacent institutional pillar. Our study tries to link the micro-level action of actors to discuss field-level dynamics through collective and contested action while providing insights into the dynamics of collective institutional entrepreneurship. Table 4 summarizes the main differences and similarities as outlined in Section 4.

With respect to the political work we show that Finland has a rigorous legal framework defining strict measures and monitoring mechanisms, which sometimes even impedes the development of wind energy. Conversely, India lacks thorough enforcement and implementation mechanisms to implement wind energy policies and regulations, due to the government's and regulatory agencies' weak political autonomy. In the emerging institutional context of India, with weakly enforced institutional arrangements and uncertain institutional environment, political work is focused more on improvisation and adaptive strategies to work within – and challenge – the dominant institutional constraints. Another significant difference lies in the lack of independent wind energy lobbying groups in Finland, and the presence of too many lobbying groups in India, which reduces their collective action and finds limited success with respect to creating supportive institutional conditions for wind energy. Both Finland and India have limited opportunities for public hearings and forums, and consequently limited opportunities to hear the voices of non-elites and the common public due to the power imposed by political elites and experts.

Second, there are differences in the technical work in both countries. Finland has dominantly focused on creating a wind technology cluster that supports export opportunities, jobs, national income and national competitiveness. Finland recognizes the strategic importance of the domestic wind industry, whereas India has limited aspirations for global wind energy competitiveness and mostly focuses on a large-scale domestic deployment. India has relied on imported wind energy technologies and lacks indigenous

Table 4
Key differences and similarities in institutional entrepreneurship for wind energy in Finland and India.

	Key similarities	Key differences
Political work	<p>(1) Wind energy development critically dependent on legally autonomous municipalities in Finland, and the state governments in India due to the federal government structure; need for co-ordinated effort between central and regional authorities in both Finland and India</p> <p>(2) Wind energy implementation dependent on complex bureaucratic procedures at the local, regional and national level</p> <p>(3) Wind energy development largely driven by energy security concerns; wind energy is still considered an insignificant contributor to the long term energy needs; long term energy agendas dominated by economic rationale for low cost fossil fuels and nuclear energy</p> <p>(4) Limited use of public hearings and forums to understand voices of non-elites and common public</p> <p>(5) Limited effectiveness of lobbying and advocacy by interest groups due to competing interest and disagreements between them.</p> <p>(6) Wind energy firms and industry associations using multiple approaches to interact with government with more flexibility in engagement in India</p>	<p>(1) Balancing of competing interests such as energy security, chronic energy shortages, climate change, energy access, job creation etc. in India; whereas energy independence, self-sufficiency, and low energy cost for tax payers critical concerns in Finland</p> <p>(2) Wind energy competing for political support with solar energy in India and with bio energy in Finland</p> <p>(3) Critical role of regulatory agencies in India in balancing conflicting interests, such as adequate profits to the wind developers, low financial impact on utilities, low cost to consumers, and justified use of public resources; in contrast to narrower scope of Finnish regulatory agency, which mainly focuses on planning and implementation of production subsidies and market co-ordination rules</p> <p>(4) Regulatory agencies both at central and state level in India facing greater legitimacy risks due to lack of political autonomy and not being equally responsiveness to all stakeholder interests; Finnish energy regulator's independence unquestioned</p> <p>(5) Lack of strict enforcement and implementation of policies and regulation in India due to limited capacity and capabilities of government and implementing agencies; in contrast to resistance from political elites in Finland</p> <p>(6) Lack of independent wind energy lobbying groups in Finland with presence of too many lobbying groups in India resulting in limited influence due to competing interests;</p>
Technical work	<p>(1) Influential role of consultants and advocacy groups in policy and regulatory advice through techno-economic studies in both Finland and India</p> <p>(2) Common technical challenges, such as transmission and grid integration of wind energy, production fluctuations, better knowledge of wind resources, and advancement of wind energy atlas</p>	<p>(1) R&D push for creation of domestic wind turbine industry in Finland with focus on competence building, e.g. wind turbine components, and arctic technologies; in contrast to limited focus on development of indigenous capabilities for R&D in India due to reliance on imported technologies mainly from Europe</p> <p>(2) Focus on wind turbine development in low wind speed regimes and weak grid conditions in India; core focus in Finland on R&D for arctic and off-shore conditions</p> <p>(3) Dominant focus on creation of a wind industry for export potential, new markets, job creation, and national competitiveness in Finland; in contrast to limited aspirations for global competitiveness in India and focus on large scale domestic deployment;</p>
Cultural work	<p>(1) Weak participation of general public and large energy users in public debates</p> <p>(2) Difficulties in moving beyond mere consultation and participation in public forums organized by government and regulatory agencies to having an influence on actual decision making processes</p>	<p>(1) Dominant focus of civil society groups on social and equity issues in India; in contrast to planning, environmental concerns, landscape constraints, and aesthetic issues associated with wind energy in Finland</p> <p>(2) Civil society groups in India focusing on promoting wind energy through economic justifiable means considering ground realities in India; in contrast to ideological environmental concerns in Finland</p> <p>(3) Civil society groups in India additionally serving to protect citizens, consumers, and disadvantaged rural groups against exploitation mainly by vested interests and inefficient regulations;</p>

R&D capabilities. Most wind turbine research in India has focused on low wind speed and low electricity quality in the country. In contrast, Finnish R&D programs have focused on the development of indigenous research on arctic and off-shore conditions. Local wind energy deployment is still limited in Finland; in contrast, India has not been successful in developing an indigenous wind turbine industry or in creating export opportunities, except for a few prominent firms such as Suzlon. Due to its intermittency and grid integration challenges, wind energy is still considered a 'troublemaker' and as a backup source of energy in India.

Third, there are differences in cultural work. In India, the cultural work has been dominated by civil and environmental groups emphasizing social justice, equity issues, land grabbing, access to clean energy, fair distribution of subsidies and encouraging participatory procedures while setting up wind energy projects. The key concern in India has been related to developing deliberative process where possibility for interaction between common citizens, government, and industry experts takes place on equal standing. In Finland, the emphasis has been on planning, environmental

concerns in coastal and forest regions, landscape constraints and aesthetic issues. Finnish civil society groups have campaigned for wind energy mainly on ideological and environmental grounds, while Indian civil society groups have promoted wind energy on economic and societal grounds, stressing its impacts on ordinary consumers and rural populations. However, civil society groups in both countries have had a limited influence on the actual decision-making processes that deal with wind energy, and face the challenge of moving from mere consultation and participation in public forums organized by government and regulatory agencies to having an actual impact.

Based on the differences and similarities between institutional entrepreneurship for wind energy in Finland and India, our study responds to the existing debates which suggest that institutional entrepreneurship in emerging institutional contexts, which exhibit high degree of institutional uncertainty and low degree of institutionalization, might not act as barriers for institutional entrepreneurship but instead provide more opportunities for successful transformation of institutional arrangements [125]. By

examining the variations across India and Finland, we suggest that both mature and emerging institutional contexts create challenges for institutional entrepreneurship. Furthermore, there are several similarities in the nature of institutional constraints in both mature and emerging institutional contexts, as highlighted in our study. Therefore, it may not be appropriate to suggest that an emerging institutional context, like India provides more opportunities for institutional entrepreneurship than a mature institutional context, such as Finland. Hence, our research suggests that there is a need for a deeper look into the claim that emerging contexts provide more opportunities for institutional entrepreneurship. However, we cannot offer a decisive theoretical claim on this complex issue, as making inferences on institutional strategies in different institutional contexts still remains challenging.

6. Discussion and conclusion

This paper responded to calls for more nuanced approach for understanding how actors collectively shape institutional arrangements in different institutional contexts. The key research question we explore in this paper is: *What are the differences in the ways in which actors have collectively engaged in shaping the institutional context for wind energy development in Finland and India?* The paper answers this question by looking at the differences between political, technical and cultural work for development of wind energy in Finland and India. We empirically illustrated different types of actors specializing in specific kinds of political, technical and cultural work by emphasizing one type of actor engaging in either political, technical or cultural work. The paper finds that: (1) political work to support wind energy in Finland and India has found resistance due to conflicting interests between different actors such as incumbent energy actors, government, wind energy industry associations, and wind energy firms and the lack of collective action between them in supporting wind energy; (2) Finland has a stronger position than India in technical work due to the significant research and development across the value chain of wind energy technology; (3) in terms of cultural work, the dominant focus of civil and environmental groups in India has been more focused on social justice and equity issues, while in Finland the emphasis has been on planning, environmental concerns and aesthetic issues.

In our account, we also show that actors engaged in political and technical work are in contradiction with those engaged in cultural work, thereby leading to conflicts in both contexts. Political and technical work aimed at institutionalizing wind energy have often lead to unanticipated impacts that marginalize weaker actors which have further increased the resistance of cultural-work actors against the unanticipated negative impacts and their initiators. In our study we highlight the lack of co-ordination between multiple actors involved in institutionalization of wind energy in Finland as well as India. This is in contrast to the successful cases, such as Denmark where development of wind energy has been relatively more successful than Finland and India. Denmark has been successful in involving multiple actors such as wind turbine designers, manufacturers, entrepreneurs, academics, politicians, local planners, local co-operative agencies, electrical utilities, distribution companies, wind associations, insurance companies, and users and buyers for supporting wind energy [65]. Denmark also benefitted from commitment towards wind energy at the local level made by ordinary citizens, farmers, local municipal, and consumer co-operatives for supporting wind energy along with the commitment made by political parties and government at the national level. In the Danish case, the national government did not control the development of wind energy in a central and top down manner but multiple actors were engaged in development of wind energy in a collaborative manner which has made Denmark the leading coun-

try with the highest share of wind energy in the overall energy mix [65,117,31].

While we have highlighted in our study how actors collectively challenge institutional arrangements in different institutional contexts, we still have limited insights on conditions for stimulating collective action between heterogeneous actors. Existing literature has suggested that collective institutional entrepreneurship involves overcoming collective inaction and achieving sustained collaboration among dispersed actors for transforming institutional arrangements [143]. However, sustaining collective action is challenging as actors need to be held responsible for their inaction instead of actors externalizing their responsibilities to other actors. There are also instances in which actors are simply waiting for other actors to resolve the collective inaction dilemmas. Furthermore, achieving sustained collective action is also difficult as some actors may not be interested in contributing to the collective action but instead appropriate benefits from efforts of others or simply wait for others to take the first lead in stimulating collective action. In such circumstances, multiple actors might not be simply interested in contributing towards collective action as they may feel that their individual actions do not lead to any significant changes [143,4,140].

Our study indicates that collective action between multiple actors performing specific forms of political, technical and cultural work can be facilitated when actors move beyond short-term personal interests and regularly co-ordinate their actions for shaping collective action. As our results highlight, there are tensions between actors specifically performing political and cultural work in both Finland and India which suggest the need for more deliberation and collaboration between actors performing these specific forms of institutional work. Our study highlights the crucial need for actors performing political and cultural work to deliberate on important matters of concern and actors engaged in political work to be more receptive towards the concerns of actors engaged in cultural work by providing them with greater legitimacy for representing their concerns. We suggest that, powerful actors, such as national governments can take the lead and induce co-operation by incentivizing engagement in common forums or putting in strict coercive and penal measures for sustaining co-operation between multiple actors with different interests who are engaged in political, technical and cultural work.

In terms of scope for future research, the insights in the paper open avenues for further conceptual improvements by moving beyond dichotomies of ideologically motivated challengers supporting sustainable energy initiatives and incumbents with vested interests that are in contradiction with each other. First, our research points out to future research which can focus on multiple actors performing particular type of political, technical and cultural work and stress their effective collaboration for the institutionalization of sustainable innovations. In this paper, we restricted our analysis to specific types of actors engaging in either political, technical and cultural work. We limited our analysis to a particular type of actor engaged in specific kind of institutional work. Future research can broaden the scope of our analysis by considering different actors engaged in performing political, technical and cultural work simultaneously. Second, our study highlights the extent to which institutional context shapes the institutional strategies of actors in experimenting and shaping institutional context for transformation of energy systems [113]. We suggest that our study has produced important insights about how actors collectively shape institutional arrangements for institutionalizing sustainable energy innovations by considering the case of a specific mature institutional context, i.e. Finland and emerging institutional context, i.e. India. However, the context-specific nature of our findings suggests the need for further research in order to extend the findings which could be generalized across other nations. Our study

points to the need for developing typologies of institutional strategies for successful institutionalization of sustainable innovations which are generalizable across both mature and emerging institutional contexts. Third, we hope that our paper may open up avenues for more comparative research on differences in sustainable energy transitions between mature and emerging institutional contexts and generating insights into why some institutional contexts are relatively more successful than others. Our study also points to the need for looking at different institutional strategies which are successful in institutionalizing sustainable energy innovations in both mature and emerging institutional contexts and the extent to which they are transferrable across different contexts.

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