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Fostering a local energy transition in a post-socialist policy setting

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ABSTRACT

We explore the conditions critical for the enactment of ambitious local energy transition in a post-socialist renewable energy policy environment that constrains local initiatives. We analyse the island of Krk (Croatia) as a unique case of shared vision of 100 % renewable energy in post-socialist countries. We apply Kingdon's multiple-streams approach to advance the understanding of policy change in transitions literature by examining problem, policy and political streams. We investigate the political and policy landscape, multidimensional roles and interactions of key actors, and the governance mode. The underlying mechanism consists of the island community's common interest – tourism, unprecedented political stability, and synchronized policy actions by the local self-governments, where the public utility inspires policy entrepreneurs to pursue new niches and policy proposals. A novel, inclusive and horizontal governance mode focused on island-level steering secures high-level support for new policy initiatives through coordination and a sense of co-creation and co-ownership.

1. Introduction

The central strategy for keeping global warming below the 2 °C limit is the transition to renewable energy sources (RES). This is envisioned at multiple political and policy levels, ranging from the global and EU levels to cities and local configurations (Manoli et al., 2016; Rogelj et al., 2016). This vision is articulated through high RES targets and reduced greenhouse gas emissions, and includes diverse state-driven top-down and community-driven participatory bottom-up solutions, as each alone cannot bring about the required change (Akizu et al., 2018; Oteman et al., 2014). Bottom-up approaches to energy transition are anchored in decentralized, community-based solutions, innovative tailor-made municipal models promoting broad citizen participation, and community co-creation and co-ownership. However, they need an enabling national renewable energy (RE) policy environment to thrive (Akizu et al., 2018; Beermann and Tews, 2017; Dütschke and Wesche, 2018; Young and Brans, 2017).

Despite political commitments, RES potential, advanced technologies and decreasing production costs, ongoing energy transition remains a challenge. The main questions, concerning their triggers, multiple barriers, the role of different actors, governance mode, and drivers, such as energy security, economic development, preservation of the collective good, climate change, and European integration, remain only partially answered by historical and contemporary accounts: This is because complex socio-institutional processes play a crucial role alongside the techno-economic dimensions (Finon and Perez, 2006; Kern and Rogge, 2016; Sovacool and Geels, 2016).

The focus of research on sustainability transitions has recently shifted from the national level (Markard et al., 2012) to cities (Bulkeley, 2010; Bulkeley et al., 2011; Frantzeskaki et al., 2017; Hansen and Coenen, 2015; Hodson and Marvin, 2010; Loorbach et al., 2016; Wittmayer and Loorbach, 2016), and there are now calls to focus on even smaller entities, including districts, local self-

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governments (LSGs), and geographical units such as islands or communities of shared values (Schäpke et al., 2017; Wittmayer et al., 2014). This shift aligns with earlier contributions from Shove and Walker (2007), who noted the importance of contextual factors, such as the political environment. Since then, research has paid some attention to the importance of place specificity (Coenen and Truffer, 2012; Hansen and Coenen, 2015), suggesting that sustainability transitions unfold in a geographically uneven way (Bulkeley et al., 2013), with urban or local policies often running ahead of national and supranational ones. In this regard, accounts of the sustainable transition of local configurations have become a critical area for research (Bulkeley et al., 2011; Nevens et al., 2013; Süsser et al., 2017; Young and Brans, 2017).

Within this area of research, we choose to analyse the critical conditions for the enactment of an ambitious local energy transition in the post-socialist context with little tradition in RE policy innovation that to a large extent constrains bottom-up approaches. The accounts of local energy transition in a post-socialist policy setting are almost absent from the literature (Capellán-Pérez et al., 2020). We look for a smaller administrative and geographical entity that is committed to an outcome we aim to explain and that is a *shared, ambitious and governed vision of an energy independent, 100 % RE community*. We perform field and internet-based research and combine the results with parallel research on community energy initiatives in sixteen post-socialist European countries (Capellán-Pérez et al., 2020), to conclude that the island of Krk in Croatia is possibly the only case in the whole region that fulfils the research criteria. Based on these findings we explore the island of Krk as a notable example of local energy transition efforts in Croatia. As opposed to the dynamics at the national level, the community of the island of Krk has experienced early and continuous developments unmatched in both Croatia and across the whole Central and South East Europe region. The island of Krk is comprised of seven LSGs led by parties from across the political spectrum with a shared vision of 100 % renewable energy by 2030, unique in a post-socialist policy setting. In addition, we compare Krk with three other Croatian islands that have populations above 10,000 inhabitants with thriving tourism and find no similar visionary energy transition strategy, neither on the level of LSGs, nor at the island level (Tourism, 2018; Korčula Waste, 2017; Brač Waste, 2018; Hvar Waste, 2015; Energetika-net, 2019; Interview 3; Census, 2011a; Table 1). Our comparison set consists of four islands – Krk, Korčula, Brač and Hvar – that represent the only Croatian islands with populations over 10,000 (Census, 2011a; Starc and Stubbs, 2014). In addition, all four islands have comparable central functions that fall within the ‘first rank centrality’ as defined by Marinković (2018), who classifies the 303 settlements on the 47 inhabited Croatian islands based on the quality of their central functions, including administration, healthcare, education, post and telecommunications, supply and financial operations.

Krk has committed to the ambitious goal of becoming the first energy independent and 100 % RE island in the Mediterranean by 2030 through the adoption of the visionary Zero CO₂ Emission Strategy in 2012 (Zero Emission Strategy, 2012). The Strategy outlines a set of specific measures for significant energy savings to increase energy efficiency and deploy local renewable energy sources through targeted technology investments and improved governance, with a number of follow-up achievements. We aim to explore how this ambition and shared vision has come about in this context and to identify the critical conditions for the initiation of local energy transition in this policy setting, while also analysing the governance mode. While we touch upon some implementation activities, their contribution to the goals of the Strategy and to the evaluation in general fall outside the scope of this paper. The period covered by our research stretches from 2000 to the first half of 2019.

Table 1
Indicators considered for a comparison set.

Island	Number of inhabitants	Number of administrative units	Main economic sector	Visionary island or LSG level local energy strategy	Visionary island level local waste management strategy	Island level governance of waste and energy
Krk	19,383	7	Tourism	Yes since 2012	Yes	Yes
Korčula	15,522	5	Tourism	No	No	No
Brač	13,956	8	Tourism	No	No	No
Hvar	11,077	4	Tourism	No	No	No

We address our research puzzle through an operational framework consisting of elements presented in the literature on transitions and societal change (Geels, 2004, 2005; Geels and Schot, 2007; Geels et al., 2016), as operationalized in Young and Brans (2017). We complement it with Kingdon’s multiple streams approach (MSA) to policy change (Kingdon, 2011), advancing the understanding of policy change accounts in transitions literature. Recognizing the importance of technology-driven explanations, we remain aware of their weaknesses, and posit that it is just as crucial to grasp the process of policy change, place specificity, the roles of state and non-state actors, and the governance mode (Jegen and Philion, 2018; Fischer and Newig, 2016).

We use a within-case analysis using process tracing as a heuristic method to identify the conditions critical to the outcome (Gerring, 2004). We perform a limited comparison of the presence of the critical conditions that we find in the case of Krk with the other three Croatian islands to strengthen our conclusions. Empirical material is gathered through researching available documents, field visit, focus group discussions, and in-depth interviews.

2. Research design

2.1. Rationale for the operational framework

To address our research question – *What are the critical conditions for the enactment of an ambitious local energy transition in a post-socialist country with little tradition in renewable energy policy innovation?* – and explain the outcome defined as a *shared, ambitious and governed vision of an energy independent, 100 % RE community by 2030*, we construct an inclusive operational framework inspired by different strands of literature (Fig. 1).

Firstly, to analyse how energy transition comes about from below rather than as a result of a nationally-driven process, we posit that our case is embedded in the national policy environment, which displays limitations for local energy transition. Despite dynamic, EU-driven RE policy development, the available assessments underline that RE policy in Croatia has been hampered by a number of barriers stemming from strategic level and policy inconsistencies, an unpredictable regulatory framework, policy design, implementation issues and the governance mode (Boromisa, 2016; Luttenberger, 2015). We investigate this policy stream to determine the national-level approach to energy transition and how it affects bottom-up initiatives.

Secondly, as emerging research on energy transitions is anchored in the literature on sustainability transitions, we consider this growing body of literature that seeks to explain how transitions take place or how to facilitate trail-blazing changes. The interactions between political and social institutions, policies, culture and values, civil society, industry, markets, technology are, according to this literature, variable outcomes of long-term co-evolutionary processes (Araújo, 2014; Geels et al., 2016; Geels and Schot, 2007; Köhler et al., 2017; Markard et al., 2012; Strunz, 2014). The analytical emphasis is on processes such as learning, radical innovation, the search for new paths, and multi-actor participatory interactions (Geels et al., 2016; Köhler et al., 2017; Turnheim et al., 2018). The multi-level perspective (MLP), which is one of the transition frameworks, suggests that socio-technical transitions result from alignments between developments at three analytical levels: niche-innovation, socio-technical regime, and socio-technical landscape (Geels and Schot, 2007; Moss and Gailing, 2016; Smith et al., 2010). Niches are ‘incubation rooms’ where innovations are created in the existing regime and landscape, and where pioneers develop a novel socio-technical configuration by experimenting with new business models or user practices (Geels, 2002, p. 1260–1). Socio-technical regimes include technical, social, material, political, institutional, and even cognitive components that, although locked in, exhibit incremental innovations (Geels, 2006). The landscape dimension can be compared to soil conditions, climate, long-term social, cultural and political changes, and key events, etc. (Geels and Schot, 2007). The MLP suggests that landscape, niche, or internal pressures on the regime leads to cracks or windows of opportunity that trigger change. Subsequent interactions between niches and regimes are enacted by supportive actors that fight, negotiate, and build coalitions as they navigate transitions (Köhler et al., 2017). As we hypothesise that our case is embedded in a setting that lacks an innovative tradition in the renewable energy sector and constrains bottom-up approaches, we consider the MLP only as a way of exploring the circumstances under which the current local-level regime provides opportunities for change. We explore whether there are any critical points of alignment, bearing in mind the place specificities, local RE potential and synergies of policies or economic activities at the regime level, such as the alignment of environmental, economic, and landscape interests. We investigate whether there were any technological niches or innovative business or user practices stimulating change in the present regime.

Thirdly, we consider the strengths and weaknesses revealed in the application of transition frameworks and the specificity of our case. The strengths are associated with the *bigger picture* accounts that conceptualize transitions as longitudinal, multi-dimensional, and multi-actor processes. As weaknesses include overemphasis of technological niches, insufficient focus on the processes of change, and limited attention to issues such as agency, power, politics, we decide to move beyond them in the analysis of our case (Farla et al., 2012; Kern and Rogge, 2016; Kern et al., 2014; Lawhon and Murphy, 2012; Meadowcroft, 2009; Moss and Gailing, 2016; Shove and Walker, 2007; Smith and Stirling, 2010, 2007; Smith et al., 2010; Sovacool, 2014). In response to these weaknesses, the issues of power, agency and politics have received increased attention as scholars have mobilised insights from different approaches (Avelino and Rotmans, 2009; Avelino and Wittmayer, 2016; Bulkeley et al., 2013; Farla et al., 2012; Fischer and Newig, 2016; Fuenschilling and Truffer, 2016; Markard, 2018; Wittmayer et al., 2017; for a detailed overview see Köhler et al., 2017) that we advance by applying the Kingdom’s multiple streams framework of policy change and governance mode to our case analysis.

By linking sustainability transitions to the accounts of policy change, we aim to advance the understanding of energy transition frameworks as recently recommended by transitions scholars. As we undertake process tracing, conduct interviews, engage in field research and perform comparisons, we bring needed empirical facts into our theoretical perspective, analyse them through our operational framework (Fig. 1), and arrive at conclusions that deepen the understanding of how local energy transitions unfold in the contexts where there is little domestic tradition of renewable energy policy innovation and where the energy policy environment substantively constrains bottom-up initiatives.

2.1.1. Bringing the evidence into operational framework

Drawing on recent accounts that emphasize the role of politics and policies in socio-technical transitions, we zoom in on the political environment that makes the adoption of ground-breaking policies likely, shedding light on the *micro-politics* of energy transition processes in Krk (Avelino and Wittmayer, 2016; Hess, 2014; Hoffman and Loeber, 2016; Markard et al., 2016; Normann, 2015). We analyse the political landscape across Krk’s seven administrative units since 2000, and the major political decisions in the energy sector at both local and national levels. In the spirit of policy studies, our focus is how energy transition got onto the policy agenda, how it was translated into public decisions and which factors explain these developments and the sustained efforts to implement the decisions. Besides the investigation of energy policy content, we think more systematically about policy processes and

critical factors of policy change (Baumgartner et al., 2006; Haukkala, 2018; Hess, 2014; Markard, 2018; Markard et al., 2016; Normann, 2017). Our narrative is inspired and guided by Kingdon's MSA, which is widely used to explain policy change by analysing when and why issues receive attention, which actors participate in decision-making, and the role of policy entrepreneurs (Ackrill et al., 2013; Zahariadis, 2007). As MSA is sensitive to interactions among many factors, including institutions, ideas, individual actors, and external processes, it supports the narrative of local policy change and is consistent with recent applications in energy transitions research (Carter and Jacobs, 2014; Jegen and Phillion, 2018; Jegen and Phillion, 2018). Kingdon claims that policy change occurs when the three streams of problems, politics, and policies, which mostly operate independently of one another, converge. When significant convincing problems or political events cause the streams to align, *windows of opportunity* open for an issue to be placed on the agenda, leading to a major policy change. Windows of opportunity are exploited by policy entrepreneurs who *couple* the streams together 'to push their pet solutions, or to push attention to their special problems' (Kingdon, 1995, p.165) and thereby act as agents of change (Kingdon, 2011). In the problem stream, we focus on how policy problems that concern relevant actors or the critical masses, including external events, are linked to local energy transition and whether they are perceived as important by local policy makers. In the policy stream, we catalogue developments in the energy sector at the national level and ideas about energy transition in local administration, civil society, the public utilities, and key actors, and whether this issue is framed as technically feasible and publicly desirable. In the political stream, we investigate the prominence of energy transition among local politicians. Finally, we consider whether these streams were coupled consequentially by policy entrepreneurs to create a window of opportunity for policy change (Kingdon, 1995), thereby incorporating issues of agency and including the multidimensional roles and interactions of the local actors involved in sustainability transitions in Krk (Farla et al., 2012; Hansen and Coenen, 2015; Smith and Raven, 2012). Haukkala (2018) highlights that traditionally, agency in transitions has been attributed to states and business, although a wide variety of non-state actors at subnational levels are involved in the design and implementation of energy transition (Avelino and Wittmayer, 2016; Wittmayer et al., 2017). We pay special attention to non-state actors such as local leaders, public utilities, businesses, civil society and entrepreneurs, including influential individuals, and the diversity of their individual roles through their multiple engagements in political parties, local public utilities, civil society organisations, advocacy and educational activities, tourism, administration, and the like. We utilize the idea of policy entrepreneurship, which draws on resources to produce a favoured policy outcome. Araújo talks about path creation, highlighting the agency of entrepreneurs who promote a broad vision of energy transition and specific solutions that require a broad change in the local energy sector (Araújo, 2014; Garud et al., 2010). They can be 'in or out of government, in elected or appointed positions, in interest groups or research organisations' (Kingdon, 1995, p.122). A successful policy entrepreneur needs to attract the attention of policy makers, sometimes by building wider coalitions, and to indicate appropriate policy responses (Mintrom and Vergari, 1996; Mintrom and Norman, 2009). We investigate how the roles and capabilities of the local actors trigger or influence the transformation processes, and analyse whether there is a shared understanding of local energy transition in the three streams that opens a policy window and allows policy entrepreneurs to formulate and push forward a ground-breaking local energy transition policy (Jegen and Phillion, 2018). Although the model predicts that '*windows do not stay open long*' (Kingdon, 1995, p. 166, 169–70, 204), we concur with Carter and Jacobs (2014) that policy windows can remain open far longer than Kingdon's model predicts.

Finally, in accordance with Smith et al. (2005) and Young and Brans (2017) we bring governance into the analysis. Innovative forms of governance feature high on the transitions research agenda (Turnheim et al., 2018). To achieve the desired outcome, governance requires the involvement of different non-state individuals or institutional regime actors, the coordination of resources, and the alignment of actors' ambitions, ideas and activities, and their inclusion and exclusion in energy decisions (Smith et al., 2005; Sovacool, 2014; Young and Brans, 2017) which is encompassed in Rutherford & Coutard's (2014) definition of energy transition that is local, inclusive, democratic, social-technical change. To characterize the governance mode in this case, we consult Bulkeley and Kern's (2006) typology, which differentiates the four dimensions through which LSGs can coordinate change: governing by authority,

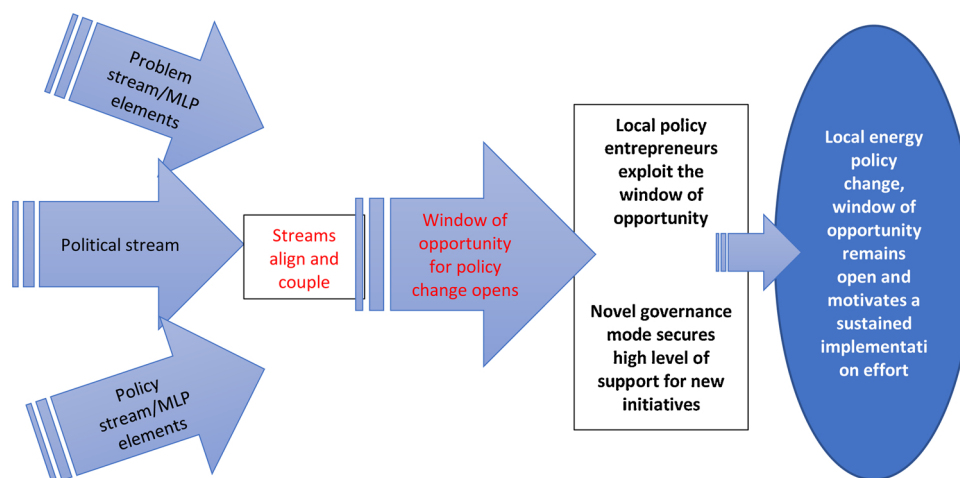


Fig. 1. A schematic view of the operational framework the explanation of its mechanism.

provision, enabling, and self-governing. Smedby and Quitzau (2016) talk about enabling strategies based on shared goals and visions, and highlight that in this mode of governing, a change in the *status quo* policy position and practice is only possible where key stakeholders are actively involved and in agreement about shared goals and visions. Young and Brans (2017) find that the participation of the local community in the open decision-making process from the outset represents a critical condition in the shift towards a 100 % RE community. We analyse whether the governance mode is characterised by horizontal *self-steering* and participative decision-making, which encourages communities to co-own the process, engage in the search for solutions to the problems they face, and therefore support the local energy transition (Moss et al., 2015; Rutherford and Coutard, 2014; Sovacool, 2014; Wittmayer et al., 2017; Wurzel et al., 2013; Young and Brans, 2017).

We start by analysing the envisioning process (Peter and Jennings, 2008) in which the active participation of stakeholders is essential, then decode the governance mode and explore its relevance for the outcome by examining the nature of the decision-making process and the involvement in the initiatives undertaken jointly by local stakeholders.

2.2. Within-case analysis and data

We apply a set of strategies for within-case analysis that provides evidence of process characteristics and drivers of actual outcomes, thus opening an avenue to identify the outcome's critical conditions. We focus on the empirically rich and context-specific advantages of a single case study which are significant for our research puzzle while remaining conscious of such limitations as its generalizability (Bennett and Checkel, 2014; Bennett and Elman, 2007). In addition, we compare Krk with three other Croatian islands with more than 10,000 inhabitants (Table 1). We test whether the conditions identified within our operational framework are present. They include the existence of visionary energy policy strategic developments either at the level of LSG or island, governance mode, public utilities in the waste and energy sectors, the islands dominant economic drivers, and RES potential. Although our research design is not comparative in nature, as within our project it was not feasible to replicate an intensive field and empirical research undertaken in the case of Krk to other islands, our brief comparison serves to strengthen our analytical approach and conclusions, and provides recommendations for further research.

We employ process tracing. This method is widely used for detailed empirical tracing of the underlying mechanisms within an individual case (Beach, 2017), both as a heuristic method and as a way of analysing the observable manifestations of relevant factors proposed in our operational framework, suggesting that a set of factors work together to produce the outcome. We use process tracing for the minute tracing of the narrative to the point where the events to be investigated are detailed, and the elements defined in the operational framework are correspondingly more certain. We present the events in Croatia and on the island of Krk since the 2000s.

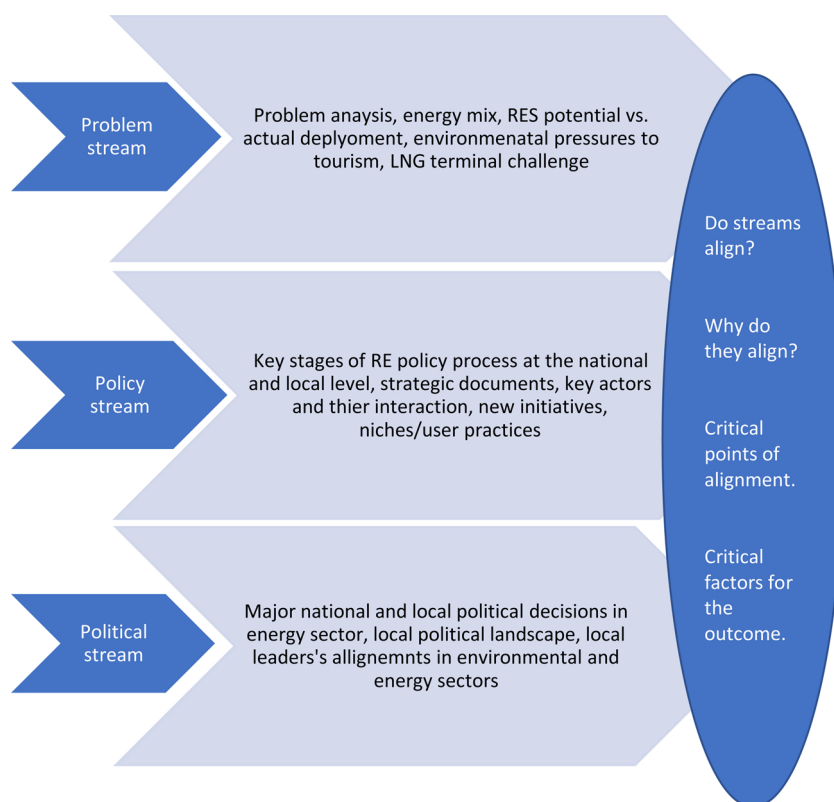


Fig. 2. Stages and process of within-case analysis of the island of Krk.

To understand how the three streams relate to one another we analyse RE policy development at the national level, and the strategic policy documents for all seven administrative units of Krk, to identify the key steps in the process that Collier regards as a part of a temporal sequence. This allows for sufficient analysis of change and sequence (Collier, 2011) and is complemented by a careful description of the essential building blocks of the process that is, according to Mahoney (2010), the foundation of process tracing. The key steps of the process and the temporal sequence are crucial for our analytical ordering, as they help define the relative contribution of factors to the outcome presented in the operational framework (Fig. 2).

Firstly, we examine the process that charts the RE policy landscape development, identifies the niches and external factors, and provides insights into the elements of the underlying mechanism through desk research and the secondary literature of the Croatian national policy framework, starting with energy reform driven by the EU accession process.

Secondly, we analyse the local political landscape of all seven LSGs in Krk since the 2000s and their respective political positions regarding the energy sector, as well as their respective natural resource potential, the state of the economy, local strategic documents relevant for energy transition, and the decision-making process that identifies the governance mode.

Thirdly, setting a 100 % RE path implies a major change not only in policy, but also in the ways in which actors are involved. To get a thorough understanding of the actors, we visited the island of Krk in May 2017 to observe the case directly and trace the roles of the actors involved, their motives as well as the governance mode (Gerring, 2004). The field visit involved our participation in seven focused discussions on local energy transition in Krk with: the National Fund for Environmental Protection and Energy Efficiency; the Ministry of Environment and Energy; the Public Utility Ponikve; the Office of the Mayor of the Town of Krk; the energy independent household of an influential local priest; two energy cooperatives, one that works in Krk and one that covers all Croatia; and three representatives of civil society organisations. Eleven in-depth interviews were conducted from December 22nd 2018 to January 18th 2019 with the main local decision makers and national-level stakeholders including the civil society representatives. We thereby learned about their multiple roles, levels of expertise, motivations and modes of interaction, and came to understand their positions regarding the EU and national agendas, local political priorities, local socio-economic development and opportunities (e.g. connected industries, tourism, reduction of energy bills to the benefit of the inhabitants and local economic players), and their opportunities to regain control of energy and economic issues and decision-making (Fig. 2). The evidence collected represents the core material for the identification of critical factors in local energy transition through the lenses outlined in our operational framework (Fig. 1).

3. Research findings

3.1. Development of renewable energy policy in Croatia

In this section, we present the findings related to the development of the RE policy in Croatia, including the broader policy context, major policy decisions, their political aspects, interactions, and RE policy consequences. We follow the logic of the process tracing methodology in the problem, policy, and political streams presented in the Fig. 2, and emphasise the critical points of the streams' alignment or nonalignment that are explained in the discussion section.

The energy mix of total primary energy supply in Croatia is characterized by a relatively high share of oil (41,3 %), followed by natural gas (26,2 %), renewable energy (24,7 %) and a 7,6 % share of solid fossil fuels with no nuclear energy (Krško nuclear power plant in Slovenia, of which the state-owned electricity group HEP owns 50 % is counted under imports in the statistics (IEA, 2016a). However, almost a half of Croatia's energy supply comes from imports, with an upward trend (IEA, 2020; CP, 2020). The shares of specific energy forms in the total energy import show that Croatia is a net importer of fossil fuels and electricity (IEA, 2016b). As a result of dependency on energy imports, energy policy in Croatia has traditionally revolved around energy security (CP, 2002, 2009; 2020). Although Croatia produces around 60 % of its own electricity, this figure heavily depends on volatile hydrological conditions, as hydropower plants are the largest producer of renewable electricity in Croatia. In 2016, 55 % of domestically-generated electricity came from hydropower, 20 % from coal, 13 % from oil/gas, 8 % from wind, 3,4 % from biofuels and 0,5 % from solar. In other words, non-hydropower renewables accounted for just under 12 % of generation (IEA, 2016c, 2016d). The energy system is based on firm governmental control and regulation dominated by state-owned firms (CP, 2002, 2009). Most of the electricity generation capacity, including its distribution, as well as heat supply and gas distribution is owned by HEP - the state-owned power group, organized in the form of a holding company with several daughter companies (HEP Group Companies, 2019).

Since the 2000s, energy policy in Croatia has been driven by the EU accession process, which establishes the direction and pace of reforms required for membership (Croatia joined in 2013). In 2001, the first legislative package introduced the liberalisation of the energy market, while RES were declared a national interest (Boromisa, 2016). Following the adoption of the first Energy Strategy in 2002 (CP, 2002) the Environmental Protection and Energy Efficiency Fund was established to channel resources towards the use of RES, especially subventions for households, and this opportunity was used in Krk (CP, 2003; FV, 2017). In 2006, Croatia joined the Energy Community that mandated the transposition of the EU energy *acquis*, but at a slower pace. In 2007, feed-in tariffs for producing energy from RES were introduced, while a new Energy Strategy (CP, 2009) envisaged its further promotion. In 2012–2013 new legislation simplified licensing and introduced guarantees of origin for RES. The further transposition of the EU *acquis* replaced the feed-in tariffs with a feed-in premium in 2016 (Boromisa, 2016, 2018). However, we find that the proposed design lacked an innovative approach, not solely because fossil fuels were eligible within high-efficiency cogeneration schemes. It remained largely limited to small-scale local energy initiatives (for a detailed overview see Soysal and Kitzing, 2016), and lacked implementation of a tendering procedure due to the absence of bylaws. The resulting absence of prosumers at the local and individual level stunted the development of local RE models (FV, 2017).

In this period, the development of RE continued to be burdened by a strategic and political focus on fossil fuels, a lack of

diversification efforts in RE sector (IEA, 2016c, 2016d), and the slow implementation of RE policy due to existing legislative and administrative barriers. Firstly, we find that a widely-promoted assertion that Croatia had already reached its overall renewable energy target for 2020, set at 20 % share of renewable energy in gross final energy consumption, is misleading in terms of RE policy development (EC, 2020). This target was based on a 12,6 % share in 2005. In the meantime, a correction of historical data was undertaken, following a change in national energy balances due to the recorded biomass consumption in households. Therefore, IEA recalculates that the share of renewable energy in 2005 gross final consumption was 23,8 %, not 12,6 %, and the corrected target, based on the same methodology for 2020, would be a 31,2 %, while at the EU level target of 20 % is still officially communicated (IEA, 2018; Eurostat, 2019; EC, 2020). Secondly, facilitation of small-scale RES initiatives applicable at the local level was insufficient due to the lack of legal authority to act as a prosumer and utilize abundant solar PV sources in Croatia with the total technical potential estimated to at least 8000 MW (FV, 2017; CP, 2020). Thirdly, the actual increase of the share of renewable energy in gross final energy consumption, and the structure of renewable electricity generation, suggest a lack of focus on solar PV that Croatia abounds with. Although the share of renewable energy in gross final energy consumption increased (Eurostat, 2019), the structure of the share of sources, for example, in renewable electricity generation that consists of 84,3 % of hydropower and 0.8 % of solar PV, reveals the stated asymmetry (IEA, 2016c, 2016d). The same can be said for transport that is represented only by 1,2 % of the overall share of RES, which is the second-worst result among EU countries (after Estonia; Eurostat, 2017).

The governance mode of RE national policy resembles a path dependency and suggests the lack of an innovative approach to the development and implementation of a new policy. Centrally-steered and in the interests of large scale RES (wind and HE), RE policy imposes many barriers to the horizontal-steering crucial for local energy transitions and innovative community energy solutions (FV, 2017; Wurzel et al., 2013). This is illustrated by the above-mentioned share of sources in renewable electricity generation (IEA, 2016c, 2016d). This asymmetry will most likely take a long time to balance out as HEP invests heavily in the upgrading and building of hydro-power plants, in addition to recent plans to invest to a much lesser extent in solar PV (HES Kosinj-Senj, 2020; EIA, 2018). Some of these plans are challenged by numerous restrictions on potential construction locations since large areas of Croatia (30–40 %) are under Natura 2000 and other environmental protection zones (HEP Projects, 2019). For example, the HEP project for HE Ombla was cancelled due to a negative environmental impact assessment (EIA, 2015), while the current one – Kosinj – has sparked a public debate about its impact despite the green light given by the responsible Ministry (EIA, 2018; FV, 2017).

At the same time, the PV quota that translates to a higher uptake of decentralized local RE solutions, was capped at a low level (50 MW), leaving many interested local parties out of the game, despite the unprecedented PV potential (Jerkić et al., 2015; CP, 2009). Further, the protracted absence of net-metering (introduced only at the beginning of 2019) has made smaller projects, which contribute greatly to local energy transition, very rare. For example, the number of local energy-democratic initiatives, including energy cooperatives which make key contributions to energy transitions in the western EU, is still comparatively low in Croatia – eight are reported on the National portal for energy efficiency (Boromisa, 2018; FV, 2017; Jerkić et al., 2015; Kunze and Becker, 2014; National Portal for Energy Efficiency, 2019). Meanwhile, the newly-adopted law promises the development of small-scale renewables within citizens' households and the self-consumption of electricity through the long-awaited net-metering (CP, 2018). The legislative standstill was broken in December 2018 with the adoption of the new law, while the implementing legislation was enacted in January 2019, with the first auction announced for the same year (CP, 2018; Croatian Government, 2018a, 2018b, 2019). These possibilities still need to prove effective as they arrived much later than expected.

Finally, our findings suggest that RE policy has been undermined by continuous shocks stemming from strategic energy decisions and investments which, while provoking political confrontations between the national and local levels, have also strengthened local cohesion and energy transition action in Krk (FV, 2017, Interviews, 1–7; 11). The struggle started in 2001, when the industrially-burdened Omišalj LSG in Krk, without giving its consent, became a crucial location for the reloading of Russian oil destined for export to European markets. Outraged by this central government decision, Krk's local actors from across the political spectrum unanimously opposed this the project and gained support from all over Croatia. The project was finally cancelled (2005) with the rejection of the Environmental Impact Assessment, which seemingly undervalued the negative externalities that would have had devastating consequences for local tourism (FV, 2017; Interviews 1; 4).

Subsequent projects in which Croatia invested significant time and resources also suggest a national focus on fossil fuels and the lack of an innovative approach in the RE sector. These centrally-driven projects and at the heart of the (geo)political energy war in Croatia (Romac, 2018; Bankwatch Network, 2020). They include the 500 MW coal-fuelled Plomin C in nearby Istria, envisaged to be run on imported coal as Croatia no longer has its own coal reserves, and the 450 MW Peruća gas power plant, despite decreasing domestic production of natural gas (IEA, 2020). After many back and forth interactions and decisions among the Ministry, investors and the public, these projects have recently been put on hold or cancelled due to revealed weaknesses (Interview 3; 9; EIA, 2017). However, a third one, a floating Liquefied Natural Gas (LNG) terminal in Krk, is still planned, with support from the EU (EIA, 2014, 2018). The national level highlights that this project is of strategic national interest, while all the political players from left and right spectrum in Krk and the County fiercely oppose it (CP, 2020; Interview 1; 5; FV, 2017). They argue that the project lacks economic feasibility, as LNG from the US is even more expensive than Russian gas (Interview 1; 4), that is in breach of County and local-level spatial plans, and that the process lacks transparency (that crucial documents were not publicly available), local participation (consultation with public was obstructed), and acceptance of local community (rejection of floating LNG terminal). Our findings to a large extent support these propositions (FV, 2017; Gerebizza, 2019; Harper, 2018; Interviews, 1–11; Romac, 2018). The hopes of Krk and the County that this project in its current version (floating LNG terminal) would be destined to fail were raised by the repeated failures of binding bids to contract its capacity (Interviews 1; 2; 4; 6). However, the European Commission approved the state aid for the terminal at Krk island in July 2019 (EC, 2019), and the project is green-lighted.

The most recent energy debate at the highest national level was burdened by the rapidly decreasing domestic production of

primary energy and the invigoration of the contested LNG terminal by *lex specialis*. At the end of October 2019, the systematic debate on the country's energy direction entered the National Parliament, to discuss the new national energy strategy through 2030 with projections for 2050 that looks beyond fossil fuels towards renewable energy domestic resources including solar energy. The Strategy that in the most ambitious scenario defines 65,6 % of RES in gross final energy consumption in 2050, with a steeper growth envisaged only after 2030, was adopted on February 28th, 2020 (CP, 2020).

3.2. Island of Krk – a special place with the local politicians across ideological spectrum pushing in the same direction

In this section we present the findings at the level of the island of Krk. We find that place specificity, rooted in history, geography, economy and energy, features high in all discussions and interviews about Krk, and includes discussants beyond Krk as they perceive this island as a distinctive place and community with a matching geographical boundary (FV, 2017; Interviews, 1–11). In the paragraphs that follow, we present the findings on place specificities in an attempt to untangle the elements of perceived distinctiveness and their contribution to the outcome of this study. We continue to follow the logic of Kingdon's three streams and their proposed alignments in sections 2.1 and 2.2, and present the findings from the local problem, political and policy angles (Fig. 1).

First of all, the largest and most populous Croatian island, located in the northern Adriatic, is part of Primorje Gorski Kotar County (PGC), has a rich history and is the home of the famous Croatian Frankopan family (Krk's Dukes). Ruled over time by many, including the Venetians, Austrians and French, and home to the Glagolitic alphabet preserved in the Baška tablet (one of the oldest preserved texts in Croatian), it has been a centre of Croatian culture since medieval times (History Krk, 2018a, 2018b; Croatian Encyclopaedia, 2020). These facts were mentioned by most discussants in relation to their sense of belonging to the distinctive island's community and their traditional approach to progressive ideas (FV, 2017; Interviews, 1; 3–6; 9).

Secondly, we find that although industrial development in the Omišalj LSG has become a contentious issue since the 2000s in relation to LNG project, decades ago it symbolised progress. In the 1960s, due to its location in deep waters accessible to big tankers, it was chosen to host the Rijeka oil terminal, which attracted educated young people from all over Yugoslavia (Interview, 1; JANAF, 2019; Omišalj, 2019). Nowadays, Krk remains a rare case among Croatian islands, with a notable population increase from 17,860 in 2001 to 19,374 in 2011 and a continually growing trend (Census, 2011b). Our respondents highlighted that the positive effects of this migration that increased a number of technically literate people, coupled with the positive population growth trend and local people's receptivity to innovative thinking, creates a space for dialogue in which new and rational policy ideas that benefit the whole island can be pursued (FV, 2017; Interviews, 1–6).

Thirdly, its 2,500 h of sunshine per year, fertile soil for Mediterranean produce, wine, rich cultural heritage and seashore make it a top tourist destination in Croatia. Tourism is the main economic sector of common interest (Interview 1) Annual reports show that Krk continues to have the highest tourist base among all other islands in Croatia, marked by an upward trend from the 2000s, with the island of Krk contributing more than 5 % to the total tourism output in Croatia based on overnight stays in 2017 (Tourism, 2020). Its citizens increasingly participate in the creation and delivery of a complementary touristic experience '... most offer accommodation, some run restaurants, some offer boat tours, while others sell locally-produced wine, olive oil, souvenirs, ice-cream...' (quote Interview 5). There are eight local wineries and around 60 local tourist agencies. The island of Krk is predominantly the destination with the greatest tourist capacity offered by the local families (57 %), followed by camps (28 %), with the hotels providing only 13 % (Krk Tourism Strategy, 2016). Also, we come across examples of local resistance towards gated beach resort projects that would restrict access to the previously public beaches exclusively to the resort guests (Interviews 1; 11). The most notable is the recent rejection of a Russian investor's offer to redevelop the abandoned hotel resort from Yugoslav era (Haludovo) into a closed resort, which would have entailed closing off beach access to the public. The LSG Malinska, state administration and locals would only support the project if it maintained public access to the beach. However, this condition was not acceptable to the investor (Interview 11). The consistently steep growth of tourism makes it the island's 'bread and butter' (Krk Tourism Strategy, 2016; quote Interview 5). However, the ten-fold increase in population during the tourism high season places pressure on the water, waste and energy regimes. This pressure shaped a strategic decision to pursue a more sustainable, locally-owned tourist offer complemented by local produce and services, also reflected in the energy sector. This strategic decision took decades to achieve. Zlatar Gamberozić and Tonković (2015) highlight this in their paper, focusing on the perceptions of the role of tourism from the different aspects of local development in Croatian island communities. They conclude that while sustainable development may be adopted as a desirable form of tourism development, it is often implemented only declaratively, without much effort to seriously reconsider tourism development and its consequences on environmental resources and the economic, social and cultural dimensions of local development. We nevertheless find some activities undertaken towards sustainable development in the case of Krk. One illustration includes the total growth of accommodation capacities between 2005–2015, where private family accommodation shows the highest growth rate of 40 %, while at the same time the growth rate of hotel capacities is 3 % (FV, 2017; Interviews, 1–11; Krk Tourism Strategy, 2016; Statistics, 2019). Krk abounds in local solar and wind potential that has been translated into concrete plans to install some 368 MWp of new photovoltaic installations on rooftops, 4 MWp of photovoltaic installations on the ground, 252 MW of wind power and 250 kWel in biogas plants by 2030. While many households have installed PV systems on their roofs and invested in energy efficiency, there is no accurate database on the numbers (Interview 1). The rich local renewable energy potential stands against the snapshot of energy supply of the island of Krk that relies on fossil fuels and electricity from the mainland (although connected with the bridge). In 2011, the reference year for the local energy strategy, a first energy balance for the island was created. It revealed that the energy supply of Krk consisted of a 42 % share of electricity, 32 % of oil, 21 % of wooden biomass, 2 % of solar thermal, 2 % of gas and diesel used in transport¹ and 1 % of LNG. Households accounted for over the 90 % of total energy consumption (Zero Emission Strategy, 2012, page 4).

Fourthly, Krk has had seven LSGs – the town of Krk and six municipalities since the 1992 reforms. However, our findings suggest

that the island continues to operate as a whole in all strategic matters, with Krk town continuing to act as the administrative, political, economic and religious centre, resembling the administrative model of Yugoslav times. Institutions such as the kindergarten, the fire brigade, the local public utility Ponikve that manages energy, waste and water, and the tourist board are all steered at the island level, which is the only case among our comparative set and possibly the only such case in Croatia (Interview 3; Table 1; 2). The representative of public utility says ‘... we believe that this is the most efficient and effective way to address all the issues on the island and work in common interest ...’ (quote Interview 8). Our comparison with other Croatian islands found neither similar management and governance structures at the island level nor strategic documents such as waste management strategy, energy balance, 2030 strategy (Interview 1; 3; 5; Table 1; 2).

Finally, in the local political stream we find that the shared vision of energy transition is commonly created, maintained, unanimously adopted in 2012, and governed by all seven LSGs. In spite of political heterogeneity that was analysed since 2000 these exhibit a high level of political stability and support, a shared understanding and a united approach to vital issues, ranging from the external (geo)political – such as the LNG terminal – to a new communal waste management model in Croatia, to the initiation of energy transition (Interviews 1–11). The mayor of the town of Krk highlights that ‘... in Krk left and right pull in the same direction ...’ (quote Interview 5). While many municipal mayors in Krk serve multiple terms in the office, the mayor of Krk town, who was referred to as ‘first among equals’ (quote Interview 1), holds the record in Croatia with seven consecutive mandates (since 1993). In 2017, he was unopposed for the office and won the seventh mandate, which infers that he enjoys a high level of respect from the political opposition (FV, 2017; Interviews, 1–11). His mission is to ‘... provide a good atmosphere and understanding among all seven LSGs and, based on solidarity, to pursue common interests and bring investments ...’ (quote Interview 5).

3.3. Development of local niches prompted by key actors and a novel governance mode

In the early 2000s, accumulated problems with waste during the tourist season resulted in a strategic decision to tackle waste management in a more sustainable and efficient way (FV, 2017). A longstanding island-level actor, the Ponikve public utility, proposed a municipal waste business and user practice model coined *Eco Island Krk* that was innovative not only for Krk community, as it was launched few years earlier than national-level strategy, but also more ambitious and apparently more successful than the existing national-level strategy for waste management (CP, 2005; Košak, 2017). For example, Croatia pledged to reduce the quantity of biodegradable waste within municipal waste by 50 % by the end of 2016. Krk already achieved this in 2014. Also, Croatia pledged to collect 50 % of the waste separately disposed by 2020 while Krk was at 54 % in 2016 with an upward trend. To date, Croatia is considered at risk of failing to meet the 2020 target of 50 % preparation for re-use/recycling for municipal waste (the EC has issued the warning in 2018), while in 2019 Krk announced the plan to close a previously reconstructed landfill in order to achieve its strategic zero-waste goal in 2020 (EC, 2018; FV, 2017; Interviews, 1–11). The proposed municipal waste business and user practice model in Krk was unanimously adopted by all 105 members of the town and municipal councils and supported by local citizens, schools, kindergartens, industry, academia, civil society and the Church which, through co-financing and participation, profoundly influenced the subsequent outcomes (FV, 2017; Interview, 1; 5). Although the model itself is not novel in absolute terms, we argue that it ought to be interpreted within the existing national context as a serious attempt to introduce new user practices and business models through a multi-actor participatory bottom-up action that complies with Geels’s definition of the niche (Geels, 2002, 2006).

Our analysis of the actors takes us back to 2001 when the idea of having one public utility for the whole island was articulated, as local leaders believed that it was the most efficient and effective way to provide common services (Interview 8). Since the 2000s, the local public utility has initiated and implemented important communal projects in its three sectors: water, waste and energy, including the first strategic project to bring a water system to each household on the island and a new environmentally friendlier system of waste management covering the whole island in 2005 (Ponikve History, 2019). This was followed by the reconstruction of landfill sites (that is now planned for closure within the new local zero-waste by 2020 strategy) and the development of a production system based on RES and energy efficiency in the public sector, including the installation of the PV systems on the roofs of the waste sorting facility Treskavac with an output of 1368 kWp in 2012, public schools, utility buildings, and fire stations (30 kW), and an almost completed replacement of the public lightening with energy-efficient LED lights with energy and related budget savings of one-third, despite an increase in the number of lights from 102 million kWh in 2010 to 734,864 kWh in 2018 (Interview 5,6; Trinajstić, 2019). Nowadays, Ponikve employees use electric cars and bikes, playing an exemplary role, while the significant savings on energy bills as a result of these developments are constantly promoted. In 2016, in cooperation with E-mobile team Krk, it finalised a first conversion of a classic to an electric car and opened 11 charging stations for electric vehicles, making it the largest charging network in Croatia, with many features such as visibility on the e-Roaming platform, the possibility to book charging, real-time energy consumption, and so on. Also, local public utility received the *Ambassador of alternative fuels* award for excellence (Ponikve History, 2019; FV, 2017). We find that no initiative, strategic plan, decision or implementing activity has been made in water, energy and waste sectors without this actor on the island of Krk since the 2000s (FV, 2017; Interviews, 1–11). Also, all the interviewees and discussants pointed out that this actor and its devoted leadership play a crucial role in the outcome. The director who ran local public utility for 20 years was identified as a visionary actor who often acted beyond his mandate to push for novel solutions, including the use of diverse funding sources and his persistent visits to institutions in the Croatian capital to ‘... get things done...’ (quote Interview 5). In this way he

¹ The energy balance was developed based on the EU Covenant of Mayors model for Sustainable Energy Action Plan. The share of transport using gas and diesel (2 %) refers only to transport in public sector, including the usage of private vehicles by public sector employees to travel to and from work. The category of private transport/cars is intentionally left out of the energy balance.

secured the funds from the National Fund for Environmental Protection and Energy Efficiency to co-finance a number of public utility-led projects in these sectors (Ponikve History, 2019). He seemed to enjoy high-level of support from the influential and longstanding mayor of the town of Krk and the other municipal mayors. Unanimous support among decision-makers for new policy ideas coming from local public utility comes from the fact that ‘... the longstanding head of public utility was a visionary professional who had enjoyed far-reaching support for the new proposals’ (quote Interview 5). His successor was also appointed unanimously by the mayors of all seven LSGs in 2017 (Interview 5). Public utility mandate and ownership structure, balanced among all the LSGs, also illustrates the decision-making approach (Ponikve Ownership, 2020). These findings seem to translate to a high level of consensus in the decision-making process in the energy, water and waste sectors, with many decisions made unanimously (Interviews 1; 4–6; 8; 9). In fact, two landmark strategic documents, Krk’s Waste Management Model and the Zero Emission Strategy, have been anonymously adopted by all seven LSGs. The cases (that we failed to uncover) are rare when proposals from Ponikve in these sectors since the 2000s were objected to by decision-makers (Interviews 1,5,6). Also, during our field visit it became obvious that the leaders of the Ponikve Eco Island Krk branch for energy often search beyond Croatia for best practices and funding for new ideas, and invest their free time to develop and promote these projects. This included the identification of networking, fund-raising, public awareness and educational activities (FV, 2017). They also promote their know-how to other Croatian islands in a number of on-going projects, such as the Local Action Group (LAG), by partnering in a number of European projects to build their capacity and knowledge base, and by fund-raising abroad for studies, including German funds for Zero Emission Strategy in 2012, and by making the island’s first energy balance, unmatched by any other Croatian island (Zero Emission Strategy, 2012; FV, 2017). These activities are in most cases undertaken in cooperation with all LSGs and led by the town of Krk, including the civil society and citizens. Also, the decision makers at the energy sector of the public utility, together with the head of a local environmental NGO, initiated the first energy cooperative in Krk and Croatia in 2012 that the town of Krk also co-founded with the aim to endorse social innovations in local energy (Interview 1; 2; 5).

Finally, our findings suggest that the Krk community has established a novel horizontal governance mode that is participative, inclusive, and oriented towards the common interests of the island. Firstly, every local decision in Krk, including energy transition, goes through both formal and informal discussion fora before it is proposed and adopted, while civil society and citizens are engaged and responsive (FV, 2017; Interview, 1–11). Krk appears to be a tightknit community where the actors interrelate in many ways, either knowing each other from childhood, local schools, or through familial or neighbourly connections, attending the same church and/or performing multiple functions where decisions about the energy and related sectors are made. For example, the head of Ponikve’s energy sector is also a deputy municipal mayor, a member of an energy cooperative, the president of Local Action Group of Kvarner Islands that Krk belongs to, and the owner of a tourist business. He went to school together with the head of a local environmental NGO who served as a municipal council member, is a member of an energy cooperative, and the owner of a local tourist agency. An influential local priest built a 100 % RE energy-independent household (that we visited during the field visit in 2017) and preaches energy transition to anyone interested, from his congregation to donors, tourists, politicians and the expert community. Also, it is apparent that a large majority of the actors and citizens have a stake in the main economic sector – tourism (Interviews 1–11). The mayor of Krk town highlighted that in this town alone there are 700 locally-owned SMEs that offer tourist services and stated ‘...literally everyone has at least a dual professional role, one always being in the tourist sector’ (quote Interview 5). In addition, five of our interviewees pointed out that its Mediterranean lifestyle and focus on tourist services means that local politicians, bureaucrats, experts and citizens meet on a daily basis, either at the open market, shops, restaurants, beach, sports or cultural events, providing additional opportunities to discuss issues of common concern and interest (Interviews 1–5). Finally, we find that Krk has a unique informal coordinating body of decision makers (*cro. koordinacija gradonačelnika*) consisting of all seven mayors who meet regularly to discuss issues of both strategic and day-to-day importance, including energy. This is absent from the other islands in our comparative set (Table 2) and consistent with the conclusions of the historically-based overview of the participatory strategic planning of the development in Croatian islands by Starc and Stubbs (2014), who point out that compared to the Southern islands, the Northern, more developed, islands have better mechanisms for the identification and implementation of development decisions that are made in a participatory manner. The municipal mayor states ‘... politics is never discussed in the meetings of the informal coordinating body, only issues that are in the interest of the island, grounded in facts rather than political ideologies...’ (quote Interview 4). The LSGs very often ‘...anticipate each other’s needs and do favours, such as the co-financing of important projects ...’ (quote Interview 5) or ‘...rejection of strategic energy projects such as floating LNG...’ (quote Interview 4). Throughout island-level institutions such as Ponikve, the kindergarten, and tourist board that are also uniquely present in our comparative set, the LSG leaders meet even more frequently and work towards common goals, while their open-door policy places them within daily reach of all actors and citizens. Moreover, Ponikve has formed ‘...an energy team that has a representative in each LSG in order to be as close to local politicians and citizens as possible

Table 2
Findings within comparative set.

Island	Rich historical cultural heritage	Rich and underutilized solar potential	External energy projects of strategic interest	Island level public utility	Governance, coordination among the LSGs – island level	Island level institutions – tourist board	Energy team, staff in each LSG
Krk	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Korčula	Yes	Yes	No	No	No	No	No
Brač	Yes	Yes	No	No	No	No	No
Hvar	Yes	Yes	No	No	No	No	No

...’ (quote Interview 6). This governance feature is also absent from our comparative set (Table 2).

4. Three-stream alignment with a supportive governance mode enables policy entrepreneurs to deliver

The discussion follows the logic of the proposed operational framework (Fig. 1). The findings presented in section 3.1 support the assumption that our case is embedded in a context with little tradition in RE policy innovation which in turn substantively constrains bottom-up approaches to energy transition. We concur with Boromisa (2016, 2018) that Krk’s pioneering effort towards local energy transition is situated in a fairly centralised and deficient RE policy framework driven by EU compliance that has nevertheless influenced goals and policy instruments in a positive manner. During the period of our case development and analysis (from 2000 to the beginning of 2019), innovative, bottom-up energy initiatives have mainly been neglected within the national level policy stream. Our findings reveal that the duality of supranational and national level RE policy streams motivates the outcome in two ways. Firstly, the EU level introduced best practices and the availability of funds for EU integration that Krk used effectively whenever possible. Secondly, the iterative and to a large extent limiting national RE policy for local initiatives, coupled with the local renewable energy potential, and locally-contested external strategic energy investments that are perceived as a threat to Krk’s main economic sector – tourism – seem to provide a set of defining impulses for alignment in the local policy and problem stream (FV, 2017; Interviews 1–9). The issue of common interest is reaffirmed along two lines of reasoning. On the one hand, it is displayed through a shared understanding of the benefits of sustainable transition in general, and in energy terms in particular, among the local level actors, including the politicians from the opposite sides of the political spectrum, who support this local policy change. On the other hand, it is demonstrated to be in disagreement with the national level, hence the need to disconnect from the mainstream nationally-driven policy that the Krk community does not co-create or co-own. These conditions are partially attributed to place specificity, such as abundant and underutilised RES, and fortified by external threats illustrated through centrally-imposed and locally-opposed strategic energy investments in LNG on Krk, where national and local energy supply is characterised by the net energy imports of price-volatile fossil fuels. Stemming from common interests and shared understandings of the problems facing them, these motivators are articulated through the shared understanding of the solutions that include the utilization of abundant local renewable energy sources and energy independence that determine the critical point for alignment in a problem stream (Kingdon, 1995, 2011). Also, the newly-developed local waste management niche in Krk’s environmental sector, the first of its kind in Croatia, while locked in the existing socio-technical configuration, nevertheless seems to exhibit incremental innovations that change its regime and penetrate the local problem and policy streams in general, aligning with complementary sectors. This most likely boosted subsequent support for other island-level innovations, meeting the expectations of the MLP (Köhler et al., 2017), and spilling over into energy sector and providing alignment opportunities in the local policy streams as predicted by our model (Geels, 2002, 2005; Fig. 1). These factors to a large extent reinforced the determination across all local political parties and LSGs to endorse a local energy transition in 2012, linking up the third – political stream – with the problem and policy streams to allow the next stage of Kingdon’s model of policy change to materialize (Kingdon, 1995, 2011; FV, 2017; Fig. 1), as we present in the following paragraphs.

When it comes to place specificity, we observe that a number of the identified elements in section 3.2 can also be found on the other Croatian islands in our comparative set (Tables 1 and 2). Besides a very specific industrial development and bridge connection with the mainland that is unique for Krk, other islands from our comparative set also abound in underutilised RES (mainly solar) potential, on the one hand, and a fossil-fuelled energy mix that is imported to the island, on the other hand. These islands share a distinctive historical and cultural identity, have tourism as a major economic sector of common interest, and asymmetric environmental and energy pressures due to tourist season (Tables 1 and 2). However, only in the case of Krk do we find that these pressures are uniquely and strategically governed at the island level, suggesting a dynamic role of the actors and a unique governance approach to the problems they face or novelties they introduce (FV, 2017; Interviews 1,3–5,9; Young and Brans, 2017; Zero Emission Strategy, 2012).

In sections 3.1 and 3.2 we presented findings in the policy, problem, and political streams with embedded place specificities that opened Kingdon’s (1995; 2011) window of opportunity for agents of change to pursue their innovative ideas on energy transition. Our findings suggest that the island-level public utility Ponikve, its top management and energy team play an entrepreneurial role in local energy transition through the initiation of innovative ideas, new niches in waste and energy, conversion of electric car, solar panels on public buildings, its exemplary role, and in fund-raising (Araújo, 2014; FV, 2017; Garud et al., 2010; Interviews 1–11; Mintrom and Norman, 2009; Ponikve History, 2019). We observe that they very often go beyond their contractual obligations to introduce and promote new models and user practices in their sectors of expertise. With its exemplary role, the promotion of good results such as energy savings, networking, educational activities, including kindergartens, schools and adult education, this actor seems to have had a significant convincing authority to exploit the window of opportunity and promote their policy solutions in the environmental and energy sectors. The fact that decision-makers rarely object to any proposal from Ponikve, while many are unanimously adopted, suggests that there is a high level of support for solutions not only from the influential mayor of Krk town and the other municipal mayors but also from civil society and citizens that contribute to the ongoing initiatives.

Finally, the policy entrepreneurs actively use an innovative governance mode set up at the island level. A novel governance mode that is participative, inclusive and oriented towards the common interests of the island and local population, combined with the diverse and interdependent roles of the actors, are not only the building blocks of major policy change, but are crucial for the sustained implementation of the effort towards the envisaged energy transition (Avelino and Wittmayer, 2016; Wittmayer et al., 2017). The informal governance coordination body of the island’s decisions makers, the island-level energy team with representatives in each of the LSGs, island-level utilities with a balanced ownership structure among all LSGs that manages water, waste and energy, other numerous opportunities to openly discuss issues of concern in different forums, an inclusive, participatory, and democratic

approach to decision-making, combined with policy entrepreneurship in the energy field, most likely have had a profound impact on the shared vision of energy transition endorsed as Zero Emission Strategy, which was unanimously adopted in 2012 and subsequently governed in a wide and still open window of opportunity that allows through the agency of policy entrepreneurs and the governance mode the continuous promotion and functioning of new ideas (FV, 2017; Interviews, 1–11). The findings related to policy entrepreneurship and the governance mode, while in a completely different RE policy environment, and in a more controlled local endeavour, resemble the critical conditions for local energy transition found in Young and Brans (2017). However, the effectiveness of implementation remains difficult to assess due to the ongoing revision and evaluation of the Zero Emission Strategy and falls outside of the scope of this research.

5. Conclusions

The aim of this study is to explore how local energy transitions unfold in a renewable energy policy environment that constrains bottom-up initiatives. As we found a lack of literature on energy transitions in post-socialist countries, we searched for a promising research case in this region that would address our research question: *What are the critical conditions for the enactment of an ambitious local energy transition in a post-socialist country with little tradition in renewable energy policy innovation?* As possibly the only case in the post-socialist region with ambitious locally-driven commitments to 100 % RE community by 2030, we investigate the case of Krk in Croatia using process tracing methodology for within-case analysis. To strengthen our findings and conclusions we undertake a limited comparison with other three Croatian islands.

To explain how this ambition and shared vision has come about in this context and identify the critical conditions for the initiation of local energy transition in this policy setting, we construct an inclusive operational framework that is derived from sustainability transitions approaches such as MLP, Kingdon's MSA on policy change, and governance approaches (Fig. 1). Our findings and discussion follow this logic in the presentation of the national and local problems, the policy and political streams emphasizing the critical points of alignment, and the role of policy entrepreneurs and the governance mode for the outcome.

We find that a set of conditions work together in a mutually reinforcing way to produce an outcome that is a *shared, ambitious and governed vision of an energy independent, 100 % RE community by 2030* in Krk adopted in 2012. Our findings suggest that, as opposed to the dynamics at the national level, the Krk community has demonstrated early, ambitious and continuous bottom-up efforts towards energy transition. A strong sense of belonging within the island's community, common interests and a shared understanding of the solutions to local problems, combined with political stability and synchronised political action across the spectrum represent the heart of the underlying mechanism for our outcome. These conditions are aligned in the problem, political, and policy streams, allowing the agency of policy entrepreneurs, gathered in and around the local public utility, to exploit windows of opportunity to initiate new niches or propose innovative policy initiatives. An innovative, inclusive, horizontal governance mode is actively used by policy entrepreneurs, and represents the wheels of the underlying mechanism, securing high-level support for new initiatives.

Our research suggests that the construction of an inclusive operational framework that combines different strands of literature can be a wise approach for the study of local energy transitions. With the application of Kingdon's MSA, we advance the understanding of policy change accounts in transitions literature by examining the effects of external factors, and focusing on contextual ones in problem, policy, and political streams. Taking into account external factors and focusing on place specificity, the local political landscape, the role of agency, especially by policy entrepreneurs, and an innovative governance mode, we uncover the conditions under which local energy transition develops and thrives in a less-enabling national policy environment. We also demonstrate that once opened, Kingdon's *window of opportunity* that is exploited by local policy entrepreneurs may stay open long enough to allow different exemplary activities to be undertaken and showcased if embedded in a novel, inclusive and horizontal governance mode. Finally, our limited comparison with three other Croatian islands demonstrates the crucial importance of the agency of policy entrepreneurs and of a novel governance mode for local energy transitions.

Although we include a limited comparison as primarily a within-case study, our research is limited by the weakness of single case studies – generalizability – and so future research should take these findings further by a fully-fledged comparative study of cases, focusing on the role of the actors and the mode of governance. Also, further research could look more closely into the implementation record and evaluate the action's overall effectiveness.

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- Interview 2. Green energy cooperative.
- Interview 3. RES consultant/project developer for energy transition of Croatian Islands
- Interview 4. Municipal mayor 1.
- Interview 5. Municipal mayor 2.
- Interview 6. Deputy municipal mayor; Decision maker at public utility energy team 1; Member of energy cooperative Krk, Decision maker of Local Action Group for Development of Croatian Islands.
- Interview 7. Municipal mayor 3.
- Interview 8. Decision maker at public utility 2.
- Interview 9. Decision maker at Regional Energy Agency.
- Interview 10. Municipal public servant.
- Interview 11. Municipal mayor 4.
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