

## Article

# Cultural Heritage, Sustainable Development, and Climate Policy: Comparing the UNESCO World Heritage Cities of Potsdam and Bern

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**Abstract:** Developing sustainable, carbon-neutral, and climate-resilient districts seems to be particularly challenging with respect to historic city centers. However, barriers posed by legal requirements for historical buildings are counterbalanced by opportunities because historic cities have not undergone urban modernization and did not embrace the concept of functional cities, which nowadays impedes urban sustainability transformations. Thus, this paper focuses on the relationship between cultural heritage, urban sustainable development, and climate policy. We study continuity and change in the mid-sized UNESCO World Heritage cities Potsdam (Germany) and Bern (Switzerland). These matching forerunner cities share many characteristics, which enables them to transfer policies and jointly create new solutions for common problems. We find that national context matters, but we also identify functional equivalents like referenda and active citizen participation. Despite many similarities, Potsdam is ahead of Bern with respect to the institutionalization and integration of climate mitigation and adaptation. The comparative analysis (interviews and document analysis) identifies innovations that can be transferred between the two cities (e.g., Potsdam's integrative climate policy or Bern's efforts to become a role model for stakeholders and citizens). Moreover, the challenge to coordinate heritage management and climate governance offers chances for cooperation between matching cities like Bern and Potsdam.

**Keywords:** climate policy; sustainable development; governance; UNESCO World Heritage; (urban) heritage management; historical cities; forerunner cities; matching cities; city of Potsdam; city of Bern



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## 1. Introduction

Climate change has become an important topic in urban politics and affects many policy areas [1]. Therefore, new approaches are needed in the areas of climate mitigation as well as climate adaptation [2]. Many local experiments focus on new neighborhoods but also on the regeneration of existing neighborhoods [3]. Developing sustainable, carbon-neutral, and climate-resilient districts seems to be most challenging with respect to historic city centers, which are strongly affected by air pollution and climate change.

Thus, this paper focuses on cities with historic city centers, in particular mid-sized cities with statuses as UNESCO World Heritage Sites. Interest in these types of cities has focused primarily on their cultural heritage and options to preserve it. Although research suggests that status as a UNESCO World Heritage city may be a good basis for sustainable urban development [4–6], the relationship between a city's world heritage status and its performance in the area of climate policy has not yet been studied. UNESCO World Heritage cities are of special interest here because their experiences are highly relevant to other cities. We assume that institutional and policy innovations, which work in UNESCO

World Heritage cities, may work in many other cities with historic city centers as well, especially if the whole inner city is under monument protection.

There are different perspectives when it comes to the effects of the UNESCO World Heritage label and heritage preservation on a city's options for sustainable urban development and climate policy. Most often negative aspects are emphasized due to problems in increasing the energy efficiency and climate resilience of protected historical buildings. In contrast to new buildings, it is far more challenging to reduce CO<sub>2</sub> emissions of protected historical buildings, not to mention city districts made up of such buildings. However, from a wider perspective, protected historical city centers have not undergone urban modernization. After the Second World War, and particularly in the late 1960s and 1970s, urban planners embraced the idea of creating functional cities. Thus, they transformed compact cities into cities that were built around cars and not around people. From this perspective historical city centers are rather an asset for creating "cities for people" [7] because historically cities were built as compact and car-free cities.

Thus, this explorative paper concentrates on the relationship between status as a UNESCO World Heritage city, urban sustainable development, and climate policy (adaptation and mitigation) in mid-sized cities. We ask in particular how a city's world heritage status affects urban climate governance. Does this status imply barriers or does it offer chances to develop successful climate policies?

While research on urban climate governance has concentrated mainly on large cities, mid-sized cities such as Bern and Potsdam are still highly understudied [2,3,8]. Contrary to bigger cities, the development of smaller cities is strongly affected by their historical and cultural heritage because it shapes the identity of the whole city. Bern and Potsdam were chosen as case-studies because these mid-sized forerunner cities share many characteristics (e.g., with respect to size, history, and economy). Thus, we regard them as "matching cities" for transferring ideas, policies, and institutional arrangements, exchanging knowledge, and learning from each other. Matching cities have the capabilities to jointly create new ideas and solve common problems. This approach goes beyond the common idea that best practice can be transferred between cities, even if national framework conditions differ considerably. We argue that such transfers are most promising between matching cities. This is relevant not only for researchers but also for practitioners because the comparison of matching cities provides a basis for policy recommendations.

Section 2 links the literature on urban heritage management, sustainable urban development, and urban climate governance. The selection of the two case studies and the methodological approach are outlined in Section 3. Subsequently, the empirical findings are presented in Section 4, followed by the discussion and conclusions (Section 5).

## 2. Exploring Urban World Heritage Management and Climate Governance

### 2.1. Managing World Heritage in Cities

Dealing with cultural heritage in an urban context has for a long time been shaped by the central conflict between continuity and change [9]. However, as the pressures on cities and their cultural heritage increase, e.g., through urbanization or over-tourism, a new field of action has emerged at the interface of historic preservation, heritage management, and urban planning [10–12]. The aim of urban heritage management is to establish a more "holistic and integrated management that is part of a larger socioeconomic development framework" [10] (p 22). Taking up these trends, since 2011, UNESCO has promoted the approach of the "historic urban landscape" (HUL), replacing the perception of urban cultural heritage as isolated physical objects and as a visual category [13,14]. This change of paradigm in the UNESCO discourse gave another boost to urban heritage management, which addresses not only UNESCO World Heritage cities, but urban cultural heritage in general [10].

As urban heritage management originates in heritage theory rather than in urban planning, the initial perspective focuses on the cultural heritage surrounded by urban space [13]. More recently, heritage management has been transferred from heritage theory

to urban planning [15] by placing “the spectrum of urban heritage within the mainstream of urban planning policy and practice” [16] (p. 240). The urban studies perspective perceives the city as an organism, embracing elements of cultural heritage. However, a general research gap on world heritage cities can be noted compared to the rich body of literature on “regular”, uninhabited world heritage sites [17], and they require special management instruments due to their complex legal situation and the high significance of urban heritage for a city’s identity [18].

In research, special attention is given to the synergies between heritage and sustainable urban development [6]. Published since 2011, the *Journal of Cultural Heritage and Sustainable Development* assembles diverse theoretical and empirical approaches to elaborate the potential of cultural heritage for (urban) sustainable development [17]. Hence, the scholarly debate takes up the sustainable development goals (SDGs) of the United Nations. Indeed, SDG 11—“sustainable cities and communities”—broaches the issue of integrating sustainability and heritage. This is specified in SDG 11.4: “strengthen efforts to protect and safeguard the world’s cultural and natural heritage” [19].

By applying the HUL approach, the UNESCO title is commonly regarded as a tool and a positive factor for holistic urban sustainable development [20]. For instance, the authors of a study on St. Petersburg, Stralsund, and Wismar found that world heritage status results in positive impacts on local quality of life, cities’ identities, and their attractiveness as residential areas [21]. Additionally, the local economy is stimulated and the cities gain attractiveness as business locations, as is also promoted by the World Bank [22]. However, in practice, the HUL approach has not been implemented sufficiently in world heritage cities. Thus, heritage cannot fully unfold its positive effects on sustainable urban development. This is proven by the frequent conflicts between conservation instruments and local policies, which are rarely addressed in heritage theory [9,17]. A comprehensive and critical examination of the urban world heritage status and its special implications for sustainable urban development is still pending. Initial insights have been provided in Manz’s study on Quedlinburg (1999) [23], whereas Bigio (2015) discussed links between world heritage and local climate policy in Edinburgh [24].

Moreover, there is a considerable research gap on the governance of world heritage cities. Research has concentrated on conservation instruments and strategic documents, in particular management plans [25] and buffer zones [26], while planning processes have received little attention. This might derive from the fact that most urban world heritage sites are managed by a network of actors, pursuing a management plan [10,17,27,28]. Responsibilities are distributed among various actors in the city administration that do not communicate cross-sectionally and thus execute their assignments in isolation [18]. The offices for historical preservation or heritage specialists often take a key position. They implement conservation measures and enforce heritage protection acts, but they do not actively participate in planning processes. Only a few heritage coordination units exist, and they typically focus on conservation issues, marketing, tourism management, and visitor information, e.g., in Wismar, Stralsund, Regensburg, and Bamberg [17].

Existing case studies on world heritage cities address aspects like conservation policies and tools, urban redevelopment, and quality of life [23,27–31]. Veldpaus (2015) provides a taxonomy-based policy analysis tool, which is used for a case study on Amsterdam [10]. However, there is still a lack of systematic and comparative studies of world heritage cities, in particular on the question of how heritage interests are taken into consideration in planning processes and strategic development.

Concerning the integration of heritage management in sustainable urban development, cities with historic centers face similar problems as UNESCO World Heritage cities. Therefore, research findings on urban cultural heritage without UNESCO status but under monument protection could be combined with the knowledge gained about world heritage cities in order to detect synergies for urban sustainable development and improve the preconditions for successful urban climate policies.

## 2.2. Governing Climate Change in Matching Forerunner Cities

Cities with historic centers face a multitude of challenges, particularly the integration of heritage management and urban climate governance, which require cross-sectoral thinking and actions. The concept of sustainability represents a bridgehead between heritage management and climate governance at the local level. Cities are increasingly regarded as key actors in governing climate change [32,33].

In the 1990s, forerunner cities started to tackle the issue of climate change by developing strategies, formulating emission reduction targets, and joining transnational networks [34–36]. Climate policy forerunners usually show high capacities for action [3,8,37,38], including

- A growing and young population with above-average education and skills [3,39–42];
- A sound economy, low unemployment rates, and a high number of jobs in the service and the green tech industries [39–42];
- Political and administrative support for climate action—ideally from the mayor—and political influence of green parties [38,41,43];
- A supportive and broadly diversified research environment [42,44,45];
- A strong and active civil society, especially environmental groups [3,37–39,43].

In cities that have managed to become forerunners, local climate policy ambitions and actions are often driven by individual actors within the city administration [46]. The literature refers to these actors as “policy entrepreneurs” [47,48]. They are characterized by the ability to identify the “right” moment to take action and open a policy window. Policy entrepreneurs dedicate large amounts of time and energy to promoting their topic, which is necessary to put and keep a topic on the political agenda [47,48]. Although climate action does not necessarily need to be triggered by top-level political leadership, policy entrepreneurs depend on supportive or at least tolerant policy-makers [49]. Institutionalization ensures continuity even if policy entrepreneurs are absent, e.g., when they change jobs or retire.

Another key factor for forceful local climate governance and, eventually, for a city to become a forerunner is posed by the organizational conditions that facilitate the development and implementation of relevant policies. In the past, this has mainly concerned climate mitigation [50], but in recent years climate adaptation has become an equivalent pillar of climate action [51]. Nevertheless, in many cities the integration of climate mitigation and adaptation is still in its early stages [52]. In this context, Kern et al. (2021) distinguish three models of integration [53]:

- Full integration model (concentration of tasks in one strategy or city department);
- Pillarized integration model (tasks are distributed over several strategies or city departments);
- Project-based integration model (tasks are integrated at the operational level only).

Our study focuses on matching forerunner cities because we assume that policy transfers between cities are most promising if the cities share many characteristics and match with respect to population size, history, economy, etc. We distinguish three dimensions of matching cities: First, we start from a comparative approach and study the climate policies of matching cities, including, for example, their ambitions, strategies, and institutional capacities. By taking the strengths and weaknesses of matching cities in climate policy into account, we can assess the similarities and differences between them. Second, we study the transfer potential between matching cities, based on the results of the comparative analysis. Here, we focus on already existing policies in matching cities and assume that they provide an excellent basis for exchanging knowledge and transferring policies and institutional arrangements. Third, we expect that matching cities have the capabilities to jointly create new ideas and develop innovative policies, which help to cope with new and emerging problems [53].

### 3. Case Selection and Methodological Approach

There are more than 470 UNESCO World Heritage Sites in Europe (2019), most of them stand-alone buildings or building complexes such as cathedrals, monasteries, and palaces. In these cases, the UNESCO World Heritage status is usually limited to a certain territory in the city, often surrounded by buildings legally protected as historic monuments. However, there are 92 UNESCO World Heritage Sites (including Potsdam and Bern) that cover larger parts of cities, particularly historic city centers and parklands (see Table 1). We assume that those large-scale heritage sites have a stronger impact on city development than stand-alone sites.

**Table 1.** UNESCO World Heritage Sites in Europe covering larger parts of cities.

More than 1,000,000 Inhabitants (7)	500,000 to 1,000,000 Inhabitants (7)	250,000 to 500,000 Inhabitants (11)
Austria: <i>Vienna</i> Czech Republic: <i>Prague</i> Italy: <i>Rome</i> Poland: <i>Warsaw</i> Russia: <i>Saint Petersburg</i> Turkey: <i>Istanbul</i> United Kingdom: <i>London/Greenwich</i>	Italy: <i>Naples</i> Latvia: <i>Riga</i> Lithuania: <i>Vilnius</i> Poland: <i>Cracow</i> Russia: <i>Yaroslavl</i> Ukraine: <i>Lviv</i> United Kingdom: <i>Edinburgh</i>	Austria: <i>Graz</i> Estonia: <i>Tallinn</i> France: <i>Bordeaux, Strasbourg</i> Italy: <i>Florence, Venice, Verona</i> Norway: <i>Bergen</i> Russia: <i>Veliky Novgorod</i> Spain: <i>Córdoba</i> United Kingdom: <i>Liverpool</i>
100,000 to 250,000 Inhabitants (19)	50,000 to 100,000 Inhabitants (16)	Less than 50,000 Inhabitants (32)
Austria: <i>Salzburg</i> Belgium: <i>Bruges</i> Bosnia and Herzegovina: <i>Mostar</i> Croatia: <i>Split</i> France: <i>Le Havre</i> Italy: <i>Ferrara, Syracuse, Vicenza</i> <b>Germany: Lübeck, Potsdam, Regensburg</b> Luxembourg: <i>Luxembourg</i> Poland: <i>Toruń</i> Portugal: <i>Guimarães, Porto</i> Spain: <i>Granada, Salamanca, San Cristóbal de La Laguna</i> <b>Switzerland: Bern</b>	France: <i>Arles, Avignon</i> Germany: <i>Bamberg, Goslar, Stralsund, Weimar</i> Greece: <i>Rhodos</i> Italy: <i>Siena</i> Poland: <i>Zamość</i> Portugal: <i>Évora</i> Spain: <i>Ávila, Cáceres, Cuenca, Segovia, Toledo</i> United Kingdom: <i>Bath</i>	Albania: <i>Berat, Gjirokastra</i> Bulgaria: <i>Nessebar</i> Croatia: <i>Dubrovnik, Trogir</i> Czech Republic: <i>Český Krumlov, Kutná Hora, Telč, Třebíč</i> France: <i>Carcassonne</i> Finland: <i>Rauma</i> Germany: <i>Quedlinburg, Wismar</i> Greece: <i>Korfu, Patmos</i> Italy: <i>Ivrea, Mantova, Pienza, Sabbioneta, San Gimignano, Urbino</i> Malta: <i>Valletta</i> Norway: <i>Røros</i> Portugal: <i>Angra do Heroísmo, Elvas</i> Romania: <i>Sighişoara</i> San Marino: <i>San Marino</i> Slovakia: <i>Bardejov, Levoča, Spišské Podhradie</i> Spain: <i>Santiago de Compostela</i> Sweden: <i>Visby</i>

Bern and Potsdam can be considered matching cities because they share many characteristics (see Table 2). However, they are not identical twins, i.e., they differ with respect to their performance in policy areas that are relevant for climate governance (such as energy, transport, and green space). This enables them to exchange their knowledge and experiences, learn from each other, and transfer their ideas, policies, and institutional innovations on a bilateral basis. Moreover, they have the potential to jointly develop new approaches for common challenges and problems.



Table 2. City profiles of Bern and Potsdam.

City	Bern	Potsdam
History, heritage, and culture	<ul style="list-style-type: none"> <li>• <b>1191:</b> City of Bern is founded</li> <li>• <b>1300–1555:</b> Expansive territorial policy; Bern becomes the largest city-state north of the Alps; golden age ends around 1800</li> <li>• <b>1803:</b> <i>Kanton</i> and city of Bern reorganize themselves as independent authorities; responsibilities and assets separated</li> <li>• <b>1848:</b> Central federal authorities of the newly founded Swiss Confederation placed in Bern (de facto capital)</li> <li>• <b>Around 1850:</b> Industrialization starts</li> <li>• <b>From 1950:</b> Economic boom leads to an increased influx of workers from abroad and the construction of high-rise residential areas</li> <li>• <b>1983:</b> Old Town is designated as a UNESCO World Heritage Site</li> </ul>	<ul style="list-style-type: none"> <li>• <b>993:</b> First mentioned in historical documents</li> <li>• <b>17th century:</b> Rise to the status of a Prussian garrison and residence town after the Potsdam Edict of Toleration (1685) and the settling of Huguenots</li> <li>• <b>Second World War:</b> Heavy destruction</li> <li>• <b>1952–1990:</b> Administrative headquarters of the Potsdam district in the German Democratic Republic</li> <li>• <b>Since 1990</b> (German reunification): Capital of the federal state of Brandenburg (Land Brandenburg)</li> <li>• <b>1990:</b> Large parts of the city's cultural landscape are designated as UNESCO World Heritage Sites; extension in 1992 and 1999</li> <li>• <b>Since 1999:</b> Restoration of the city center and the historic cityscape</li> </ul>
Location and significance	<ul style="list-style-type: none"> <li>• Located in the Swiss “Mittelland” region</li> <li>• Capital of the canton of Bern (Kanton Bern) and capital of Switzerland</li> </ul>	<ul style="list-style-type: none"> <li>• Located in the agglomeration of Berlin (around 4.5 million inhabitants)</li> <li>• Capital of the federal state of Brandenburg (Land Brandenburg)</li> </ul>
Population	<ul style="list-style-type: none"> <li>• 143,000 inhabitants, 2771 inhabitants/km<sup>2</sup> (2019)</li> <li>• Increase in population of 7.6% between 1990 and 2019; forecast for 2050: 159,648 inhabitants</li> <li>• Average age: city of Bern—40.7 (2019); canton of Bern—43.0 (2018); Switzerland—42.6 (2019)</li> </ul>	<ul style="list-style-type: none"> <li>• 180,503 inhabitants, 956 inhabitants/km<sup>2</sup> (2020)</li> <li>• Increase in population of 9.2% between 1990 and 2019; forecast for 2035: 220,100 inhabitants</li> <li>• Average age: Potsdam—42.4 (2020); Brandenburg—47.2 (2019); Germany—44.5 (2019)</li> </ul>
Economy	<ul style="list-style-type: none"> <li>• Services comprise the most important sector; manufacturing and raw materials are only of minor importance</li> <li>• Bern is home to companies of above-average size compared to the rest of Switzerland</li> <li>• Center of the economic region Bern-Mittelland</li> <li>• Unemployment rates (2020): city of Bern—2.6%; canton of Bern—2.5%; Switzerland—3.1%</li> </ul>	<ul style="list-style-type: none"> <li>• Services comprise the most important sector; manufacturing and raw materials are only of minor importance</li> <li>• More than 90% of all employees work in small or medium-sized enterprises</li> <li>• Focus on medium-sized enterprises and creative industries; media and IT; life science and health economics; tourism and congresses; science and research</li> <li>• Unemployment rates (2020): Potsdam—5.7%; Brandenburg—6.2%; Germany—5.9%</li> </ul>
Politics	<ul style="list-style-type: none"> <li>• City council of Bern is dominated by social democratic and green parties (so-called <i>RotGrünMitte</i> (RGM)) since 1992</li> <li>• Canton of Bern is dominated by conservative parties</li> </ul>	<ul style="list-style-type: none"> <li>• City council of Potsdam is dominated by left-green parties since 1990</li> <li>• Brandenburg is governed by a coalition of social democrats, conservatives, and greens</li> </ul>
Research environment	<ul style="list-style-type: none"> <li>• Three public universities</li> <li>• Several non-university research institutions, e.g., Federal Institute for Metrology (METAS)</li> <li>• Several institutions relevant for climate and sustainability research: <ul style="list-style-type: none"> <li>○ Oeschger Centre for Climate Change Research (OCCR)</li> <li>○ Centre for Development and Environment (CDE)</li> <li>○ Wyss Academy for Nature</li> <li>○ BFH Centre Energy Storage, BFH Institute Sustainable Business</li> </ul> </li> <li>• Approximately 30,000 students</li> </ul>	<ul style="list-style-type: none"> <li>• Five universities</li> <li>• More than 40 non-university research institutions</li> <li>• Several institutions of international importance for climate and sustainability research: <ul style="list-style-type: none"> <li>○ Potsdam Institute for Climate Impact Research (Potsdam-Institut für Klimafolgenforschung (PIK))</li> <li>○ Institute for Advanced Sustainability Studies (IASS)</li> <li>○ German Research Centre for Geosciences (Deutsches GeoForschungsZentrum (GFZ))</li> </ul> </li> <li>• Approximately 10,000 researchers and 25,000 students; 62,000 virtual students at Hasso Plattner Institute (HPI)</li> </ul>
Civil society	<ul style="list-style-type: none"> <li>• Strong and active civil society</li> <li>• Informal collaboration between local government and civil society (e.g., Fridays for Future)</li> <li>• Forms of direct democracy (referendums, popular votes)</li> </ul>	<ul style="list-style-type: none"> <li>• Strong and active civil society</li> <li>• Fridays for Future influenced the council decision to declare climate emergency in 2019</li> <li>• Two representatives of Fridays for Future as guests/observers in the climate council (Klimarat)</li> </ul>

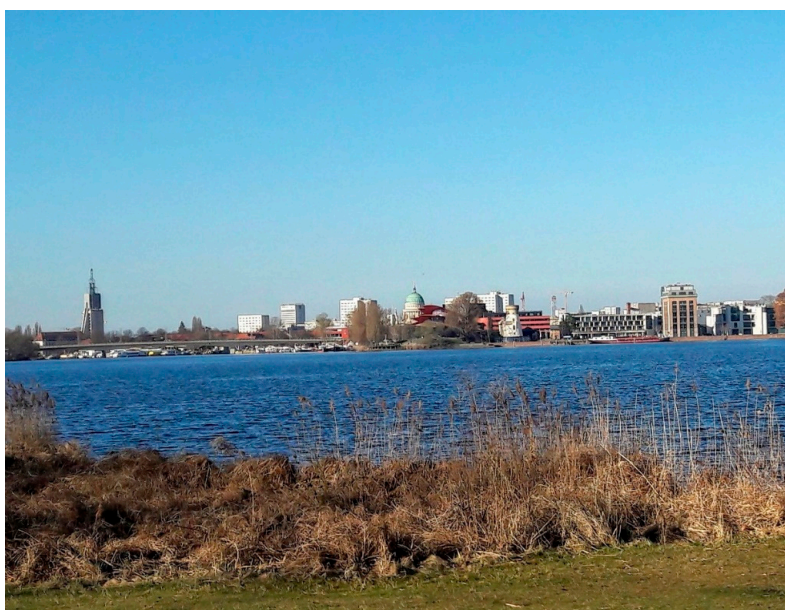
From a methodological point of view, the analysis of matching cities requires a comparative approach, which provides a basis for assessing the transfer potential of already existing and tested policy innovations. Moreover, the comparison can also help to identify unsolved problems in both cities. We assume that collaboration between matching cities is

a tool to develop new solutions that can be applied successfully in both cities (and other matching cities). Our study focuses primarily on the comparative analysis of Potsdam and Bern, but we also draw some conclusions with regard to the potential for the transfer of existing policies and chances for the development of solutions for unsolved problems.

Both cities place a high value on preserving their historical cityscape. Therefore, both host large-scale ensembles and monuments on their territory that are recognized as UNESCO World Heritage Sites. The medieval city center of Bern was added to the UNESCO World Heritage list in 1983. Potsdam's and Berlin's Prussian gardens and palaces were awarded the same status in 1990. Besides the significance of the UNESCO World Heritage, Bern and Potsdam share other characteristics (see Figures 1 and 2). They are mid-sized cities of roughly the same population size located in advanced democracies in Central Europe. Both are university cities with a strong and diversified research environment and an economy that is dominated by service industries. Furthermore, both cities have acquired the reputation of being forerunners in climate governance within their countries [54] (see Table 2).



**Figure 1.** City of Bern.



**Figure 2.** City of Potsdam.

Our two case studies are strongly explorative since the relationship between a city's world heritage status and its performance in the area of climate policy has not yet been studied by other researchers. While theoretical contributions do exist for local climate governance and urban heritage management separately, our paper combines these two literature streams. Therefore, we cannot draw on an existing overarching theoretical background. Nevertheless, our empirical findings provide a theoretical starting point for future research on the nexus between climate governance and heritage management in cities.

The empirical work in Bern and Potsdam mainly included expert interviews with local key actors (e.g., city staff, policy-makers) and analysis of key policy documents (e.g., mitigation and adaptation strategies, urban development concepts, heritage protection acts) (see data availability statement). Furthermore, we studied supplementary sources, including additional municipal reports and strategies on various topics, such as protocols of city council meetings and reports of local service providers. Overall, 20 semi-structured and guided expert interviews were carried out between July 2017 and March 2021 (on-site, via telephone or video conferencing). The guideline questions particularly addressed the following issues:

- Relevance of climate issues in local politics, economy, and society;
- Key actors in local climate action;
- Key events that enhanced or hindered local climate action;
- Development of climate policy (mitigation and adaptation);
- Integration and mainstreaming of climate policies; and
- Relevance of the UNESCO World Heritage status for climate policy.

#### 4. Findings—Comparing Bern and Potsdam

##### 4.1. Climate Policy Pathways

In the 1990s, Bern and Potsdam had already started to tackle climate change on their territories. Both cities have delivered mitigation and adaptation strategies and received awards for their activities (see Table 3). A common feature of both cities is that their governments have been dominated by red-green majorities for the last three decades. In Bern, the city council (Stadtrat) and government (Gemeinderat) have been in the hands of red-green-middle parties since 1992. Red and left-wing parties have held the majority in Potsdam's city council (Stadtverordnetenversammlung) since 1990, and all mayors have been social democrats (see Table 2). This continuity seems to be a favorable precondition for the cities' progressive climate policies.

Potsdam committed itself to climate mitigation in 1995 by joining the Climate Alliance (Klimabündnis), a transnational city network founded in 1990/1991 [35]. Today, this network has around 1800 members in 27 European countries (including around 540 German and 20 Swiss local authorities) and aims at climate neutrality by 2050. Bern only became a member of this network in 2004, but, in 1998, the city was awarded the label "energy city" (Energiestadt), a certification system for Swiss cities (Energiestadt Schweiz) that started around the same time (1991) as the Climate Alliance and has become very popular among Swiss cities since then (with 636 participants today). Thus, membership in the Climate Alliance and certification as energy city (Energiestadt) can be regarded as functional equivalents.

Even though the term "climate" was first mentioned in the heading of a political strategy in 2015, Bern started its climate-relevant activities only a few years later than Potsdam (see Table 3). Climate mitigation has been addressed as a sub-topic of sustainability since around 2005 (see interview 3) and framed as energy policy, the focus on energy issues being a common trend in local climate policy in the 1990s [55]. Today, both cities show a similar level of annual emissions per capita (around 4.5 tons) and are regarded as forerunners for climate policy within their regions and countries (see interviews 5, 7, 10, and 19).



**Table 3.** Climate policy milestones in Bern and Potsdam.

Bern	Potsdam
–	<ul style="list-style-type: none"> <li>• <b>1992:</b> Foundation of the Potsdam Institute for Climate Impact Research (Potsdam-Institut für Klimafolgenforschung (PIK))</li> </ul>
<ul style="list-style-type: none"> <li>• <b>1998:</b> Awarded the label “energy city” (Energiestadt Schweiz certification system)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>1995:</b> Replacement of the coal-fired power plant with a gas-fired power plant</li> <li>• <b>1995:</b> Entry into the Climate Alliance</li> <li>• <b>1996/1999:</b> City council decision to develop the Local Agenda 21 (LA21)</li> <li>• <b>1999:</b> First climate report</li> </ul>
<ul style="list-style-type: none"> <li>• <b>2000:</b> City council decision to develop the LA21</li> <li>• <b>2004:</b> Entry into the Climate Alliance</li> </ul>	–
<ul style="list-style-type: none"> <li>• <b>2005:</b> Large parts of the Old Town flooded by the river Aare</li> <li>• <b>2006:</b> Energy strategy 2006–2015 (Energiesstrategie)</li> <li>• <b>2006:</b> Foundation of a climate platform in the economy (Klimaplatzform der Wirtschaft) within the LA21 framework</li> <li>• <b>2007/2009:</b> Foundation of the Oeschger Centre for Climate Research (OCCR) and the Centre for Development and Environment (CDE)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>2007:</b> City council passes a resolution to reduce CO<sub>2</sub> emissions by 20% compared to 2005 by 2020</li> <li>• <b>2008:</b> Establishment of a Climate Coordination Office (Koordinierungsstelle Klimaschutz) within the city administration</li> <li>• <b>2008:</b> Establishment of a municipal climate council (Klimarat) (advisory committee)</li> </ul>
<ul style="list-style-type: none"> <li>• <b>2010:</b> Awarded the label “energy city gold” (Energiesstadt Gold); renewed in 2019</li> <li>• <b>2010:</b> Municipal utility company (Energie Wasser Bern (ewb)) supposed to only produce, buy, and sell electricity from renewable sources by 2039</li> <li>• <b>2014:</b> Master energy plan 2035 (Richtplan Energie)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>2010:</b> Integrated climate strategy (Integriertes Klimaschutzkonzept)</li> <li>• <b>2014:</b> Winner of a national climate action award for municipalities (Wettbewerb Klimaaktive Kommune)</li> </ul>
<ul style="list-style-type: none"> <li>• <b>2015:</b> Energy and climate strategy 2016–2025 (Energie- und Klimastrategie)</li> <li>• <b>2019:</b> Foundation of the Wyss Academy for Nature</li> <li>• <b>2019:</b> Declaration of “climate emergency”; resolution to reduce CO<sub>2</sub> emissions to 1 ton/capita by 2035</li> </ul>	<ul style="list-style-type: none"> <li>• <b>2015:</b> Climate adaptation strategy (Klimaanpassungskonzept)</li> <li>• <b>2017:</b> Climate mitigation strategy aiming at climate neutrality by 2050 (Masterplan 100% Klimaschutz)</li> <li>• <b>2019:</b> Declaration of “climate emergency”</li> </ul>
<ul style="list-style-type: none"> <li>• <b>2021:</b> Framework strategy for sustainable development (Rahmenstrategie Nachhaltige Entwicklung) and climate strategy (Klimareglement) in preparation</li> </ul>	<ul style="list-style-type: none"> <li>• <b>2021:</b> Preparation of a city climate map (Stadtklimakarte)</li> </ul>

In Potsdam, mitigation activities gained traction with the foundation of the Climate Coordination Office (Koordinierungsstelle Klimaschutz) in 2008 and the release of the first mitigation strategy in 2010 (see interviews 7, 10, and 17). Nevertheless, empirical research indicates that both cities started relevant activities earlier than they adopted climate policies, mainly in the field of environmental and energy policy (see interviews 1, 5, 7, and 17).

Despite the increasingly common practice of integrating climate adaptation into climate policy [51–53], Bern is still prioritizing mitigation and seems delayed with regard to climate adaptation (see interviews 1 and 5). Potsdam pursues a more balanced approach and started to integrate adaptation into its climate activities around 2010, publishing an adaptation strategy in 2015. Besides, Potsdam’s Climate Coordination Office is staffed with personnel specialized in both climate mitigation and adaptation (see interview 18). In Bern, adaptation was officially enshrined in the master energy plan in 2014 only (see interviews 1 and 5).

#### 4.2. Path Dependencies

The current status of climate policy in Bern and Potsdam is shaped by path dependencies, which have substantially influenced the long-term development of climate policy in both cities and will most likely affect future development as well. As “green cities

by water” (Potsdam’s official urban development vision.), both cities reveal favorable starting conditions for sustainable urban (re)development (see interviews 1 and 5). Long before sustainability and, later on, climate topics emerged, Bern’s historic city center was designed as a sustainable place (e.g., car-free city center, pedestrian areas) and has not been affected by the urban modernization and car-friendly urban development that has occurred since the middle of the 20th century. Moreover, the Danish architect Jan Gehl, who popularized the “cities for people” approach, advised Bern in 2016/2017 on the use of public space and public life. He confirmed that the old town of Bern is ideal for pedestrians, as everything is within walking distance and many shops, offices, and service providers lie next to each other. As the shares of cycling and public transport are also very high, Gehl concluded that Bern’s historic city center is strong in sustainable mobility [56]. In Potsdam, the large parklands and gardens, primarily designated for recreation, significantly increase the quality of life and already contributed to adaptation long before adaptation strategies or measures were adopted (see interviews 8, 11, and 19).

Both cities do not show negative lock-in effects due to the absence of emission-generating industries and car-friendly urban structures [57,58]. Moreover, our case studies did not reveal any significant path dependencies that hinder local climate action. In Potsdam, the municipal housing association ProPotsdam is highly committed to climate activities. Substantial progress in redeveloping urban neighborhoods in a climate-friendly way has already been made in the *garden city Drewitz* (see interview 17). The experiences gained there now serve as a model for other projects, like the redevelopment of the former barracks of Krampnitz (interviews 8, 9, and 15).

Not surprisingly, UNESCO World Heritage status, with its high symbolic value, also affects local climate governance in both cities. In Potsdam, the World Heritage Site consists of park landscapes and (groupings of) historical buildings, mainly palaces. The historic site and its buffer zone cover more than 28% of the city’s territory. Additionally, the heritage protection act of the federal state of Brandenburg (Brandenburgisches Denkmalschutzgesetz) covers the baroque Old Town. However, Potsdam’s whole cityscape is still shaped by the legacies of Second World War destruction and socialist urban planning during GDR times (e.g., the removal of Prussian architecture, construction of large housing estates).

In contrast to Potsdam, Bern’s old town covers only 1.7% of the city’s territory. Hence, it is not a priority area for realizing climate policies (see interviews 1, 2, 5, and 6). Urban green spaces are not part of the World Heritage Site in Bern, which has proven to be beneficial in Potsdam for synergies between the World Heritage Site and climate adaptation. These differences may explain why Potsdam faces more permanent and stronger conflicts about urban development (historicizing vs. modern development) than Bern, where the urban structure is not contested as much (see interview 19).

Bern’s medieval structure has remained largely unchanged and the urban development is characterized by a high degree of continuity. The Old Town is not considered an unsustainable neighborhood since it was constructed from local materials in a long-lasting way and, for instance, allows infiltration through the paving (see interview 4). Besides preserving the city core and its traditional building fabric—which is by definition understood as a step towards sustainability—mitigation measures have also been implemented in the Old Town (e.g., district heating in parts of the Old Town, electronic mobility; see interviews 1 and 5). As severe conflicts between world heritage and climate activities in Bern were not mentioned by the interviewees, our findings suggest that political and administrative actors have accepted the conditions of the world heritage and operate within this framework.

Both cities demonstrate that the historic urban structures, the protected areas, and the cities’ identities constitute significant path dependencies regarding climate policy. World heritage often takes a central role in the urban vision and city branding (see interviews 8, 9, and 19). Thus, it forms one of a city’s “highest assets” that must be protected in order to preserve the city’s identity and ensure its function as an economic resource.

Like Potsdam, many cities struggle with conflicts between continuity and change regarding cultural heritage in an urban context. This central conflict is widely discussed

in heritage theory as well as urban studies [9,10]. Through urban heritage management approaches and single instruments like management plans many cities try to bridge this gap [13,25]. However, such an approach has not yet been fully implemented in Potsdam and Bern. For instance, both cities have not yet developed management plans for their World Heritage Sites. While Bern is currently preparing a plan upon the request of UNESCO (see interview 4), in Potsdam no such efforts have been made.

From a climate governance perspective, world heritage is often considered as a brake on sustainability and climate policies. For example, in Potsdam, monument conservation requirements prohibit the installation of solar panels on protected and even on unprotected buildings—if they cross visual axes and thus impair the view on protected monuments. Also, the irrigation of the historic parks requires large amounts of water, which is becoming scarce due to increasing droughts and population growth. Nevertheless, the Foundation for Prussian Palaces and Gardens (Stiftung Preussische Schlösser und Gärten (SPSG)) is committed to mitigation and adaptation: it has developed strategies for irrigating the gardens sustainably and energetically renovated many historical buildings. Moreover, adaptation is driven by the SPSPG's vision to preserve the parks for future generations (see interviews 18 and 19).

Nonetheless, this rather narrow perspective on sustainability disregards the fact that world heritage can slow down sustainable urban development and local climate policy in numerous ways. World heritage mainly inhibits climate action because of unsustainable conservation instruments or heritage protection legislation, which do not allow solar panels, energetic renovation, or the reconstruction of roads for the benefit of sustainable mobility.

#### 4.3. Integration and Coordination

Both cities are comparatively well-equipped in terms of personnel responsible for climate activities, which is a typical characteristic of climate forerunners [3,8,37,38]. However, in Bern and Potsdam, climate mitigation and adaption, on the one hand, and heritage management, on the other, are handled differently with regard to the degree of institutionalization, as well as the degree of integration and coordination between them.

In Bern, the responsibilities for mitigation and adaptation are distributed over various directorates (Direktionen) of the city administration, led by the Office for Environmental Protection (Amt für Umweltschutz (AfU)) (see interviews 1, 3, and 6). Climate activities are coordinated through various channels such as the AfU, the directorate for Safety, Environment, and Energy (Direktion für Sicherheit, Umwelt und Energie (SUE)), the city council, the municipal utility company (Energie Wasser Bern (ewb)), and the climate platform of the economy (Klimaplatzform der Wirtschaft) (see interview 1). Although there is still a lack of integration of climate policy, and especially coordination of adaptation policies between different directorates, in Bern, most interviewees did not advocate the establishment of a coordinating unit—except the interviewees from the ewb, which currently seems to carry out a major part of the coordination tasks (see interviews 1, 5, and 6). However, an informal administrative coordination board is currently being set up (see interview 1).

In Potsdam, management for mitigation and adaptation lies primarily with the Climate Coordination Office, which cooperates with relevant offices (Ämter) on a project basis. Furthermore, Potsdam's most recent climate strategy combines both mitigation and adaptation. Even though their integration has hardly been studied so far, there is empirical evidence that institutional integration of mitigation and adaptation could be advantageous [52]. Beyond this internal integration, the climate council (Klimarat) and the city–science climate partnership (Klimapartnerschaft Stadt und Wissenschaft) facilitate the integration of climate policies outside the municipal administration (see Section 4.5).

Altogether, mitigation and adaptation are more integrated in Potsdam, which seems to follow a “full integration model”, while Bern's climate policy shows many characteristics of a “project-based integration model” [53]. The institutional integration of mitigation and adaptation in Potsdam and the fact that Bern is lagging behind might be a result of diverging funding practices. In Germany, national programs offer options for funding cli-

mate managers and support the development of mitigation and adaptation strategies. This might explain the popularity of integrated approaches in Germany (e.g., the establishment of climate coordination offices). No such funding is available in Switzerland and, thus, integrated approaches are less common and climate coordination offices rarely exist.

Though project-related coordination of climate policy exists in both cities, there is still a lack of institutionalized coordination regarding world heritage (see interview 17). This might be explained by the fact that the responsibility for world heritage management in Bern and Potsdam mainly lies with the offices for historical preservation, which traditionally do not take a proactive role in urban development but concentrate on conservation issues. Furthermore, in Potsdam, additional offices at the municipal and federal-state levels need to be involved because the world heritage zone includes territories located outside the city borders (see interviews 7 and 18). In both cities no coordination units exist that act independently from the offices for historical preservation. Instead, world heritage is governed by a network of stakeholders [10,27].

Our findings confirm previous studies that revealed that climate policy has been neglected by urban heritage management, while more attention being given to the synergies between heritage and sustainable urban development [4,6,21,59]. This might be a reason for the weak integration and the missing links between world heritage and climate activities.

#### 4.4. Key Actors and Key Events

Our empirical results illustrate that Bern's and Potsdam's urban development and climate policy pathways have been substantially influenced by a few key actors and key events, as well as the interplay between them. In both cities, climate action received steady support from local politicians who have pressed for climate action and the development of strategies (see interviews 2, 7, 10, 18, and 19). This was crucial for putting and keeping climate change on the agenda and confirms previous research findings that have highlighted the importance of political support for local climate action [38,41,43]. Additionally, in Potsdam, decisive support came from the social-democratic city mayor who decided to replace an old high-emission coal-fired power plant with a gas-fired one in 1995 (see interviews 10 and 19, Table 3). Although this decision was not driven by the motivation to decarbonize the city but rather to reduce air pollution, it reduced Potsdam's CO<sub>2</sub> emissions considerably.

Besides political actors, municipal staff also proved to be of major importance for local climate action in both cities. One of the main reasons for the dynamic development of climate and energy policy in both cities has been the continuous and dedicated engagement of long-time employees, who have formed and maintained networks within and beyond the city administration (see interviews 5 and 6). This has enabled them to develop strategies and establish connections between different departments.

In Bern, this helped the city administration to build up the image of a role model in pioneering sustainability and climate policies. Thus, Bern's energy and climate strategy includes detailed goals for the city administration itself (e.g., energy-efficient new buildings, electrification of the municipal vehicle fleet). This confirms that policy entrepreneurs such as municipal staff can become key driving forces of (local) policy change [47,49].

In Potsdam, the urgency of responding to threats posed by climate change and the willingness to protect world heritage made Potsdam's Director of Gardens (Gartendirektor) a rather progressive actor in local climate governance (see interview 18). In contrast to Bern's historic city center, Potsdam's parks and some of its buildings are endangered by the impacts of climate change. Rising temperatures and prolonged periods of drought cause significant damage to trees and plants, as well as moisture damage to historical buildings. As counteracting measures are energy-intensive, their energy efficiency need to be improved. However, the severe challenges posed by climate change to the conservation of world heritage can be observed all over the globe [24].

In addition, municipal utilities and service companies are essential for the success of climate activities in both cities. The leading managers of these companies have constantly



supported the city administrations in Bern and Potsdam from the outset (see interviews 5, 17, and 19). They have committed themselves to the municipal climate strategies and targets and have integrated energy and climate measures into their everyday activities (see interviews 1, 5, 12, 13, 16, and 17). This applies to the energy and water sector (Energie Wasser Potsdam (EWP); Energie Wasser Bern (ewb)), to public transport (Verkehrsbetrieb in Potsdam (ViP); BernMobil), and, in Potsdam, also to public housing company (ProPotsdam). This confirms that cities that still own utilities and service companies and have abstained from privatization are in a much better position to implement their climate and energy strategies [53].

With regard to key events that had a major influence on the cities' urban development and climate policy pathways, the interviews revealed marked differences between Bern and Potsdam. Asked about key events, the interviewees in Potsdam identified events not directly connected to the formulation of local climate policies. These events were (i) the award as UNESCO World Heritage Site in 1990; (ii) the establishment of the Potsdam Institute for Climate Impact Research (PIK) in 1991; and (iii) the already mentioned shift from coal to gas in 1995 (see interviews 7, 10, 17, 18, and 19). In contrast, in Bern the interviewees exclusively referred to the adoption of relevant strategies such as the master energy plan 2035 (2014) (see interviews 1 and 5), while the world heritage status was hardly mentioned. Despite these differences, in both cities there is no indication that the development of climate policies was triggered by extreme weather events.

#### 4.5. Cooperation with Research Institutions and Civil Society

Researchers from the PIK have significantly contributed to the development of Potsdam's mitigation (2010, 2017) and adaption strategies (2015). Furthermore, city–science interactions include a transdisciplinary research project on urban climate resilience led by the University of Potsdam and collaboration between the local utility company and the German Research Centre for Geosciences (GFZ) to explore the potential of using geothermal energy. Moreover, a climate partnership between the city of Potsdam and local research institutes (Klimapartnerschaft Stadt und Wissenschaft) was established in 2018 (see interview 18). The partnership aims at facilitating collaboration between actors from city government and various research institutes located in Potsdam. In contrast, city–science interactions in Bern are mainly restricted to single projects (see interview 1). Examples include the collaboration of two local universities and the AfU with three cities in Chile, and the adaptation project “climate balconies” (Klimabalkone) guided by the University of Bern, which aims at increasing biodiversity and improving the microclimate in Bern (see interviews 1, 5).

This emphasizes that city–science collaboration varies considerably, even though both cities have strong and diversified research environments, which constitutes another typical characteristic of climate forerunners [42,44,45]. The interviews showed that the potential for city–science cooperation has been utilized to a much greater degree in Potsdam than in Bern. They showed that mutual interest in partnerships is essential for the establishment of successful collaborations and requires active outreach from both sides (see interviews 17 and 18). This was the case in Potsdam, which led to the first steps towards an institutionalized city–science partnership, while in Bern there seems to be a lack of ambition in cooperating beyond single projects. This may be explained by the fact that Potsdam promotes itself as a city of science, while Bern, despite its existing research landscape, places little value on these resources. Moreover, the foundation of the PIK in 1992 and its strong leadership shaped Potsdam's climate policy from the outset.

Similar to the city–science cooperation, Potsdam involves civil society more actively and in a more structured way in climate policy discussions than Bern. While Potsdam's strong and active civil society is pushing for climate action and is involved in discussions and planning processes (e.g., guest status of Fridays for Future in the climate council), Bern's administration collaborates rather informally with civil society actors (e.g., with Fridays for Future) (see interviews 1, 5, and 19). However, Swiss citizens can express their

opinions through public votes and referenda and are therefore actively involved in the political process.

Although there are generally much fewer conflicts about the urban structure in Bern than in Potsdam, two examples illustrate how civil society in Bern influences decision-making on climate-relevant issues and actively influences climate policy measures. First, the planning process for the new tramline from Bern to Ostermundigen has been underway since 2014, with various failed and accepted proposals at the municipal and cantonal levels, including popular votes, and even a complaint to the federal court (see interview 2). Second, Bern's government wants to reduce the public parking slots in the city center by half in favor of climate mitigation, whereas many citizens strongly oppose these plans. This conflict is not restricted to the existing parking spaces in the historic center but rather is an ongoing conflict, which also affects discussions about the parking spaces for new buildings outside the city center.

Contrary to Bern, Potsdam's climate policy was not influenced and shaped by referenda. In German cities, practices of direct democracy are less common than in Swiss cities, where referenda and decisions about public investments determine the political process. Nevertheless, in recent years various successful referenda (e.g., on bike infrastructure in Berlin and Rostock) have gained public attention and been imitated nationwide [53]. Despite the differing participation structures, it can be concluded that both cities have an active civil society, especially with respect to environmental concerns, which is a typical characteristic of forerunners [3,37–39,43].

#### 4.6. Urban–Regional Relations

Another common feature of Potsdam and Bern is their progressive role in developing innovative climate policies while being surrounded by less ambitious regions and neighboring municipalities. However, differences do exist between the governments of the federal state of Brandenburg and the canton of Bern. In Bern, the cantonal government is composed of several conservative parties, while Brandenburg is traditionally governed by a coalition led by the social democrats. However, due to the close connections between them and the coal industry, Brandenburg's social democrats are not known for their innovative climate and energy policy (see interviews 10, 17, and 19).

The city of Bern is more dependent on the canton of Bern than Potsdam on the federal state of Brandenburg. As an example, the narrow rejection of a cantonal energy law limited the financial security for Bern's district heating network because there is no legal obligation for the neighboring municipalities to connect to the city's heating network (see interviews 5 and 6). Moreover, when the city of Bern plans to purchase new public transport vehicles, the financing is handled by the canton, which usually opts for the cheapest solution and has thus delayed the complete electrification of Bern's public transport fleet (see interviews 1, 2, and 5). In addition, the decision-making process for the new tramline shows that the neighboring municipalities are also important for Bern's climate policy. Similarly, empirical research indicates a lack of cooperation between the city of Potsdam and the surrounding county (Landkreis) Potsdam-Mittelmark and its municipalities.

Although Potsdam is less slowed down by the federal state of Brandenburg, it shows greater dependence on national funding. Indeed, many German municipalities strongly depend on national funding for the development and implementation of their climate policies [54]. This concerns, in particular, funding programs for mitigation and adaptation projects, climate strategies, and additional staff (see interviews 7, 17, and 19). Conversely, in Bern, there is far less funding for climate activities from the regional (cantonal) or the national governments available. This lack of reinforcing measures and support from upper levels of government leads to lower expectations with respect to regional and national assistance. This seems to be one reason why Bern acts more autonomously.

The experiences of both cities demonstrate that mid-sized cities can become forerunners in climate governance even if they are not substantially supported by the surrounding region. These are encouraging findings for local policy-makers in other cities since they

suggest that cities can autonomously and successfully develop their own approaches if they have the ambitions and capacities to do so. Our results imply that a combination of factors—including the urban structure and cityscape as well as institutional preconditions, such as political continuity and municipal ownership of utility companies—creates a favorable local environment for climate policies.

## 5. Discussion and Conclusions

Our study shows that cities with historic city centers, such as Potsdam and Bern, can become climate policy forerunners despite barriers to climate mitigation and adaptation policies. Such negative effects on climate policies exist, but the conservation of historic city centers also has advantages because they were designed before the car was invented. Thus, we see a lock-in effect, which has prevented the transformation of historical cities into (modern) car cities. Today, the urban design of historic cities is beneficial for the envisioned transformation into climate-neutral and climate-resilient cities.

The comparison of both cities shows more similarities than differences. Both cities are governed by red-green governments with active politicians and administrators serving as policy entrepreneurs. Another common trait is the ownership of public utilities, i.e., the energy and transport sectors did not undergo privatization. Thus, both cities have considerable influence on policy areas that are most important for the reduction of CO<sub>2</sub> emissions. Our results confirm our own research findings that have previously shown that cities that own local energy and transport companies are in a better position to develop successful climate policies than cities with privatized public services [53]. As this aspect has been neglected in the literature, future studies on forerunners cities in climate policy should take these findings in account.

Although national differences exist, there are functional equivalents of the political and administrative institutions in Germany and Switzerland. While referenda are a highly institutionalized form of citizen participation in Bern, this form of direct democracy is not as important in Potsdam. In contrast to other German cities (such as Berlin or Rostock), referenda have not played an essential role in Potsdam's energy and climate policy. However, citizen engagement has been high in Potsdam and initiatives such as the Fridays for Future movement have influenced climate policy and stimulated policy-makers to declare a "climate emergency". Functional equivalents can also be found with respect to the membership in city networks such as the Climate Alliance (in the case of Potsdam) and participation in certification schemes such as the "energy city" (Energiestadt) label (in the case of Bern).

The main difference between Potsdam and Bern seems to be the framing of climate policy. While in Bern sustainable development and energy policy are strongly emphasized, the debate in Potsdam has focused on climate policy from the outset. Due to national funding, climate policy in Potsdam is more advanced than in Bern and characterized by a higher degree of institutionalization and integration of climate mitigation and adaptation. Moreover, in Potsdam, synergies between world heritage and climate activities are boosted by the fact that the world heritage area and the buffer zone cover large parts of the city territory, including parks. Bern, where green spaces are not protected by the UNESCO status, does not benefit from this unique feature.

As Bern and Potsdam share many characteristics, but nonetheless show top performances in different areas, these matching cities can learn from each other with regard to energy and climate policies. For the city of Bern, our empirical findings support three recommendations: First, the city could introduce a more institutionalized, formalized, and integrative approach to climate mitigation and adaptation. Second, Bern could set up an external advisory committee for climate issues, which would support both the administration and the council. Third, Bern could improve its performance by institutionalizing the cooperation with its local research institutes and thus benefit from these underutilized capacities. Vice versa, Potsdam could learn from Bern in two areas: First, the city administration could intensify its efforts to become a role model for stakeholders

and citizens alike, e.g., by setting a deadline for making its own facilities climate-neutral and climate-resilient. Second, Potsdam could participate in voluntary certification schemes. Although the “energy city” (Energierstadt) label is restricted to cities in Switzerland and Liechtenstein, German cities have the option to join similar certification schemes (European Energy Award, European Climate Adaptation Award).

Furthermore, both cities could jointly search for institutional and procedural innovations that improve the coordination of heritage management, sustainable urban development, and climate policy (e.g., by setting up management plans or coordination units). Although this debate is still in its infancy, it could be taken up by matching cities such as Potsdam and Bern because they face the same challenges and have the potential to jointly develop appropriate solutions to mitigate these shortcomings. Such efforts are facilitated if matching cities share not only material but also non-material forms of cultural heritage, such as the same language.

From a wider perspective, our case studies show that cities with historic centers can become forerunners or even leaders in climate policy. Therefore, Potsdam and Bern could serve as examples not only for other world heritage cities but also for many other cities with historical city centers. Despite the barriers posed by legal requirements for historical monuments, or by UNESCO World Heritage Site status, this urban set-up offers opportunities because such cities have not undergone urban modernization and did not embrace ideas such as the concept of functional cities, which nowadays impedes the development of sustainable cities.

Moreover, the case studies on Bern and Potsdam show the trade-offs between continuity and change in the urban fabric. In contrast to Bern, debates on urban planning around the UNESCO World Heritage Sites are very common in Potsdam. We assume that such debates, which require new approaches, can be traced back to disruptive events in Potsdam’s history, in particular destruction during the Second World War and German reunification in 1990. While the Second World War resulted in a void of the built environment, German reunification left an institutional void because political and administrative institutions of the GDR disappeared and had to be replaced by democratic institutions. Although such disruptive events may have destructive effects in the short run, they seem to open new opportunities in the long run, not only for directly affected cities like Potsdam but also for matching cities like Bern, which can learn from Potsdam’s experiences.

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