

Citation: Koehrsen, Jens (2015): Does religion promote environmental sustainability? - Exploring the role of religion in local energy transitions. In: Social Compass 62 (3), S. 296–310. DOI: 10.1177/0037768615587808.

Does Religion Promote Environmental Sustainability? – Exploring the Role of Religion in Local Energy Transitions

Draft Version

Author:

Jens Koehrsen, University of Basel, Switzerland

Address: Jens Köhrsen, University Basel, Faculty of Theology, Nadelberg 10
4051 Basel, Switzerland.

Email: jens.koehrsen@unibas.ch

Abstract

This article explores the role of religion in local energy transition processes. By combining insights from (a) sustainability studies and (b) academic contributions on religion and sustainability, a theoretical approach for describing the role of religion in local energy transitions is developed. Religion is conceived of as a subsystem among other local subsystems that potentially contribute via their competences to energy transition processes. Three potential functions of religion are identified: (1) Campaigning and intermediation in the public sphere; (2) “Materialization” of transitions in the form of participation in projects related to sustainable transitions; and (3) Dissemination of values and worldviews that empower environmental attitudes and action. These functions are studied in the case of the energy transition in Emden, a city in North-Western Germany. Although religion attends, to some degree, each of the three functions, it does not assume a dominant role relative to other local subsystems. Actors from other social subsystems appear to overtake these functions in a more efficient way. As such, in a highly environmentally active region, there are few indications for a specific function of religion. These results shed a critical light on the previously held assumption that religion has a crucial impact on sustainability transitions.

Keywords

Religion, Ecology, Climate Change, Regional Innovation Systems, Germany.

Introduction

Western societies are currently struggling to evolve and implement more sustainable forms of living, as is reflected in rising academic efforts to understand and inform these transitional processes. To this end, a particular strand of research addressing sustainability transitions has lately emerged in the social sciences. Here, sustainability transitions are understood as ‘long-term, multi-dimensional, and fundamental transformation processes through which established socio-technical systems shift to more sustainable modes of production and consumption’ (Markard et al., 2012: 956). Different theoretical approaches – for example, the Multi-Level Perspective (MLP) (Geels, 2004; Verbong and Geels, 2007) and the Technological Innovation Systems (TIS) approach (Bergek et al., 2008; Carlsson and Stankiewicz, 1991; Hekkert et al., 2007; Weber and Rohracher, 2012) – have been developed to comprehend the dynamics of sustainability transitions, particularly energy transitions. Academic contributions to this major topic have mostly concentrated on social evolution and the diffusion of particular technologies (e.g. solar or wind power), rather than taking a holistic perspective on the transformation processes in specific regions and localities. Consequently, the interplay between actors on the concrete level of regions and cities has received very limited attention in the transitions literature (Coenen et al., 2012; Hodson and Marvin, 2009; Späth and Rohracher, 2012). Moreover, sustainability transition research, thus far, has not managed to put forward a broader picture of transition processes that includes actors and social spheres not immediately involved in the transformation processes, but may nonetheless play an important role. One of these spheres is religion. Although scholars have studied different types of actors – such as municipalities, businesses, intermediaries, politicians, public utilities, and research institutes, the potential roles of religious actors have remained unexplored.

Unconnected to the aforementioned research strand, another academic field has emerged that underscores the role of religion in sustainability transitions: the field of “religion and ecology”. The contributions to this debate are often related to religious studies and tend to highlight the advantages of religion for promoting sustainability transitions (Clugston and Holt, 2012; Kimmins, 1993; Gottlieb, 2008; Rolston III, 2006; Rasmussen, 2011; Tucker, 2008). They suggest different channels through which religion can influence sustainability transitions: directly, in the form of activities and public statements by religious organizations (Christiansen, 2011; Harper, 2011); or indirectly, through faith traditions that provide moral guidance, spend hope, and encourage environmental action (Gottlieb, 2008; Laurendeau, 2011). Many of these contributions take a normative stance and describe religion as indispensable in promoting sustainability transitions. This stance may inhibit more critical explorations that take into account its limitations. Nevertheless, this strand is complemented by some empirical studies in social sciences that mostly focus on the US and highlight – often with divergent results – the varying impacts of religion on environmental attitudes (Barker and Bearce, 2013; Djupe and Hunt, 2009; Djupe and Gwiasda, 2010; Greeley, 1993; Guth et al., 1995; Sherkat and Ellison, 2007; Wardekker et al., 2009).

So far, both academic fields – the field of sustainability transitions research and the field addressing the relationship of religion and sustainability – have developed independently of each other. Research on sustainability transitions disregards the religious factor, while contributions highlighting the potential role of religion barely refer to the current state of sustainability transitions research. Moreover, there is a general lack of empirical insights into the relationship between religion and sustainability transformation processes.

A strongly discussed subfield of sustainability transitions is energy transitions. Although national and international configurations (i.e. national funding schemes) play an important role in low carbon transitions, many transformation processes occur on the level of small-scale regions. Cities and rural areas seem to constitute a hotbed and experimental environment for these change processes (Bulkeley and Kern, 2006; Hodson and Marvin, 2010; Hodson and Marvin, 2012;

Maassen, 2012; McCauley and Stephens, 2012; Schönberger, 2013; Späth and Rohrer, 2012). Local actors such as politicians, entrepreneurs, energy suppliers, scientists, and environmental initiatives originate and foster changes in the local energy configuration. Aside from these actors, religious communities may contribute to these processes by using their public voice and organizational resources. However, given the lack of empirical research, it is still unclear what role religion assumes in local energy transitions. This paper addresses this gap by interrogating in what way religion can contribute to local energy transitions. This question is tackled a) theoretically, by elaborating upon an approach for describing potential roles of religion in energy transitions and b) empirically, by exploring these roles in a case study on the energy transition in Emden, a city in north-western Germany. In this way, this article aims to provide some preliminary findings on the potential role of religion in local energy transition processes.

The paper is structured as follows: The first section combines both aforementioned debates to develop an approach for describing potential roles of religion in local energy transitions. Based on this, the following section studies these roles in the case of Emden's energy transition. The conclusion discusses the results and portrays its consequences for the research on religion and energy transitions.

Unfolding the Potential Roles of Religion in Sustainability Transitions

Although energy transitions have become an increasingly prominent topic in social sciences, so far, we lack an approach for addressing the potential roles of religion in these change processes. The following paragraphs develop some preliminary concepts regarding these roles by combining insights from both the field of sustainability transitions research and the field addressing the relationship of religion and sustainability. In accordance with the research focus, the emphasis is on energy transition processes in small-scale regions.

Referring to the research on sustainability transitions, energy transitions can be defined as complex socio-technological transformation processes leading to more sustainable patterns of energy production, supply, and consumption (Bridge et al., 2013; Cherp et al., 2011; Coutard and Rutherford, 2010; Grubler, 2012; Verbong and Geels, 2007). These transitions imply changes in the technological setting as well as in the social and cultural domain (e.g. changes in consumption patterns). Moreover, they usually involve different social spheres and types of actors (Geels et al., 2008). Although energy transitions are ultimately supposed to lead to more sustainable energy settings, the transformation processes are likely to unfold non-linearly (Markard et al., 2012): they may evolve along numerous loosely coupled processes originating from different actors and social spheres.

So far, academic contributions have mostly concentrated on the emergence and diffusion of particular technologies on the national level, whereas the interplay between various types of actors and change processes at the concrete level of small-scale regions has only received very limited attention (Hodson and Marvin, 2009). As a result of this academic focus, transition literature today lacks an analytical approach that grasps transformation processes on the regional and local levels. Therefore, this study draws upon the concept of regional innovation systems (RIS) to apprehend change processes in small-scale socio-geographic spaces.¹ The RIS concept was originally developed to explain intense innovation activities in particular regions by placing a holistic view on regional production structures (Cooke et al., 1997; Doloreux, 2002). Innovation activities are conceived of as the outcome of interactive processes between actors from different social subsystems. According to this RIS approach, we can conceive socio-technological transformation processes in small-scale regions as the outcome of complex interactions of different social subsystems (Huber et al., 2013). Such a perspective considers numerous social subsystems

¹ The idea to apply the RIS-approach to local energy transitions is based on Huber (2012), Huber et al. (2013), and Mattes et al. (2015). The RIS approach is related to the concept of innovation systems (Carlsson, 1991; Lundvall, 1992) and despite some similarities, is different from the Technological Innovation Systems (TIS)

(Heidenreich et al., 2012; Kuhlmann, 2001; Mattes, 2010): scientific, industrial, political, financial (venture capital and banks), intermediaries (networking organisations such as the local chamber of commerce), municipal administration, and civil society. Each of these subsystems consists of collective and individual actors (organizations and individuals), their activities, and their relationships.

The subsystems, their functions, and their relationships stand in the centre of the analysis. Each subsystem contributes with its competences to the transitional process and thereby assumes a specific social function. In the case of energy transitions, the scientific subsystem might, for instance, evolve knowledge and create new technological solutions, while the political subsystem would employ its political power to support these new solutions with funding schemes and favourable bills. As energy transitions imply encompassing changes that span different social spheres, they rely on functional contributions from various subsystems and are likely to unfold in the course of the interaction of these systems. Thus, local energy transitions are unlikely to be the product of the activity of just one subsystem: they take place during complex interactions between various subsystems, complementing each other (Huber et al., 2013). However, depending on the locality, specific subsystems may assume more dominant roles, while others are less visible or even hamper transformation processes.

In addition to the aforementioned subsystems, religion may also assume a function in local energy transitions. Studies on religion and sustainability provide examples for different forms in which religion influences sustainability transitions (i.e. public campaigning, diffusion of pro-environmental moral values, low carbon projects etc.). The contributions of religion to sustainability transitions that are mentioned by the literature can be basically systematized along three potentially functions: (1) Campaigning and intermediation in the public sphere; (2) “Materialization” of

approach, as it takes a broader stance on the involved actors and system functions, and different from Luhmann’s system theory (Luhmann, 1997), as it takes concrete actors and their activities into account.

transitions in the form of participation in projects related to sustainability transitions; and (3) Dissemination of values and worldviews that empower environmental attitudes and actions.

The *first function* refers to the public sphere: religious actors can have a strong presence and impact in the public spheres of modern western societies (Casanova, 1994; Habermas, 2008; Willaime, 2008). Thus, they may shape debates on sustainability through public statements and activities (Johnston, 2010). In the US, religious organizations – particularly evangelical churches – increasingly communicate their positions regarding climate change within the public (Dewitt, 2006; Djupe and Gwiasda, 2010; McCammack, 2007; Nagle, 2008; Wardekker et al., 2009). However, in many cases, climate change and low carbon transition compete with other issues, such as poverty reduction, for the top position on the public agenda of religious actors. Therefore, the official statements of evangelicals are not unanimous: while some actors call for a pro-active policy against climate change, other congregations assume more reluctant positions, fearing the negative impact on emerging economies. The general influence of religious statements on climate change is reported to be high in the US, where contributions from churches are amply covered in media debates (Wardekker et al., 2009). It remains to be studied whether the European media similarly probes religious statements concerning climate change (Köhrsen, 2012). Aside from media statements, religious organizations may further contribute to public debates on sustainability transitions by bringing together different actors in the form of round tables and debate forums.

The *second function* contends that religious organizations can have an active stance in “materializing” sustainability transitions (Gottlieb, 2006; Harper, 2011). For instance, church headquarters launch campaigns encouraging local congregations to reduce their CO₂ emissions. Accordingly, congregations create local environmental groups that organize energy efficient refurbishments of church buildings or the installation of solar panels on church roofs. As these activities are restricted to the given congregation, their impact does not extend to the wider transformation process. However, a religious organization might also participate in designing municipal strategies to reduce CO₂ emissions or launch large-scale projects in close collaboration

with actors from other subsystems. For example, supplying church land to wind farm projects or participating with other actors in citizen solar initiatives. In some cases, religious actors even assume a leadership role for initiating local transition activities by launching low carbon projects and building pro-environmental local coalitions with actors from different subsystems.

The *third function* comprises the dissemination of religious values and worldviews that foster environmental attitudes and behaviour. Religion orientates human behaviour towards the environment, particularly in the form of ethical teachings. Thus, several scholars portray religion as the social sphere that can provide an ethical framework to address the environmental crisis – a task that can hardly be fulfilled by other social spheres (cf. Gardner, 2006; Gottlieb, 2008; Rolston, 2006; Tucker, 2006). For instance, Laurendeau contends that in the US, religion rather than scientists could act as messengers of the energy transition by promoting an “ethic of responsibility” that advances changes in lifestyles (Laurendeau, 2011). Other scholars highlight patterns in different faith traditions that match the ideals of sustainability (i.e. care for the natural world, justice, and ascetism) (Rasmussen, 2011).² Religion is expected to encourage people to promote environmentally friendly behaviour and policies. The dissemination of these values and worldviews occur through organizational and non-organizational forms of religion. Religious organizations provide the function, for instance, by transmitting pro-ecological values in church services and Sunday-schools (Clugston and Holt, 2012; Djupe and Hunt, 2009; Gottlieb, 2008), where they are often embedded in a wider discourse on the “preservation of the creation”. In addition, the third function also involves non-organizational forms of value transmission, such as subliminal proliferation of religious values and worldviews in the course of religious socialization.

As this systematization refers only to the most discussed roles of religion in sustainability transitions, it does not claim to be exhaustive.³ Many contributions to the debate focus on the third function as the unique role of religion in sustainability transitions. The underlying assumption is that

² Nonetheless, religious worldviews and values can also have a negative impact on the environment (Barker, 2013; Mebratu, 1998; White, 1966).

religion conveys moral values that inspire ‘eco-friendly’ attitudes and cannot be imparted by other subsystems (Rolston, 2006). This hypothesis is studied together with the other potential functions of religion in the following empirical case study.

Empirical Insights: Case Study on the Energy Transition in the City of Emden

The case study draws on empirical insights arising from a research project on local energy transitions. Its purpose was to carry out a study on local energy transition processes in the region of East Frisia in North-Western Germany. Due to its high activity in the energy transition, the city of Emden, a small city of around 52,000 inhabitants, was chosen as the subject of an in-depth exploration. Emden is often described as a pioneering region in the energy transition (Klagge and Brocke, 2012); as such it can be regarded as a special test case for the potential role of religion in local energy transitions. In total, 37 semi-structured, qualitative interviews with leading actors from different subsystems have been conducted in the city. The sampling strategy consisted in selecting those actors from each subsystem that were most involved in the local energy transition. In most cases, interviews took around 1.5 hours and included questions about their contributions to the energy transition and networks with other actors. A part from the interviews, reports (e.g. on the climate strategies of specific actors), web pages, and local press statements were analyzed. The broad empirical approach of embracing various types of actors allows for the identification of the functions that different subsystems assume in the local energy transition and the determination if, and in what way, religion plays a role in this process. The focus of the empirical research was organized forms of religion (local congregations).

The city of Emden started to experiment with renewable energy comparatively early. Already in 1987, the municipal utility company (*Stadtwerke*) – Emden’s main energy supplier – mounted the

³ Moreover, the systematization does not exclude potential overlaps between the mentioned functions.

first windmill to power the local water works. In the early 1990s, the public utility company reoriented its business towards renewable energy and energy efficiency. In the following years, it constructed its first wind farm and implemented different programs to encourage its clients to save energy. Besides the *Stadtwerke*, actors from different subsystems have contributed with their specific competencies to the local energy transition: politicians have promoted the local energy transition by their decisions; local businesses have carried out low carbon projects, such as the construction of wind and solar farms and the implementation of energy saving measures. Their projects have been supported by the city's administration, which has handled applications related to low carbon projects in a favourable way and has also implemented its own transition projects (e.g. energy efficient refurbishments of city districts, promotion of bicycle mobility). In 2003, Emden joined the European Energy Award programme and in 2008 the Climate Alliance. In the course of these projects, the city set its climate targets: a 10 % reduction of CO₂ emissions every five years and a 50% cut of the total CO₂ emissions until 2030, compared to 1990 (Stadt Emden, 2010).

Different subsystems contribute with specific functions – directly or indirectly – to the local energy transition: the city administration acts as a public administrator, organizer and implementer; the economic subsystem as an implementer of innovative projects; the scientific subsystem as a developer of knowledge and new solutions; the political subsystem as a creator of a favorable socio-political context; intermediaries as networking actors; the financial subsystem as a provider of financial resources; and civil society as a moral driver and watchdog. The local energy transition evolves in the interplay of these subsystems. One example is the first wind farm of the public utility company at the factory site of a big car producer: local banks provided loans for the wind farm; the city administration handled the application procedures in a favorable manner; politicians in the city council supported the construction politically; the car factory granted access to its site; and the public utility company planned and constructed the wind farm.

In terms of the religious subsystem, there are three major denominations: the Catholic Church, the Lutheran Church, and the Reformed Church. The two Protestant denominations

represent the bulk of the population: according to the 2011 census, 66.3% of the population belong in almost equal parts to the Lutheran and Reformed Church, whereas Catholics constitute an 8.8% minority in this Protestant area (Statistische Ämter des Bundes und der Länder, 2013). In interviews, local representatives of the three denominations lamented the decrease in some forms of church religiosity – particularly baptisms and funerals – but stated that religion may remain more dominant than in other German regions. Furthermore, they claimed that their religious organizations endorse the ‘preservation of the creation’ and identify themselves with sustainability transitions in general and energy transitions in particular. This raises the question of how this stance leads to functional contributions to energy transitions. Each of the three previously mentioned functions – public campaigning and intermediation, materialization of transitions, and dissemination of values/worldviews – is, to some degree, attended by religious organizations in the case of Emden’s energy transition.

In the first instance of public campaigning and intermediation, local churches rarely communicate open statements regarding public topics. Nonetheless, because of the local media coverage of church activities, churches enjoy some presence in the public sphere. Most of their events move in the spectrum of three major subjects: social justice, peace, and preservation of the creation. The Lutheran and Catholic congregations place an emphasis on social justice, while the Reformed Church also prominently covers the peace-topic in the local public sphere – for instance, by organizing an annual Emden peace-forum. While the topics of ‘social justice’ and ‘peace’ are strongly promoted by local churches, no congregation seeks to cover the ‘preservation of the creation’ in public. Thus, topics such as deprivation, poverty reduction and peace are by far more prevalent than climate change and energy transition in public communications and events of local churches. Among the very rare church statements in the local press is, for instance, a quote from the president of the reformed church, who welcomes the German nuclear phase-out (Emden Zeitung, 2011). In another occasion, the Catholic Church supports a petition for the energy transition launched by the green party, but adds the requirement that the energy transition must also be

obtainable for the economically challenged. Unlike religious actors, actors from subsystems such as civil society, politics, and industry show a strong presence in public debates on subjects related to the energy transition. In particular, the municipal utility company, an energy consulting business, the Greenpeace group, the Citizen Initiative for Clean Air ('Bürgerinitiative Saubere Luft'), and the Green-Party act as public communicators, facilitators and watchdogs for topics around the energy transition and climate change. Remarkably, a pastor stated that many of these actors are invited to church services to present their projects and campaign for support among church members. Local churches seem to lend their public voice to other actors, rather than assuming an active public stance regarding low carbon transitions.

In the second instance, regarding the 'materialization' of the energy transition, the activities of local religious organizations are usually inwardly oriented. For instance, congregations improve the energy efficiency of their buildings or place solar panels on their roofs. However, despite the availability of vast roof spaces, so far only a very small proportion of local church buildings are equipped with solar panels. Some congregations participate in official energy saving programs that were launched by their mother churches and involve an ecological certification process – again with little success. One example is the project 'Green Cock' ('Grüner Hahn') of the Reformed Church, which implies a certification process based on data collection and the implementation of concrete measures to improve the sustainability record of the given congregation. To date, only one congregation in Emden has decided to participate in this project. During its starting phase, the ex-CEO of the public utility company – who is often portrayed as a pioneer of Emden's 'Energiewende' – was invited to a church service and gave a presentation that persuaded several members to join the 'Green Cock' church group. However, when it came to proposing and implementing concrete long and mid-term measures, the group dissolved. Since other issues are experienced as more vital, the church group has yet to be resuscitated. Also the Lutheran Church in Emden recently joined a project in which each congregation assigns an 'energy appointee' ('Energiebeauftragter') who will be professionally trained and is responsible for controlling the energy consumption of church

buildings. However, with limited resources at their disposal, the likelihood of materializing low carbon initiatives is slim. Even congregations that demonstrate an above-average interest in environmental protection prefer to use their scarce resources on social outreach projects (e.g. meal programs). Consequently, more encompassing and outwardly oriented low carbon projects, in which religious organizations are involved, could not be determined. Also, in interviews with secular actors, religious actors were not mentioned in conjunction with the local energy transition. One leading figure contended that, for local churches, the energy transition plays no role. Other subsystems such as the city administration, the industry, and, to some degree, civil society, have a significantly higher stake in materializing the energy transition through the implementation of low carbon projects.

Finally, in the third instance, the dissemination of religious values and worldviews that empower environmental attitudes is thought to assume a central role in sustainability transition processes (Gardner, 2006; Gottlieb, 2008; Rolston, 2006a; Tucker, 2006). However, assessing the moral function of religion is difficult, since the religious values act as internal, often subliminal, motivation. Representatives from religious organizations stated that values related to sustainability transitions are promoted in church services and church education facilities. For instance, in the case of the Lutheran Church, confirmation classes and Christian kindergartens teach sustainable use of resources by employing learning material from the *Stadtwerke* and organizing visits at the *Ökowerk*, a local ecology centre that promotes environmental protection and works as a non-profit citizen association. Moreover, the ‘preservation of the creation’ is regularly tackled in the churches services along with the two other major subjects (‘peace’ and ‘social justice’). Nevertheless, it remains unclear to what degree these religious discourses guide the behaviour of local actors. Non-religious interview-partners mainly listed rational motives for their participation in the local energy transition, such as economic profit and public recognition. In the rare cases where they described the protection of the environment as their moral responsibility, no particular religious worldviews or values or any kind of personal religious background appeared to be their motivation. Only on one occasion did a

secular actor, who had founded a renewable energy business, establish some form of relationship to his religious background. He mentioned that his commitment to environmental protection arose out of church group activity and was encouraged by his religious values. Hence, there are few indications towards an impact of religious worldviews and values on transition activities of non-religious actors. Furthermore, aside from religion, there are other actors – mostly from the citizen subsystem – that also have a stake in fostering pro-environmental attitudes. One example is the project E-Spas, an energy education program. The main part of the project is a kind of ‘energy boot camp’, which is carried out in the form of specific courses at primary school in different grades. During these courses instructors not only create an understanding of how to save energy, but also engender an emotional concern and a feeling of righteousness about saving energy among the school children. This project, as well as other activities from civil society actors, illustrate that religion does not fulfill an exclusive function for advancing pro-environmental attitudes among the population.

To summarize these findings, religious organizations do not assume a dominant role relative to other local subsystems in any of these functions. One pastor described the role of religion as that of a follower rather than a pioneer in the energy transition; another pastor made the analogy of jumping onto a moving train. There are two factors explaining their minor role in the local energy transition processes. Firstly, in churches, ‘sustainability’ competes with other topics for limited financial, time and personnel resources. Congregations favour projects related to ‘social justice’ and sometimes ‘peace’ over those related to ‘the preservation of the creation’. This preference may be related to the second factor: sustainability, and in particular the energy transition, is already continuously present in Emden and has become a competitive arena. While some actors, such as the public utility company, have managed to brand themselves as pioneers of Emden’s energy transitions, other actors are currently struggling for this position. In this highly competitive field, it would be extremely difficult for religious actors to establish themselves as facilitators of the local energy transition. Accordingly, they stated that there is no need to engage more ferociously in the energy transition, since other local actors monopolize this role. As church resources are limited and

other actors highly committed, religious organizations tend to delegate their potential functions in the energy transition to these actors.

Conclusion

The present study has combined insights from sustainability studies and academic contributions on religion and sustainability to tackle the role of religion in energy transitions. As such, it has taken a functional perspective: religion is conceived of as one subsystem among a variety of social subsystems that potentially contribute to the transformation processes. Three potential functions of religion have been determined: (1) Campaigning and intermediation in the public sphere; (2) ‘Materialization’ of transitions; and (3) Dissemination of values and worldviews that empower environmental attitudes and action. They have been studied in relation to the city of Emden, a pioneering region in the energy transition. Regarding the first function, religion is barely visible in local debates on climate change, sustainability, and energy transition. While religious actors in the US increasingly shape public debates on these topics (Dewitt, 2006; Djupe and Gwiasda, 2010; McCammack, 2007; Nagle, 2008; Wardekker et al., 2009), in the specific case of Emden, there is little evidence for such a public role of religion. Instead, non-religious actors oversee this role and are sometimes actively encouraged by religious actors to do so. In the second function, there is little evidence of encompassing efforts among religious organizations to ‘materialize’ the local energy transition, since the churches prefer to allocate their limited resources to projects that promote

'social justice'. Although religious actors, to some extent, fulfill the third function of value dissemination, it remains unclear to what degree these values influence the attitudes of local actors. When indicating a moral motivation for their involvement in the energy transition, 'secular' interview partners do not usually refer to religious values or worldviews. Nevertheless, there may be subliminal religious influences on pro-environmental attitudes that are empirically difficult to determine. In total, the results shed a critical light on the assumption that religion has a crucial impact on sustainability transitions. In a highly environmentally active region, there are few indications for a specific function of religion. The results may be related to the peculiarities of the studied region. In particular, the high commitment of other subsystems may render the need for a strong religious involvement obsolete. Instead of involving themselves in the local transition processes, religious organizations tend to delegate their potential roles to other actors.

This empirical study has several restrictions: firstly, the study has explored only one particular region. In other regions with lower general commitment, religion may assume a more pronounced role, perhaps acting as a facilitator and promoter of low carbon transition processes. Secondly, the emphasis was on organized forms of religiosity. Accordingly, the potential religious dimension of values and concepts associated with sustainability transitions remains unexplored (Johnston, 2010: 177; Leahy, 2013; Rudiak-Gould, 2013; Skrimshire, 2013).

More research – employing different methods (e.g. ethnographic research) – is necessary to unfold the empirical role of religion in these transformation processes. Research on the relationship between religion and sustainability can contribute to a more encompassing and inclusive understanding of sustainability transitions, and may reveal new possibilities for advancing these transformation processes (Tikjoeb, 2004; Tucker, 2008). However, it remains to be explored if religion does in fact form a relevant functional subsystem for sustainability transition processes or whether other subsystems fulfill the potential functions of religion in a more effective manner.

Funding

I would like to thank ADEME for the financial funding of this research as part of the project COMPOSITE

Acknowledgements

I am grateful for the support of Jannika Mattes and helpful remarks from Michelle Witen, the anonymous reviewers, and the members from the research group of the *Center for Religion, Economy and Politics*, Regina Betz, Manfred Brocker, Mario Kaiser, Patrick Kupper, Harald Matern, Georg Pfeleiderer, Ekaterina Svetlova, who commented on a previous version of the article.

References

Barker DC and Bearce DH (2013) End-Times Theology, the Shadow of the Future, and Public Resistance to Addressing Global Climate Change. *Political Research Quarterly* 66(2): 267–279.

Bergek A, Jacobsson S, Carlsson B, et al. (2008) Analyzing the functional dynamics of technological innovation systems: A scheme of analysis. *Research Policy* 37(3): 407–429.

Bridge G, Bouzarovski S, Bradshaw M, et al. (2013) Geographies of energy transition: Space, place and the low-carbon economy. *Energy Policy* 53: 331–340 (accessed 21 November 2013).

Bulkeley H and Kern K (2006) Local Government and the Governing of Climate Change in Germany and the UK. *Urban Studies* 43(12): 2237–2259.

Carlsson B and Stankiewicz R (1991) On the nature, function and composition of technological systems. *Journal of Evolutionary Economics* 1(2): 93–118.

Casanova J (1994) *Public religions in the modern world*. Chicago: University of Chicago Press.

Cherp A, Jewell J, and Goldthau A (2011) Governing Global Energy: Systems, Transitions, Complexity. *Global Policy* 2(1): 75–88.

Christiansen D (2011) Church Teaching, Public Advocacy, and Environmental Action. *Zygon* 46(4): 972–984.

Clugston R and Holt S (2012) *Exploring Synergies between Faith Values and Education for Sustainable Development*. San José: Earth Charter International.

Coenen L, Benneworth P, and Truffer B (2012) Toward a spatial perspective on sustainability transitions: Special Section on Sustainability Transitions. *Research Policy* 41(6): 968–979.

Cooke P, Uranga MG, and Etxebarria G (1997) Regional innovation systems: Institutional and organisational dimensions. *Research Policy* 26(4-5): 475–491.

Coutard O and Rutherford J (2010) Energy transition and city–region planning: understanding the spatial politics of systemic change. *Technology Analysis & Strategic Management* 22(6): 711–727.

Dewitt CB (2006) The Scientist and the Shepherd: The Emergence of Evangelical Environmentalism. In: Gottlieb RS (ed.) *The Oxford handbook of religion and ecology*. Oxford: Oxford University Press.

Djupe PA and Gwiasda GW (2010) Evangelizing the environment: Decision process effects in political persuasion. *Journal for the Scientific Study of Religion* 49(1): 73–86.

Djupe PA and Hunt PK (2009) Beyond the Lynn White thesis: Congregational effects on environmental concern. *Journal for the Scientific Study of Religion* 48(4): 670–686.

Doloreux D (2002) What we should know about regional systems of innovation. *Technology in Society* 24(3): 243–263.

Emder Zeitung (2011) *Grüne: Stadtwerke sollen auf Atomstrom verzichten* [Green party says: Public utilities should abandon nuclear energy]. Available at: <https://www.emderzeitung.de/emden/~/~grne-stadtwerke-sollen-auf-atomstrom-verzichten-35232> (accessed 10 October 2014).

Gardner GT (2006) *Inspiring progress: religions' contributions to sustainable development*. Worldwatch Institute: New York.

Geels FW (2004) From sectoral systems of innovation to socio-technical systems. *Research Policy* 33(6-7): 897–920.

Geels FW, Hekkert MP, and Jacobsson S (2008) The dynamics of sustainable innovation journeys. *Technology Analysis & Strategic Management* 20(5): 521–536.

Gottlieb R (2008) You gonna be here long? Religion and Sustainability. *Worldviews: Global Religions, Culture, and Ecology* 12(2): 163–178.

Gottlieb RS (2006) Religious Environmentalism in Action. In: Gottlieb RS (ed.) *The Oxford handbook of religion and ecology*. Oxford: Oxford University Press, 467–509.

Greeley A (1993) Religion and attitudes toward the environment. *Journal for the Scientific Study of Religion* 32(1) of Religion: 19–28.

Grubler A (2012) Energy transitions research: Insights and cautionary tales. *Energy Policy* 50: 8–16.

Guth JL, Green JC, Kellstedt LA, et al. (1995) Faith and the environment: Religious beliefs and attitudes on environmental policy. *American Journal of Political Science* 39(2): 364–382.

Habermas J (2008) Notes on Post-Secular Society. *New perspectives quarterly* 25(4): 17–29.

Harper F (2011) Greening Faith: Turning Belief into Action for the Earth. *Zygon* 46(4): 957–971.

Heidenreich M, Barmeyer C, Koschatzky K, et al. (2012) *Multinational Enterprises and Innovation: Regional Learning in Networks*. London, New York: Routledge.

Hekkert MP, Suurs R, Negro SO, et al. (2007) Functions of innovation systems: A new approach for analysing technological change. *Technological Forecasting and Social Change* 74(4): 413–432.

Hodson M and Marvin S (2009) Cities mediating technological transitions: understanding visions, intermediation and consequences. *Technology Analysis & Strategic Management* 21(4): 515–534.

Hodson M and Marvin S (2010) Can cities shape socio-technical transitions and how would we know if they were? *Research Policy* 39(4): 477–485.

Hodson M and Marvin S (2012) Mediating Low-Carbon Urban Transitions? Forms of Organization, Knowledge and Action. *European Planning Studies* 20(3): 421–439.

Huber A and Mattes J (2012) *Regional Innovation System in the Energy Transition: Towards a*

Framework of Indicators for Analysing Local Reorganisation Processes. Presentation at the International Conference on Sustainability Transitions, Copenhagen, Denmark, August 29th-31st, 2012.

Huber A, Köhrsen J, and Mattes J (2013) Towards a better understanding of local reorganization processes – empirical findings from two case studies. Proceedings of the ECEEE 2013 summer study: 271–282.

Johnston L (2010) The Religious Dimensions of Sustainability: Institutional Religions, Civil Society, and International Politics since the Turn of the Twentieth Century. *Religion Compass* 4(3): 176–189.

Kimmins JP (1993) Ecology, environmentalism and green religion. *The Forestry Chronicle* 69(3): 285–289.

Klage B and Brocke T (2012) Decentralized electricity generation from renewable sources as a chance for local economic development: a qualitative study of two pioneer regions in Germany. *Energy, Sustainability and Society* 2(5): 2–9.

Köhrsen J (2012) How religious is the public sphere? – A critical stance on the debate about public religion and post-secularity. *Acta Sociologica* 55(3): 273–288.

Kuhlmann S (2001) Future governance of innovation policy in Europe – three scenarios. *Research Policy* 30(6): 953–976.

Laurendeau NM (2011) An Energy Primer: From Thermodynamics to Theology. *Zygon* 46(4): 890–914.

Leahy T (2013) Facing the Apocalypse: Environmental Crisis and Religion. *Religion and Society: Advances in Research* 4(1): 182–187.

Luhmann N (1997) *Die Gesellschaft der Gesellschaft* [The society of the society]. Frankfurt am Main: Suhrkamp.

Lundvall B (1992) *National systems of innovation: Towards a theory of innovation and interactive learning*. London: Pinter.

Maassen A (2012) Heterogeneity of lock-in and the role of strategic technological interventions in urban infrastructural transformations. *European Planning Studies* 20(3): 441–460.

McCammack B (2007) Hot damned America: Evangelicalism and the climate change policy debate. *American Quarterly* 59(3): 645–668.

McCauley SM and Stephens JC (2012) Green energy clusters and socio-technical transitions: analysis of a sustainable energy cluster for regional economic development in Central Massachusetts, USA. *Sustainability Science* 7(2): 213–225.

Markard J, Raven R, and Truffer B (2012) Sustainability transitions: An emerging field of research and its prospects. *Research Policy* 41(6): 955–967.

Mattes J (2010) *Innovation in multinational companies: organisational, international and regional dilemmas*. Frankfurt, London: Peter Lang.

Mattes J, Huber A and Koehrsen J (2015) Energy transitions in small-scale regions – what we can learn from a regional innovation systems perspective. *Energy Policy* 78: 255–264.

Mebratu D (1998) Sustainability and sustainable development: historical and conceptual review. *Environmental impact assessment review* 18(6): 493–520.

Nagle JC (2008) *The Evangelical Debate Over Climate Change*. Available at: http://scholarship.law.nd.edu/law_faculty_scholarship/433 (accessed 31.09.2014).

Rasmussen LL (2011) Energy: The Challenges to and from Religion. *Zygon* 46(4): 985–1002.

Rolston H (2006) Caring for nature: What science and economics can't teach us but religion can. *Environmental Values* 15(3): 307–313.

Rolston III H (2006) Science and Religion in the Face of the Environmental Crisis. In: Gottlieb RS (ed.) *The Oxford handbook of religion and ecology*. Oxford University Press, 376–397.

Rudiak-Gould P (2013) The Revelation of Climate Change. *Religion and Society: Advances in Research* 4(1): 176–181.

Schönberger P (2013) *Municipalities as Key Actors of German Renewable Energy Governance:*

An Analysis of Opportunities, Obstacles, and Multi-Level Influences. Available at: <http://wupperinst.org/en/publications/details/wi/a/s/ad/2056/> (accessed 31.09.2013).

Sherkat DE and Ellison CG (2007) Structuring the Religion-Environment Connection: Identifying Religious Influences on Environmental Concern and Activism. *Journal for the Scientific Study of Religion* 46(1): 71–85.

Skrimshire S (2013) Challenging the Skeptics: False Prophecy and Climate Activism. *Religion and Society: Advances in Research* 4(1): 189–195.

Späth P and Rohracher H (2012) Local demonstrations for global transitions: Dynamics across governance levels fostering socio-technical regime change towards sustainability. *European Planning Studies* 20(3): 461–479.

Stadt Emden (2010) *Integriertes Kommunales Klimaschutzkonzept* [Integrated municipal climate protection plan]. Available at: https://www.emden.de/fileadmin/media/stadtemden/PDF/FB_300/FD_362/Energie_Klima/klimaschutzkonzept_gesamt_endversion.pdf. (accessed 20 September 2014).

Statistische Ämter des Bundes und der Länder [Federal Statistical Office and the statistical Offices of the Länder] (2013) *Zensus 2011*. Available at: <https://www.zensus2011.de> (accessed 10 October 2014).

Tikjoeb SA (2004) Mainstreaming Religion in Sustainable Development. *Journal of Futures Studies* 8(4): 47–60.

Tucker ME (2006) Religion and Ecology: Survey of the field. In: Gottlieb RS (ed.) *The Oxford handbook of religion and ecology*. Oxford University Press, 398–418.

Tucker ME (2008) World Religions, the Earth Charter, and Sustainability. *Worldviews: Global Religions, Culture, and Ecology* 12(2): 115–128.

Verbong G and Geels F (2007) The ongoing energy transition: Lessons from a socio-technical, multi-level analysis of the Dutch electricity system (1960–2004). *Energy Policy* 35(2): 1025–1037.

Wardekker JA, Petersen AC, and van der Sluijs JP (2009) Ethics and public perception of climate change: Exploring the Christian voices in the US public debate. *Global Environmental Change* 19(4): 512–521.

Weber KM and Rohracher H (2012) Legitimizing research, technology and innovation policies for transformative change. *Research Policy* 41(6): 1037–1047.

White L (1966) The historical roots of our ecologic crisis. *Science* 155(3767): 1203–1207.

Willaime J (2008) *Le retour du religieux dans la sphère publique. Vers une laïcité de reconnaissance et de dialogue*. Lyon: Olivétan.