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Environmental Conflicts in Austria from 1950 to 2015

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Environmental Conflicts in Austria from 1950 to 2015*

von

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Abstract

During the second half of the 20th century, Austria experienced a fundamental transition of its energy regime. Within few years oil replaced the predominant regime of biomass and coal. This change had not only radical impacts on society's production and consumption patterns but most notably on society's relationship to nature. During the post-war modernisation process, nature and landscapes were dramatically transformed by human biophysical activities. However, with growing impacts, this development was increasingly questioned by parts of society and environmental conflicts emerged. The master thesis assembles Austria's environmental conflicts that took place around the transition's material manifestations – dams, power plants, infrastructure projects – described through the prism of social ecology.

A comprehensive review of literature, newspapers and the internet, supplemented by selected experts and contemporary witness interviews, created an extensive list of 108 environmental conflict cases in Austria after World War II. The cases are analyzed by a set of selected indicators and cases of high significance are described in detail to illustrate the patterns and trends of Austria's environmental conflict history. Therefore, the thesis responds to the key question how the nature of environmental conflicts changed in the course of the industrialisation and modernisation processes by excavating and interrelating conflict causes, issues at stake and its impacts, and conflict outcomes.

The main objective of this thesis is, primarily, to show how environmental conflicts resulted from diverging imaginations of the future and lacking governance. Secondly, the thesis documents how environmental conflicts influenced Austria’s decision-making and its political and institutional landscape. Finally, a contemporary reflection on environmental conflicts helps not only to challenge future conflicts but also to determine the preconditions and constraints for a sustainability transition. Although the developed classification of environmental conflict cases can be further improved, it provides a useful reference for future research on environmental conflicts, i.e. in other countries.

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#	Case	Location	Time	Conflict issue
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#	Case	Location	Time	Conflict issue
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#	Case	Location	Time	Conflict issue
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#	Case	Location	Time	Conflict issue
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#	Case	Location	Time	Conflict issue
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Chapter One: Introduction

1.1 Preliminary remarks

What kind of nature do we want? And in what kind of environment do we want to live? These are not only highly political questions but also questions that are highly contested. The social responses to these questions have repeatedly caused intense turbulences within society and culminated in various manifest conflicts.

Especially the industrialization and modernization process, that was initiated after World War II, has added fuel to the fire in the argument about nature. The emergence of the oil-based socio-ecological regime in the second half of the 20th century triggered radical material, social and political transformations and determined the very own practices of society's relationship to the natural world. As a consequence of this socio-ecological transition (Fischer-Kowalski and Haberl 2007), human biophysical activities have caused massive impacts on nature and environment. In Austria, hydroelectric dams and reservoirs constituted large-scale interventions into alpine landscapes, the construction of transport infrastructure networks penetrated rural areas and increased human mobility and material flows, the economic utilization of alpine space for the mass touristic leisure of skiing converted sensitive mountainous ecosystems into winter theme parks, their traces are distinctly and visibly.

However, these material interventions into nature have as well generated antagonisms within society since they have produced environmental burdens and risks that affected the health and livelihood of the local population (Martinez-Alier 2003; 2009). On these grounds, conflicts arose around built, not built, and not used power plants, about the siting and planning of infrastructure projects, about the contested use and distribution of natural resources, about the management of technology-induced risks, or about the pollution caused by industrial facilities.

The following work collected these types of conflict – conceptualized as *environmental conflict* – for the case of Austria. The result is a list of 108 environmental conflicts that are chronologically illustrated in the beginning of this document.

In the context of increasing economic pressures and growing demand for an environmentally and socially sustainable development, environmental conflicts appear as the social arenas in which the social relationship to nature is being negotiated and formulated. In these arenas clash a range of social actors that share different interests regarding the use of natural resources and express contrasting interpretations of the future state of the environment, in which they want to live. In particular since the 1970s, the number of environmental conflicts has increased, evoking a growing interest in studying their characteristics, their causes, forms, actors, stages and outcome. However, in the light of promoting sustainable development, research is increasingly confronted with the question of how environmental conflicts should be managed and if they should rather be resolved, prevented or even promoted (Hellström 2001). The present thesis is an attempt to respond to this question by understanding the nature of environmental conflicts in the case of Austria. The collection of over one hundred conflict cases offers the opportunity for a first comparative analysis of environmental conflicts in Austria on the basis of a specifically developed set of indicators.

Since the beginning of research on social conflicts, the question was raised if conflicts were a need for society and if they were even able to push society forward and to provoke social change. Nevertheless, the observation of environmental conflicts in Austria illustrates that

modern environmental policy would not have the shape of today without these controversies and the intensive public debates they triggered. The new social movements, in particular the environmental movement, have constituted themselves in the wake of environmental conflicts and played a crucial role in their course. Last but not least, the places of environmental conflicts are charged with emotions, images and stories. Names, such as Zwentendorf and Hainburg, and the narratives and myths that are spinning around them are deeply anchored in the memory of society, they marked turning points in Austria's environmental history.

1.2 Scope and limitations

The conceptualization and analytical observation of environmental conflicts in this study is based on a socio-ecological approach. From that point of view, the appropiate unit of analysis must be society, understood as a socio-economic system that interacts with its natural environment (see *Chapter 2.3: 'The socio-ecological perspective on environmental conflicts'*) (Fischer-Kowalski and Weisz 1999). To allow feasible analyses, social ecology determines society within national boundaries, which is in this case the state of Austria and its socio-economic system, but with the knowledge that environmental issues and hence conflicts do not stop at invisible man-made borders. However, the thesis does include conflicts with a range going beyond these borders integrating Austria's neighboring states on the basis of Austrian opposition to foreign human biophysical activities. The issues dealt with in these conflicts are mainly (but not only) related to nuclear power considering that its risks disperse transboundary. Since Austria itself never operated a nuclear power plant (even though they built one), initiatives arose to oppose border-zone power stations in the Czech Republic, Slovakia and Slovenia.

Temporally, the thesis intentionally narrows its scope on the time after World War II, that is the second half of the 20th century and the beginning 21st century, being aware that environmental problems as well as efforts for nature conservation and hence environmental conflicts existed before1. Including the first half of the 20th century would not only go beyond a workable scope but would also distract from the special characteristics of modern industrial society which evolved in the 1950s and which played a key figure in this research (see *Chapter 2.3.3: 'The socio-ecological transition in Austria'*). Still, reviewing cases of such a large period of time is naturally posing challenges in terms of gaining a complete record of all events. To cope with this challenge, the focus on environmentalism ensures the study as tractable since the present environmental movement has a well-defined starting point in the 1960s (Dryzek et al. 2003) with a few exception in the 1950s. For further readings, chronologies and full descriptions of the origins of nature conservation are well presented for instance by Radkau (2011) and Payer and Zangerl-Weisz (1997).

The key task of environmental history research is 'observation' constituted by two objectives: to distinguish and to identify (Winiwarter 2012). The function that follows from this executes the identification of environmental conflicts and the distinction from other environmental issues. For instance, the issues of 'waldsterben', 'ozone depletion', or the 'mad cow disease' represent environmental issues but not environmental conflicts. These events triggered intensified debates about society's natural relations, but they did not symbolize environmental conflicts. What converts an environmental issue into an environmental conflicts will be explained in *Chapter Two: 'Theoretical framework'*. The following chapter presents the

1 A good example for environmental conflicts in the 19th century represents the controversy around the Vienna Woods and its protection in 1873, compare Brunner and Schneider (2005); Neuwirth (2008).

research questions which underlie this thesis.

1.3 Research questions

Briefly summarized, the present thesis conceptualizes, observes and compares environmental conflicts that emerged in Austria since World War II in order to identify their characteristics and to trace how their nature changed over time in the light of Austria's socio-ecological transition. The main aim is to provide a better understanding for the relationship between human society and nature. The outcome of this is the following key research question:

How has the nature of environmental conflicts in Austria changed since the 1950s in the light of the socio-ecological transition?

From this key research question arise sub-questions which will support to answer the key research question and will be issued by means of this thesis:

- **What characterizes environmental conflicts in Austria?**
- **What are the spatial, temporal and thematic hotspots of environmental conflicts in Austria?**
- **Why do environmental conflicts in Austria not address environmental justice issues?**

1.4 Research objectives

The history of Austria's environmental conflicts is written up to remember, to understand and to gain perspective. First, recording the multitude of conflict cases opens the opportunity to remember the evocative history of modern environmental movements and environmental politics, their origins and their evolution. Beyond that, the second benefit of studying environmental conflicts is to better understand socio-ecological transitions in order to produce a knowledge base for promoting future sustainable development. In this spirit, the research helps to identify if environmental conflicts are productive for driving social or political changes or if they rather produce blockades and the stabilisation of a dominant socio-ecological regime. Studying environmental conflicts means to better comprehend imbalances between human society and the material world, as well as to better comprehend friction between social groups related to environmental issues. That provides a better understanding of the meaning of sustainability and what ideas and languages exist for it. Thirdly and probably most notably, studying environmental conflicts enables to gain perspective of what threatens the reproduction of socio-ecological systems and to manage these threats.

So far, studies have dedicated their attention basically to environmental conflict description and analysis on single events or particular conflict themes, e.g. forest related issues (Hellström 2001), conflicts in coastal areas (Cadoret 2009; Khan et al. 2013), disputes over fishery (Bennett et al. 2001; Charles 1992), or to the analysis of conflicts related to natural resource uses in developing countries (Gerber 2011; Martinez-Alier 2002). Sociological studies are concerned with the worldviews and images of nature represented in environmental and technological conflicts (Gill 2003). However, little attention is paid to a comprehensive thematic characterization of environmental conflicts on national scale that can also be reproduced in other places. Yet research emphasizes on environmental conflicts in countries of the global south. But, from a central european point of view, environmental conflicts do exist on the own doorstep, where the names 'Hainburg' and 'Zwentendorf' bear major importance for Austria's contemporary history. Nevertheless, contributions are needed to seek for more than these two vivid milestones, especially since a comprehensive view on environmental conflicts in Austria is still missing within environmental history research. Furthermore, this research aims to make the issues 'nature' and 'environment' more visible as relevant aspects of social conflicts and to emphasize the role of environmental conflicts for social development, taking into account that environmental conflicts may take on greater social significance due to increasing resource scarcities, land use competition and advancing global change (e.g. climate change impacts). Conceptualizing, observing and comparing a variety of historical cases enables to extract coherent patterns of socio-ecological problems and to detect what kind of political consequences resulted from them (Dryzek 1997; Hajer 1995).

In terms of methodology, existing research on environmental conflicts roughly aims to create comprehensive images of individual aspects of conflicts, e.g. resource mobilisation, protest forms, network building, political decision-making or conflict management and mediation. In contrast, this study focuses on 'the bigger picture', a longitudinal analysis that brings together cases of a time period of sixty years with the goal to compare them and to examine if underlying fundamental conflicts or changes of conflict types, forms and issues exist in order to get an idea of how conflicts evolved over time and what processes influenced their changes. Understanding the complex processes that form these conflicts helps in the end to manage and resolve such conflicts by giving new insights that rest on a more interdisciplinary knowledge base. An effective prevention and management of conflicts requires the study of

their nature and causes as well as their visible and potential outcomes. Nonetheless, the challenge for scholars studying environmental conflicts is to develop the competence for a "co-operative conceptualisation of complex controversies" (Ueberhorst 1995 in Feindt and Saretzki 2010: 37) to describe, to forecast and to evaluate these conflicts in a comprehensible manner (Feindt and Saretzki 2010).

1.5 Design of the thesis

After completing the introductory part of the thesis by outlining the value of studying environmental conflicts, by framing the scope and limitations of research and drawing up the research questions and objectives of the thesis, C*hapter Two* approaches the concept of environmental conflict by peering its idea and theoretical interpretations. Leaving from there, a socio-ecological perspective on environmental conflicts is taken in order to follow the previously proposed research questions. The outcome of this is a definition of environmental conflicts which refers to the socio-ecological perspective and which effectively distinguishes environmental conflicts from other environmental issues.

Chapter Three points out the research process by describing the case data collection and by illustrating the selection of cases. Furthermore, a set of selected variables is prepared in order to analyze and compare the conflicts and to map them across different scales.

As a result of the analytical process, *Chapter Four* presents a comprehensive list of environmental conflicts, including cases all over Austria from 1950 to 2015. Beyond that, the chapter includes selected cases of high significance for Austria's environmental history which will be described in detail.

In *Chapter Five* the generated list of environmental conflict cases and the results of the indicator analysis are discussed by looking at the 'bigger picture', in the light of the historical transition of the energy regime. That enables to derive hypotheses about the characteristics of environmental conflicts.

The concluding *Chapter Six* closes the thesis by summing up the key points of the thesis. The conclusion gives the opportunity for an outlook of potential future research issues and for a look at future hotspots of environmental conflicts in Austria in the light of global change (climate change) and new challenges for environmental and resource policy.

Chapter Two: Theoretical framework – gaining a socio-ecological perspective on conflicts

2.1 Starting point: a conflict

Conflicts are concrete social constructions. They are no abstract entities but rather real matters. Neither placeless nor timeless, they have a historical index (Saretzki 2010) and always existed. However, evidence suggest that actors who were involved in conflicts and the ones who observed used to understand and adopt the term 'conflict' differently out of which a variety of interpretations evolved that likewise touched other terms, e.g. 'problem', 'issue', 'struggle', 'dispute', 'debate', 'controversy', 'fight', 'tragedy', or 'social dilemma' (Stepanova and Bruckmeier 2013). Anyway, such understandings implicate the existence of forms of 'communication' and 'interaction' as well as 'competition' and 'opposition' (Walker and Daniels 1997). This emphasizes the significance to study conflicts and the need for a comprehensive conceptualization. Even though the concept of conflict seems to be vital in social and political sciences, a comprehensive conflict theory that could be practiced in empirical studies is virtually non-existing (Feindt and Saretzki 2010). That draws the conclusion that no general conflict theory corresponds to the significance to further analyze conflicts which means that the scientific field of conceptualizing and analyzing conflicts is as highly contested as the conflicts themselves. On these grounds, this chapter aims to make sense of the dim forest of conflict concepts and elaborates in particular the idea and conceptualizations of environmental conflicts which are the subject of this study.

In a culturally highly differentiated world, perspectives on the virtue of conflicts seem to range from 'conflicts as taboos' to 'conflicts as needs' for social life (Stepanova and Bruckmeier 2013). Supporting the latter, Coser (1965) and Dahrendorf (1961; 1969) conceptualized conflicts2 by absorbing the idea of Marx' class theory of a per se 'productive conflict' and Simmel's sociology of interactions (Reusswig and Laas 2007). Both seeked, independently from each other, to answer the question of social change (by asking *"what pushes society forward?"*) rather than to explain social stability and order (by asking *"what keeps society together?"*). In their eyes, conflicts would explain social change as "conflicts do not emerge as disturbing factors to a stable social equilibrium but as those forces to push societies forward, to provoke social change" as Feindt and Saretzki (2010: 35) outlined the conflict theory postulated by Coser and Dahrendorf. In that sense, a conflict describes a fight over values and claims to scarce status, power and resources in order to design society (Reusswig and Lass 2007) and a battle in which "the aims of the opponents are to neutralize, injure or eliminate their rivals" (Coser 1965). Conflicts mirror social relationships based on opposed norms and expectations between elements of society (Dahrendorf 1969).

2 in the field of sociology as a critical reaction to the dominant structure-functionalistic theory defended by Talcott Parsons (1957; 1961) and others.

Furthermore, modern societies would have in fact discovered the socializing effects of conflicts (Simmel 1908: 284; Böschen 2010: 105) which do not necessarily appear to be negative since peaceful conflicts may operate as a medium for social change (Barnett 2000). Hence, they may symbolize an "early warning sign that something has gone wrong in a valued relationship" (Cheldelin et al. 2003: 47) and "contribute to the improvement of social relations, democratic processes and the content and quality of decisions" (Sandström et al. 2013).

2.2 What makes a conflict environmentally?

Ecological degradations are created by and within society which means that they become primarily relevant within society. Environmental problems are in this effect social problems as they are problems of human kind, its past and its livelihood (Beck 1986). Environmental impacts strike back on society, they are underlying social interpretations, and they are reference points of social mobilization and of social conflicts. In that sense, environmental conflicts rest on a social conflict constellation and never exist without the social dimension. However, it requires to explain what makes a conflict particularly "environmental".

First of all, behind the term 'environment' hides a wide spectrum of topics which become apparent by looking at the environmental movement: themes range from the protection of species to the conservation of landscapes and natural scenery; or from environmental pollution to the protection of scarce resources. However, such diverse thematic issuing rather delineates an irritating fuzziness of 'the environmental movement' than a clear positioning and illustrates at the same time that *one* single definition of the environment does not exists (Uekötter 2012).

The same applies for research on environmental conflict, a field that has been approached by several (mostly social scientific) disciplines, e.g. sociology (e.g. Daniels and Walker 1997), anthropology (e.g. Escobar 2006), political sciences (e.g. Homer-Dixon 1999, Feindt and Saretzki 2010) and economic sciences (e.g. Schnaiberg 1994) resulting in parallel, often competing, theoretical languages. And still, most of socially-relevant research on environmental conflict happens within isolated disciplinary holes as "fragmented, unconnected coexistence of different theoretical approaches" (Feindt and Saretzki 2010: 37) in the discussion about environmental conflicts can be detected. That means, a consistent conflict theory to analyze environmental conflicts is yet to be found as the following review of environmental conflict theories will illustrate.

Theoretical approaches and analyses of environmental conflicts vary and can yet be divided in *resource-based natural* science research (resource overuse and pollution) and *actors-based social* science research (values, interests, resource use practices) (Stepanova and Bruckmeier 2013). Nevertheless, sufficient research with interdisciplinary focus is still lacking although novel interdisciplinary studies exist, e.g. human ecology (Burke 2001) and ecological economics (Martinez-Alier 2005; Martinez-Alier et al. 2010).

Certainly, academic interest in environmental conflicts has remarkably risen in the past

years out of which two major research approaches have emerged to conceptualize environmental conflicts3 expressed by a 'resource conservation and management perspective' and a 'security and peace research perspective' (Khan et al. 2013: 37), although general definitions of environmental conflicts still tend to be vague (Stepanova and Bruckmeier 2013).

The first approach identifies environmental conflicts to be formed by normative incompatibilities (e.g. between actions, goals, values, beliefs) between two or more parties concerning decisions that deal with the natural environment (e.g. air, land, water) (Hellbrück and Kals 2012: 114) and to import "incompatible interaction between at least two actors over the use of natural resources or an environmental system, where one of the actors is damaged by the interaction, and the other actor intends or ignores this damage" (Stepanova and Bruckmeier 2013). Thus, environmental conflicts would represent "an expressed difference between at least two interdependent parties who perceive incompatible goals, scarce resources or interference from another party in achieving their goals" (WRDC, 1992).

Such definitions of environmental conflict point out the elemental social dimension of these conflicts and further indicate the presence of at least two diverging perceptions within such conflict. Hence, the 'environment' functions as a part of 'perception' and is, in that sense, socially constructed:

> "'The environment', in other words, is something upon which very many frames of reference converge. But there is no frame of reference which is as it were 'naturally given', and which does not have to be contended for in environmental debate; no standard or criterion of comparison for environmental value which inherently transcends the perspective of a particular cultural understanding of nature and our relation to it" (O'Neill 1997: 10).

However, substantial material of research focuses rather on the second, more conventional approach to environmental conflicts: the perspective of (environmental) security, (armed) conflicts and peace studies (Brown 1989; ENCOP 1992-1996; Homer-Dixon 1991, 1999; Libiszewski 1992). Within this framework, analyses of environmental conflicts are dominated by contributions that focus on environmentally-*induced,* violent conflicts. Such studies deduce that environmental conflicts are induced by environmental degradation (Libiszewski 1992; Scheffran 1998) but with the bottom line that they are perceived as "political, social, economic, ethnic, religious or territorial conflicts or conflicts over national interests" (Khan et al. 2013; ENCOP 1992). However, the role of natural resources in conflict settings, and hence about the question what causes environmentally-induced conflicts, is contested. Views on environmental conflicts diverge whether *resource scarcity* (Homer-Dixon 1994) or *resource abundance* (Collier and Hoeffler 2005) would lead to environmental conflicts. Nevertheless, since the conditions of natural resources are socially constructed (Le Billon 2001; Khan et al. 2013), views of scarcity and abundance become rather subjective (Barnett and Adger 2007), meaning that such approaches are prone to be shortsighted. In

3 Stepanova and Bruckmeier (2013) give a comprehensive overview about different research fields and terminologies of environmental conflicts.

fact, a variety of contextual factors have impact on the likelihood of conflicts requiring a holistic view that integrates broader social and institutional angles (Barnett 2000; Barnett and Adger 2007).

Considering that conflicts involve two or more actors, they appear as feedback-related articulations and concrete social manifestations of controversies around environmental burdens. Air pollution or the pollution of a river, the construction of industrial and power generation facilities, or the extensive exploitation of land and natural resources, are by itself no environmental conflicts. Such issues only become a concrete conflict when an infringement of one's interests or resource use is communicated. In doing so, the disputant directs his critical communication towards the polluter, the project operator, the facility constructor, the resource user or resource exploiter and not to the issue itself. The outcome of this is, that these antagonists have at any time a concrete spatial reference which allows to locate environmental conflicts spatially, giving the issues related to environmental pollution, environmental behaviour or issues related to the interplay between men and nature, at any time a concrete spatial component (Winiwarter and Knoll 2007). In that sense, environmental conflicts do not only occur to a certain time but also at a special scene.

In addition, environmental conflicts arise due to a myriad of motives highly depending on the perspective that is taken to observe them, which can be e.g. social dysfunction (the view of a sociologist), from unequal power relations (the view of a political scientist) or as a consequence of rational decision-making by an individual (or an organization) aspiring to maximize its personal benefit from a stock of scarce resources (the view of an economist) (Homer-Dixon 1991; 1994; Khan et al. 2010: 51). However, although environmental conflicts are constructed socially, structured by interests and power relations and shaped by cultural perceptions of nature, they effectively result from resource based social interactions and hence from the biophysical structures and activities of society and its actors. Material reasons respective changes in the material base (i.e. the extraction of natural resources, the management of biophysical stocks or the disposal of waste) are fundamental for the existence of such conflicts (Martinez-Alier et al. 2010).

2.3 The socio-ecological perspective on environmental conflicts

2.3.1 The human-nature relationship

Ecosystems are increasingly challenged by human demands and interests. Human societies (i.e. its actors 'the state', 'economy') are intervening in ecological relations by changing, influencing or destabilizing them for their benefits. However, the ways human societies interact with their environment have not only impact on the natural system but also on the social system itself. That means that the costs and benefits of natural resource uses are not only distributed environmentally but also socially.

In response to that, science must examine the human activities that cause the disturbance of ecological relations in order to explain how these activities can be changed to avoid future undesirable effects on the environment and hence on society itself. This task, however, requires an interdisciplinary, problem-oriented approach that understands, on one

side, ecology (its relations and sensibilities) and, on the other, society (its structures and dynamics). In this spirit, scholars of Social Ecology cope with such demand by developing theoretical concepts that describe the complex relations between human society and nature. To understand its complexity, Fischer-Kowalski et al. (1997) conceptualized a simplified human-nature interaction model that comprehends the relationship as a 'socio-ecological system' consisting of two overlapping spheres – 'nature' and 'culture'.

In the interaction model, shown in Figure 1, the cultural sphere features culture and its arrangements and discloses a purely symbolic system of cultural reproduction and reflection. Culture represents everything that is “artificial, technological, ordered by arrangements and conventions” and that is “human-made, enforced, designed, or cultivated” (Sieferle 1997) and therefore “subject to the rules of meaning” (Fischer-Kowalski and Haberl 2007: 8). The sphere of nature describes an “ecological ordered system” to which belong “all material elements of reality, except they are human” (Sieferle 1997). The natural sphere is, in contrast to the cultural sphere, a purely material system. Society, from a socio-ecological point of view, embraces a structural coupling of a “cultural system, as a system of recurrent self-referential communication”, with elements of a distinctly natural (respectively material) origin and character (Fischer-Kowalski and Haberl 2007; Fischer-Kowalski and Hausknost 2014). These biophysical components comprise a specific human population and – an aspect that becomes crucial for the analysis of environmental conflicts – their physical infrastructure, i.e. buildings, roads, machines, technical artifacts and animal livestock. In its entirety these components symbolize the biophysical structures of society, located in the overlap of the spheres of nature and culture.

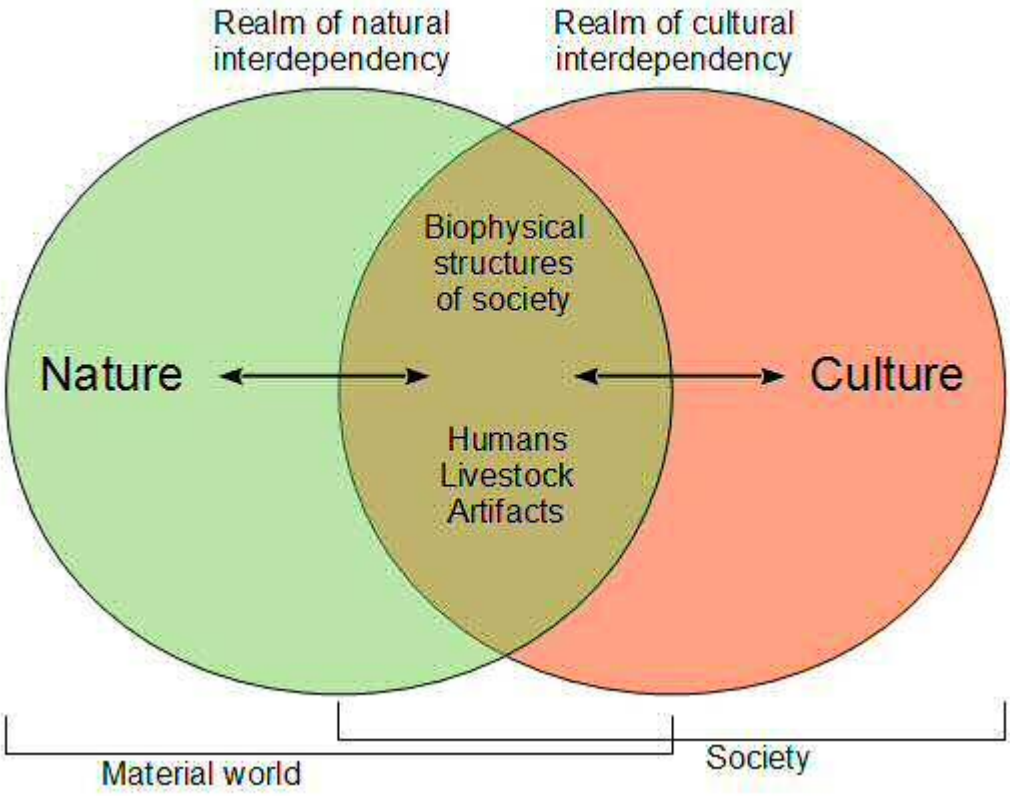

Figure 1: The socio-ecological human-nature interaction model developed by Fischer-Kowalski et al. 1997 (own illustration).

Human society, as a social unit operating to reproduce a certain population within a certain territory, interacts with nature by organizing material and energy flows which serve to maintain and reproduce society's biophysical structures and functions (Fischer-Kowalski et al. 1997; Fischer-Kowalski and Haberl 2007). The socio-ecological concept of s*ocial metabolism* describes, analogue to the biological concept of metabolism, the totality of material and energy flows a society requires to build up and maintain its biophysical stocks. To provide their metabolism societies extract natural resources from their environment and process them, within the socio-economic system, to consumable products to subsequently deposit the leftovers to nature in form of waste or emissions (see Figure 2). The concept of social metabolism becomes useful for the analysis of environmental conflicts, its scheme of *input*, *stocks* and *output*-related human activities will be applied for the characterization of environmental conflicts (see *Chapter 3.5 'Selection of indicators'*).

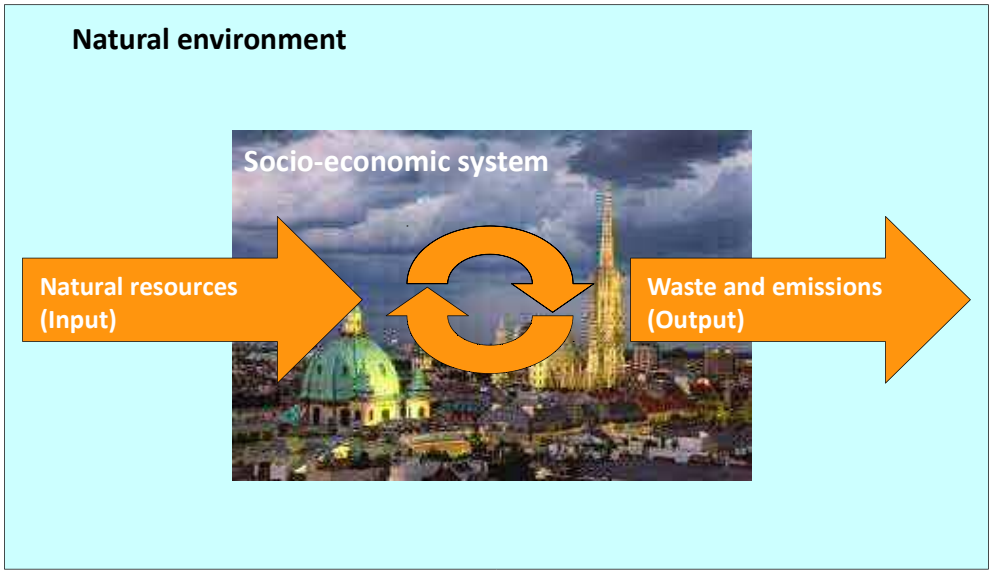

Figure 2: Socio-metabolic input-output scheme (Krausmann and Erb 2012).

In order to guarantee the maintenance of the socially required material and energy metabolism, societies are influencing and altering natural systems so that they become more productive as in their original state. To explain such social activities, the socio-ecological perspective offers a second idea, the concept of *colonization of nature*, which describes the permanent and intended manipulation of natural processes by society as a gain for satisfying social demands (Fischer-Kowalski et al. 1997). The most prominent colonization process is represented by agriculture, but also the intervention in the evolution of plants and animals (i.e. breeding, genetic engineering) as well as the establishment and maintenance of alpine ski regions would describe a colonizing process.

2.3.2 Socio-ecological regimes

Sieferle (1982, 2001) and later Fischer-Kowalski and Haberl (2007) used the idea of historically dominant 'socio-metabolic regime' to describe the evolution of human kind in terms of changing socio-metabolic profiles. In their eyes, a socio-ecological regime represents a particular fundamental pattern of interplay between (human) society and the natural world (Fischer-Kowalski and Haberl 2007) characterized by a specific mode of human production and subsistence (Krausmann et al. 2008). The social organization in such a regime (i.e. the structures, institutions and operations of society) is optimized to maintain the dominant energy system with its specific social metabolism (Sieferle 2003). The sources of energy and its primary conversion technologies constitute the energy system (Fischer-Kowalski 2010).

Historically, three socio-ecological regimes were characterized to be dominant since the existence of human being: the regime of *hunter-gatherer*, the *agrarian* regime, and the *industrial* regime (Fischer-Kowalski and Haberl 1997). The transitions between these regimes are determined by structural changes of the interlinked natural and social systems (Fischer-Kowalski 2010) and characterized by 'metabolic revolutions' (Fischer-Kowalski and Haberl 2007: 232). The industrialization process, that started in the United Kingdom in the 18th century, created the prevailing industrial socio-ecological regime based on the use of fossil fuels and enhanced the social metabolism progressively. The associated socio-ecological transition that occurred in Austria will be described in the following chapter.

2.3.3 The socio-ecological transition in Austria

Since the 19th century Austria has undertaken a transformation from a mostly agricultural society – under agrarian regime – to the modern industrial society – under industrial regime – of today. During the agrarian regime, energy consumption was yet covered exclusively by biomass. However, with the evolution of steam engines and hence rapidly increasing coal-based iron production in the 19th century and escalating oil exploitation in the 20th century, this has changed dramatically. In particular the phase after World War II, characterized by oil-based industrialization, post-war reconstruction and mass consumption, resulted in an exponential growth of material and energy use.

Oil and gas increasingly replaced coal, which has been used predominantly till the 1950s to fire railroads and iron industries as well as to heat urban households (Fischer-Kowalski 2010; Krausmann et al. 2008). These new energy carriers together with the diffusion of technological innovations (cluster of petroleum, steel and automobile in company with electricity) created the last step of the industrial transition (ibid.). Agriculture was industrialized and agricultural production was decoupled from animate power. Steam engines were discharged by internal combustion engines and electric motors. In general terms, energy substituted labour (Pfister 2010). Furthermore, electricity changed the patterns of energy use fundamentally, making energy increasingly flexible and available at any time, creating new forms of mass production and mass consumption (e.g. mobility: cars and an extensive road system). That caused a dramatic shift in the basic economic bias of the people from enforced austerity to unleashed consumerism (Pfister 2003; 2010) and the rising metabolic revolution began to puncture all aspects of society, triggering a rise in household energy consumption and growth in quality of life, only limitated to its energy resource base which it eroded successively (Fischer-Kowalski and Haberl 2007), a dynamic that become well-known as the *1950s Syndrome* (Pfister 2003; 2010).

Nevertheless, the economic transformation was also enhanced by the state, who had the aim to rebuild post-war Austria with large-scale infrastructure projects including road construction programmes, nation-wide electrification and the construction of large-scale power plants to satisfy increasing industrial and social power consumption (Krausmann et al. 2008) and to create a modernized welfare society. Although the industrial society resolved the sustainability problems of previous generations (balance of production and population) (Fischer-Kowalski et al. 1997: 32), the newly gained abundance of energy and materials

created an economy of mass production and mass consumption that implicated severe impacts on nature as well as human environment. In fact, output-related environmental burdens, habitat loss and inequality within society not only generated social conflicts but also set a considerable threat to a sustainable development.

The period of accelerated growth of the 1950s and 1960s came to an end in consequence of the *oil price shock* in 1973 which had persistent effects on global politics and the economy and caused an comprehensive economic recession in oil consuming Western countries (Wiedenhofer et al. 2013). In 1950, the energy consumption in Austria fluctuated aroud 80 GJ per capita. Between 1950 and 1973 per capita energy use in Austria rose by 123%, with the oil crisis the prevailing growth in energy consumption paused and energy use began to fluctuate around 200 GJ per capita (Krausmann et al. 2008: 195).

Western industrial societies struggled with the economic and social turbulences created by the oil price shock. To prevent future collapses of their energy system and hence their economy, they changed their political agendas by setting *energy security* as a top priority and in order to achieve that, they focused on alternative energy sources to replace oil. While many countries massively invested in nuclear power (e.g. France, Germany, Japan, UK, USA) or accessed domestic oil and gas resources (e.g. the Netherlands, Norway, UK, USA), Austria, in contrast, expanded their capacities of hydroelectric power and intensified the use of biomass to reduce their dependency on energy imports (ibid.: 198). In the following years after the oil price shock, Austria made use of its geographical and hydromorphological characteristics and began to invest in hydroelectric dams and power plants along the abundantly available alpine streams. This shift in domestic energy policy not only changed the composition of energy carriers but also reshaped Austria's landscape and natural capital and moreover, with growing societal environmental consciousness, created social tensions that even influenced the country's domestic politics.

Today, the industrial socio-ecological regime rests upon a high level of per capita consumption of energy and material resources which is not only related to material and energy intensive industrial production systems (incl. agriculture), but also to the construction and maintenance of large-scale infrastructure (e.g. roads and buildings) as well as physical stocks (e.g. cars). In a spatially differentiated economy the mobility of goods and people has not only becoming more extensive but even indispensable for a common high material standard of living including central heating, air conditioning, electrical household devices, dietery patterns and tourism (Krausmann et al. 2008a).

2.3.4 Environmental conflicts in the light of socio-ecological transitions

In the light of the socio-ecological transition described above, environmental conflicts stress the sustainability problems, that emerge in the wake of this transition, on a cultural stage. Environmental conflicts make the inner-social disremption of society's development path visible and show that social, economic and material transformations are not proceeding without internal complications and obstacles. Environmental conflicts appear as social arenas in which the relationship, that society keeps to nature, is negotiated and formulated. In these

arenas clash a range of actors that share different interests regarding the use of natural resources and that express contrasting interpretations of the future state of the environment, in which they want to live.

However, environmental conflicts appear as well as a 'product of the social metabolism' (Martinez-Alier et al. 2010) with a range of different impacts on health and the environment, and since environmental conflicts have their roots in the material base of society, the focus on the material and energetic input-output settings of the socio-economic system becomes crucial for the analysis of environmental conflicts. Seen from a socio-ecological perspective, conflicts emerge at three different levels: 1) input level; 2) stocks level; and 3) output level. Conflicts at the *input level* stress the disputed view on the exhaustibility of resources, land use competition, interventions into ecosystems (e.g. hydropower) and the loss of biodiversity (Krausmann and Erb 2012). Input-level conflicts are especially related to energy sources, i.e. fossil fuels, hydropower and nuclear energy. The key issues in such conflicts are the impacts of pollution and the disposal problem (fossil fuels); the resource availability and transformations of river ecosystems (hydropower); the production and distribution of risks and problem of disposal (nuclear energy). Land use impacts related to buildings and infrastructure and their utilization as well as stock dynamics trigger conflicts on the *stocks level* (ibid.). Conflicts emerge due to incompatible views on the augmentation and management of biophysical stocks. *Output*-related conflicts address impacts of toxic emissions and pollution, land use impacts of waste disposal and other undesirable environmental effects of specific depletion (ibid.). In such conceptualization, environmental conflicts manifest from social mobilizations created by stakeholders that share a negative perception about the environmental impacts of specific biophysical activities within the socio-economic system (Muradian et al. 2012).

Within this perspective, conflict-related socio-ecological studies focus on analyzing the access to and the consequences of natural resource use (Stepanova and Bruckmeier 2013). In doing so, scholars concentrate on the unequal distribution of natural resources (Escobar 2006; Martinez-Alier 2002; Mason et al. 2007). By emphasizing on the significance of diverging environmental claims (made by the resource users) for the emergence of environmental conflicts, Joan Martinez-Alier (2002) explains that an unequal balance of power would lead to one-sided enforcement of these claims and further to "conflicts on the burdens of pollution" (e.g. neighbors bear the burdens of air pollution of a nearby incinerator) as well as to conflicts "on the sharing of uncertain environmental risks" (e.g. most popular represented by the deep dissent about the use of nuclear power) or to conflicts "on the loss of access to natural resources and environmental services" (e.g. resistance to dams, barrages and hydroelectric power plants) (Martinez-Alier 2002). For instance, the construction of transport infrastructure itself (e.g. a road or motorway) does not describe the triggering conflict issue since it is rather the impacts of that infrastructure on the local environment and health of the neighboring residents (air and noise pollution, traffic, etc.) that lead to project opposition.

Synopsis: Environmental Conflict

This chapter has shown, that environmental conflicts display a high degree of complexity in the way they emerge and in the forms they are shaped, which is why scholars refer to as 'complex socio-ecological constructions' (Khan et al. 2013). Such aspect makes them challenging to describe and to analyse. After this section has pointed out diverse conceptualizations, a brief synopsis will characterize the major aspects in the following:

1. ***Society's biophysical structure and activities constitute the basis for environmental conflicts***

Material reasons, i.e. the extraction of natural resources, the augmentation and management of biophysical stocks or the disposal of waste, are fundamental for the existence of environmental conflicts as such conflicts are the outcome of a) changes in the social metabolism (the input and output of energy and materials), b) of transformations of society's biophysical structures or c) of human appropiation of nature.

2. ***Environmental conflicts are at any time socially constructed and based on incompatible interests in the human-nature relationship***

Biophysical activities are caused by actors of society which have their very own cultural perceptions of nature and natural resources and their very own interest motives to use these resources. However, their needs and interests are a social construction, and this construction varies from the ones of other resource users. Hence, an environmental conflict emerges when their diverging interests produce incompatibility and this incompatibility has been communicated between the stakeholders. Environmental conflicts are, in that sense, at any time socially constructed which means they are articulated, processed and resolved within the social system. The character of such conflict is multi-dimensional including not only environmental and ecological factors but as well as social, economic, cultural and political factors (Stepanova and Bruckmeier 2013).

3. ***Environmental, socio-economic and health-related impacts trigger environmental conflicts***

Environmental conflicts disclose contested uses of the environment (space, land, water, air, and the resources embedded in them) by several involved social actors (individuals, groups, organisations, nations and institutions) and these contested uses display multiple forms of environmental, socio-economic and health-related impact (e.g. pollution, resource scarcity, biodiversity loss, climate change, loss of livelihood) which trigger the emergence of environmental conflicts.

4. ***Environmental conflicts can be described in space and time***

On the basis of their materiality, environmental conflicts have a socio-natural scene where the events take place meaning that they can be clearly attributed to specific geographical locations[4]. In addition, environmental conflicts can as well be described in matters of time, in that sense, that certain events triggered the conflict and others dissolved it. Last but not least, the places, where the conflict events occurred, stand with their names for the events of the conflict, whereby these names are charged with emotions, images and stories creating special places of social remembrance (*lieux de memoire*) (Winiwarter 2001) resp. 'ecological places of remembrance' (*ökologische Erinnerungsorte*) (Uekötter 2014).

4 In that sense, the conflict over climate change and global warming – although opposing opinions, interests and values exist – is not considered as an environmental conflict since its reach, implications and potential responses can not be located explicitly.

Chapter Three: Mapping environmental conflicts – aspects of conflict classifications

The key empirical task of this research was the collection and analysis of environmental conflict cases in Austria since the 1950s. The first steps to achieve this task were made by introducing in the history of environmental conflicts in Austria, followed by the proposal of research questions and objectives and a theoretical conceptualization of environmental conflicts. The following chapter unfolds a description of the data collection, the selection of cases and gives an overview about the set of indicators which was developed in order to analyze the characteristics of environmental conflicts.

3.1 Case data collection

The presented cases and findings rest on a variety of data collected from a wide range of sources. Despite the case references obtained by the literature review that was conducted in the course of the theoretical conceptualization, case -specific data was gathered by accessing newspaper archives[5] and by using computerized searches[6]. The search terms used were, besides 'environmental conflict' (*Umweltkonflikt*), equivalents to the term 'environment' (*Umwelt*) – e.g. 'nature', 'ecology' – in combination with terms that describe the notion of 'conflict' (*Konflikt*) – such as 'dispute', 'controversy' – or terms that express the notion of incompatibility, e.g. 'protest', 'resistance', 'opposition'. The obtained material included public relations of environmental organisations, news media coverage, review of policy and planning documents and archival data.

Digging into one case opened other cases when articles and reports referred to other historical cases. This created a domino effect that let the research process became explorative and investigative. Nevertheless, the virtual worlds of the internet seldom correspond entirely to reality, yet do environmental initiatives only exist online to involve themselves into opposition against state or company projects. Above all, recent conflicts are better documented than older cases thanks to the internet which generally archived data since the 1990s. This aspect bears the risk that it might distort the final results. To enlarge the radius of sources that provide with specific case information, expertise of professionals on environmental concerns (e.g. *Umweltanwaltschaften*7) and experiences of contemporary

5 Archives of the main newspapers: *Kronen Zeitung; der Standard; die Presse; Kurier; Wiener Zeitung; Kleine Zeitung; Vorarlberger Nachrichten; Tiroler Tageszeitung*.

6 Google-search as well as the online catalogue of the Austrian library network OBSVG (http://search.obvsg.at/primo_library/libweb/action/search.do?vid=ACC)

7 The so-called Umweltanwaltschaften (engl.: Ombuds Office for Environmental Protection) are independent (not subject to directives) institutions of Austria's provinces, as nature protection is a competence owned by the provinces. They represent the interests of nature conservation (mainly in administrative procedures), serve as a center for information and consultation and act as a mediation body in conflictual affairs, a mayor reason for their first implementation in the state of Lower Austria in 1985 in the aftermaths of the events around Hainburg. Thereafter, Umweltanwaltschaften were founded in all other federal provinces within the next twenty years.

witnesses and involved actors were accessed. Their support was very helpful to fill the gaps of information that could not be covered by literature review and archive research. Furthermore, the experts could give helpful hints where to look more in detail to reveal blind spots and unseen links between the conflicts.

With regard to the data sources, it is essential to keep in mind the endemic subjectivity of the sources used, which are to a great extent mass media reporting and eyewitness accounts (Rucht 2001). The fact that different actors with diverging values and interests take part in environmental conflicts compounds such endemic subjectivity.

3.2 Selection of cases

Although the language of involved actors in environmental issues (or its commentators) often sounds critical, provocative or controversial, the description of environmental situations or problems or the argument for environmental protection does not always determine whether the considered context is just a case that is problematic in any sense or actually an issue that is publicly debated and contested and leading to a conflict. That is why, an important precondition for approving a case as a concrete conflict case constituted the redundant media coverage of individual conflict events and the repitition of media reports across several conflict stages. Other possible markers for an emerging conflict constituted the founding of an initiative by opponents to a state's or company's project. The thesis refers to conflicts in which arguments by actors were visible, either through campaigning, street protests, direct confrontations, political disputes or lawsuits. Some local and small-scale conflicts may therefore be missing since they were lacking of sufficient public attention, legal and political disputes and decisions, or organized actors. According to that aspect, the whole entity of conflicts could not be measured and will be unknown. However, the multitude of cases is still large enough to show representativeness even though the risk exists that the generated empirical evidence is composed of case studies that are stressed with selection bias.

But still, defining whether a conflict is environmental or not is challenging. Environmental conflicts are complex and dynamic phenomena. As a result, locating the conflict issue might be anything but easy (even for scholars) since many cases show a high degree of complexity regarding the problem structure (Feindt and Saretzki 2010: 41). Even within the involved conflict parties the location of the conflict issue might be contested. On the other hand, few conflicts are touching simply environmental concerns (Hellström 2001). Often enough, economic or social issues play a key aspect within these conflicts. However, within this research, it is not the determining factor whether the main argument of the debate concerning a particular conflict is completely or partly environmental. For this research, a conflict is taken into account, if the environmental aspect related to the conflict is considered to be crucial for the outcome of the conflict (ibid.).

According to the case selection, a list of conflicts has been compiled including 108 cases located all over Austria as well as several transboundary conflicts with Austria's neighboring countries. After the cases were selected, the next move was to assess the cases on the basis of developed indicators.

3.3 Challenges of analyzing environmental conflicts

Environmental issues do not introduce themselves in clear boxes labeled as 'air pollution', 'radiation', 'climate change' or 'biodiversity', 'national parks' and 'wildlife protection' (Dryzek 1997). Such issues emerge strongly interconnected and depend on the current social context, on institutional conditions and on environmental discourses (Feindt 2010). That applies even more for environmental conflicts which reveal different levels of conflict staging. For instance, conflict parties introduce issues on a macro level to interpret conflicts on a micro or meso level (ibid.: 24). In that sense, location conflicts (e.g. siting of power generation plants) were seen as part of a more complex conflict of technology or authority. In contrast, a conflict on a macro level does not have to apply in a regional context due to low mobilization potential (e.g. GMOs) whereas harmony of interests on a macro level can yet lead to conflicts during the implementation in the regional context, as it can be seen in the case of implementing wind energy (Feindt 2010: 24). Based on the progressive resolution of domestic environmental problems and in the light of an increasingly globalized world, conflict issues are increasing embedded in global interdependency. Albeit a change from local gravities to global implications can be observed, the conflicts are still fought on a local level. Impacts of global developments are mirrored in local consequences.

Three common approaches exist to analyze individual environmental conflicts: an *actor*-oriented approach; a *stake*-oriented approach; and a *resource*-oriented approach (Khan et al. 2013). Such approaches allow to classify conflicts into typologies. From a socio-ecological perspective, the resource-oriented approach towards environmental conflicts appears to be more suitable for understanding the 'bigger picture' and to emphasize on the material base of emerging conflicts.

As stated earlier, environmental conflicts emerge as “dynamic socio-ecological constructions” (Khan et al. 2013). Describing them requires to consider several different factors and dimensions which make their classification a complex task. In this respect, scholars suggested multiple dimensions for the analysis of spatially and temporally locatable environmental conflicts, which are taken into account in the following. These dimensions are 'the conflict issue', 'conflict parties', 'forms of conflict settlement' and 'conflict resolution' (Bonacker 2005: 16; Saretzki 2010: 39).

Another methodological challenge originated from the task of determing feasible variables for the analysis since environmental conflicts appear as hybrid and dynamic phenomena (Khan et al. 2013). Hybrid refers to the challenge of determining the issue that causes the conflict, whether it is expressed in space or in natural resources, and it refers to the challenge of determining the extent resource users (direct or indirect) are involved in a conflict and which are the actual parties in a conflict. Environmental conflicts are dynamic phenomena because they change and evolve over time. Moreover, they become characterized by a high degree of complexity by what they usually encompass different layers and networks of social actors (Saretzki 2010). Due to this complexity, generalizations about their emergence and their evolution are therefore hard to achieve.

With regard to an appropiate form of description, conflict classifications usually run the risk that observed individual cases may not be subsumed under one specific type. Every single conflict is determined by its particular *local context* (institutional, environmental,

cultural, socio-economic, political) shaped by the historic, social and cultural identities and by the specific geographies. In that sense, the analytical challenge was to adequately regard the local aspect in order to avoid the reductive trap of universality which would cost understanding the particular.

3.4 The concept of environmental justice

Even though every single conflict can be studied individually, in order to respond to questions about the nature and dynamics of conflicts and its historical evolution, it requires not only the analysis of a variety of cases and their classification but also the link to a major research field to be able to make realistic statements about the characteristics of conflicts and to compare them. Looking at the international *EJOLT* project (Environmental Justice Organisations, Liabilities and Trade) shows a growing demand for studying and challenging environmental conflicts all around the world. Studies on the fields of Political Ecology, Ecological Economics, Environmental Health and Environmental Law contribute to EJOLT with a major focus on the concepts of 'ecologically unequal trade' and 'ecological debt'. Such transdisciplinary concepts are supporting a growing global environmental justice movement stressing environmental struggles, especially in regions of the global south where an increasing number of ecological distribution conflicts over natural resources has emerged in response to the ongoing globalization8 (Escobar 2006; Martinez-Alier 2002). These grassroots movements consist of social groups (mainly from rural areas) that are highly depending on the natural resources of their environment promoting an *environmentalism of the poor* (Martinez-Alier 2002). Such environmentalism stresses environmental issues by advocacy and activism. According to that, the involved environmental organisations and research institutes demand *environmental justice* for the struggle of local populations due to the increasing economic appropiation of nature (transnational extraction activities, e.g. logging, mining). Emerging conflicts highlight on the distributive and structural impacts that economic, biophysical activities have on the health and environment of local population.

The idea of environmental injustice emerged in the USA in the 1980s from the observation that some communities or social groups were disproportionately exposed to higher levels of environmental pollution and risks than other parts of society. Out of growing concerns over such unequally distributed environmental burdens emerged a social movement which publicly attacked the racial and economic injustices that especially affected the livelihood and health of low-income households, the working class, people of color, and indigenous communities and that were caused by resource extraction, waste disposal and pollution in their neighborhoods and hazards in their workplace (Bullard 1994). The concept of environmental justice that arose from this civil rights campaign was taken up by social science in the 1990s (Mohai et al. 2009). Based on increased global consumption of natural resources and on the expanding commodity frontier, a global social movement has arisen as the EJOLT project illustrates. Theory and practice of environmental justice emphasize on

8 As a result of research on such conflicts, scholars all over the world collaborated to develop an atlas – the EJOLT atlas – including descriptions of more than 1.600 environmental conflicts worldwide, available under http://ejatlas.org

conceptions of justice that are based on recognition, participation and capabilities (Schlosberg 2007) and aim at the equal protection of all citizens[9].

Current hotspots of environmental (justice) conflicts are located in the global south, e.g. countries in Latin America, Africa, India and South-East Asia. Involved environmental NGOs and research institutes report cases to the EJOLT Atlas (Environmental Justice Atlas) mapping over 1.700 cases[10]. The categories and options of the EJOLT Atlas therefore rather cope with environmental (justice) conflicts located in the global south. However, adopting EJOLT indicators for the analysis of Austrian cases might shed light on the environmental justice issue.

3.5 Selection of indicators

Often enough, studies on environmental conflicts focus only on the review of single events, in particular case studies and approaches to examine the (social or political) external effects of conflicts or the media resonance of conflict events (Rucht 2001). What is often missing is an interest in the 'bigger picture', the effort to systemize a multitude of conflicts to better understand the preconditions, characteristics and dynamics of environmental conflicts and to identify structural patterns and links between them. For that reason, the thesis' aim was to develop a reasonable and viable set of variables which makes it possible to classify all collected conflict cases and to clarify the characteristics of environmental conflicts in Austria. Even though a simplification inevitably leads to a disregard of features that would be relevant for a detailed study of single events, typologies can help to improve empirical research and to broaden its perspectives.

The set of variables for the analysis was created under the circumstances of partial data limitation. In the end, the case-specific availability of data formed the selection of variables. The following section describes the indicators developed for this analysis and Table 2 gives an overview of the selected indicators.

In the beginning, the analysis should have provided the integration of an indicator that takes the involved actors and conflict coalitions into account. However, this task could not be carried out due to unfeasible adaptation of the complex actors constellations11. Despite that, the in-depth descriptions of selected cases respond to the aspect of involved actors, and in order to further acknowledge the actors feature, Figure 3 illustrates the actors that play a part in environmental conflicts in Austria. When analyzing involved actor groups,

9 The United States Environmental Protection Agency (EPA) defined environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. It will be achieved when everyone enjoys the same degree of protection from environmental and health hazards and equal access to the decision-making process to have a healthy environment in which to live, learn, and work.“ (https://www3.epa.gov/environmentaljustice/)

10 See the Atlas for Environmental Justice, access online: http://ejatlas.org

11 The indicator coping with the actors involved could include the actor groups ‘state’, ‘companies and state enterprises’ and ‘actors of civil society’. Such categorization would roughly refer to a classification operated by the EJOLT Atlas.

additional attention should definitely be paid on the power relations between the conflict actors and the general actor constellation (Feindt 2010: 24).

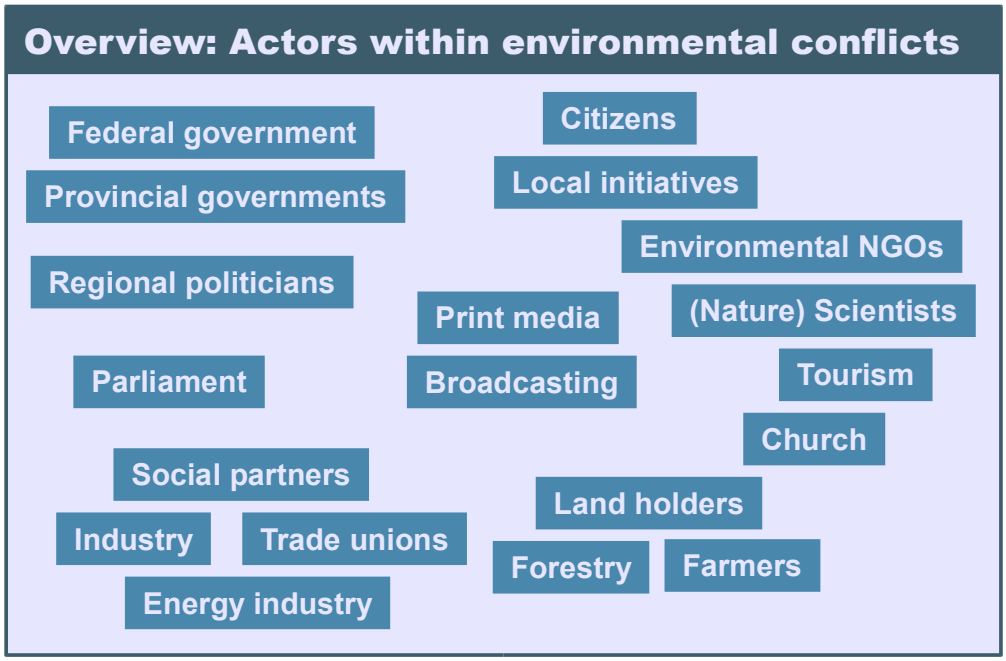

Figure 3: Overview of the actors that get involved in environmental conflicts in Austria. The figure is based on Schmid and Winiwarter 2012.

Explanatory remark: Conflictual projects

Environmental conflicts emerge as a result of socially disputed biophysical activities that have certain social, economic and environmental impacts on the livelihood of social actors which in turn object these activities. For the analysis, these biophysical activities are referred to as *projects*. This refers either to power plant projects, transport infrastructure projects, or tourism projects (e.g. ski regions) with impacts that are perceived as harmful for the environment and the livelihood of local residents but it as well refers to projects that are widely perceived as environmentally beneficial but will impair the interests of individual stakeholder groups (e.g. the establishment of nature reserves or national parks). This methodological construction helps to better evaluate the cases according to the selected indicators.

The key research question the thesis is dealing with refers to the (changing) nature of environmental conflicts which is understood as the characteristics of a conflict, the context in which the conflict is embedded and the causes which triggered the conflict (Khan et al. 2013: 27). The following variables cope with this understanding.

3.6 Overview of indicators

This section gives an overview of the indicators that were selected for the analysis of the cases. Each individual variable includes a certain number of options with which the individual cases could be attributed. Table 2 located at the end of this section summarizes the indicators and the corresponding options.

- ***I) Typological classification***

The first indicator classified the environmental conflicts into different typologies. With this step the cases were linked to the typological categories established for the EJOLT Atlas. Based on the EJOLT classification, ten main conflict categories exist and are listed and described below in Table 1. The EJOLT classification seeks to cover all conflict characteristics worldwide having regard to a resource perspective (Martinez-Alier 2002).

- ***II) Stage of material flow***

Environmental conflicts are a product of the social metabolism (Martinez-Alier et al. 2010). The second variable refers to that aspect. The conflicts were allocated corresponding to the socio-ecological input-output model to address the material base of the conflict. According to the model, environmental conflicts emerge within the limits of the socio-economic system either *input*-related, *stocks*-related or *output*-related. Figure 4 below illustrates the factors of the individual conflict levels.

- ***III) Conflict concern***

The third indicator described the underlying *concern* that has triggered the conflict and referred to the resource perspective. The cases were summarized to four categories characterized as conflicts about *pollution*, *resource use or distribution*, *risk* and *siting or planning*.

Table 1: Overview of the typological classifications according to EJOLT.

Name	Description	Examples
Biodiversity Conservation	Conflicts provoked by an intended protection of ecosystems and biodiversity	Establishment of reserves, protected areas and national parks
Biomass and Land	Conflicts around the management of forests, agriculture and livestock; land use conflicts	Green space/parks; hog farming sites (intensive food production); GMOs
Energy, fossil fuels and climate change	Fossil fuels-related conflicts and energy conflicts related to climate change	Oil and gas exploration, extraction and refining; shale gas fracking; thermal power plants; windmills
Industrial and Utilities	Conflicts due to perceived cutback of life quality caused by industry-related pollution (air, noise, water)	Chemical industries; manufacturing activities; ports
Infrastructure and Built Environment	Conflicts related to the construction and development of transport infrastructure; urban development conflicts	Mega-infrastructure projects; transport infrastructure networks (roads, railways, pipelines, transmission lines)
Mineral Ores and Building Materials Extraction	Conflicts emerged due to the extraction of mineral ores and building materials and due to their pollution	Quarries and gravel pits
Nuclear	Conflicts around the civil use and risk management of nuclear power	Nuclear power plants; nuclear waste storage
Tourism Recreation	Facilities and infrastructure for tourism and recreational uses in conflict with nature and landscape conservation	Ski resorts, hotels
Waste management	Conflicts related to the management of waste	Incinerators; landfills, toxic waste treatment and uncontrolled dump sites
Water management	Conflicts emerged due to contested uses of water bodies	Hydroelectric power plants, dams and barrages

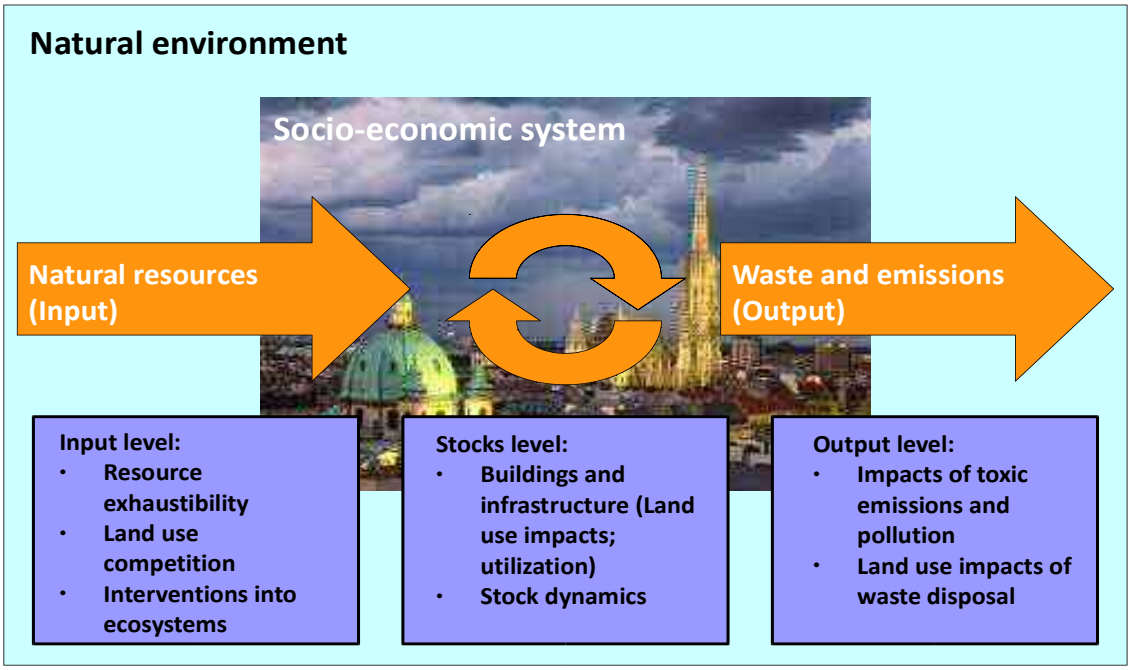

Figure 4: The stages on which environmental conflicts take place according to the social metabolism model: input, stocks, and output (figure based on Krausmann and Erb 2012).

- ***IV) Spatial and temporal scale***

This fourth variable regarded the scales of a conflict. On a *spatial scale*, the analysis resorted to the four dimensions *transboundary, national*, *regional*, and *local* and referred to the level on which the conflict was staged. Transboundary conflicts corresponded to cases in which the issue or parties involved were located in Austria's neighboring countries. National conflicts referred to nation-wide conflict mobilisation or resolution. Conflicts on regional level included the involvement of at least two communities, a district or a province. The *temporal scale* referred to the duration of a conflict. This analysis made use of two extents described as *acute* (short-term) conflicts and *chronic* (long-term) conflicts. Acute conflicts are resolved within 10 years. Chronic conflicts result from an opposition that is streched over a relatively long period of time (> 10 years) and often implicate several crises (‘conflictual episodes’) (Khan et al. 2013) as well as phases of de-thematisation or recovery due to temporal resolution of the conflict. In the perception of actors these long-term cases tend to continue 'endlessly' and scholars have traced them as 'intractable conflicts' (Lewicki and Gray 2003). The temporal scale of a conflict was classified as *unknown* when the conflict emerged within the last ten years (since 2006) and its resolution is still pending.

- ***V) Mobilisation of project opposition***

The fifth indicator analysed when the mobilisation of project opposition began which referred to the manifestation of the conflict. Project opposition triggering a conflict began either *in anticipation* (preventive; planning phase of project) or *in reaction* to the project implementation (during construction or operation).

- ***VI) Project status***

The sixth variable addressed the *project status* and responded to the question whether the contested project was *realized*, *undecided* or *cancelled*. If the proponent could enforce his interests in face of opposition, e.g. by the construction of a proposed power plant or infrastructure or by political or legal decision-making, it means the project was realized. If the proponent had to withdraw his proposed plans, it means the project was cancelled. In other words, this indicator displays the success of environmental movements.

- ***VII) Conflict resolution***

The seventh indicator analyzed in which arena – *public*, *political* or *judicial* – the conflict was resolved. The way of how the conflict was resolved was strongly depending on the actors' forms and resources of mobilization and the resultant produced feedback of the counterparts (Reusswig and Lass 2007). However, scholars point out that resolution does not implicitly mean that the conflict was solved. Rather, it relates to the stakeholders' capacity to achieve a mutually accepted arrangement (Lewicki and Gray 2003). *Public* conflict resolution

refers to both, realized as well as cancelled projects. In such terms, it means either a project withdrawal due to overcoming oppositional campaigning or protest (*cancelled*), or the project implementation was executed despite emerged resistance (*realized*). Conflicts were resolved *politically* through (governmental or parliamentary) decision-making as well as through elections and referenda. Lawsuits and court decisions referred to *judicial* conflict resolution.

Table 2: Indicators used to analyze environmental conflicts in Austria.

Indicator		Options
I.	**Typological classification**	[Biodiversity conservation; biomass and land; energy, fossil fuels and climate change; industrial and utilities; infrastructure and built environment; mineral ores and building materials extraction; nuclear; tourism recreation; waste management; water management]
II.	**Material flow stage**	[Input; stocks; output]
III.	**Conflict concern**	[Pollution; resource use/distribution; risk; siting/ planning]
IV.a)	***Spatial scale***	[Transboundary; national; regional; local]
IV.b)	***Temporal scale***	[Acute; chronic; unknown]
V.	**Conflict mobilisation**	[In anticipation; in reaction]
VI.	**Project status**	[Realized; cancelled; undecided]

Chapter Four: Environmental conflict fields in Austria

This chapter includes the quantitative as well as qualitative outcome of the analysis. In a first step, the quantitative results according to the selected indicators (see *Chapter 3.6 'Criteria overview'*) are presented. In a second, more qualitative move, selected cases of high significance are described in more detail. Within each of the case chapters, the conflict issue, conflict course, involved actors, conflict resolution and outcome are described briefly and the case is classified into the historical development to exemplify its significance for the trajectory of Austria's socio-ecological transition. This second step is of vital importance to characterize the nature of environmental conflicts in Austria.

4.1 Results of the indicator analysis

The analysis of environmental conflicts resulted in a list of 108 cases distributed all over Austria. The collected cases cover a wide range of environmental conflict typologies. The map in Figure 5 gives an overview about the geographical distribution of environmental conflicts in Austria with regard to the typologies attributed to the individual conflicts. Conflicts about 'infrastructure and built environment' (23%), 'water management' (19%) and 'energy' related to fossil fuels (13%) represent the three main typologies of conflicts in Austria as Figure 6 shows. Conflicts about the extraction of 'mineral ores and building materials' were barely occurring (2%). On closer inspection, the results show that the main issues in Austria represent 'dams and water distribution conflicts' (19 cases) and conflicts about 'transport infrastructure' (24 cases). This aspect will be discussed in detail in *Chapter Five*.

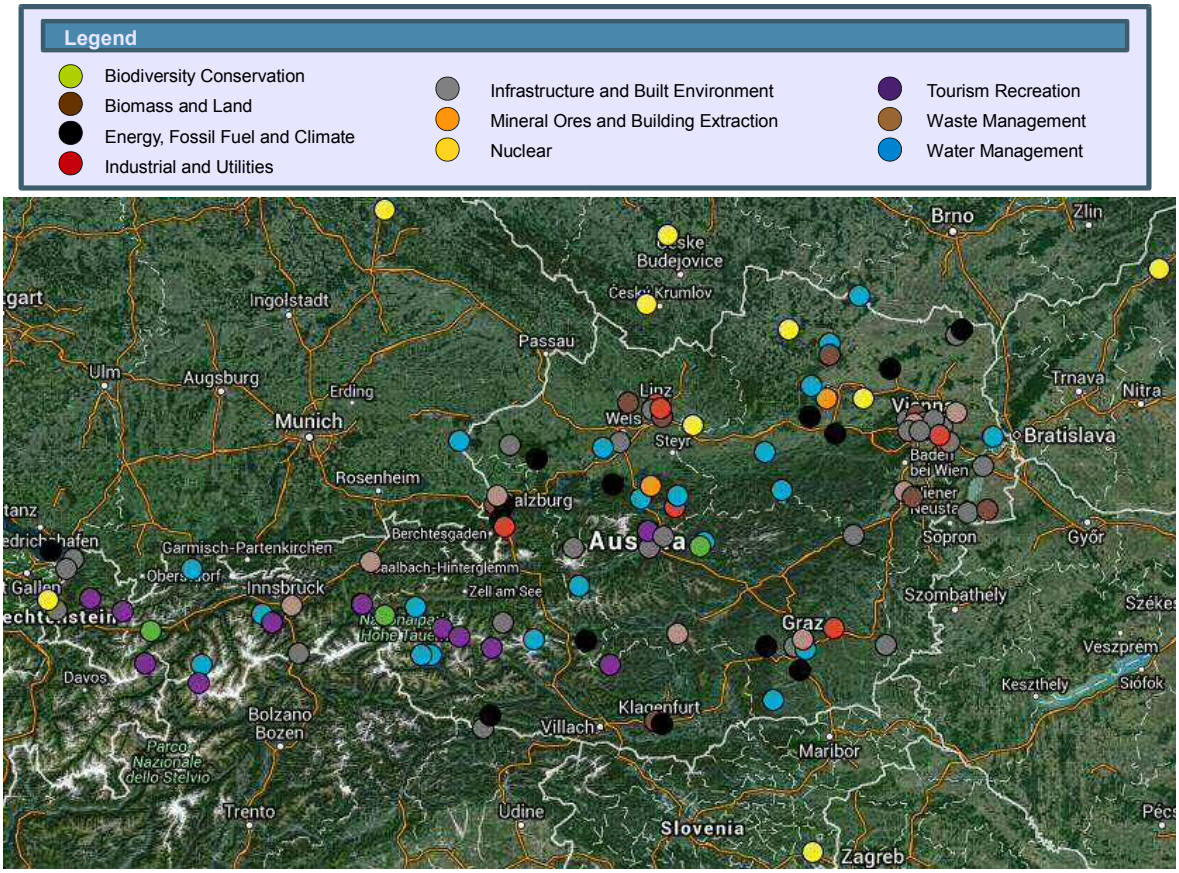

Figure 5: Map of environmental conflicts in Austria - geographical and typological distribution.

In the following, the conflict cases were arranged in an excel file and the earlier defined variables were first evaluated and then plotted against each other. This resulted in several crosstabulations and produced a statistical outcome on how often particular options are repeated. The pie charts in Figure 7 display the distribution of environmental conflicts related to the options of the specific indicator.

In reference to the level of the socio-economic system on which the conflict was staged, 36 conflicts were fought on the input level, 26 cases were output-related conflicts and 46 conflicts emerged around the development and management of biophysical stocks (Figure 7a).

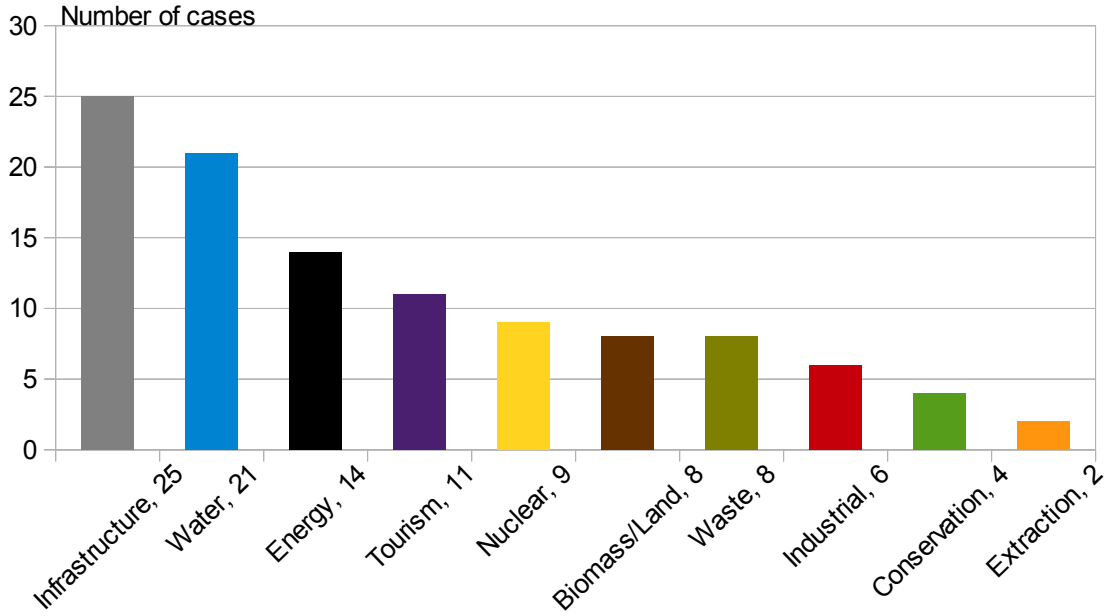

Figure 6: Distribution of the environmental conflict cases according to the EJOLT typological classification.

Concerns about siting or planning represent by far the main reasons for the emergence of environmental conflicts in Austria (68 cases). Pollution (17 cases), risk (12 cases) and resource use or distribution (11 cases) are less an issue (Figure 7b). With respect to spatial scale, more than half of the studied conflicts (66 cases) occurred on a local level (Figure 7c) whereas 25 conflicts had a regional dimension and 13 cases were transboundary conflicts, 4 conflicts reached the national level. Related to temporal scales, 68 conflicts were settled within 10 years and represent acute conflicts (Figure 7d) whereas 31 conflicts were chronic and lasted more than 10 years. The duration of 9 conflicts is still unknown. Most of the conflicts emerged in anticipation (84 cases) to the project implementation (Figure 7e). In 24 cases arose the project opposition when the conflictual project was already implemented (in reaction). Of the 108 conflictual projects, 59 projects were classified as cancelled, 38 projects as realized and 11 cases were yet undecided by the time the thesis was published (Figure 7f). When it comes to conflict settlement, the mayority of the cases were resolved publicly (50 conflicts), the other conflicts were settled in the political arena (30 conflicts) and in the judicial arena (14 conflicts) (Figure 7g).

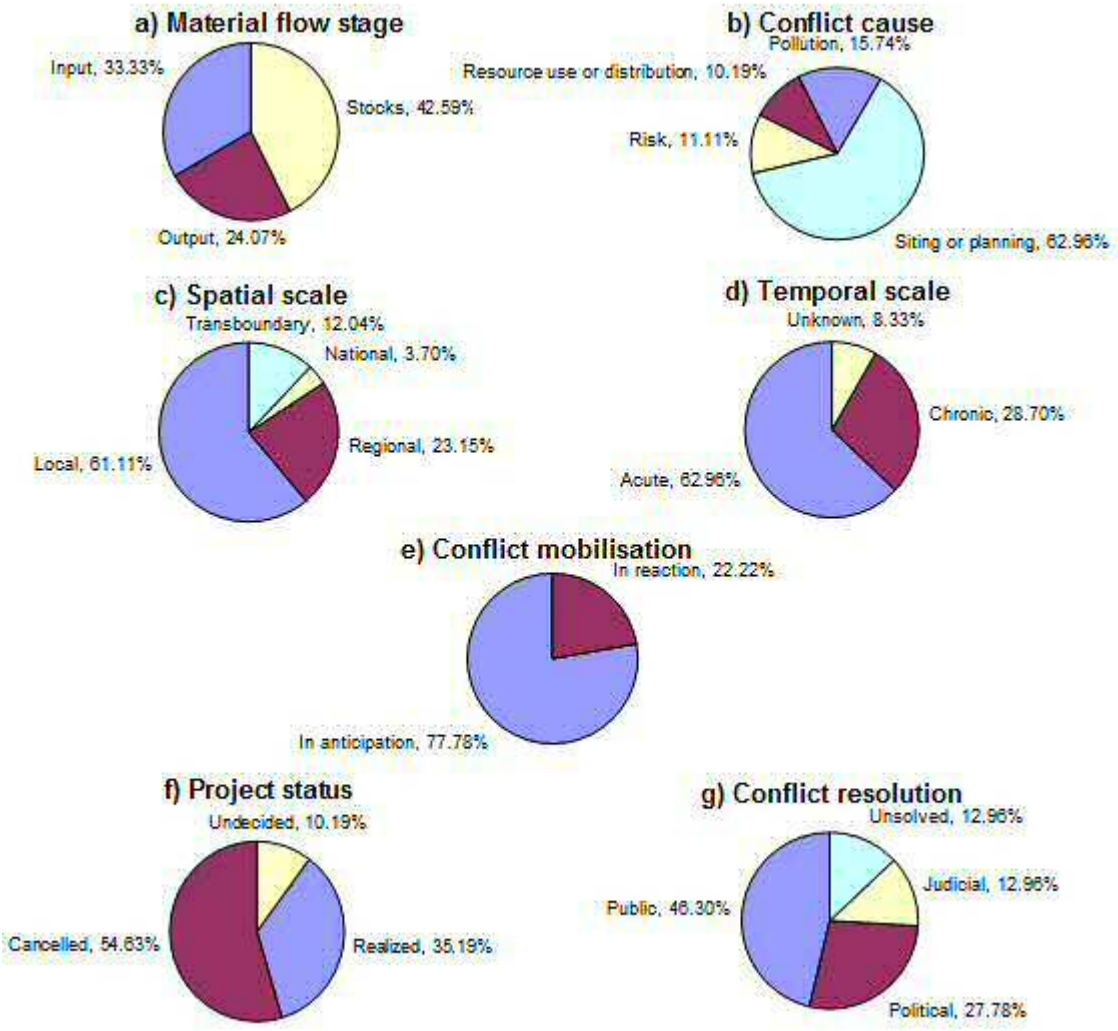

Figure 7: Indicators used for the analysis of environmental conflicts in Austria.

4.2 Cross-comparison of indicators

Related to the typological classification, a cross comparison was applied for the variables 'material flow stage', 'conflict cause', 'project opposition' as well as for the ‘spatial’ and ‘temporal scales’. The results of the cross comparison are shown in Table 3. In reference to scale, the most noticeable aspect is the high share of chronic conflicts within the 'infrastructure and built environment' typology as well as the higher-than-average share of regional conflicts within this typology and the 'energy, fossil fuel and climate change' typology. The high share of transboundary conflicts within the 'nuclear' typology is referring to the strong Austrian opposition towards foreign nuclear power plants and nuclear waste repository sites. The comparison of the typological classification with the 'material flow stage' variable shows, that the typologies 'energy, fossil fuel and climate change' and 'water management' in particular refer to input-related conflicts whereas 'industrial and utilities', 'nuclear' and 'waste management' refer to output-related conflicts. 'Infrastructure and built environment' and 'tourism recreation' address the socio-metabolic stocks. Regarding the 'conflict cause' variable, the latter two typologies deal basically with siting and planning concerns. 'Industrial and utilities' conflicts and 'waste management' conflicts are typical pollution conflicts.

The cross comparison helps to describe the typologies of environmental conflicts. Moreover, it enables to cluster the conflicts according to the indicators which in turn allows to make assumptions about the characteristics of environmental conflicts. The most significant results are outlined in the following:

- ***Conflict staging related to input, output, stocks level:*** Conflicts at the input level address siting/planning issues (as Table 4 illustrates) and can be mostly related to water management, and in particular to the contested construction of hydropower plants (predominantly in alpine landscapes as the map in Figure 5 shows). Output-related conflicts represent on one side conflicts triggered by pollution and referred to 'waste management' and 'industrial and utilities' and on the other side risk conflicts (nuclear). Conflicts at the stocks stage generally address the siting of 'infrastructure and built environment'.

- ***Conflict concern:*** Pollution conflicts are generally staged on a local level whereas risk conflicts reach the national scale (two of the national-scale conflicts are risk conflicts[12]) and international (transboundary) scale. Pollution conflicts tend to be resolved within short-term (compare Table 5).

12 Namely the conflict about nuclear energy in Zwentendorf in the 1970s and the conflict about genetic engineering in the 1990s. Both conflicts resulted in nation-wide referenda.

- ***Spatial and temporal scales:*** The number of regional conflicts can be explained by siting/planning at the stocks level (17 out of 25 regional conflicts) and in particular by regional infrastructure projects (motorways and railroads). Transboundary conflicts occurred in particular due to opposition towards foreign nuclear power plants. Siting/planning conflicts tend to be chronic (> 10 years), in contrast to pollution and risk conflicts which were mostly resolved short-term (compare Table 5).

- ***Conflict mobilisation:*** Conflicts triggered by pollution emerged mostly in reaction (the same applies for the output stage since pollution conflicts are output-related) whereas almost all siting/planning conflicts emerged in anticipation to the project implementation. Opposition against projects on input and stocks levels arose almost in every case in anticipation to the project implementation (compare Table 6).

- ***Project status:*** When conflicts emerged due to pollution concerns related to a certain project, such project tend to be cancelled. On the other hand resulted siting/planning conflicts (as well as regional conflicts) in a high share of realized projects (compare Table 7).

- ***Conflict resolution:*** The share of judicial conflict resolution is especially high in long-term conflicts: 35% of solved chronic conflicts were resolved by law suits and court decisions.

Table 3: Cross-comparison of typological classification with selected indicators.

	Biodiversity conservation	Biomass and land	Energy and fossil fuels	Industrial and utilities	Infrastructure and built environment	Extraction	Nuclear	Tourism recreation	Waste management	Water management	
Material flow stage											Total
Input	2	4	7	0	0	2	0	0	0	21	36
Stocks	2	2	5	1	25	0	0	11	0	0	46
Output	0	2	2	5	0	0	9	0	8	0	26
Total	4	8	14	6	25	2	9	11	8	21	108
Conflict cause											Total
Pollution	0	1	2	4	2	1	0	0	7	0	17
Resource use	4	5	0	0	1	0	0	0	0	1	11
Risk	0	1	2	0	0	0	9	0	0	0	12
Siting or planning	0	1	10	2	22	1	0	11	1	20	68
Total	4	8	14	6	25	2	9	11	8	21	108
Spatial scale											Total
Local	1	6	7	5	13	2	2	7	8	15	66
Regional	3	1	5	0	9	0	0	4	0	3	25
National	0	1	0	0	1	0	1	0	0	1	4
Transb.	0	0	2	1	2	0	6	0	0	2	13
Total	4	8	14	6	25	2	9	11	8	21	108
Temporal scale											Total
Acute	2	5	11	6	12	0	5	8	6	13	68
Chronic	2	2	1	0	11	1	2	2	2	8	31
Unknown	0	1	2	0	2	1	2	1	0	0	9
Total	4	8	14	6	25	2	9	11	8	21	108
Conflict mobilisation											Total
Anticipation	2	6	12	2	23	1	5	11	1	21	84
Reaction	2	2	2	4	2	1	4	0	7	0	24
Total	4	8	14	6	25	2	9	11	8	21	108

Table 4: Cross-comparison of the indicator 'material flow stage' (input, stocks, output) with the indicator 'conflict concern'.

	Stage of material flow			
Concern	Input	Stocks	Output	Total
Pollution	1	3	13	17
Resource use or distribution	7	4	0	11
Risk	2	0	10	12
Siting or planning	26	39	3	68
Total	36	46	26	108

Table 5: Cross-comparison of the indicator 'conflict concern' with 'spatial and temporal scales'.

	Conflict concern				
Spatial and temporal scales	Pollution	Resource use or distribution	Risk	Siting or planning	Total
Local	15	6	2	43	66
Regional	0	4	1	20	25
National	0	0	2	2	4
Transboundary	2	1	7	3	13
Total	17	11	12	68	108
Acute	12	5	8	43	68
Chronic	4	5	2	20	31
Unknown	1	1	2	5	9
Total	17	11	12	68	108

Table 6: Cross-comparison of the indicator 'conflict mobilisation' with the indicator 'material flow stage' and 'conflict concern'.

	Conflict mobilisation		
	In anticipation	In reaction	Total
Input	34	2	36
Stocks	42	4	46
Output	8	18	26
Total	84	24	108
Pollution	2	15	17
Resource use or distribution	8	3	11
Risk	7	5	12
Siting or planning	67	1	68
Total	84	24	108

Table 7: Cross-comparison of the indicator 'project status' with the indicator 'conflict concern'.

	Project status			
Concern	Cancelled	Realized	Undecided	Total
Pollution	13	3	1	17
Resource use or distribution	6	4	1	11
Risk	8	3	1	12
Siting or planning	32	28	8	68
Total	59	38	11	108

4.3 Selected cases of high significance

In this section, selected cases of high significance are described in detail according to the categories used by EJOLT. Therefore, the structure of the individual case descriptions will be uniform and briefly providing basic information about the conflict (e.g. source of conflict, type of conflict, project details), giving an overview about the conflict course, identifying the actors involved (project supporters and opponents), determining the visible and potential impacts of the contested project and illustrating the outcome of the conflict. The cases presented here will be published online in the EJOLT Atlas in order to contribute to the global research on environmental justice.

The first case brings us to the highly contested alpine landscapes. The alpine mountains of *Hohe Tauern* are a historical hotspot of environmental conflict incorporating the *Kaprun dam* and the *Großglockner* High alpine Road (*Hochalpenstraße*) as well as *Gamsgrube*, the *Krimml Falls* and the *Dorfertal dam*.

The second case deals with the far-reaching debate within society about the implementation of Austria's first nuclear power plant in *Zwentendorf* and about the future of nuclear energy in general. Zwentendorf also shows the emerging environmental discourse within society and the formation of an environmental movement.

The third case describes the events of *Hainburg 1984*, where the construction of a hydro-power plant shaked the established social and political structures. Hainburg represented a major turning point in Austria's environmental history that had major implications for the socio-ecological and political arrangements of society, e.g. the installation of the *Donau-Auen National Park*.

The fourth case exemplifies the periodic controversies around transport infrastructure projects. The ongoing dispute over the *Lobau-Autobahn* in Vienna shows that the construction of large-scale infrastructure projects is increasingly questioned due to their environmental impacts and economic effectiveness.

4.3.1 The myth of Kaprun

The history of environmental conflicts in Austria begins at a place that demonstratively represents the changing contrasts of society's relationship to the natural world. Although it did not incorporate an environmental conflict, *Kraftwerk Kaprun* marks the starting point of Austrian environmental conflict history and thus represents a well-defined starting point for the discussion of environmental conflicts in Austria.

Many infrastructure projects of post-war years, e.g. motorways (*Autobahnen*), the Kaprun dam13 and the projected industrialization (oil harbour) of the *Lobau* were relicts of the National Socialists and nation-wide spendings on tourism and energy economy were the

13 Plans were already made before the war and the construction of the first part of the dam began during World War II by dint of 10.000 prisoners of war and forced labourer. During the construction hundreds of workers lost their lifes (Schmid and Veichtlbauer 2006).

consequences of the ERP Fonds14 (*Marshallplan*). That the construction of the Kaprun dam did not lead to a conflict is owed to the historical circumstances of post-war reconstruction. Characterized through an overall difficult economic situation (lacking basic services, unemployment) the configuration of natural habitats and landscapes was rather perceived as a necessity. Use and protection of nature were not cemented in an 'antagonistic setting' (Schmid and Veichtlbauer 2006: 33). In that sense, the construction of the Kaprun dam was socially not related to environmental degradation and represented rather a symbol for an economically better future.

In times of post-war reconstruction Austria's typical landscapes – the Alps and the Danube – played an identity creating role for a growing national consciousness, though in a very ambiguous way. On the one hand the affluence of alpine mountains and rivers supported a new sense of place (*Heimatverbundenheit*) and a growing appreciation and elation of the native and of natural resources, that ought to be preserved from industrial utilization. In that sense, nature communicated feelings of security and stability in a rapidly changing world and served as a place for refuge (Payer and Zangerl-Weisz 1997). On the other hand, especially the alpine characteristics and natural resources were recognized as an energy-rich impulse for the country's development. The *technology euphoria* of the 1950s and 1960s was politically and economically pushed at the expenses of the Alps which experienced a forceful industrialization of landscape. Complexes of hydroelectric dams, electricity pylons and funicular stations were placed in alpine mountains (ibid.). Plans for a bridge across *Neusiedlersee* (Case #14) or plans for large-scale river damming (in *Molln* Case #12 and in *Wachau* Case #19) are examples for an utopian belief in absolute technological feasibility and total control over nature which emerged during the 1960s on the basis of rapidly growing wealth and technological development (Sieferle 1984).

4.3.2 Hohe Tauern – The Krimml Falls

The mountains of *Hohe Tauern* serve not only as a national symbol for alpine (hydropower) energy production and mass tourism but also as one of the first milestones for nature and alpine landscape protection. However, the Hohe Tauern have also turned into a contested mountain area that is characterized by conflicts between energy industry, tourism industry as well as nature conservation and environmental organizations, which is why they became a hotspot for environmental conflicts in Austria.

The *Krimml Falls* are located within the Hohe Tauern area representing – with a drop height of 380 meters in three steps – the highest waterfalls in Austria. Therefore they exhibit an abundant natural source of water power which, in the past, had consistently provoked plans for their exploitation. Such plans led to a long-lasting (chronic) *biodiversity conservation conflict*.

After World War II plans by *Tiroler Wasserkraftwerke AG* (TIWAG) existed to use the power of the waterfalls to produce energy by diverting the water upstream the falls through a tunnel to a power station in the neighbouring community of *Gerlos* (Stöger 2013). But, the

14 The financial support from the post-war Marshall Plan helped to realize the second phase of the dam construction and to inaugurate the dam in 1955.

potential economic use of the waterfalls was in conflict with the rise of tourism in the 1950s. Besides an union of Alpine Clubs and nature conservation associations15, the communities of *Pinzgau* massively protested against the diversion of the waterfalls (Straubinger 2009b: 24). The public mobilisation, expressed through the collection of 122.560 signatures organized by *Naturschutzbund*16, finally stopped the TIWAG plans in 1952.

Thereafter, several other projects were planned to develop the area around the Krimml Falls for touristic purposes (that was a road with large parking, a chairlift, a small hydropower station) whereupon all these projects were not realized also due to the resistance of nature conservation initiatives17. In the following, efforts were made to put the falls under legal nature protection. In 1961, the Salzburg nature conservation authority ennobled the waterfalls as natural monument, and in 1967, they were decorated as "european model landscape" (Straubinger 2009b: 25) with the European diploma for nature conservation by the Council of Europe18. At once provincial institutions and nature conservation organisations decided to aim for the establishment of a national park in Hohe Tauern including the Krimml Falls19.

However, in the beginning 1970s, the waterfalls were anew threatened by plans for a reservoir power station in Tyrolean *Dorfertal* (see Case #23). The diversion of two feeding streams would have decreased the water flow of the falls by a third (Straubinger 2009b). In response to the plans of the energy company *Tauernkraftwerke*, the provincial government of Salzburg declared – driven by a resolution of Naturschutzbund – the full protection of the Krimml Falls that were later guaranteed with the establishment of the Hohe Tauern National Park in the province of Salzburg in 1983, following the first part of national park installation in Corinthia in 1981 (Stöger 2013). The inclusion of the Tyrolean part in 1991 – the plans for the Dorfertal dam prevented an earlier integration – completed the full establishment of the national park.

4.3.3 The long shadow of Zwentendorf

The oil price shock in 1973/74 had created a higher sensibility in industrialized countries for the far-reaching dependency on imported fossil fuels and fluctuations in the oil price (Lauber 1996: 201) and gave rise for plans to expand the civil use of nuclear energy (Pesendorfer 2007: 46). For Austria, the oil embargo reassured the government's plan to build a nuclear power plant in *Zwentendorf* (Case #17). In the post-war years, the traditional cooperation (*Sozialpartnerschaft*) between the two main parties (People's Party and Social Democratic Party) and the major interest groups (Industrialists' Federation, Labour Unions)

15 *Verband alpiner Vereine Österreichs, Naturschutzbund, Zoologisch-Botanische Gesellschaft* (Straubinger 2009b).

16 See http://naturschutzbund.at/naturschutzbund-oesterreich/articles/meilensteine.html

17 Ibid.

18 So far, only two other protected areas in Austria were awarded with the diploma: Wachau and the Thayatal National Park
(see http://www.umweltbundesamt.at/umweltsituation/naturschutz/sg/europa_gebiete/).

19 In 1971, the three neighboring provinces of Corinthia, Salzburg and Tyrol came to the 'agreement of *Heiligenblut*' and formed the national park commission Hohe Tauern (Straubinger 2009b: 26).

agreed on the development of nuclear energy on basis of consensual economic policy (Tálos 1995) and the decision for construction was already issued by Chancellor *Bruno Kreisky* in 197120. The construction of the nuclear power plant started in 1972 and was finished four years later in 1976. However, public resistance against the Zwentendorf nuclear power plant began to emerge during the construction works in 1975, when, strongly influenced by the oil crises, the environment became a political issue whereas the new political activism by parts of civil society was unenthusiastically recognized by the government, political parties and the major interest groups (Neuwirth 2008). However, since the construction triggered a wide-spread public debate, chancellor Kreisky called the population for a referendum – the first in post-war Austria21 – to vote for the operation of the ready built nuclear power plant. The Zwentendorf referendum was held on November 5 in 1978 and resulted, contrary to the government's expectation, in a narrow refusal22 of the power plant's implementation which significantly influenced Austria's energy policy and marked the first milestone of an emerging environmental movement.

In this respect, the actual politization in the Zwentendorf case was rather caused by local initiatives and nature conservation organisations 'beyond left and right' than responsible administration and their technical authorities (Kropp 2002: 14). Moreover, the mobilization success of the anti-nuclear movement was based on the connection between different issues, amongst others the peace movement and the nature conservation movement. Growing parts of civil society were deliberating about radical political criticism of a so called 'Atomstaat' (Feindt and Saretzki 2010) and soon opposition to nuclear energy became the stomping ground for a rising environmental movement. Nation-wide, the opposition against Zwentendorf received essential support from Vorarlberg23 where resistance emerged against a nuclear power plant in *Rüthi*, Switzerland around 1970 (Case #16). In the end, the Swiss nuclear power plant was not built which was also a result of the strong opposition in Vorarlberg. But Zwentendorf was not the only case in Austria, the national nuclear energy policy was fundamentally disputed in the 1970s. At the same time as Zwentendorf, a second nuclear power plant, planned in *St. Pantaleon-Erla*, Upper Austria (Case #26), was provoking local opposition. In *Allentsteig*, Lower Austria (Case #28), the plan for a nuclear waste repository courted the resentment of the local population (mainly farmers) – questioning the pollution legacy that would have been shifted to future generations. However, the negative referendum for Zwentendorf rejected as well the plans for Stein and Allentsteig.

Despite the negative result of the referendum in 1978, the nuclear power lobby still attempted to implement nuclear energy in Austria in the following years and the issue was still discussed in the political arena (Bayer 2013). Indeed, the events of Zwentendorf were

20 See http://www.demokratiezentrum.org/wissen/timelines/das-atomkraftwerk-zwentendorf.html

21 Neuwirth 2008: 5

22 A "small but radical mayority" (Fischer-Kowalski 1988: 15) of 50,57% decided to not bring the nuclear power plant into service. The Zwentendorf referendum was the first nation-wide referendum held in Austria. Chancellor Kreisky, who was social democrat and strongly in favor for nuclear energy, attached his personal future – his potential resignation – to the outcome of the referendum. Some consider the negative outcome as the result of this circumstance since the conservatives voted against Zwentendorf to oppose Kreisky (Neuwirth 2008: 6).

23 In Vorarlberg 84,4% (107.048 votes) of the population voted against the nuclear power plant (Bayer 2013).

immediately followed by a legal act of banning nuclear energy in Austria (*Atomsperrgesetz*), though the complete renunciation of nuclear energy was in fact fostered by the catastrophe of Tchernobyl in 1986 and taken into federal constitution in 1999 after a successful public petition. After Austria decided neither to produce nor to import nuclear energy, initiatives emerged to fight nuclear power plants in neighbouring countries, namely the countries of the former *Ostblock* which are the Czech Republic (*Temelin* Case #62), Slovakia (*Bohunice and Mochovce* Case #59) and Slovenia (*Krsko* Case #84) but also Germany. The Austrian opposition – a newly formed collaboration between environmental movement and federal government – against a nuclear waste repository site in Wackersdorf, Bavaria (Case #41), represented a main driving force for the cancellation of the project and symbolized as well the begin of official Austrian foreign policy related to nuclear energy.

4.3.4 Hainburg 1984

In the wake of nuclear power dismissal in 1978 and the persistent economic impacts caused by the oil price shocks, Austria focused on a diversification of energy sources by expanding hydropower capabilities. In doing so, the state aimed to gain extensive energy security (Krausmann et al. 2008a). The energy industry was at that time publicly owned which meant that biophysical power symbolized an instrument of political power. Thus, the state constructed hydropower plants – 'organic machines'24 – to constitute the claim of power against nature and to enhance the industrialisation and modernisation process (Schmid and Veichtlbauer 2006), representing a political generation that found its first expression in Kaprun, but whose era would end with the social turnover caused in *Hainburg*.

In 1982, *Donaukraftwerke AG (DoKW)25*, at the time the biggest energy producer in Austria, announced to build a hydroelectric dam on the Danube river near Hainburg, Lower Austria (30 km downstream of Vienna). With that, the utility intended to complete its chain of dams on the Danube. Seven power plants on the Austrian reach were already built and one in *Greifenstein* (20 km upstream of Vienna) was under construction since 1981 and finished in 1985. In december 1983, the ministry for agriculture granted the necessary regulatory approval under water law giving the Hainburg project the status of "general public interest" which allowed the construction of the dam in the Hainburg floodplain, an area that was already under landscape protection since 197926. The colonizing activity by the power plant construction would have rearranged the riverstream and canalized the Danube on a length of 45 km with up to 15 m high dams (Epple 1986). The reservoir, that would have been created by the damming of the Danube, would have powered the largest hydroelectric power plant in Austria and would have flooded a 7 km² large area of protected wetland forests. In terms of potential environmental impacts, that would have indicated a loss of local ecosystems, biodiversity and landscape and reduced ecological and hydrological connectivity. However, resistance against the hydro power plant began to rise in 198327 and was

24 White 1995

25 Today *Verbund AG*

26 By the Lower Austrian Landscape Protection Act in 1979 and by the Ramsar Treaty for the Protection of Wetlands (international) in 1983 (Neuwirth 2008).

27 With a campaign by WWF – 'Rettet die Auen' (Save the floodplains)

organized by environmentalists (*WWF, Global2000, Greenpeace* and others) and local resident groups. As an expression of the gravity the project was bearing, activists and occupants of the floodplain highly identified themselves with the threatened and "pristine" nature of the wetland forests28.

After the provincial government of Lower Austria and the ministry of agriculture had completed the official proceedings, the utility started with site-clearing works in december 1984. In the wake of those activities a student organized mass demonstration culminated in the occupation of the site forcing a suspension of the company's activities whereupon the authorities declared the floodplain as restricted area. This confronted the project opponents with the police and consequently escalated the conflict. The clash between the protesters and the authorities caused a wide-spread media response, participants and observers referred to the events as a "war against nature"[29], "the battle of trees"30 and even "civil war". Not least the violent intervention of the police, but in particular the media coverage by influential mass media31, provoked a negative public opinion towards the construction of the hydropower plant. Under such public pressure, chancellor Sinowatz announced a so-called "christmas peace" and suspended further site clearings. This was affirmed after the High Court sustained an objection by local residents and hence turned against the ministerial approval under water law (Stenitzer 1994: 34). The renunciation of the dam project was further pushed by a successful popular petition – the so-called *Konrad-Lorenz Volksbegehren* with over 353.000 signatures – in March 1985.

In the wake of the events of Hainburg, the environmentalists had gained new power and a high degree of organisation. In this spirit, Hainburg initiated an institutionalisation process of nature conservation in Austria. Politically, the foundation of the Green Party emanated from the conflict and symbolized the first non-parliamentary movement that moved into parliament. Moreover, the state immediately declared the comprehensive protection of the environment as a central goal of the state by integrating it to the national constitution. Intentions to preserve the floodplains from further human appropiation were obliged with the creation of the *Donau-Auen National Park* in 1996.

4.3.5 'Lobau-Autobahn'

From a socio-ecological perspective, the design of biophysical stocks determines particular path dependencies of society. For instance, the construction of roads guides human mobility towards car-based private transportation whereby the shape of cities and whole regions is precast (Fischer-Kowalski et al. 2013). However, increasing car mobility in urban areas has significant land use impacts leading to fragmentation of urban space and ecosystems and to loss of agricultural land. Not least, transport infrastructure leads to health impacts affecting the local population caused by noise pollution and reduced air quality.

In this respect, the controversial *Lobau-Autobahn* in Vienna exemplifies the ongoing dispute about economic benefits and environmental and social impacts of transport

28 Expressed in a 'press conference of the animals on the 7th of may 1984

29 Krieg gegen die Natur; i. a. Hundertwasser, Friedensreich

30 Nenning and Huber 1985: Die Schlacht der Bäume – Hainburg 1984

31 In particular *Kronen Zeitung*

infrastructure projects. The Lobau-Autobahn – officially called *Wiener Außenring Schnellstraße S1* – is projected to be the sixth Danube crossing in Vienna and to be the gap closure of the motorway ring located in the Eastern part of Vienna. The 19 km long section was agreed in 2005 by the federal minister of transport and the governors of Vienna and Lower Austria32 and planned a 9 km long tunnel to cross the Danube. This tunnel is planned to go under the *Lobau*, the Vienna part of the Donau-Auen National Park which was created after the conflict of Hainburg (see previous *Chapter 4.3.4 Hainburg 1984*) in 1996.

Opposition to the autobahn project emerged in anticipation to the construction due to its potential negative effects on the national park and its high economic costs. Ecologically, the tunnel construction would cause large-scale disturbance of the hydro- and geological systems and lead to groundwater pollution or depletion33. The conflict escalated in 2006 when project operator *ASFiNAG* planned to execute test drillings in the area of the national park. Opposing environmental groups and local initiatives considered these activities as the beginning of construction works and erected thereupon a protest camp in the Lobau34 to stop the test drillings which succeeded for two months35. In order to settle the conflict, authorities and project opposition came to an agreement to organize a round table36 at which transport and climate protection policy of Vienna and Eastern Austria was supposed to be discussed. However, the project opposition left the negotiations accusing the project representatives for their lack of willingness to negotiate. In 2009, the obligatory environmental impact assessment (EIA) started and was completed positively in March 201537. Corresponding to the EIA, traffic experts doubt the project's effectiveness to relieve the other Danube crossing motorway (*Südosttangente*) from traffic, the project operator ASFiNAG38 would have proposed false assumptions and defective forecasts about the future development of traffic (Frey 2011), and they stress that the project would contradict the goals set by the city of Vienna to reduce the share of car traffic in the future and would threaten the emission reduction targets.

In this respect, the project became as well controversial subject within the city government of Vienna since the 2010 election as the ruling Social Democratic Party (SPÖ) had to form a coalition with the Green Party. The Social Democratic Party is supporting the tunnel project whereas the Green Party is opposing the tunnel and proposing to test alternatives.

In 2016, the conflict is still unsolved and objections to the EIA have to be followed. The case of Lobau-Autobahn illustrates, that transport infrastructure projects tend to become

32 derstandard.at - 03.03.2005: http://derstandard.at/1971127/Nordost-Umfahrung-Einigung-zwischen-Bund-und-Wien

33 Technical reports by Lahodynsky (2015) and Wessely (2012).

34 After Hainburg 1984 the second occupation of a construction site in the Danube floodplains.

35 ORF.at – 27.11.2006: http://wiev1.orf.at/stories/153583; Global2000: https://www.global2000.at/wie-ist-das-mit-der-lobau-autobahn

36 With representatives of the city of Vienna, the province of Lower Austria, the ministry of transport, ASFiNAG, local initiatives, and environmental organizations (Global2000, Greenpeace)

37 ORF.at – 27.03.2015: http://wien.orf.at/news/stories/2702071/

38 Short for *Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft.* ASFiNAG is the publicly-owned constructor and operator company of Austrian autobahns.

chronic conflicts due to extended environmental impact assessment procedures. These legal procedures are often followed by objections made by project opponents which in turn delay the implementation of the transport infrastructure – the proposed implementation of the Lobau motorway was postponed from 2015 to 2025 – or even provoke their cancellation.

Linked to the construction of the Lobau motorway S1 emerged another conflict in *Vienna-Hirschstetten* related to the planned construction of a city highway connecting the future Lobau-Autobahn with the existing city highway S2 (Case #100). Since the conflict of the Lobau motorway is not solved, the case of Hirschstetten remains manifest. In contrast to the expansion of car-related infrastructure, local initiatives demand the development of public transportation.

Chapter Five: Discussion

The previous chapter highlighted four cases that exemplarily characterize the nature of environmental conflicts in Austria by paying particular attention to the socio-ecological aspects that shaped the conflicts individually. This chapter discusses the conflicts in the light of Austria's socio-ecological transition. To do so, the research questions raised at the beginning 0(see *Chapter One*) are recalled.

The key question was:

How has the nature of environmental conflicts in Austria changed since the 1950s in the light of the socio-ecological transition?

Three sub-questions were stated to support the key research question:

- **What characterizes environmental conflicts in Austria?**
- **What are the temporal, spatial and thematic hotspots of environmental conflicts in Austria?**
- **Why do environmental conflicts in Austria not address environmental justice issues?**

Guided by these questions, the characteristics of Austria's environmental conflicts and their historical changes are discussed on the basis of the developed indicators in order to interpret the relevance and significance of environmental conflicts for society's natural relations. The discussion gathers the key factors that contribute to the emergence of environmental conflicts as well as the options for conflict resolution and potential conflict outcome. The collected data enables to map the conflicts and to locate not only geographical but also typological hotspots of environmental conflicts in Austria. Last but not least, by studying environmental conflicts, we are able to bridge to the history of environmental movements.

5.1 Characteristics of environmental conflicts in Austria

The quality of this study represents the comprehensive time perspective which allows to characterize environmental conflicts over a period of time of sixty years. This long-term perspective offers the opportunity to identify chronological marker and historical breaks that can be related to environmental conflicts. However, the historical and ongoing debates in the political and social arenas about environmental issues are evidence for a rather diffuse character of 'the environment' which means that thematic changes within environmental discourses appear rather vague and evoke a balancing act between strict demarcations of

formulated eras and empirical pressure of relativations and differentiations (Uekötter 2012). Hence, we rather have to deal with structural changes of “the ecological” and “the environmental” in contrast to explicit 'breaks' and 'eras'. This aspect applies as well for environmental conflicts, although, as often referred to in the Austrian context (Campbell 1991; Neuwirth 2008; Schmid and Veichtlbauer 2007), the Zwentendorf referendum and the occupation of Hainburger Au marked turning points in Austria’s environmental history.

Overall, the historical observation of the collected cases indicates a rise in environmental conflicts in the beginning 1970s. Between 1950 and 1970, only 13 conflicts could be registered, whereas in the period from 1970 to 1984 (Hainburg) approximately39 25 conflicts were located. The number of cases elevates to 36 conflicts by taking the six years after Hainburg into account (1970-1990). In the 1970s, economic interests were confronted with growing environmental awareness. Society began – as a result of a growing living standard – to interpret environmental pollution as a social problem and responsed with a growing need for controlling and reducing unwanted, negative effects of economic pressures on natural and cultural resources which in consequence was creating conflicts in many places.

The first environmental conflicts of the 1950s and 1960s were largely defined by disputed land use changes and the conflict between technology-driven biomass and land management and nature conservation. In the late 1960s, local groups and nature conservation organizations began to see the negative impacts that hydropower had on alpine ecosystems and landscapes. The 1970s gave rise to a growing opposition towards local and regional transport infrastructure projects and spotlighted the increasing relevance of technology-induced risk management, in particular of nuclear energy. In the 1980s, a growing number of conflicts emerged due to severe pollution concerns. These conflicts were particularly focused on the management of waste and the increasing impairment of the population by air and water pollution due to neighboring industrial facilities but also due to the local impacts of human mobility and transport infrastructure. In particular the conflicts around the siting and planning of transport infrastructure became chronic and intractable conflicts. The 2000s were to a great extent characterized by the energy debate expressed by conflicts about the future of thermal power plants and the siting of power lines through rural areas, but also by the partly opposed expansion of wind energy by some rural communities. The energy debate is strongly determined by the climate change discourse and the challenges of a sustainable energy transition. With the growing visible impacts of climate change on alpine landscapes, the economic development path of rural alpine areas is increasingly at stake. The economic orientation of alpine communities towards skiing-based tourism is increasingly questioned by environmental organisations which perceive the further expansion of ski regions as threatening for the sensitive alpine ecosystems and hence threatening for the sustainability of alpine communities.

In reference to spatial scales, the cases of Austria indicate that specific spatial configurations – the alpine landscapes of mountains, rivers and lakes – seem to favour the emergence of environmental conflicts. Output-related conflicts (due to emissions and

39 The number of cases is based on an estimate since conflict begin and conflict end of the cases cannot be determined definitely. Stated numbers refer to conflict begin.

pollution) are especially located in urban (cities) and semi-urban communities, areas that are densely populated and therefore vulnerable for the impacts of, for instance, waste treatment and power plants, industrial facilities or transport infrastructure. In densely populated, urban areas, access and distribution of green spaces (parks or recreational areas) are highly contested and linked to land use changes – an aspect that is illustrated by several cases40. Several other cases also stress the conflictual potential between tourism zones and protected areas and related land use changes which is expressed by the development of alpine ski regions.

Environmental conflicts as a result of a lack of governance

Failed governance by public authorities are a major trigger for environmental conflicts which is expressed by a severe communication deficit of urban and regional planning procedures. This aspect diminished to a great extent the social acceptance of energy- and transport-related infrastructure projects and gave rise to protests by local stakeholders against decision-making procedures that ignore or derogate their claims and concerns. Environmental conflicts become, in that sense, conflicts of power in which the legitimacy of political (and economic) decisions is contested.

In recent years, participative decision-making processes and forms of direct democracy became increasingly relevant instruments in handling conflictual situations and settling incompatible interests, especially concerning environmental issues, most notably expressed by the *Aarhus-Convention41* which was adopted to foster the participation of citizens and to facilitate the social acceptance of infrastructure and other mega projects (through access to information, public participation and access to political decision-making concerning the local, national and transnational environment). Forms of participation reach from single-issue movements, interventions according to specific participative models, standardized plebiscites, administrative party-driven proceedings (e.g. EIA) and in particular mediation.

During the first decade of the 2000s, mediation processes were initiated in the cases of the Natura2000 area in *Verwall* (Case #54), the dispute around noise pollution caused by the *Vienna International Airport* (Case #60), the siting of a biomass heating plant in *Gars am Kamp* (Case #67), and the development of Vienna *Steinhofgründe* (Case #77). However, although participative and direct-democratic strategies are increasingly considered as relevant regulating and controlling instruments for environmental issues, they are rather perceived as a panacea against environmental conflicts and a tranquilizer for so-called *Wutbürger*42, interpreted as instruments of power-political calculation and rated as relatively toothless measures. Albeit participation functions as an instrument of negotiating social contradictions, it is rather discerned by involved stakeholders to obliterate fundamental social dissent and to communicate deceptive compatibility. From a perspective

40 For instance, Salzburg (Green Land Declaration, Case #22), Vienna Sternwartepark (Case #25), Vienna Steinhofgründe (Case #35), Vienna Augarten (Case #77).

41 Official website of the UN Aarhus convention: http://www.unece.org/env/pp/welcome.html
Austrian website about public participation processes: http://www.partizipation.at/home.html
The Aarhus-Convention was ratified by Austria in 1998 and became effective in 2005.

42 *Wutbürger* is a german expression for angry or enraged citizens that got huge media response.

of stakeholder interests, a real compromise as a result of a mediation process is barely possible, since the issue-related decision is either 'yes' or 'no' (e.g. another runway will either be built or not).

Anticipation conflicts

Cadoret (2009) suggests the term *anticipation conflict* for conflicts that emerge when local population express a form of fear towards, for instance, the construction of a power plant or infrastructure project. In such conflict the project opponents anticipate the consequences of change, without necessarily having a clear vision of these (this in particular applies for infrastructure projects) (Khan et al. 2013). In this spirit, environmental movements are often confronted with the criticism that local initiatives would only follow their personal interests covered by environmental motives, a critical point often referred to as *NIMBY-mentality43*. Conflicts about wind energy reveal a potential mismatch between an abstract conceptual consensus (climate protection, climate change mitigation) and concrete siting of measures that pursue the endeavor of the consensus (climate protection in conflict with landscape preservation). However, often enough, the success of such local resistance led to political decisions to build power plants in another place where no opposition is expected.

Conflicts and environmental policy

The study of environmental conflicts has shown that conflicts have the potential to transform the political landscape and reform institutional structures leading to social change as stated in the beginning (in reference to Coser and Dahrendorf). Several cases illustrate this relevant factor in the following.

Environmental conflicts were the trigger for the establishment of nature reserves and national parks. For instance, all seven national parks that were established in Austria, were the outcome of foregoing environmental conflicts. Four of the national parks in Austria are protecting alpine regions (Hohe Tauern, Gesäuse, Nock Mountains44, Kalkalpen) and three of them are covering waters (Neusiedler See-Seewinkel, Thayatal, Donau-Auen). On a local level, environmental conflicts had impacts on the political landscape. In several cases, mayors had to resign due to the outcome of conflicts45. But also on a national scale, decision-makers linked the outcome of conflicts to their own political future (albeit they did not resign).

In the 1980s, Linz, the capital of the province of Upper Austria and third-largest city in Austria, was increasingly burdened with air pollution caused by the continuously expansion of the dominant heavy industries (steel and chemicals) which triggered an intensive public debate about the environmental and health impacts of industrial activities. Growing concerns of the local population (organized in the initiative *Linzer Luft*) gave rise to a revision of the city's institutional structures in respect to the environment and public health. The

43 NIMBY means 'Not In My Back Yard"

44 The National Park of Nockberge was translated into a biosphere reserve in 2004 since the area was not recognized as national park by the International Union for Conservation of Nature (IUCN).

45 See Case #13 (Bregenz 1970: Mayor Karl Tizian); Case #20 (Graz 1973: Mayor Gustav Scherbaum); Case #25 (Vienna 1973: Mayor Felix Slavik).

investments made by the city and the industries resulted in an improvement of air quality and reduced the pollution by the industries.

One major *turning point* (Uekötter 2010) in Austrian environmental policy constituted the phase of political breakthrough in the aftermaths of the Hainburg events (Pesendorfer 2008). The change of values – "the environmental turn" (Engels 2006b) – was visible since the beginning 1970s, but with Hainburg 1984 (see *Chapter 4.3.4*) great parts of society showed solidarity with the activists which directed their protest against environmental degradation and the political establishment (Schmid and Veichtlbauer 2006: 35). The experiences of Hainburg led to concerns that environment-related interests were not sufficiently represented within the political and administrative system and thereby legitimized radical forms of social activism. Based on these concerns, major institutional innovations in the public management of the environment were made in the second half of the 1980s, the formative phase of environmental policy (Radkau 2011). The Federal Environmental Agency (*Umweltbundesamt*) was founded in 1985 to play the role of environmental advocacy at a national level, even though it was limited to monitoring tasks. The 1972 established Ministry of Environmental Protection was reformed in 1987 and charged with more power and personnel, although still a junior ministry clashing with the Ministry of Economy. On provincial level, so-called Ombuds Offices for Environmental Protection (*Umweltanwaltschaften*) were established to advocate environmental interests in planning procedures. With the implementation of Environmental Impact Assessment (EIA) in 1993, planning procedures began to take environmental liabilities of economic activities into account. Its successive development and diffusion over the past twenty years has made EIA now obligatory for large-scale infrastructure projects, also in order to prevent future conflicts. The entry of the Green Party into national parliament in 1986 emphasized the political establishment of environmental issues (Lauber 1996). The overall institutional and political developments concerning environmental issues expressed an ecological modernization of the state with dissolving contradictions of *economy* and *ecology*, representing a 'political paradigm shift' (Campbell 1991; Pesendorfer 2008) and marking 'the ecological decades' of the 1980s and 1990s (Radkau 2011).

The fact that conflicts over natural resources found their resolution in laws and legal acts indicates that the human appropiation of nature requires the regulation of access and uses of natural resources as it would otherwise provoke more conflicts. Further does the development of laws mirror the social perception of the environment and mirror changes in society's relationship to nature. The multitude of socio-environmental conflicts led to an understanding of a nature that was violated through industrial landscapes. This understanding replaced the image of a culturally tamed and improved nature. Gradually, the society turned away from the social belief of omnipotent technology (Schmid and Veichtlbauer 2006: 39).

5.2 Hotspots of environmental conflicts

The following section tracks the geographical and typological hotspots of environmental conflicts and responds in that way to the second sub-question. As stated above, alpine landscapes seem to favour the emergence of environmental conflicts. However, this aspect is not only expressed in spatial scales but also in terms of socio-ecological classifications. The socio-ecological hotspots in Austria are located at dams and hydropower plants, transport infrastructure, tourism recreation (ski regions) and risk management (nuclear energy) and further explained below.

Water management – barrages, dams and hydropower plants

Historically, hydropower projects, either realized like the dams in *Kaprun*, *Maltatal* or *Klaus*, or stopped like the projects in *Wachau*, *Dorfertal* or *Hainburg* are evidence for a changing human-nature relationship. Men's relationship to the natural world at the time of Kaprun was shaped differently than it was 29 years later in Hainburg. The list of environmental conflicts reveals that Austria constantly relied on hydropower and conflicts about hydropower, and its negative impacts for ecosystems and landscapes, emerged at any time. But the events of 1984 clarified that the exploitation of hydropower – although Hainburg is not located in an alpine landscape – was increasingly identified as threatening for alpine ecosystems as well as for alpine communities that highly depend on intact alp landscapes to attract tourists. In contrast to Kaprun, Hainburg became a symbol for a new social relation towards nature. As the dominance over nature was the key driver for modernisation processes, the produced risks by this dominance and its large-scale destructions of nature were getting the reference point of social interactions. Power stations, in that sense, bear a double meaning (Hughes 1983). They do not only demonstrate acts of nature colonization, but also represent cultural and societal integration while they display places of national identity at the same time (Schmid and Veichtlbauer 2006: 26).

The transformation of waterbodies, and the landscapes they are embedded in, was driven by the economic potential of forming rivers for the benefit of power generation. Austria's electricity is to a major part based on hydropower, thanks to its geographical and hydromorphological characteristics. Hydropower is at present contributing 65-70% to the total electricity production of Austria and even more important than such numbers would suggest. Generating the same quantity of electricity in thermal power plants (coal, oil, gas) would need two to three times more primary energy than the quantity of hydropower used (Krausmann and Haberl 2007). Dams and reservoirs have caused massive interventions into landscapes, increasingly addressing the question of 'how much is necessary'. At present, most of the hydroelectric power plants and dams contain the immaterial substance of 'places of collective memory' (Veichtlbauer 2008) and represent historical points of reference for a rising environmental movement. But their materialization in space and time is not only limited to symbolic representation. This materialization represents as well an artifact of the predominant socio-ecological regime, which not only enables certain practices, uses and appropiations of nature but also suspends others. However, the narratives and myths that are spinning around Hainburg and other prevented power plants can be complemented by

power plants that were built, which allows to describe an era of increased colonisation of the Danube. By damming, the previously free floating and meandering stream has been remodeled into a closed chain of reservoirs. Within the Austrian reach of the Danube, nine hydropower plants were built in contrast to the one prevented in Hainburg. These nine power plants produce a fifth of Austria's total energy production (Veichtlbauer 2007). The last one of them is located in *Freudenau* and resulted in fact out of the events in Hainburg. In this respect, the environmental history of the Danube is ambiguous, on one side a symbol for destructed nature, on the other a symbol for the institutionalisation of a rising environmental consciousness. In the end, hydropower projects were and still are deeply symbolic focal points of the disputes between environmentalists and economists (Haberl 1997).

Infrastructure projects

Constantly, energy and transport related infrastructure is being modernized, upgraded, extended or even restructured. Their conversion strongly depends on the link between global economic processes and local demands for economic development within an ambience of growing environmental awareness (Khan et al. 2013). The contested use of resources by such transformations is not only causing a series of conflicts, but also not ending at a local level.

The historical observation of transport infrastructure constructions (in particular motorways) indicates a changing perception of the benefits and impacts of such projects. First understood as a desired imperative whose impacts were accepted due to the economic benefits, the attitude towards transport infrastructure changed since the late 1980s. Transregional motorways became to be denunciated and declared as disturbing factors. The 1990s are characterized by a series of conflicts evolving around transport infrastructure projects.

A deeply underlying conflict between diverging environmental values and worldviews, expressed in the balance between economic development and environmental protection, has been the dominant theme in almost all conflict cases. Thereby, economic development is primarily expressed by forms of energy production, transport infrastructures and tourism lead infrastructures. These biophysical activities obviously bring natural resources under increased stress and intensify the competition for space, especially in alpine areas. Projects, like the construction of transport infrastructure networks, are an instrument of creating growth and jobs within a globally embedded, economic agenda of 'competitiveness' that includes flexibility, connectivity and diversification. Such projects contribute not only to increased flows of energy and material but also to enhanced flows of human mobility in the form of commuters, migrants and tourists which in turn increase the flows of energy and material. However, economic growth and the creation of jobs are perceived as a local necessity to offset socio-political demands and pressures (Khan et al. 2013). In that context, environmental issues are quite often considered as a collateral damage rather than a good option for bringing local demands together with the long term benefits of a sound environment.

Tourism and conflict

Environmental conflicts in ski regions show that the economic development46 of alpine communities – their principle source of income constitutes tourism – stays in conflict with nature and landscape preservation interests. The human mobility to and within the ski regions requires infrastructure (roads, ski lifts) which has visible land use impacts and produces emissions. Artificial snowing, which became a necessity since alpine landscapes are especially sensitive to climate change impacts, is very water and energy intensive (Gross and Winiwarter 2015). Both factors are massive interventions into alpine landscapes courting the resentment not only of environmental NGOs but also of local citizens.

Risk conflicts

Related to the production and management of risks, Austria has taken a different, more precautious development path than other european countries. Austria has – as a result of environmental conflicts – realized a anti-nuclear energy policy that also concerns foreign policy issues (see *Chapter 4.3.3 The long shadow of Zwentendorf*). In addition, the implementation of genetic engineering was declined by a public referendum47. This emphasizes – in contrast to other european countries – the specific characteristics of Austria related to the management of risks.

Environmental movements

Austria's environmental conflict history is strongly linked to the history of environmental movements since they constituted a major driver for the emergence of environmental conflicts. The aspect of conflict displays a central element of social movements and the environmental movement functions as a “native immune system for society constituted on dissent and promoting the selection of opposition and conflict” (Froschauer 1996).

A first wave of nature (and landscape) conservation movement in Austria (*Naturdenkmalbewegung* and *Heimatschutzbewegung*) emerged during the transformation of agrarian landscape into industrial landscape in the light of industrialization in the first half of the 20th century (Weisz and Payer 2005). During the phase of national reconstruction (*Wirtschaftswunder*) and progress euphoria between 1950 and 1970 the process of consequent industrialization of landscape (through land re-allocation and corrections, monocultivation, road networks, water body regulation, hydroelectric power plants) (Payer and Zangerl-Weisz 1997) has shown that, except for a few single events, nature conservation was politically unimportant. However, with growing environmental awareness and growing health consciousness in the 1970s (Radkau 2002), conflicts about the construction of hydropower plants and transport networks (motorways, railways) illustrate that criticism ignites from the threatening loss of natural habitats and areas of local recreation with the inherent, defensive opinion of "not to lose even more" (Payer and Zangerl-Weisz 1997: 232). For an increasing number of local groups the degradation of natural scenery would represent a loss of local identity and sense of place and disturb the local recreation.

46 i.e. enlargement of inter-connected ski lift systems, connecting two or more ski regions.

47 Viz., no genetically engineered food in Austria, no release of GMOs in field tests, and no patents on life (see https://www.parlament.gv.at/PAKT/VHG/XX/I/I_00715/fnameorig_139588.html)

The appearance of the environmental movement in the late 1960s resulted from an aggregation of critical moments that united the ecological movement, the peace movement and movements of regionalism and localism (Dryzek et al. 2003). Thus, the escalating environmental movement of the 1970s – 'the second phase of environmentalism' (Littig and Grießler 2008) – was rather characterized by heterogenity and represented by different protagonists that used the entire political spectrum (Rootes 2014; Rucht 1994; Straubinger 2009). However, for the objective of studying environmental conflicts, the focus was less on looking at these movements from a sociological view than rather to point out their historical significance for socio-ecological transitions (Martinez-Alier 2010).

The emergence of environmental movements can only be explained by an interplay of several factors – the expansion of ecological knowledge48, a series of ecological catastrophes and environmental measures by national governments (Littig and Grießler 2008: 6; Rucht 1994: 239). Nevertheless, environmental movements have essentially constituted themselves in relation to environmental and technological conflicts. Environmental conflicts are a part of the history of environmental movements as well as a part of the dispute between the state and civil society. They display "mobilizations by social movements against particular economic activities, in which concerns about current or future negative environmental impacts are an important part of the grievances" (Martinez-Alier 2002).

Actors involved in environmental conflicts are generally organized in coalitions and networks across different scales *(*Muradian et al. 2012; Rootes 2014*)*. This aspect especially applies for actors with environmental interests which necessitates an important differentiation between national or international *organizations* (e.g. Greenpeace, WWF, Global2000 and many others) and local, single-issue initiatives (*local grassroots,* e.g. against local constructions of hydroelectric power plants or against the overload of a new motorway). Coalitions between these actors not always existed when conflicts emerged, but they usually arose out of the evolution of conflicts. For the environmental movement, the habitual and perpetually set attitude for conflicts in combination with the generalized environmental debate and local initiatives, enabled a nation-wide interlacing of conflicts that were isolated before (Engels 2006a).

Between increasing economic pressures and growing demand for an environmentally and socially sustainable development, the long-lasting argument between modernisation and conservation, the environmental movements underwent several thematic differentiations from energy to sustainable development and global environmental change (climate change, loss of biodiversity) (Haberl 1997) bringing together local crises of the environment (interpretation of the local population) with global discourses (thematisation and defining process of environmental issues). Global environmental problems are represented in local environmental conflicts.

48 e.g. Rachel Carson's *Silent Spring* (1962) or Denis Meadows' *Limits to Growth* (1971).

The value of landscapes

With the rule of the industrial regime, the quality of nature has changed. To conserve nature became to mean to conserve cultural landscapes since natural landscapes rarely do not exist anymore. Globally, dust and gases from human sources can be traced everywhere on the planet. Forests and meadows, that are perceived as natural, are extensively maintained and farmed. Agriculture and industries, as well as settlements and transport infrastructure, form our cultural landscape. What society perceives as nature is in fact a cultural-based perception of nature. However, the cultural landscapes, that are senses as natural, are socially recognized as a high good. These landscapes are appreciated for recreation and relaxation, and holiday destinations promote their own landscapes as unique to attract tourists. Out of this arose a philosophy, which Joan Martinez-Alier describes as the *cult of wilderness*, that aims to preserve wildlife and natural resources but without jolting the economic system or social values. In that sense, environmentalism expresses "an afterthought, a preoccupation arising out of deeply held values on the sacredness of nature or luxury (amenities)“ (Martinez-Alier 2003) showing that yet "the most modern and technically proficient approaches" to environmental issues at stake are determined "by moral narratives and cultural assumptions" (Farrell 2015). They confirm what is sacred and worth defending.

The alpine environments of mountains and rivers, which characterize Austria, display a broad diversity of biological and physical capital as well as they form cultural, historical and beautiful landscapes strongly marked by smallholder agriculture and preservation of native culture and traditions. Alpine environmental resources provide multiple opportunities for economic development, wealth production and the preservation and enrichment of quality of life. Moreover form the landscapes a representative scenery for foreign visitors, endowing tourism major importance for the modernisation process. To maintain this unique and attractive scenery means to maintain tourism as a major driver for the economy. Conservating and cultivating these landscapes under such conditions poses a major challenge. However, various intensified economic uses set these sensitive environments increasingly under pressure. The causes for such pressure are located in an extensive effecting global environmental change (e.g. climate change, glacier melting) driven by economic development, agricultural intensification49, soaring energy consumption, growing mobility and motorization50, tourism expansion and lifestyle changes.

Landscapes are a part of the collective social memory forming special places of remembrance (*lieux de memoire*) and national identity (Winiwarter 2001). Narrow valleys and woody mountains communicate a sense of home, safety and stability in a rapidly changing world (Payer and Zangerl-Weisz 1997: 224). Nature, in that sense, functions as an area for 'retreat'. Modifying landscape implies impacts on the identity of the people living in these landscapes interfering in the relation they constructed to their local environment, e.g.

49 Agricultural population [% of total]: 1950: 22 – 2000: 3; Cereal yield [kg/ha/yr]: 1950: 1550 – 2000: 6000 (Krausmann et al. 2008).

50 Motorization [vehicles/1000 cap]: 1950: 13 – 2000: 524 (Krausmann et al. 2008).

the relationship to a local river, mountain, or lake. These people found a common ground through a shared intrinsic value of a particular land - a shared cultural meaning given to the land.

The emergence of environmental conflicts is underlying a complex environment-related value system that includes sacredness, livelihood, territorial rights, beauty, or biodiversity (Martinez-Alier et al. 2010). When is a landscape or a natural site declared as "sacred" or "beautiful"? At what point is such sacredness or beauty affected by biophysical activities that a conflict emerges from it? These questions illustrate that environmental conflicts are, to a great extent, based on narratives, an aspect that Justin Farrell (2015) described as follows:

> "Environmental conflicts are not ultimately about scientific true and false, but about moral right and wrong. It is not about the facts themselves, but what makes the facts meaningful. There are important moral and spiritual bases of conflict that observers and participants in the conflict have ignored, muted or simply misunderstood."

5.3 Environmental justice

The last section of the discussion deals with the third sub-question stated above – why do environmental conflicts in Austria not address environmental justice issues? – and links the thesis thereby to the global research field of environmental justice.

Although there is evidence, that low-income households are more affected by environmental burdens (air and noise pollution) than high-income households, the term 'environmental justice' was so far rarely issued in Austria, neither in public debates (Lanegger 2015) nor in environmental conflicts as the thesis reveals. Local resident groups and environmental organizations, that opposed environment and health impacting projects, mostly denunciated the impairment of livelihood and health, but barely linked these issues to questions of social class or race.

On a global scale, environmental conflicts are increasingly linked with struggles that have entirely different sets of values. For instance, while genetic engineering – i.e. the implementation of genetically modified organisms (GMO) – is facing resistance by local farmers in countries of the global South on the real basis of livelihood-threatening commodification of seeds by the industry, the controversy in the North is mainly related to a general debate about the risks of modern technologies and further related to the question of expert legitimacy (Baptista 2010; Wynne 1992; Funtowicz & Ravetz 1993).

This aspect reveals two implications: the first implication refers to the fact that technology is playing a major role within environmental conflicts. Technological artifacts symbolize the biophysical activities of society for which reason conflicts, to a large extent, revolve around the implementation of technology or technical artifacts (Feindt and Saretzki 2010). Indeed, the discourse about environmental conflicts in German speaking countries is

mainly related to the term of “risk” and the risk sociological studies by Ulrich Beck (1986) and colleagues (Feindt and Saretzki 2010). In this effect, environmental conflicts and *technology conflicts* embody “new” types of social and political conflicts contrasted to “old” socio-economic conflicts that basically represent distribution conflicts (ibid.). These new conflicts would show characteristics for new social formations, e.g. the *risk society*. Primarily, it implicates a general shift from sovereignty and authority conflicts to conflicts of values, interests, knowledge and interpretation and therefore shows an absence of environmental justice issues. The second implication refers to the form of opposition that is constituted in Austria's environmental conflicts. In contrast to an environmentalism of the poor in countries of the global South, which deals with environmental equity issues (Melosi 1995), environmental conflict constellations in Austria would instead provoke an *environmentalism of the rich*.

From a socio-metabolic perspectives, the environmentalism of the poor and environmental justice refer to ecological distribution conflicts which in particular target on conflicts on the extractive industries (mining and fossil fuels) and biomass extraction conflicts (tree plantations and agro-fuels and export crops) (Martinez-Alier et al. 2010). Such conflicts are almost exclusively located in regions of the global south and entail the unequal distribution of resource benefits and burdens. The benefits are exported, while the burdens remain with the local population.

Chapter Six: Conclusions

The research presented in this thesis has produced multiple outcomes. First of all, the thesis was an attempt to understand the nature of environmental conflicts in Austria using a set of indicators that allows to locate the multitude of cases on different scales. The major outcome of this study constitutes the generated list of environmental conflicts in Austria with a number of 108 cases within the time perspective from 1950 to 2015. Based on these conflict cases, the study offers insights that provide information about the nature of environmental conflicts and its historical changes. The key aspects contributed by this study can be summarized as follows:

(a) In general, the natural characteristics of Austria – the Alps and the Danube – strongly determine the biophysical characteristics of environmental conflicts. Historically, the hotspots of environmental conflicts in Austria are located at hydropower plants and transport infrastructure projects. The development of ski regions provoked as well several conflicts. Moreover, the intensively debated nuclear energy, and the management of its risks, effectively changed the material, social and political landscape.

(b) Chronologically, the number of environmental conflicts has increased within the last sixty years. The rise of environmental conflicts in the 1970s resulted from numerous conflicts about the siting of transport infrastructure and the intensive public debate about nuclear energy. Growing environmental burdens related to industrial air pollution and urban waste overflow gave rise to several conflicts in the 1980s. Environmental conflicts in the 2000s were, to a great extent, determined by the emerging energy debate, in particular related to climate change, i.e. the future of fossil fuels and the development of renewable energy.

(c) The cases in Austria support the assumption that conflicts are able to provoke social change. The observation of environmental conflicts in Austria illustrates that modern environmental policy would not have developed in the way it is shaped today without such conflicts and the intensive public debates they triggered. The structure and topology of the energy system is actively configurated by the outcome of environmental conflicts. All seven national parks in Austria were established in the wake of the environmental conflicts which predated them. The main environmental governmental institutions and non-governmental organisations are a direct product of environmental conflicts.

(d) Most of the conflicts emerged due to the lack of governance and communication. Out of these concerns evolved several forms of public inclusion that range from general public consultation (referendum) to mediation.

(e) However, environmental conflicts in Austria emerge, to a great extent, in anticipation of biophysical activities, in particular in the cases of the siting of power plants and infrastructure projects. In contrast, pollution conflicts mostly occurred in reaction. These output-related conflicts are especially located in urban and semi-urban communities.

(f) Conflicts that address the management of transport infrastructure tend to be long-term. In turn, chronic conflicts have to be often resolved in the judicial arena.

(g) Environmental conflicts in Austria do not address environmental justice issues due to its different typological classification and set of actors and their social background. Austria does not own ecological distribution conflicts that target on conflicts on the extractive industries, which is mining, fossil fuels, tree plantation of agro-fuels and export crops, and fishery, due to the abstinence of such industries.

In contrast to the ecological distribution conflicts in regions of the global South, Austria's environmental conflicts are primarily characterized by the confrontation of economic development (industrial development, energy industry, infrastructure development, tourist industry) with environmental protection (the demand for the establishment, conservation of ecologically sensitive, valuable and protected areas). The cases illustrate that the need for economic and technological development was (and still is) perceived in high contrast to the growing need for a socially and environmentally sustainable development leading to the conclusion that all these cases is underlying a fundamental conflict between the 'economy' and the 'ecology'. Hardin's (1968) thesis on the 'tragedy of the commons', related to the over-use of natural resources, is comprehensively reproduced in alpine environments. Alpine areas stress this tragedy as the competing claims for economic development and environmental protection constantly trigger conflicts. Two further attributions may be stated: In terms of the dispute about technology, the conflict parties separate into the two factions of t*echnophilia* and *technophobia* (Feindt and Saretzki 2010), in terms of social and economic development, actors often blame each other as *destroyers* and *preventors*. Furthermore, the cases indicate that within environmental controversies, two dimensions of conflict exist. In this regard, environmental conflicts do not only include a contested issue, project or resource use but also disputed democratic procedures and decision-making processes.

Methodologically, the quantitative analysis of environmental conflicts introduced in this thesis included a set of indicators that is based on socio-ecological concepts and that is, besides the typological classification taken from EJOLT, especially developed for this research. Although the indicators can be further improved, they provide a useful reference for future research on environmental conflicts. However, the inclusion of the involved actors into the indicator analysis and its discussion was outside the scope of this thesis owed to the circumstance of overall complex actors constellations. This aspect gives space for further research on environmental conflicts.

Last but not least, on the basis of the in-depth description of four major environmental conflicts, the thesis provides new insights for research on the environmental history of Austria, to better understand the emergence and relevance of environmental movements. The four explicitly described conflict cases will be added to the international EJOLT database on environmental conflicts.

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