SWEET Call 1-2020: EDGE

Deliverable report

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Deliverable name	Publication on policy acceptance in the Swiss alpine areas: **The acceptance of policies and infrastructure projects in the Swiss Alps**
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Summary

This report presents the results of a study of regional patterns of policy acceptance in the area of the energy transition, focusing particularly on the Alpine region. The alpine region is one of three EDGE regions, distinct from urban areas and the Midlands. At a techno-economic level, the alpine region differs from the other two EDGE regions primarily in that it is and will be an important exporter of renewable energy to the other regions, as renewable energy infrastructure (mostly large-scale hydropower and open-space PV) is often located in alpine areas. Socio-politically, residents of the Alps are, on average, more right-leaning and less 'green' than the rest of Switzerland. Moreover, in Switzerland's federal and direct democratic system, the alpine population plays a crucial role in political decisions about renewable energy infrastructure, as these installations require approval from the municipality where they are located.

The regional investigations conducted under the Sweet EDGE framework operate upon two fundamental premises, previously articulated in Deliverable Reports 2.2 and 1.7, which examined the Midlands and urban areas, respectively. These foundational premises continue to inform the current analytical framework. The primary premise posits that *political measures* constitute an essential prerequisite for attaining established energy policy objectives, particularly the achievement of carbon neutrality. Such interventions may encompass financial incentives designed to expedite renewable energy deployment, as well as regulatory frameworks including statutory requirements and prohibitions. The secondary premise maintains that the successful implementation of such policy measures is contingent upon securing a minimum threshold of public endorsement. Within the Swiss democratic context, this frequently necessitates majority approval through direct democratic processes.

The first part of this report examines the identical *general policy principles,* and their public acceptance as previously investigated in Deliverable Reports 2.2 and 1.7, with the present study concentrating specifically on citizens living in the Swiss alpine region. The investigation encompasses the perceived significance of energy independence, public receptivity toward European Union (EU) collaboration, attitudes concerning international carbon offset mechanisms, and population preferences regarding the future Swiss energy mix. The second part provides an in-depth examination of the *implementation* of measures intended to accelerate energy system transformation, namely on decision-making processes surrounding alpine photovoltaic (PV) installations.

Based on the empirical results, the report formulates policy recommendations in three areas: addressing the specific situation of alpine regions; including local actors in the ownership structure of renewable energy infrastructure projects; and emphasising the collective nature of Alpine PV projects through public voting.

Zusammenfassung

Dieser Bericht präsentiert Ergebnisse zu den regionalen Mustern der Akzeptanz von politischen Massnahmen zur Unterstützung der Energietransition, wobei der Fokus insbesondere auf der Alpenregion liegt. Die Alpenregion ist eine von drei EDGE-Regionen, die sich von städtischen Gebieten und dem Mittelland unterscheiden. Auf techno-ökonomischer Ebene unterscheidet sich die Alpenregion von den anderen beiden EDGE-Regionen hauptsächlich dadurch, dass sie ein wichtiger Exporteur von erneuerbarer Energie in die anderen Regionen ist und bleiben wird, da die Infrastruktur für erneuerbare Energien (insbesondere Grosswasserkraft sowie Freiflächen-Photovoltaik) oft in alpinen Gebieten liegt. Sozio-politisch sind die Bewohner/innen der Alpen im Durchschnitt eher rechtsorientiert und weniger "grün" als der Rest der Schweiz. Ausserdem spielt die alpine Bevölkerung im föderalen und direktdemokratischen System der Schweiz eine entscheidende Rolle bei politischen Entscheidungen über die Infrastruktur für erneuerbare Energien, da diese Anlagen die Zustimmung der Standortgemeinde erfordern.

Die regionalen Untersuchungen, die im Rahmen von Sweet EDGE durchgeführt wurden, basieren auf zwei grundlegenden Prämissen, die bereits in den Deliverable Reports 2.2 und 1.7 zum Mittelland bzw. den städtischen Gebieten dargelegt wurden. Diese grundlegenden Prämissen bilden auch im vorliegenden Bericht die Grundlage für empirischen Analysen. Die erste Prämisse unterstellt, dass politische Massnahmen eine wesentliche Voraussetzung für die Erreichung der energiepolitischen Ziele darstellen, insbesondere für die Erreichung des Netto-Null Ziels. Solche Massnahmen können finanzielle Anreize sein, die darauf abzielen, den Ausbau erneuerbarer Energien zu beschleunigen, sowie regulatorische Instrumente, einschliesslich gesetzlicher Gebote und Verbote. Die zweite Prämisse besagt, dass die erfolgreiche Umsetzung solcher politischen Maßnahmen von einem Mindestmass an öffentlicher Unterstützung abhängig ist. Im Kontext des schweizerischen demokratischen Systems bedeutet dieses Mindestmass häufig eine Bevölkerungsmehrheit in direktdemokratischen Prozessen.

Der erste Teil dieses Berichts untersucht die gleichen allgemeinen politischen Grundsätze und deren öffentliche Akzeptanz, wie sie bereits in den Berichten 2.2 und 1.7 analysiert wurden, wobei sich die vorliegende Studie speziell auf die Bevölkerung der Schweizer Alpenregion konzentriert. Die Untersuchung umfasst die wahrgenommene Bedeutung von Energieunabhängigkeit, die Präferenzen bezüglich einer stärkeren Zusammenarbeit mit der Europäischen Union (EU) in Energiefragen, Einstellungen zu internationalen Mechanismen des CO2-Ausgleichs sowie Präferenzen bezüglich des zukünftigen Schweizer Energiemixes. Der zweite Teil präsentiert eine vertiefte Analyse einer Umsetzungsmassnahme zur Beschleunigung der Transformation des Energiesystems, nämlich kommunale Entscheidungsprozesse im Zusammenhang mit alpinen PV-Anlagen.

Auf der Grundlage der empirischen Ergebnisse formuliert der Bericht Empfehlungen in drei Bereichen: Eingehen auf die spezifische Situation der Alpenregionen, lokale Akteure als (Co-)Eigentümer in erneuerbare Energieprojekte einbeziehen und die kollektive Natur alpiner PV-Projekte durch öffentliche Abstimmungen betonen.

Résumé

Ce rapport présente les résultats d'une étude sur les disparités régionales en matière d'acceptation des politiques de promotion de la transition énergétique, en se concentrant plus particulièrement sur la région alpine. La région alpine est l'une des trois régions EDGE, distincte des zones urbaines et des Midlands. Au niveau technico-économique, la région alpine se distingue des deux autres régions EDGE principalement par le fait qu'elle est et sera un exportateur important d'énergie renouvelable vers les autres régions, étant donné que les infrastructures d'énergie renouvelable (principalement l'hydroélectricité à grande échelle et le photovoltaïque en espace ouvert) sont souvent situées dans les zones alpines. D'un point de vue sociopolitique, les habitants des Alpes sont, en moyenne, plus à droite et moins « verts » que le reste de la Suisse. En outre, dans le système de démocratie fédérale et directe de la Suisse, la population alpine joue un rôle crucial dans les décisions politiques concernant les infrastructures d'énergie renouvelable, car ces installations doivent être approuvées par la municipalité où elles sont situées.

Les études régionales menées dans le cadre de Sweet EDGE s'appuient sur deux principes fondamentaux, précédemment exposés dans les Deliverable Reports 2.2 et 1.7, qui portaient respectivement sur les régions moyennes et les zones urbaines. Ces principes fondamentaux continuent d'inspirer le cadre analytique actuel. Le premier postulat est que les mesures politiques constituent une condition préalable essentielle pour atteindre les objectifs de la politique énergétique, en particulier la neutralité carbone. Ces mesures peuvent être des incitations financières visant à accélérer le développement des énergies renouvelables, ainsi que des instruments réglementaires, y compris des obligations et des interdictions légales. La deuxième prémisse est que la mise en œuvre réussie de ces mesures politiques dépend d'un niveau minimum de soutien public. Dans le contexte du système démocratique suisse, ce minimum signifie souvent une majorité de la population dans les processus de démocratie directe.

La première partie de ce rapport examine les mêmes principes politiques généraux et leur acceptation par le public que ceux déjà analysés dans les Deliverable Reports 2.2 et 1.7, mais la présente étude se concentre plus particulièrement sur la population de la région alpine suisse. L'étude porte sur l'importance perçue de l'indépendance énergétique, les préférences en matière de coopération renforcée avec l'Union européenne (UE) sur les questions énergétiques, les attitudes envers les mécanismes internationaux de compensation du CO2 et les préférences concernant le futur mix énergétique suisse. La deuxième partie présente une analyse approfondie d'une mesure de mise en œuvre visant à accélérer la transformation du système énergétique, à savoir les processus de décision communaux en rapport avec les installations photovoltaïques alpines.

Sur la base des résultats empiriques, le rapport formule des recommandations dans trois domaines : Tenir compte de la situation spécifique des régions alpines, impliquer les acteurs locaux en tant que (co)propriétaires dans les projets d'énergie renouvelable et souligner la nature collective des projets PV alpins par le biais de votes publics.

Acknowledgment

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1 Introduction

This Deliverable Report focuses on policy acceptance in alpine areas and serves as a follow-up, closely linked to Deliverable Reports 1.7 and 2.2, which addressed urban areas and the Swiss Midlands, respectively. Therefore, this report also understands *policy acceptance* as a multidimensional concept that must be considered to better understand why and under what conditions citizens accept or oppose certain measures. In this context, the report provides two main contributions.

First, we expand our previous analyses on the regional dimension of policy acceptance, this time focusing on the preferences of citizens living in alpine areas. The previous Deliverable Reports revealed that policy acceptance in Switzerland has a strong national character (see D2.2), consistent with the nationalization of discourse through political and direct-democratic debates over the past decade. However, they also documented some relevant regional differences, particularly between urban areas and other regions (see D1.7). Hence, this report completes the picture by focusing on people living in the Alps, who are particularly affected by ongoing discussions about the siting and construction of renewable energy infrastructure. In the first part of this report, we analyse the policy principles that underpin Swiss energy policy and serve as a guide for more concrete policy decisions from an urban perspective.

The second part of the report then focuses on the aforementioned infrastructure projects. In the context of the so-called “Solar Express”, the national parliament has provided extensive subsidies for large-scale photovoltaics (PV) installations that emphasize winter production. This has led to an intense discussion and planning activity related to alpine PV projects, which are most likely to fulfil the winter production requirement. In terms of process, in the context of the “Solar Express”, Swiss municipalities from the alpine area become central players given that every project needs to be approved by the municipality in which the project is located. The last two years have demonstrated that populations in these municipalities can and do play their role as veto-player (Stadelmann-Steffen, 2011), i.e., rejecting a project and thus prohibiting the implementation of such infrastructure needed for the energy transition. In our analyses of 40 alpine PV projects that have put to a popular vote between June 2023 and December 2024 we delve deeper into this potential veto-player role of local populations.

The data presented in the first part was gathered through a large-scale survey conducted in Switzerland from August 26 to October 31, 2022. Invitations to participate in the survey were distributed to a random sample of the Swiss resident population, stratified by nine geographical areas, as illustrated in Figure 1. A total of 4,948 respondents completed the survey, resulting in a response rate of 36.6%. Among these respondents, 1,562 reside in the Alps as defined for the current analyses. The sample aligns well with population metrics regarding gender, age, and education, although higher-income individuals, as is often the case in surveys, are somewhat overrepresented. Regional differences are depicted graphically, while OLS and logistic regressions have been employed (and are detailed in the Appendix) to assess the statistical significance of observed differences. In these regression models, we accounted for household income, educational level, age, gender, homeownership status, and self-placement on the political left-right scale to address potential regional composition effects. For the second part of the report, we compiled a data set on all 40 alpine PV projects that were subject to a direct democratic vote between June 2023 and December 2024 in the context of the national parliament's “Solar Express” and used Bayesian beta regression to for the analyses.

This report is organized as follows. Initially, we provide a characterization of the alpine areas, detailing how this region is defined within the EDGE project and describing the composition of the alpine population as represented in the EDGE survey. Subsequently, we proceed with the analyses of the alpine PV projects. The report concludes with a summary of the main findings and policy recommendations.

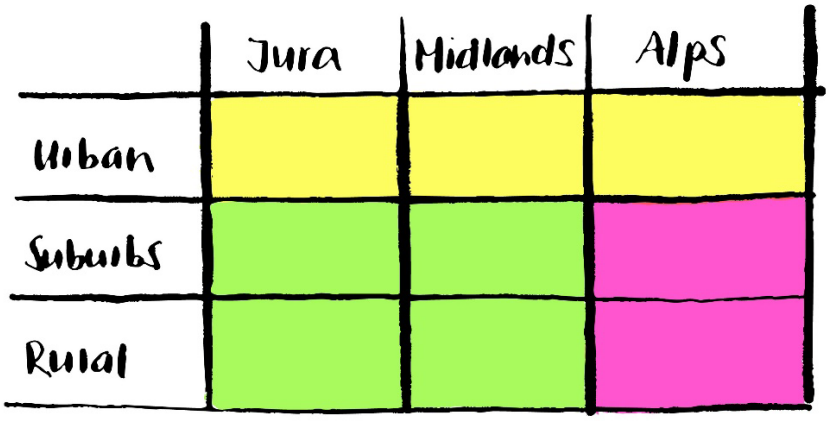
2 Who lives in alpine areas?

2.1 Definition of EDGE regions

The EDGE consortium has established three geographical regions by combining two primary spatial criteria: geographical zones[1] (Alps, Midlands, Jura) and urban-rural classification[2] (urban, peri-urban, and rural territories). As depicted in Figure 1, the Alps within the Sweet EDGE framework and for these analyses encompass the suburban and rural portions of the alpine geographical zone. Conversely, urban centres situated within the alpine zone are excluded from this category and instead classified under urban areas per the EDGE framework. Throughout this report, references to alpine areas consistently adhere to this classification.

While earlier reports have focused on the urban areas as well as on the (rural and peri-urban) Midlands, the present report concentrates on the (rural and peri-urban) Alps. It aims at identifying this region's peculiarities by distinguishing survey data from alpine contexts from the rest of Switzerland. The subsequent subsections provide an overview of the existing knowledge and EDGE survey results regarding the techno-economic and socio-political characteristics of the alpine region. While the former capture factors such as the technological potential and availability but also economic aspects of technologies, the latter includes the socio-economic and political composition of the population. The insights on the techno-economic and socio-political characteristics subsequently guide our expectations regarding policy acceptance and empirical analyses.

Figure 1: The EDGE regional typology



Note: Yellow = Urban; Pink = Alps; Green = Midlands

2.2 Techno-economic characteristics of the urban areas

From a techno-economic perspective, urban areas differ from the other two EDGE regions in several ways. Most notably, many of the infrastructure projects for renewable electricity production currently under discussion are typically located in the alpine region, where wind potential and solar irradiation (particularly in winter) are highest (Heinisch et al., 2023). This means that alpine populations are most strongly affected by potential landscape impacts, with regional electricity production exceeding their own demand (Sasse & Trutnevyte, 2019).

Moreover, alpine areas are naturally characterized by their low population density, sparse buildings, and limited infrastructure, which present specific opportunities and challenges. For example, the more remote living locations and limited public transport options result in a higher proportion of respondents in the EDGE survey who own a car compared to the rest of Switzerland (Table 1). On the other hand, the

[1] https://www.eda.admin.ch/aboutswitzerland/de/home/umwelt/geografie/geografie---fakten-und-zahlen.html

[2] https://www.bfs.admin.ch/bfs/de/home/statistiken/querschnittsthemen/raeumliche-analysen/raeumliche-gliederungen/raeumliche-typologien.html

share of homeowners is more significant, and related to the housing structure, the proportion of respondents still relying on fossil fuel heating systems is comparatively low.

Table 1: Socio-economic and political characteristics of the alpine area compared

	Alps		Other		
	N	Percent	N	Percent	Test
Education	1190		3538		X2=30.349***
... Secondary I	61	5%	198	6%	
... Secondary II	622	52%	1526	43%	
... Tertiary	507	43%	1814	51%	
Income	1201		3584		X2=47.885***
... under CHF 5	261	22%	654	18%	
... CHF 5001-7000	332	28%	753	21%	
... CHF 7001-9000	244	20%	725	20%	
... CHF 9001-13000	220	18%	870	24%	
... over CHF 13001	144	12%	582	16%	
Left-right placement	1562		4640		X2=11.341**
... Left	385	25%	1340	29%	
... Center	369	24%	1014	22%	
... Right	463	30%	1270	27%	
... None	345	22%	1016	22%	
Preferred political party	1562		4640		X2=54.296***
... Green Liberal Party	113	7%	412	9%	
... Green Party	59	4%	344	7%	
... Liberal Party	159	10%	429	9%	
... Swiss People's Party	184	12%	394	8%	
... Social Democrats	103	7%	378	8%	
... The Center	132	8%	296	6%	
... Other	274	18%	849	18%	
... None	225	14%	623	13%	
... NA	313	20%	915	20%	
Trust in Science	1228		3687		F=22.725***
Mean	7		7.3		
SD	2.3		2.2		
Housing conditions	1237		3701		X2=54.825***
... Cooperative	3	0%	52	1%	
... Other	74	6%	140	4%	
... Own flat	172	14%	448	12%	
... Own house	571	46%	1460	39%	
... Tenant	417	34%	1601	43%	
Heating of the house/apartment	1562		4640		X2=28.856***
... (Some) Renewables	1034	66%	2713	58%	
... Oil or gas	528	34%	1927	42%	
Household has…	1436		4279		X2=37.765***
... a car	1366	95%	3840	90%	
... no car	70	5%	439	10%	

2.3 Socio-political characteristics of the alpine sample

Table 1 displays various socio-political variables pertinent to energy transition and EDGE consortium research, contrasting their prevalence in the alpine sample against respondents from the Midlands and urban regions.

The statistically significant findings reveal that the alpine sample differs markedly from other regions across all measured attributes. Regarding socio-economic characteristics, alpine participants exhibit lower rates of tertiary education completion and demonstrate a notably higher concentration within lower income groups.

Furthermore, the proportion of individuals positioning themselves on the political left[3] is substantially smaller, whereas a greater number embrace right-leaning political orientations. These tendencies are mirrored in party preferences, with alpine respondents showing stronger support for the Swiss People's Party (along with marginally higher support for the Center Party and Liberal Party), while displaying reduced affinity for left-wing and green parties. Additionally, alpine respondents demonstrate somewhat lower levels of trust in science compared to their Midlands and urban counterparts.

2.4 Expectations about policy acceptance in the urban areas

The analyses conducted in this report are guided by two competing expectations. On one hand, the analyses in Deliverable Reports 1.7 and 2.2 have provided evidence that the energy transition debate in Switzerland has a strong national dimension, despite the existence of many regional differences. In particular, the repeated direct-democratic campaigns and decisions, most recently the clear acceptance of the Electricity Act in June 2024, have largely nationalized the energy transition debate. Moreover, the country's small size may prevent preferences from having a strong regional dimension, such as preferences for energy infrastructure located "away" from one's own region, because distances are small regardless.

On the other hand, however, the alpine population may still exhibit differences due to the unique characteristics of the alpine region. First, the alpine region is a significant producer of renewable electricity—traditionally through large hydropower plants and, more recently and importantly for the future, as a location for large-scale wind or PV plants. If the "not in my backyard" (NIMBY) phenomenon (Devine-Wright, 2009; Wolsink, 2000) is relevant anywhere, it should be in the Alps. Additionally, the below-average prevalence of left and green political norms (see Table 1) could be a further hindering factor in supporting renewable energy policy and projects. In combination, it can be expected that residents in alpine areas are particularly sceptical of renewable energy policies and infrastructure projects, while their voice is particularly relevant in siting processes. Against this background, we examine the extent to which these alpine peculiarities correlate with patterns of policy acceptance.

Following Deliverable Reports 1.7 and 2.2, we adopt a comprehensive understanding of policy acceptance and recognize that social acceptance represents a complex phenomenon, heavily influenced by the particular subject being accepted, the stakeholders involved, and their functions within policy development (Dermont et al., 2017). Consequently, we examine two primary elements of socio-political acceptance (Wüstenhagen et al., 2007) that hold relevance across different stages of the policy formulation process (Dermont et al., 2017):

Our initial research interest centres on the overarching **policy principles** that shape Switzerland's energy policy architecture. These relate to broader energy policy goals, including the shift from fossil fuel dependence to renewable energy alternatives. Moreover, these policy principles incorporate prerequisites necessary for realizing such objectives—specifically, the approaches through which these goals should be pursued. In Section 3, we analyse diverse policy principles, encompassing the importance of energy independence, cooperation with the EU, mitigation of CO2 emissions abroad, and public attitudes toward the future Swiss energy mix as well as energy provider responsibilities. These components

[3] The left-right scale ranges from 0 to 10 with low values indicating a left-wing orientation and high values describing a rightist political view.

function as essential policy guidelines. The degree to which citizens support these principles subsequently shapes the acceptance of particular policy instruments. In contrast to the two other deliverable reports and to strengthen the comparative perspective, we contrast the findings for the alpine region with a differentiated view on the Midlands and the urban areas.

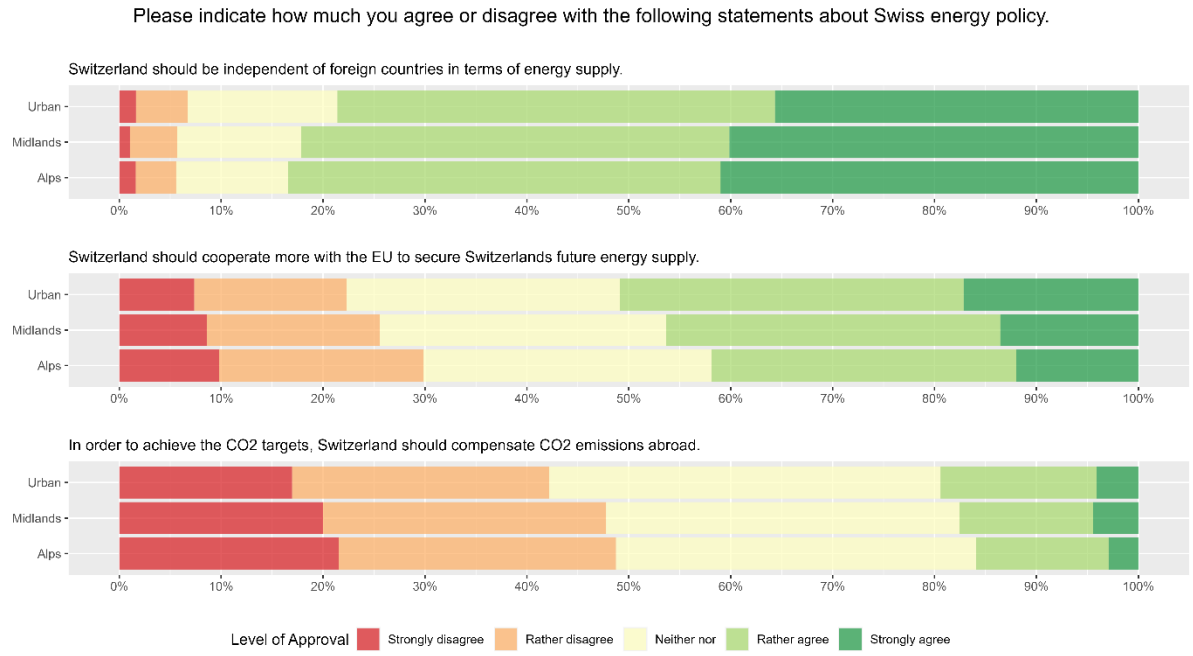
In Section 4, we take a closer look at a key issue in the Alps related to the energy transition: the building of large infrastructure projects. This makes the Alps a vital source of renewable winter electricity. At the same time, it puts the alpine population in a crucial position as potential veto-player, whose approval is essential for advancing the energy transition.

3 Energy policy preferences in the Alps

3.1 General principles of Swiss energy policy

The most important political principle for the population in the alpine region is energy independence, with over 80% of residents in the alpine region agreeing with the statement that Switzerland should be independent from other countries in terms of energy supply (see Figure 2). This level of agreement is slightly but significantly higher in the Alps than in the urban areas and the Midlands. At the same time, alpine residents are significantly less supportive of further EU cooperation in the energy sector. These differences are in accordance with the prevalent more conservative political views in this region.

Figure 2: Preferences for Swiss energy policy



Note: The respective differences between the alpine regions and the other Swiss regions (taken together) are statistically significant (see Table 2 in the Appendix).

Finally, we also find significantly lower agreement (or stronger disagreement) that Switzerland should compensate CO2 emissions abroad to meet its CO2 target. Across all regions, however, support for CO2 emission compensation abroad is limited, with a large proportion of respondents being undecided on this question (see also D.1.7 for more in-depth analyses on this question).

As highlighted in the first Sweet EDGE Renewable Energy Outlook (Trutnevyte et al., 2024), hydropower and the expansion of solar PV at the building level are key components of Switzerland's future electricity

supply. However, other technologies—such as wind power, alpine PV, and biomass—will also be essential to meet energy targets. Additionally, nuclear power has re-emerged on the political agenda, culminating in a popular initiative, which would allow to construct new nuclear power plants again, as well as the Federal Council's proposition to develop an indirect counterproposal (also lifting the ban on new nuclear power plants). In this context, public preferences for different energy sources are a crucial aspect of policy principles, influencing the acceptance of specific policy instruments and mixes.

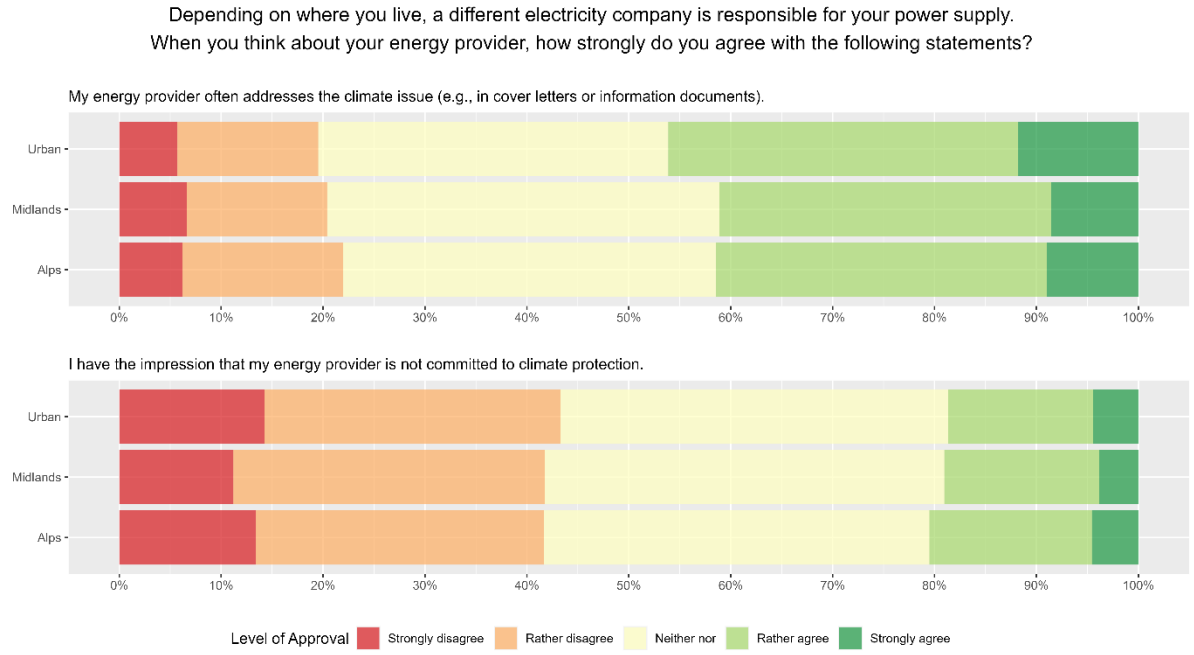
Figure 3 shows that, not surprisingly, large hydro power and rooftop PV are clearly the most popular energy sources. Electricity imports are disfavoured by almost 80% of respondents, followed by gas-fired power plants with a disagreement around 40% of respondents. Respondents in the Alps show the strongest support for hydropower, both large-scale and small-scale. Similarly, support for wind power is slightly but significantly stronger, especially compared to the Midlands. Conversely, the social acceptance of open-space and building-level PV is significantly lower than in the other two Swiss regions. These findings point to an interesting difference between the “old” renewable energy source hydropower, and the “new” renewables PV and wind: Whereas for hydropower, experience and local “affectedness” seems to be conductive to support, the pattern for the new renewables speak for the contrary. Regarding the latter, the discussion about alpine PV projects seems to be associated with lower acceptance levels, while wind energy, where many conflictual projects are located in the Midlands or in the Jura region, is relatively more popular among alpine residents.

Figure 3: Preferences about the future Swiss energy mix

Note: All but the differences between alpine regions and the other Swiss areas (taken together) related to biomass and geothermal energy are statistically significant (with a p-value < 0.10) (see Table 3 in the Appendix).

Energy providers play a crucial role in Swiss energy governance. While these providers tend to be privately organized companies, many of them are majority- or completely publicly owned. Additionally, they hold regional monopolies for supplying private households and can act as important multiplier to push the energy transition forward, e.g., through attractive feed-in tariffs or an active role in promoting renewable energy projects. Overall, as shown in Figure 4, the Swiss population is rather divided on how they perceive their energy provider with respect to their role and commitment for the energy transition. Differences between residents in alpine regions and their counterparts in the other Swiss regions are only marginal and not statistically significant. The only relevant difference in this area is the more positive view of urban residents related to their energy providers (as discussed in Deliverable Report 1.7).

Figure 4: Perceptions about the local energy provider



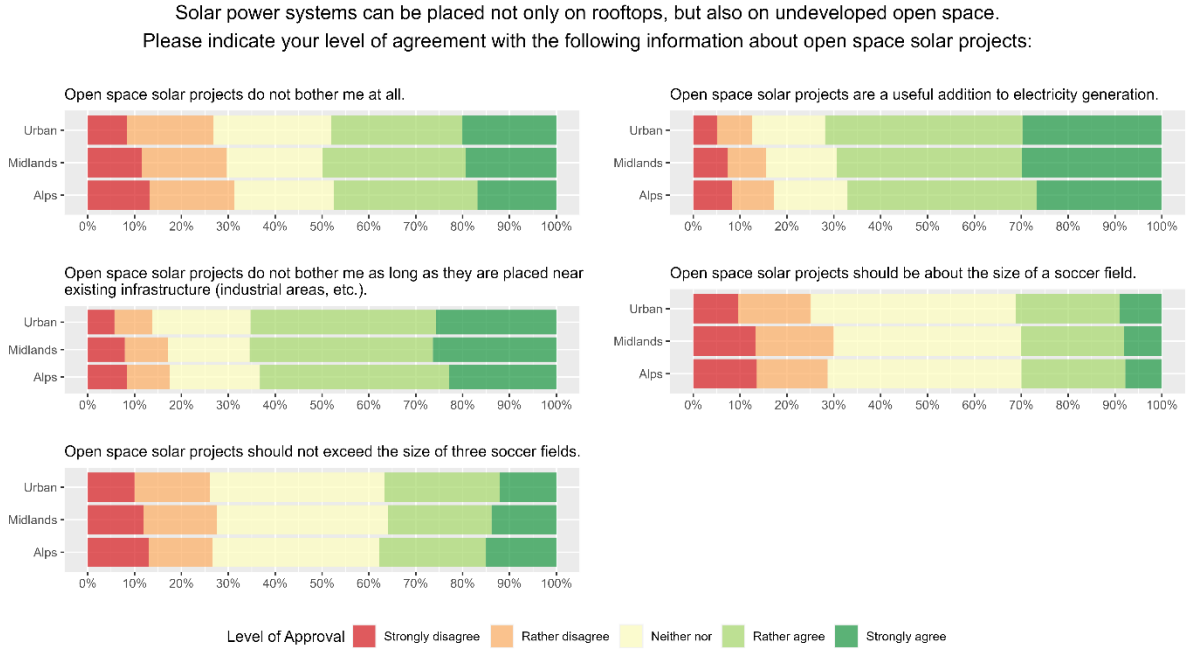
Note: The differences between the alpine region and the rest of Switzerland (taken together) are not statistically significant (see Table 4 in the Appendix).

3.2 A focus on open-space PV

According to the EDGE energy models (Heinisch et al., 2023), open-space PV can play an important role in Switzerland's energy transition. At the same time, recent debates around the "Solar Express", but also data from the EDGE survey (Trutnevyte et al., 2024), show that open-space PV is much less popular with the Swiss population than building level PV (see also Figure 3).

Figure 5 provides more detailed information on the conditions under which the population is more or less critical of open-space PV. The main finding is that clear majorities of respondents consider this type of PV to be useful, provided that the installations are located near existing infrastructure. However, significant differences can be observed between residents in alpine regions and other Swiss residents in relation to these two items. Indeed, residents in the Alps are more likely to question the usefulness of these installations and are more likely to say that open-space PV is disturbing. Section 4 will further examine public acceptance of open-space PV, with a particular focus on the alpine region, and the influence of decision-making processes and ownership on the approval or rejection of specific projects.

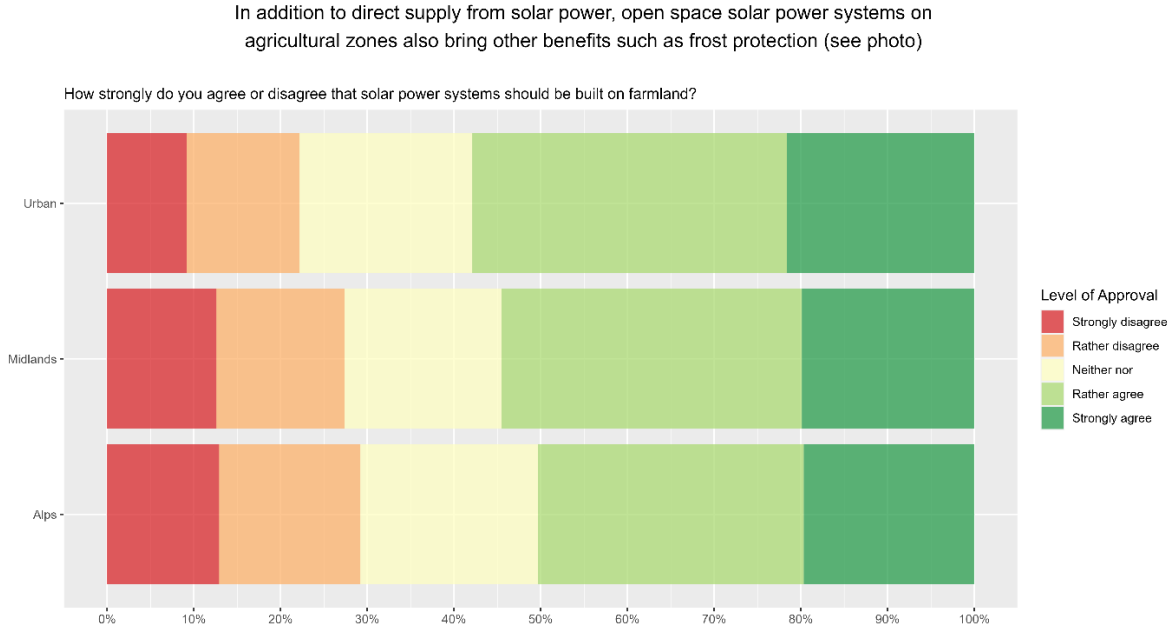
Figure 5: Acceptance of open-space PV promotion in the alpine region



Note: The following difference between alpine regions and the other Swiss areas (taken together) are statistically significant: “Open-space solar projects are a useful addition to electricity generation”, “Open-space solar projects do not bother me at all (see Table 5 in the Appendix).

Next to projects in alpine regions, a typical application of open-space PV is its placement on farmland or farms (Agri-PV). Figure 6 shows that, overall, about 55% of the population agree that open-space PV should be placed on agricultural land. This proportion is significantly lower among respondents from alpine areas, while more people in alpine regions (tend to) disagree with agricultural PV. It should be noted that the wording of this question tends to emphasize the positive side effects of Agri-PV rather than the potential risks and challenges. Against this background, the proportion of respondents in favour of Agri-PV can be considered rather low.

Figure 6: Acceptance of Agri-PV promotion in the alpine region



Note: The difference between the alpine region and the rest of Switzerland (taken together) is statistically significant ($p < 0.10$). The photo integrated into the survey question to show what Agri-PV looks like, can be found in Figure 8 in the Appendix.

4 Voting on alpine PV

4.1 General motivation for studying the governance of alpine PV projects

Given the climate change concerns as well as the quest for greater energy independence against the background of geopolitical challenges, the expansion of renewable energies gained in importance (Bashir et al., 2025; Sanchez Nieminen & Laitinen, 2025). Although energy independence is important for Swiss residents (see Figure 2) and a broad consensus among the public exists that the transition to renewable energy is necessary, concrete renewable energy projects often face public opposition (Batel et al., 2013; Breukers & Wolsink, 2007; Sanchez Nieminen & Laitinen, 2025). In a direct-democratic context like Switzerland, this can lead to local decisions blocking or preventing the realization of renewable energy infrastructure (Stadelmann-Steffen, 2011; Stadelmann-Steffen & Dermont, 2021).

In the context of the Swiss “Solar Express”, aimed at incentivising alpine PV projects by offering a single payment covering up to 60% of the investment costs, 40 projects in alpine regions have been put to a political decision in the siting municipality by the end of 2024. Approximately two-third of the projects have been approved by a majority of citizens and one third has been rejected, whereas may of the decisions were accompanied by heated and emotional debates, even after the decision was taken.

This research posits that the local approval of renewable energy infrastructure such as alpine PV should be viewed as a collective action problem (Bouman et al., 2021; Scruggs, 1999). This means that short-term individual interests are colliding with broader societal long-term interests such as renewable energy, respectively ensuring sufficient energy production in the future and especially during winter. As large-scale alpine PV is an important option to materialize this societal interest (Trutnevyte et al., 2024), accepting such projects is a contribution to the common good (Ostrom, 2010; Smith & Mayer, 2018), i.e., a country’s renewable energy supply. However, there also exist ‘costs’ when deciding on renewable energy projects, such as a perceived negative impact on the landscape and the environment through the realization of the project (Cousse, 2021; Vuichard et al., 2021). Especially if the projects are large (Salak et al., 2022) and include the presence of private/distance companies (Vuichard et al., 2021), the individual ‘costs’ may be considered higher than the societal ‘benefits’. However, research by Granulo et al. (2025) has shown that individuals often use a transition heuristic, leading to initial resistance against the project due to perceived losses compared to the status quo, while they exhibit a stronger focus on societal gains after a project’s implementation.

Based on these existing insights, the study considers specific **governance structures** of alpine PV projects as a way to emphasize the collective nature of these projects. These governance structures concern the type of decision-making (public vs. secret voting) at municipal level and ownership structures (distant vs. local (co-)owners). We argue that these two factors influence to what extent citizens’ decisions are dominated by a focus on the societal gains (collective action logic), or by a focus on individual or local losses (veto-player logic). It is expected that the domination of the collective action logic will lead to higher municipal approval of alpine PV projects compared to a situation where the veto-player logic dominates.

The study draws on a unique dataset of all Swiss alpine PV projects that were subject to local decisions between June 2023 and December 2024 and decided on in municipal assemblies either by public (e.g., raise hands) or secret (e.g., ballot) voting. We use Bayesian regression analysis to investigate the drivers of high yes-shares in these municipal decisions. Thereby, we expand existing research by investigating real-life decision-making procedures and decisions, e.g., true community acceptance (Dermont et al., 2017). The research design is further optimized through the short time of similar decisions taken without high variance regarding the context conditions. Moreover, we combine recent insights from psychological research (Granulo et al., 2025; Gross et al., 2025) with theoretical insights on the social acceptance of renewable energy infrastructure (Dermont et al., 2017; Wüstenhagen et al., 2007) as well as direct-democracy and deliberation (Grönlund et al., 2010; Setälä et al., 2010; Stadelmann-Steffen, 2011).

This section presents the theoretical background as well as the main findings. The full study can be found in the following conference paper attached to this Deliverable Report:

Isabelle Stadelmann-Steffen, Céline Imobersteg and Matthias Heim (2025). Voting on renewable energy infrastructure as collective action problem – The case of alpine photovoltaic projects in Swiss municipalities. Paper to be presented at EPG 2025, 11-13 June, Sachseln, Switzerland.

4.2 Theoretical background on deliberative democracy, decision-making and ownership structure

Attitudes and preferences towards policies and renewable energy infrastructure projects change over time. A recent study by Granulo et al. (2025), which focused on system-level policies, examined the underlying psychological mechanisms behind changes in support for these projects. Using transition heuristics, the researchers demonstrate that initial opposition is frequently rooted in a comparison between the anticipated future state with the measure in place and the current conditions, resulting in a focus on potential personal losses. Once these policies are in place, opposition generally diminishes as individuals recognise the greater societal benefits compared to the personal drawbacks. This suggests that emphasising the potential collective benefits beforehand could facilitate the acceptance and subsequent implementation of system-level measures. Considering decision-making and ownership structures, we determine the circumstances in which such an 'ex-post environment' can be established before a policy or project is implemented.

When adopting a public choice lens, individuals base their decisions on a personal cost-benefit analysis (Bornstein & Thalmann, 2008; Deacon & Shapiro, 1975). This is particularly important for decisions relating to the environment, where the long-term benefits are often unclear and not recognised by voters (Stadelmann-Steffen & Dermont, 2018). Furthermore, local decision-making is considered an important aspect of municipal autonomy, ensuring that individual or local concerns are addressed. Due to the focus on short-term 'costs' and the municipalities' veto position, direct democracy can act as a veto player (Scruggs, 1999) when it comes to decisions on specific renewable energy projects. To counter the veto-player logic, deliberation and deliberative decision-making (Grönlund et al., 2010) are considered a way of highlighting the collective benefit in the context of direct democratic decision-making. Deliberative processes focus on exchanging different points of view among individuals with the aim of reaching a common agreement about the outcome (Chambers, 2003). These processes are considered to result in a higher propensity towards collective action by promoting an increased emphasis on the common good (Grönlund et al., 2010; Warren & Gastil, 2015).

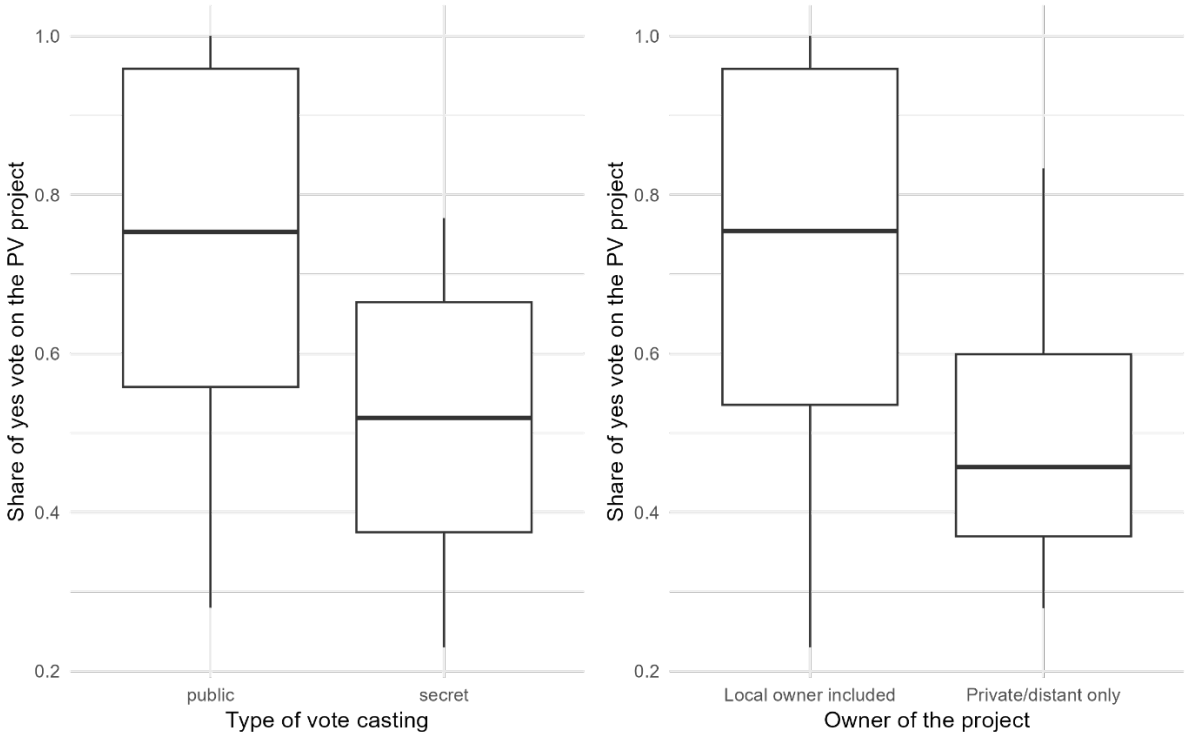
The ownership structure is another aspect of governance that can influence the propensity for collective action. Evidence from different types of renewable energy infrastructure shows that citizens favour local ownership over private ownership or distant project developers (Stadelmann-Steffen & Dermont, 2021; Tabi & Wüstenhagen, 2017). Local ownership may generate economic benefits for a region or municipality (Linnerud et al., 2022) and, due to its perceived sensitivity to local values and structures (Brouwer et al., 2025), we anticipate that it will promote collective action, focusing on societal gains. In contrast, private or distant ownership implies a stronger focus on private gains with limited contribution to the common good.

Taken together, we argue that the collective rationale of alpine PV projects can be emphasised in a public decision in which the deliberative element dominates as well as by local project owners. Furthermore, we expect the decision-making process to reinforce existing tendencies towards acceptance or refusal, rather than inherently prompting citizens to approve alpine PV projects. An interaction analysis between the type of decision-making and the ownership structure is used to examine these potential contingencies.

4.3 Main results

Our Bayesian beta regression analyses consistently show that public voting on alpine PV projects increases approval rates compared to secret voting. This supports deliberation research suggesting that public processes emphasize the common good. However, voting procedure alone doesn't determine outcomes. The strongest support for alpine PV projects—and the largest difference between secret and public voting—occurs in municipalities that also approved the 2024 national referendum on accelerating renewable energy. This suggests public voting prevents pro-renewable municipalities from defaulting to their veto-player role rather than creating artificial majorities.

Figure 7: Descriptive differences in yes-votes depending on governance structures



Note: Distribution of yes-votes conditional on type of decision-making and project owner.

Similarly, citizens prefer projects with local or municipal ownership over those owned by distant private companies. While previous research attributed this to economic benefits and local sensitivity, we argue local ownership frames projects as collective action. Distant owners may trigger veto responses, as municipal autonomy is highly valued in Switzerland's federal system. Notably, even established energy companies with decades of regional presence through hydropower were perceived as "distant" when they sent headquarters managers rather than local representatives to municipal assemblies.

Furthermore, we demonstrate that ownership structure and voting type interact. Public voting increases approval for locally-owned projects but not for those exclusively owned by distant private companies, confirming that public voting cannot compensate for lack of local ownership.

5 Conclusions and policy implications

This report examined regional policy acceptance among alpine inhabitants, recognizing significant techno-economic and socio-political distinctions between the Alps and other Swiss regions. From a techno-economic standpoint, alpine areas serve as crucial energy producers for other regions while bearing the primary landscape costs of renewable energy infrastructure. Simultaneously, the left-green political orientations that typically foster renewable energy acceptance are less prevalent in the Alps, where right-wing conservative values predominate. This configuration positions alpine residents as a "least likely" constituency for social acceptance, yet their support remains essential within Switzerland's direct democratic framework (Stadelmann-Steffen, 2011). The report therefore investigated how alpine populations actually differ in policy preferences and identified conditions under which alpine PV projects—currently among the most debated renewable energy infrastructures—achieve political majorities in alpine municipalities.

Our analysis reveals that alpine residents differ notably from Midlands and urban populations across several dimensions. While these differences are not enormous, and our findings generally align with Deliverable Report 2.2's conclusion that regional variation in policy acceptance remains limited, this third report—alongside Deliverable Report 1.7 on urban areas—demonstrates that the Midlands occupy a middle position on many policy acceptance measures, while alpine and urban residents hold somewhat divergent perspectives. Where Deliverable Report 1.7 documented urban populations' ideological alignment with renewable energy goals while being net energy importers, this report characterizes alpine regions as somewhat more sceptical of European energy cooperation, placing greater weight on energy independence, and showing particularly strong preference for hydropower while displaying less enthusiasm for PV installations at both building and large scales.

Additionally, we conducted a unique analysis of 40 alpine PV projects subjected to popular votes in (predominantly alpine) Swiss municipalities. This analysis shows that two-thirds of these alpine PV projects gained majority approval from local populations. We identified local (co-)ownership as a crucial factor influencing project approval rates in these local decisions. Moreover, alpine PV projects receive greater municipal support when decisions occur through public rather than secret voting. While our analysis demonstrates that citizen support cannot be "engineered" simply through procedural choices, the findings support the perspective that alpine PV projects face collective action challenges. Public voting and local (co-)ownership emphasize the collective dimension of these projects, thereby facilitating municipal support.

Drawing from the findings and implications presented in this report, we formulate the following policy recommendations:

1) Addressing the specific situation of alpine regions

While the alpine population represents a minority in Switzerland, they assume a critical veto-player role in renewable energy infrastructure implementation. Since this infrastructure, particularly alpine PV projects, is predominantly situated in alpine regions and requires approval from the host municipality as a legal prerequisite for construction, the concerns of these communities must be addressed seriously. This becomes especially crucial given that the prevailing socio-political norms in these areas do not naturally favour renewable energy acceptance. Consequently, it is essential to engage local municipalities early in the development process and to design high-quality projects that minimize the tension between society's need for renewable (winter) electricity and local municipalities' perceived costs. More specifically, this report identified two concrete measures to make alpine PV projects more acceptable for local populations.

2) **Do include local actors into the ownership structure**

Our analyses of real-world municipal decisions consistently reveal that projects following the pattern of 'a distant energy company from the midlands coming to the Alps to build an alpine PV park' face significant challenges from the outset. This observation that local (co-)ownership matters, while not novel, aligns seamlessly with prior survey research (Stadelmann-Steffen & Dermont, 2021; Vuichard et al.,

2021). Despite this well-documented finding, projects under investigation in this study, as well as recent examples[4], demonstrate that such initiatives persist, i.e., projects are initiated without any local actor being part of the project owners. Addressing this issue appears straightforward: energy companies aiming to invest in alpine PV must secure local allies who are credibly integrated into the governance structure of the proposed project. Leveraging previous regional experiences, particularly in hydropower, seems a promising strategy for identifying partners and effectively communicating with the local population. Conversely, local energy providers and municipalities can enhance the acceptance of alpine PV projects by demonstrating openness or actively seeking collaboration with larger energy companies that possess both the willingness and the resources to invest.

3) **Emphasizing the collective nature of alpine PV projects through a public vote**

This report, along with its accompanying in-depth article, demonstrates both theoretically and empirically that emphasizing the collective nature of such projects can be a significant factor in their success. Alpine PV projects inherently involve balancing the societal goal of domestic renewable electricity production, particularly in winter, with the interests of local communities in protecting their local environment. This presents a collective action challenge, as the broader societal goal will not be achieved if individual municipalities prioritize local landscape or nature-related concerns over renewable electricity production. While there is an ongoing debate in Switzerland about whether municipalities should have the right to vote on each project[5], our study suggests a middle path: if municipalities retain the right to approve or reject individual projects, these local decisions should be made through public rather than secret voting. This approach facilitates deliberative discussions and favours decisions that support collective goals. At the same time, as our analyses also indicate, it does not "socially engineer" municipal approval but still reflects general local preferences and cannot compensate for poorly structured projects. Since the decision about whether a local vote will be public or secret can itself be subject to political conflict, it should not be made during the project-related process. Instead, it should be formally integrated into municipal regulations beforehand to avoid further politicisation.

[4] In May 2025, for example, the municipality of Erlenbach i.S. rejected a project initiated by the private company Mountain Sun Technologies AG with no local co-owner with 137:2 No-votes. **https://www.erlenbach-be.ch/de/aktuelles/meldungen/Medienmitteilung-GV-Beschluesse-26.05.2025.php**.

[5] In the canton of Lucerne, the cantonal population has approved a new law in November 2024 that does no longer awards this veto right to municipalities but assigns the ultimate decision about large wind projects to the cantonal government, **https://www.srf.ch/news/schweiz/abstimmungen-24-november-2024/abstimmung-kanton-luzern-windparks-koennen-kuenftig-schneller-gebaut-werden**

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Appendix

Table 2: Regional policy preference – Regression results

	Independence	EU cooperation	Compensation abroad	Independence	EU cooperation	Compensation abroad
Other region (Ref.: Alps)	0.067**	-0.127***	-0.113***	0.046	-0.091	0.035
	(0.030)	(0.038)	(0.037)	(0.057)	(0.071)	(0.069)
Lower income (Ref.: High income)	0.043	0.026	-0.045	0.042	0.026	-0.045
	(0.031)	(0.039)	(0.038)	(0.031)	(0.039)	(0.038)
Education (Ref.: Sec. I)						
Secondary II	-0.126**	0.077	0.233***	-0.130**	0.074	0.230***
	(0.061)	(0.077)	(0.074)	(0.061)	(0.077)	(0.074)
Tertiary	-0.095	-0.168**	0.300***	-0.099	-0.171**	0.300***
	(0.061)	(0.077)	(0.073)	(0.061)	(0.077)	(0.074)
Age	-0.0003	-0.012***	0.004***	-0.0003	-0.012***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gender (Ref.: Female)						
Male	-0.064**	-0.061*	0.171***	-0.064**	-0.061*	0.168***
	(0.027)	(0.033)	(0.032)	(0.027)	(0.033)	(0.032)
Non-binary (as umbrella term)	-0.063	0.741**	0.817***	-0.073	0.726**	0.805***
	(0.235)	(0.307)	(0.284)	(0.236)	(0.307)	(0.284)
Owns house	-0.081***	-0.049	0.158***	-0.082***	-0.048	0.159***
	(0.029)	(0.036)	(0.035)	(0.029)	(0.036)	(0.035)
Region*Political ideology						
Alps*Left				-0.020	0.003	-0.197**
				(0.077)	(0.097)	(0.094)
Alps *None				0.332	0.293	-0.119
				(0.263)	(0.331)	(0.319)
Alps *Right				0.059	-0.107	-0.216**
				(0.075)	(0.094)	(0.090)
Political ideology (Ref.: Centre)						
Left	0.122***	-0.300***	0.018	0.139**	-0.304***	0.164**
	(0.034)	(0.043)	(0.041)	(0.067)	(0.085)	(0.081)
Right	-0.122***	0.332***	0.216***	-0.165***	0.410***	0.374***
	(0.034)	(0.042)	(0.041)	(0.064)	(0.081)	(0.078)
None	0.088	0.199	0.199	-0.169	-0.030	0.285
	(0.109)	(0.139)	(0.134)	(0.232)	(0.291)	(0.280)
Constant	1.967***	3.470***	2.856***	1.987***	3.447***	2.750***
	(0.081)	(0.102)	(0.098)	(0.088)	(0.111)	(0.106)
Observations	4,517	4,511	4,502	4,517	4,511	4,502
R^2	0.024	0.095	0.039	0.024	0.096	0.040
Adjusted R^2	0.021	0.093	0.036	0.021	0.093	0.037

Note: High values stand for disagreement

*p <0.1, **p <0.05, ***p<0.01

Table 3: Regional policy mix preferences

	Large Hydro	Nuclear	Small Hydro	OS-PV	Small PV	Geothermal	Wind	Biomass	Gas	Imports
Other region (Ref.: Alps)	0.081***	-0.091**	0.118***	-0.077*	-0.049*	-0.048	0.102**	0.013	-0.138***	-0.081***
	(0.030)	(0.044)	(0.039)	(0.043)	(0.026)	(0.035)	(0.041)	(0.031)	(0.038)	(0.031)
Lower income (Ref.: High income)	0.022	-0.030	0.006	0.080*	0.129***	0.145***	0.045	0.117***	0.006	-0.046
	(0.030)	(0.045)	(0.040)	(0.044)	(0.027)	(0.036)	(0.042)	(0.032)	(0.039)	(0.031)
Education (Ref.: Sec. I)										
Secondary II	-0.047	0.026	0.021	0.011	-0.074	0.115	-0.001	-0.071	0.171**	0.254***
	(0.059)	(0.087)	(0.078)	(0.087)	(0.052)	(0.071)	(0.081)	(0.064)	(0.077)	(0.061)
Tertiary	-0.079	0.095	0.001	-0.168*	-0.238***	-0.182**	-0.008	-0.205***	0.217***	0.347***
	(0.059)	(0.087)	(0.078)	(0.086)	(0.052)	(0.071)	(0.081)	(0.063)	(0.077)	(0.061)
Age	-0.005***	0.003**	0.001	-0.004***	-0.003***	0.002	0.003**	-0.006***	0.001	-0.0002
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gender (Ref.: Female)										
Male	-0.189***	-0.240***	-0.131***	-0.092**	-0.086***	-0.270***	-0.020	-0.081***	0.213***	0.046*
	(0.026)	(0.038)	(0.034)	(0.038)	(0.023)	(0.031)	(0.035)	(0.028)	(0.033)	(0.027)
Non-binary (as umbrella term)	-0.341	-0.373	0.049	0.610*	0.328	0.626**	0.568*	-0.070	0.361	0.098
	(0.238)	(0.338)	(0.302)	(0.334)	(0.203)	(0.272)	(0.315)	(0.244)	(0.297)	(0.237)
Owns house	-0.127***	0.025	-0.097***	0.125***	-0.100***	-0.021	-0.049	-0.118***	0.173***	0.062**
	(0.028)	(0.041)	(0.037)	(0.041)	(0.025)	(0.033)	(0.038)	(0.030)	(0.036)	(0.029)
Political ideology (Ref.: Centre)										
Left	0.077**	0.699***	0.198***	-0.182***	-0.183***	-0.111***	-0.213***	-0.154***	0.209***	0.118***
	(0.033)	(0.048)	(0.043)	(0.048)	(0.029)	(0.039)	(0.045)	(0.035)	(0.043)	(0.034)
Right	-0.129***	-0.578***	-0.047	0.196***	0.022	-0.038	0.209***	-0.009	0.017	0.102***
	(0.033)	(0.048)	(0.043)	(0.048)	(0.029)	(0.039)	(0.045)	(0.035)	(0.042)	(0.034)
None	0.215**	0.431***	0.139	0.604***	0.125	0.160	0.219	0.133	0.050	-0.004
	(0.105)	(0.155)	(0.138)	(0.152)	(0.092)	(0.127)	(0.143)	(0.114)	(0.137)	(0.109)
Constant	2.203***	2.861***	2.417***	2.771***	1.922***	2.432***	2.233***	2.672***	2.816***	3.779***
	(0.079)	(0.116)	(0.103)	(0.115)	(0.070)	(0.094)	(0.108)	(0.084)	(0.102)	(0.081)
Observations	4,518	4,519	4,521	4,516	4,521	4,506	4,522	4,509	4,509	4,514
R^2	0.048	0.172	0.019	0.033	0.050	0.050	0.026	0.037	0.028	0.017
Adjusted R^2	0.046	0.170	0.016	0.031	0.048	0.047	0.024	0.034	0.025	0.015

Note: High values indicate disagreement

*p <0.1, **p <0.05, ***p<0.01

Table 4: Regional perception of the energy provider

	Active Provider	Committed Provider
Other region (Ref.: Alps)	-0.038	0.024
	(0.035)	(0.035)
Lower income (Ref.: High income)	0.001	-0.075**
	(0.036)	(0.036)
Education (Ref.: Sec. I)		
Secondary II	-0.040	0.108
	(0.070)	(0.070)
Tertiary	-0.060	0.140**
	(0.070)	(0.070)
Age	-0.013***	0.008***
	(0.001)	(0.001)
Gender (Ref.: Female)		
Male	-0.069**	0.067**
	(0.030)	(0.031)
Non-binary (as umbrella term)	0.176	-0.203
	(0.270)	(0.270)
Owns house	0.012	0.020
	(0.033)	(0.033)
Political ideology (Ref.: Centre)		
Left	0.018	0.070*
	(0.039)	(0.039)
Right	-0.054	0.165***
	(0.039)	(0.039)
None	0.036	-0.049
	(0.122)	(0.123)
Constant	3.465***	2.711***
	(0.093)	(0.093)
Observations	4,521	4,502
R^2	0.039	0.026
Adjusted R^2	0.037	0.023

Note: High values indicate disagreement

*p <0.1, **p <0.05, ***p<0.01

Table 5: Regional preferences for open-space PV

	Useful	Do not bother	Close to infrastructure	Size soccer field	Max. 3 Soccer fields
Other region (Ref.: Alps)	-0.069*	-0.082*	-0.032	-0.043	0.005
	(0.039)	(0.044)	(0.040)	(0.038)	(0.040)
Lower income (Ref.: High income)	0.004	-0.066	0.096**	0.039	0.073*
	(0.040)	(0.045)	(0.041)	(0.039)	(0.041)
Education (Ref.: Sec. I)					
Secondary II	-0.035	0.189**	0.190**	0.056	0.071
	(0.078)	(0.087)	(0.079)	(0.076)	(0.080)
Tertiary	-0.193**	0.161*	0.061	0.073	0.151*
	(0.078)	(0.087)	(0.079)	(0.075)	(0.080)
Age	-0.008***	-0.006***	-0.005***	-0.004***	-0.0001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Gender (Ref.: Female)					
Male	-0.062*	-0.106***	0.089**	0.051	0.358***
	(0.034)	(0.038)	(0.035)	(0.033)	(0.035)
Non-binary (as umbrella term)	0.891***	0.455	0.813***	0.514*	0.124
	(0.303)	(0.338)	(0.307)	(0.293)	(0.311)
Owns house	0.100***	0.149***	0.094**	0.160***	0.132***
	(0.037)	(0.041)	(0.037)	(0.036)	(0.038)
Political ideology (Ref.: Centre)					
Left	-0.144***	-0.032	-0.096**	-0.029	0.059
	(0.044)	(0.049)	(0.044)	(0.042)	(0.045)
Right	0.117***	0.152***	0.075*	0.050	0.083*
	(0.043)	(0.048)	(0.044)	(0.042)	(0.045)
None	0.479***	0.349**	0.375***	0.321**	0.102
	(0.137)	(0.153)	(0.140)	(0.132)	(0.142)
Constant	2.698***	2.848***	2.261***	3.022***	2.404***
	(0.104)	(0.116)	(0.105)	(0.100)	(0.107)
Observations	4,520	4,516	4,515	4,510	4,510
R^2	0.030	0.015	0.018	0.010	0.031
Adjusted R^2	0.027	0.013	0.016	0.008	0.028

Note: High values indicate disagreement

*p <0.1, **p <0.05, ***p<0.01

Figure 8: Picture of Agri-PV integrated in the EDGE survey next to the question on Agri-PV