

Article

Framing Energy Sufficiency in a Swiss Mountain Resort

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Abstract: This article analyses how energy sufficiency can be applied in tourism destinations. It begins by highlighting the importance of decarbonizing tourism for climate action, given the sector's high CO₂ emissions. Energy sufficiency, a key pillar of the energy transition, is defined as the voluntary reduction in energy demand within climate and CO₂ emission constraints. The study investigates how stakeholders interpret and frame this concept, by focusing on strategies that align with the public image of the resort to reduce its energy requirements. The methodology includes semi-structured interviews with key players in Verbier—Val de Bagnes, focus groups with cooperation partners, participant observations at local meetings and events, and analysis of local documentation. Research was undertaken using living lab methods. The results reveal five main categories and eleven subcategories in which local stakeholders frame sufficiency, including oppositional framings, off-framings, selective framings, institutional framings, and disempowering framings. The article concludes with recommendations to reframe sufficiency in order to align with the destination's strategy and representations. While energy sufficiency is often overshadowed by narratives of economic growth, technological innovation, and material abundance, it appears crucial to reframe these narratives and integrate post-growth strategies that prioritize sustainability in tourism planning.

Keywords: sufficiency; energy; low-carbon tourism; destination management; sustainable tourism; degrowth



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1. Introduction

Tourism emissions are estimated to contribute up to 8% of global emissions yearly [1–4]. The estimate provided by Sustainable Travel International displays the share across sectors of activities related to tourism, reporting that almost half of all tourism emissions are related to transportation (49%), whereas smaller shares are related to food, accommodation, leisure, and goods shopping. While transportation is estimated to cause 16% of all human activities, its share for the tourism sector is significantly higher [2,3], and it is expected to increase by 25% before 2030 compared to 2016 levels [2,5].

These calculations do not cover the supply chains underpinning tourism, and therefore do not represent true carbon footprints. The evaluation of tourism carbon footprints requires methods that cover the life cycle or supply chain emissions of tourism-related goods and services. It is crucial to consider the carbon footprint of tourism activities across all scopes (1, 2, and 3) [4,6]. Scope 1 includes direct emissions from owned or controlled sources, Scope 2 covers indirect emissions from the generation of purchased electricity, and Scope 3 encompasses all other indirect emissions that occur in the value chain. Addressing these emissions comprehensively is essential for responsible tourism planning, as it highlights the sector's role in contributing to global greenhouse gas emissions [1].

The UNWTO reviewed the relationship between sustainability and tourism in the mountain tourism industry. Mountain ecosystems, especially in Alpine regions, are vital for tourism activities like skiing and hiking but face significant environmental impacts, particularly from GHG emissions [7]. Mountain areas are at the forefront, as they are recognized to be extremely vulnerable to climate change [8]. Moreover, mountain tourism often relies on natural resources that are directly affected by climate change, such as glacier tourism [9] or ski tourism [10]. Tourism development in these areas requires infrastructure like accommodation and access facilities, which are energy-intensive and increase GHGs, especially during winter. The UNWTO estimates there are 115 million skiers globally, making up 14% of international tourism [7]. In Switzerland, tourism accounts for around 5.2% of GHG emissions, of which 80% are linked to air travel, 10% to accommodation, and 7% to other transport [11]. In the context of winter sports, Switzerland ranked sixth highest in terms of visitors in 2014, even considering the stagnation of the market observed in the last four decades. Swiss winter tourism was also the third highest after Andorra and Austria, taking 50% of international visitors [7].

There is an increasing need to decarbonize the tourism sector as part of global climate action. To achieve the Paris Agreement targets, a medium-to-long-term systemic transition is required to shift towards a low-carbon economy [6,12]. Simultaneously, in the short term, destination managers need to find ways to ramp down tourism emissions.

Energy sufficiency plays a critical role in this transition, complementing efficiency and renewable energy deployment as part of the “negawatt” triad of energy strategies. The Negawatt Association is a French nonprofit organization advocating for sustainable energy systems through reduced consumption and reliance on renewable energy. Their “negawatt” approach to energy transition emphasizes three key pillars: energy sufficiency (minimizing energy demand by prioritizing essential needs), energy efficiency (optimizing systems to use less energy for the same output), and renewable energy deployment replacing fossil fuels with sustainable energy sources. This triad aims to achieve a more equitable, environmentally friendly, and resilient energy system [13]. While efficiency focuses on optimizing energy use and renewables aim to decarbonize energy supply, sufficiency involves questioning and reducing excessive energy demand to align with sustainable consumption patterns [14]. Studying energy sufficiency narratives is particularly important for the tourism sector because it challenges the deeply ingrained imaginaries that underpin carbon-intensive tourism activities, such as long-haul travel and luxury accommodations. This article approaches energy sufficiency through the lens of cognitive framings, offering a novel perspective on this emergent topic. By analyzing the discourses that shape tourism practices, we aim to uncover the underlying assumptions that perpetuate high energy use and propose ways to shift towards more sustainable models. This narrative-based approach highlights the potential of sufficiency to reimagine tourism as a less carbon-intensive, yet equally fulfilling, industry.

2. Theoretical Framework

Energy sufficiency is defined as the voluntary reduction in energy demand while delivering well-being for all within planetary limits. Energy sufficiency is a concept that refers to the deliberate and structured reduction in energy consumption [14]. It describes a situation where everyone has access to all the energy services they need and a fair share of the energy services they want, while, at the same time, the impacts of the energy system do not exceed environmental limits [15]. Sufficiency differs in this sense with the notion of efficiency. Energy efficiency involves using technology to achieve the same level of service with less energy, such as shifting from traditional gasoline cars to electric vehicles (EVs), which convert more energy into movement and less into waste heat. In contrast,

energy sufficiency focuses on reducing overall energy demand by changing behaviour and usage patterns, like reducing car use by opting for public transportation, carpooling, or using smaller, less energy-intensive cars. Efficiency relies on technical innovation, while sufficiency relies on social innovation and a reflection around basic human needs [16]. Both notions are inseparable, mainly because sufficiency is what makes efficiency work and prevents a rebound effect (efficiency gains transferred to other uses or consumption) [17]. Referring to the Sufficiency, Efficiency and Renewables (SER) framework developed by a French NGO [18], the IPCC 2022 [19] report defines sufficiency as “avoiding the demand for materials, energy, land, water and other natural resources while delivering a decent living standard for all within the planetary boundaries” [19,20]. It further insists that “the SER framework introduces a hierarchical layering, sufficiency first followed by efficiency and renewable” [19,21]. Energy sufficiency introduces a tangible aspect to energy management. It shifts our focus from automatic energy availability to deliberate choices. For energy sufficiency to be meaningful, it requires political discussions on equitable resource sharing. Such collective and individual dialogues aim to reduce energy use fairly. In this context, energy sufficiency becomes a political tool for democratic resilience, especially during energy crises [22].

Energy sufficiency in sustainable tourism refers to the conscious and effective use of energy resources throughout the travel experience. It involves making choices that optimize energy consumption to minimize negative environmental impacts and reduce the carbon footprint associated with travel. This means promoting low-energy activities, encouraging tourists to stay longer in one place to reduce transportation energy, promoting local tourism to reduce long-distance travel, encouraging the use of public transportation, promoting off-peak travel to reduce energy demand during peak times, and designing tourist accommodations to be more energy-efficient [6,23]. NègaWatt distinguishes four ways of implementing sufficiency as follows [24]:

Structural sufficiency, which consists of creating, in the organization of space or our activities, the conditions for moderating our consumption. For a tourism destination, this could mean developing integrated transport networks that connect hotels, attractions, and residential areas, making it easy for tourists to move around without needing a car. For a ski resort, this could mean ensuring that ski lifts, accommodation, and dining areas are all within walking distance.

Sufficiency in terms of size, which concerns the right-sizing of facilities in relation to their conditions of use. For a ski resort or hotel company, this might involve right-sizing facilities to match actual usage patterns. For instance, building smaller, more energy-efficient hotels that meet the needs of guests without excess space, or limiting the number of ski runs to those that are most frequently used.

Sufficiency of use, which involves reducing energy requirements by changing the way equipment is used. For a tourist destination, this could mean reducing lighting in public areas during off-peak hours or using energy-efficient heating systems that adjust based on occupancy.

User-friendly or cooperative sufficiency, which involves sharing facilities and their use. For a tourism destination, this could involve sharing resources and facilities. For example, hotels could share conference rooms and recreational facilities with each other, or a community could develop shared transportation options like shuttle buses that serve multiple hotels and attractions.

Sufficiency can also be considered under different scales of actions [25]: the micro level refers to the different consumption practices of individuals; the meso level refers to all initiatives (citizen, collective, institutional, private, public, other) that aim to deploy limited

means to meet the basic needs of a community; the macro level refers to the societal projects and policies carried forward by various stakeholders, which are to be defined politically.

These criteria allow us to represent energy sufficiency in tourism destinations through a bi-dimensional table (Table 1).

Table 1. Sufficiency matrix: Examples of energy sufficiency measures in the tourism sector.

Level/Dimension	Structural Sufficiency	Sufficiency in Terms of Size	Sufficiency of Use	User-Friendly or Cooperative Sufficiency
Micro (Individual)	Travel locally, to places that do not rely on fossil fuel transportation.	Reduce accommodation, luggage, or transportation size	Reduce the use of lifts or thermal vehicles.	Use public transportation or car-sharing to travel to the destination
Meso (Community/Collective)	Developing integrated public transport networks to reduce car dependency.	Reduce the size of tourism infrastructure (e.g., smaller accommodation space) and building area (densify).	Reduce the use of public lighting; adapt timetable and opening hours of ski lifts.	Establishing shared recreational facilities and public transport. Supporting equipment rental, maintenance and upcycling.
Macro (Societal/Policy)	Marketing strategies that target proximity tourists. Urban planning policies that promote mixed-use developments to reduce travel distances.	Enforcing building codes that require right-sizing of commercial and residential buildings.	Campaigns to promote energy-saving behaviours, like adjusting the thermostat.	Policies encouraging the sharing economy, such as car-sharing programs and co-working spaces.

Applying the concept of energy sufficiency in tourism implies addressing degrowth strategies [26,27]. The concept of degrowth has been discussed in the field of tourism as a broader socio-economic concept that challenges the imperative of continuous economic growth [17,20,27–29]. The degrowth perspective advocates for reducing the scale of tourism activities to minimize environmental impacts and promote sustainability, by promoting fundamental changes in practices, policies, and business models to align with the principles of ecological sustainability, social justice, and cultural preservation [26,28,30]. Degrowth has been addressed by grassroot movements such as the Neighbourhood Assembly for Tourist Degrowth (ABDT) in Barcelona [31] and Protect Our Winters (POW) in North America and Europe [32]. Protect Our Winters (POW) advocates for degrowth in mountain tourism by promoting sustainability and equity through reduced consumption and production. They use educational campaigns, political lobbying, and athlete ambassadors to shift social perceptions and encourage sustainable practices in the tourism industry. In 2023, POW Switzerland launched several political initiatives, including a voter turnout campaign, the Climate Protection Act for carbon neutrality by 2050, the Swiss Outdoor Coalition, and a petition to pressure the International Ski Federation on climate measures [33].

Energy sufficiency and degrowth are both concepts that share a common goal of reducing emissions/environmental impact and promoting sustainability. They emphasize the need for systemic changes rather than relying solely on efficient technological solutions [12]. Enhancing efficiency to reduce per capita emissions does not always lead to overall emissions reductions in sectors like tourism, where anticipated growth can outpace efficiency gains [34]. Both approaches advocate for a shift in values and behaviours to achieve a more sustainable and equitable society. Energy sufficiency focuses specifically on reducing energy consumption, while degrowth addresses a wider range of economic and social practices, including tourism.

Our research employs the concept of “framing” [35] taken from cybernetics [36], a form of public policy cognitive analysis [35,37] used to comprehend how stakeholders validate or challenge the idea of “sufficiency” within the energy transition discourse. The process of framing is understood as the discursive efforts made by groups of people to shape shared understandings of the world and themselves, which legitimize and motivate collective

action [35,38,39]. People's perceptions of different forms of sufficiency are significantly influenced by how engagement with sufficiency is portrayed (Brown, 2013) [40]. Perceptions of sufficiency measures can vary significantly depending on one's perspective. Individuals with a more liberal and individualistic orientation may view such measures as overly restrictive, whereas others may perceive them as liberating from consumer dependence, as promoting conviviality, or even as a public luxury. Promoting sufficiency in the tourism industry requires framing the desired changes in ways that resonate with and gain widespread cultural acceptance (Klintman, 2006) [41]. This study seeks to answer the following research question: "How is energy sufficiency framed by stakeholders in mountain tourism destinations, and what strategies can be employed to reframe it as a viable concept for the energy transition in high-end tourism contexts like Verbier—Val de Bagnes?"

By investigating the cognitive framings of energy sufficiency among key local actors and proposing reframing strategies, this study contributes to the broader conversation on sustainable tourism, degrowth and energy transition in Alpine regions.

3. Materials and Methods

Our research explores the impact of energy sufficiency narratives in a Swiss ski resort. We conducted an in-depth qualitative analysis to understand how local stakeholders navigate the balance between energy transition and sufficiency as a tool to achieve it. Co-creation workshops were carried out with stakeholders as well as participant observations at several events and meetings. The methods were applied using a living lab approach [42] in an effort to orchestrate an open, collaborative and co-creative environment amongst the stakeholders and to learn more about how to reframe sufficiency. Energy sufficiency is examined within the context of the destination's energy constraints and tourism-related economic activities.

While our study does not employ probability sampling, it provides rich qualitative, contextual data that can inform broader discussions and inspire further research. We acknowledge that our findings are specific to the case study of a top-tier Swiss alpine destination and may not be generalizable to the entire tourism sector. However, we encourage readers to consider the transferability of our findings to other settings with similar contexts. The limitations of our study are clearly stated, and we emphasize that the results should be interpreted with caution due to the non-probability sampling method used.

3.1. Case Study: Val de Bagnes

Val de Bagnes is a municipality in the Swiss Alps composed of a stunning valley known for its picturesque landscapes, characterized by rugged mountains, lush meadows, and charming alpine villages (Verbier, Bruson). Val des Bagnes' territory and tourism activities have already been assessed concerning different projects to support future sustainable development, revealing that individual cars, buildings and snow grooming were the biggest sources of GHG emissions, along with equipment and food supply. According to a recent report [43], in 2021, Val des Bagnes emitted 72 kt CO₂e, where 31.6 kt CO₂e was related to heating, 40 kt CO₂e to mobility, and 0.6 kt CO₂e to electricity consumption. Fossil sources provided 54% of the total energy. Heating consumption, which is highly impacted by heating oil, corresponds to 3 kt/person, which covers 36% of heating consumption while causing 82.6% of emissions. The electricity consumption corresponds to 0.1 t/resident, which is mainly employed for heating and sourced mainly from hydropower sources (both local and imported). Ultimately, the mobility sector's carbon footprint corresponds to 3.9 t/resident, where 72% belongs to car transportation, 21% to air transportation, and 4.7% to snow grooming. Almost all local and tourism vehicles accessing Val des Bagnes are based on fossil fuels (93%). The project Smart Altitude in Val des Bagnes provided insight

into the principal enterprise carbon footprint of the ski resort through its report [44]. The project explored different components of the ski resort activities, highlighting the impact of snow grooming among others, as summarized in Table 2.

Table 2. Energy and emissions from resort productive system. Summary of energy consumption and GHG emissions across activities related to the ski resort managed by Téléverbier SA.

	Energy Consumption	GHG Emission
Snow grooming	37%	77%
Ski lift	35%	19%
Buildings	21%	3%
Snowmaking	7%	1%

3.2. Semi-Structured Interviews

To complement these structured discussions, we selected key stakeholders from different sectors of the tourism productive system in the region, based on their high energy consumption and their roles in the tourism ecosystem (Table 3). The interviewee sample consisted of eight stakeholders from the destination, each providing unique insights into the energy sufficiency landscape in Verbier, Val de Bagnes (VB).

Table 3. Semi-structured interviewee sample.

Type of Actor	Gender	Job Position	Date and Place of Interview
Cantonal Energy Expert	Female	Co-director/Project Manager	October 2023—Virtual meeting
Ski Lifts company	Female	Chief commercial officer	October 2023—Local coffee Shop at VB
Municipality	Female	Delegate for sustainable development	October 2023—Virtual meeting
Energy provider	Female	Project Manager—Facilitator on energy renovations	November 2023—Virtual meeting
Financial entrepreneur/Philanthropy	Male	Founder and CEO financial venture	December 2023—Local coffee shop at VB
Municipality	Male	Delegate for economic promotion	January 2024—Virtual meeting
Entrepreneur	Female	Co-founder Head of sustainability and business development	February 2024—Company facilities at VB
Tourism economic local actor	Male	Founder and CEO of own company Vice-president of development society	February 2024—Company facilities at VB

3.3. Co-Creation Workshops and Participant Observations

In line with the collaborative approach, we established a monitoring group with key stakeholders of the destination interested in low-carbon tourism planning, including representatives of the municipality, of the local energy provider, an executive of the ski lift company, and staff from the tourism office. Starting in July 2022, we organized trimestral gatherings with this group to collect and disseminate information on the energy transition, specifically focusing on the notion of energy sufficiency in Val de Bagnes. With this group, we had the opportunity to test several co-creation tools to explore aspects of energy and climate change in a constructive way. On one occasion, we used the Futures Wheel method [45] to visualize and discuss the potential impacts of an energy crisis on the ski resort, considering both immediate and long-term consequences of an energy shortage and contingency restrictions. On another occasion, we tested a pilot version of a climate education game (The Mountain Tourism Fresco) to explore tourism causes and consequences of

climate change in the destination. These workshop settings allowed us to explore different narratives of sufficiency and possible re-framing strategies.

Participant observations in local events were also very valuable to collect insights and narratives on sufficiency in a contextualized, non-directive way (Table 4). The public conference “*Les changements en marche*” [Changes in Progress], organized in September 2024 by the municipality in collaboration with a local youth association, offered valuable contextual insights, as it dealt specifically on the topic of sufficiency. Additionally, observations at the private conference “*Verbier Summit*” (March 2024), dedicated to climate finance and the green economy, were particularly useful to approach Verbier’s entrepreneurial community and assess their understandings of sustainability and sufficiency.

Table 4. Summary of participant observations.

Name of Event	Description	Date	Place	N° of Participants
Futures Wheel Workshop	Workshop using the Futures Wheel method to explore the potential impacts of an energy crisis on the ski resort.	October 2023	Le Chable, Municipality	~10
Mountain Tourism Fresco	Pilot workshop for a climate education tool focused on the causes, consequences, and adaptation and mitigation solutions for climate change in mountain tourism.	March 2024	Le Chable, Industrial services	~16
Verbier Summit	Private conference co-organized with a Swiss bank focused on climate finance, philanthropy and green economy, attended mostly by international and finance stakeholders.	March 2024	Verbier, Private Hotel	~80–100
PPE Durable (Multi-unit property renovations)	Various local gatherings focused on communication, energy renovations, and facilitation of procedures for multi-unit property funding options, and a focus on local governance. Conformed by local actors (architects, municipality, industrial services). ¹	December 2023 February 2024 April 2024	Le Chable, industrial services	~08–14
Les changements en marche	Public conference on energy sufficiency organized by the municipality, industrial services, and local youth association.	September 2024	Le Chable	~50–70

¹ Energithèque—Valoriser et rendre ma PPE durable “Title of the Document”, FlippingBook, <https://online.flippingbook.com/view/809274740/3/>, accessed 17 October 2024.

4. Results

4.1. Futures Wheel: Impacts of an Energy Supply Crisis

During one of the meetings with cooperation partners, we applied the Futures Wheel method to the OSTRAL Contingency Plan. Managed by the Organisation for Power Supply in Extraordinary Situations (OSTRAL), this plan emerged in 2022, following the war in Ukraine and consecutive energy crisis shortages, to address potential electricity shortages in Switzerland (“OSTRAL—Measures for Electricity”, Federal Office for National Economic Supply (FONES), <https://www.bwl.admin.ch/bwl/fr/home/bereiche/energie/massnahmen/elektrizitaet/ostral.html>, accessed 17 October 2024). This plan included several levels of emergencies and restrictions to ensure a stable power supply during crises. One of them (level 3) included a “ban on the use of snowmaking installations”. This event was imagined during peak season, in Christmas, when energy supplies are rather low in Switzerland, while energy (and tourism) demand is high. Applying the Futures Wheel

method [45], we invited participants (representatives of the municipality, the lift company and the tourism office) to think about possible impacts. These impacts were then further explored to identify direct and indirect consequences, categorized as positive, negative, or neutral.

By using the Futures Wheel with this (hypothetical) OSTRAL restriction imposed by the federal government, we were able to introduce the concept of (forced) sufficiency and visualize the potential impacts of drastic reductions in energy use in the ski resort, considering both immediate and long-term consequences. Initially, there was aversion among participants, as they imagined that the destination's structure was incompatible without the ski resort in operation, leading to negative outcomes and potential burnout of their tourism system. However, as the workshop progressed, brainstorming led to the emergence of different future scenarios, including positive outcomes such as energy savings, new low-carbon trends for customers, adapted governance, diversification of practices, and a new seasonality of tourism activity. This exercise highlighted that energy sufficiency, when framed under unique circumstances like an energy crisis, could reveal alternative pathways. Key stakeholders, who rely on the ski resort as the backbone of their offerings, realized that there could be other ways to thrive as a destination. Figure 1 shows how the exercise was completed with different direct and indirect (negative, neutral, positive) outcomes.

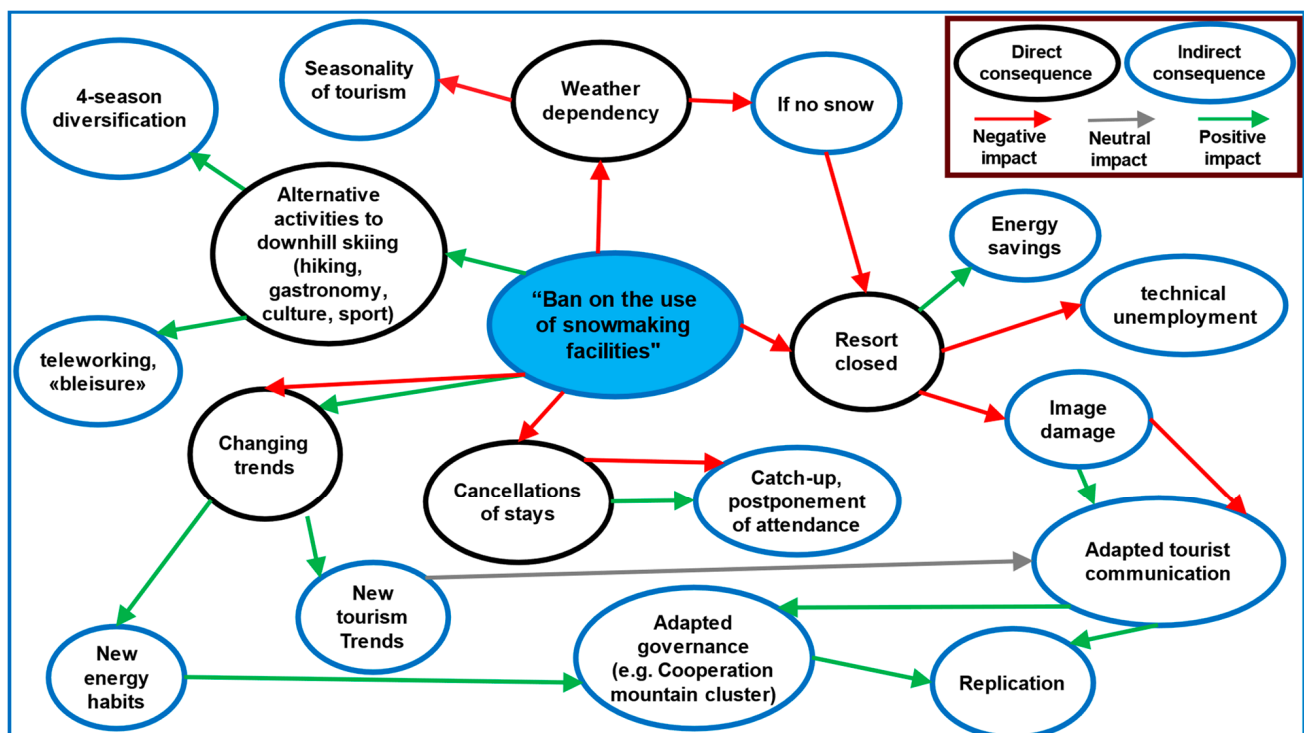


Figure 1. Futures Wheel results.

4.2. Mountain Tourism Fresco

During the Mountain Tourism Fresco workshop, a climate education game designed to raise awareness about climate change in alpine destinations and co-create solutions, the concept of “energy sufficiency” was addressed through various practical measures. This workshop created by our research team was conducted in collaboration with cooperation partners from the destination. Notably, the serious game includes a specific card on energy sufficiency, which guided participants in thinking about possible sufficiency measures in the destination. Participants initially considered energy sufficiency in the

context of buildings, proposing the reduction in heating in non-critical spaces such as ski rooms and second homes. The discussion then expanded into marketing strategies, emphasizing the importance of targeting proximity markets over long-distance tourists to minimize energy consumption associated with travel. Additionally, participants explored the potential for adjusting ski lift operating hours and dates to further conserve energy, though they acknowledged potential resistance from other tourism stakeholders to such changes (<https://sweet-lantern.ch/discover-the-mountain-tourism-fresk-developed-through-the-sweet-lantern-programm/> accessed on 17 October 2024).

4.3. Tourism Stakeholders' Take on Energy Sufficiency

The notion of energy sufficiency was addressed in semi-structured interviews with eight relevant stakeholders from the destination. Table A1 Appendix A offers a comprehensive breakdown of the actors involved in the tourism ecosystem in Verbier—Val de Bagnes and their various cognitive frameworks related to energy sufficiency. The results reveal how different research participants, each with their specific roles and challenges, interpret and respond to the concept of sufficiency. The statements of the research participants reveal cognitive frameworks that are prevalent across organizations but exhibit variability within each organization depending on their role and personal opinions.

4.3.1. Municipality

The municipality plays a central role as an institutional actor responsible for implementing policy and coordinating the energy transition. There are different interpretations and priorities within the municipality depending on local departments. For this research, we interviewed local civil servants and representatives in charge of sustainability, communication, and economic development. Sufficiency is often considered as a form of imposed restriction, which may contradict the liberal opinions of the political majority (At the time of the study, The Liberals (PLR) was the dominant party in Val de Bagnes.). The municipality recently named a sustainable development delegate who is particularly receptive to sufficiency challenges. The municipality also engages in intersectoral planning, integrating environmental and socio-economic factors. Instead of imposing this notion, their primary focus is to set an example, ensuring that new policies on sufficiency are incorporated. One of the key challenges they face is managing the expectations of visitors and second-home owners, who often seek comfort and luxury, making it difficult to enforce energy-saving measures.

4.3.2. Energy Supplier—Industrial Services

The Energy Supplier in Val de Bagnes is the primary actor that recognizes energy sufficiency as a useful tool in the energy transition. Drawing inspiration from the Industrial Services of Geneva (SIG) and other energy programs, the energy supplier has recently introduced sufficiency as a strategy to navigate energy constraints and encourage sustainable energy use. Their user-centred programs provide essential resources and guidance to local actors and ensure that energy-saving behaviours become a central topic among local inhabitants.

4.3.3. Ski Lift Company

As a key actor in maintaining Verbier's status as a top-tier ski destination, the Ski Lift Company faces unique challenges. They must balance their private ambition for growth with their responsibility to reduce emissions. As a major energy consumer, they comply with the OSTRAL Plan, but they also see sufficiency as a cost-reduction opportunity, improving energy efficiency through lift speed monitoring and optimizing unused spaces. However, the company's growth ambitions, which include increasing tourism numbers

and expanding their offerings, are sometimes at odds with sufficiency goals, especially in the context of emissions reduction.

4.3.4. Hoteliers

Hoteliers in Verbier show a wide variety of responses to energy sufficiency. They typically lack a cohesive strategy for energy management and instead adopt individual adaptation strategies. Hoteliers recognize the importance of environmental sustainability but are often constrained by the competitive landscape, making it difficult to formulate a unified vision for carbon emission reduction. While some hotels highlight their efforts to promote eco-friendly services such as soft mobility, energy sufficiency is often viewed as a threat to service quality, particularly in a luxury destination like Verbier. However, some hoteliers independently comply with sustainability practices, even if they are not legally mandated to do so. Their take on sustainability is often limited to aspects of local management and fail to consider long-distance mobility and geographic origin of tourists as a scope of action.

4.3.5. Skiwear Rental Company

We interviewed executives from a local shop involved in skiwear rental and circular economy. They represent an innovative and resilient actor in the mountain tourism ecosystem. They are engaged in applied research to assess the life cycle of products, such as textiles, and are actively working to decouple their business practices from high energy consumption. The company recognizes energy sufficiency as an opportunity for regional development, especially by promoting shorter economic circuits and quality enhancement. Their efforts include offering lightweight, premium second-hand textiles and efficient delivery systems, which contribute to lowering the environmental impact of good consumption in travel and tourism activities. Their disruptive business model is not yet entirely understood by local stakeholders and they are looking for additional market segments.

4.3.6. Tourism Office

For the local Tourism Office, the main challenge is balancing sustainability with maintaining Verbier's high-end image. They are tasked with developing new strategies to attract year-round tourism, but they must also follow their commitment to CO₂ reduction. This balance is complicated by the fear of greenwashing, as promoting sufficiency in a luxury setting like Verbier may conflict with the expectations of affluent tourists. Additionally, there is resistance from partners in the tourism sector, who often perceive radical changes as risky. Therefore, the tourism office seems caught between maintaining Verbier's elite reputation and advancing the goals of the climate transition.

4.4. Analysis: Framing Categories of Energy Sufficiency

This section presents the various ways energy sufficiency is perceived, framed, and acted upon by different stakeholders in Verbier—Val de Bagnes. These framings emerged during interviews, participatory observations, and document analyses, and are crucial to understanding the cognitive and social landscape of energy sufficiency within this tourism-dependent area. The results highlight a range of interpretations, from outright rejection to strategic integration, showcasing the complexity of implementing energy sufficiency in this high-end tourism destination. As outlined in Table 3, the concept of energy sufficiency was framed by stakeholders into five main categories and eleven sub-categories. These framings help us understand how energy sufficiency is processed and integrated—or not—into the daily operations of tourism-related businesses, public authorities, and local citizens. Below is an in-depth discussion of each framing, their relationships with the broader theoretical

concepts of energy sufficiency, and their implications for tourism management in mountain resorts like Verbier.

4.4.1. Off-Framings

This first category reveals a lack of understanding or misinterpretations of sufficiency. Unawareness was most commonly observed among private actors and lay citizens. Many stakeholders admitted they had “never heard of the concept” of energy sufficiency, a surprising finding in a region increasingly affected by energy constraints. This unawareness indicates a disconnect between high-level discussions about energy transition and the lived reality of tourism stakeholders. This framing can be linked to the earlier discussion of energy sufficiency as a voluntary reduction in energy demand, which, despite its growing importance in policy circles, has not penetrated the everyday consciousness of the population. The theoretical framework suggested that sufficiency is a tool for achieving well-being within planetary limits, but this tool is ineffective if the concept itself is not understood. The lack of familiarity poses a fundamental barrier to the implementation of sufficiency measures in the region.

Misconception emerged as another significant framing, particularly among lay citizens. Many participants confused sufficiency with energy efficiency or recycling, viewing it as synonymous with reducing consumption through technological solutions rather than behavioural changes. This confusion illustrates the difficulty of communicating the distinct concept of sufficiency, which, as described in the theoretical framework, focuses on reducing energy demand, not just using energy more efficiently. This framing underscores the need for better education and communication about the difference between sufficiency and efficiency. The misconception risks undermining sufficiency efforts by conflating it with more familiar concepts like efficiency, which, while valuable, do not address the deeper behavioural changes required for genuine sufficiency.

4.4.2. Oppositional Framings

These framings reflect resistance to sufficiency, often associating it with loss or contradictions to current tourism models.

Aversion was identified primarily among entrepreneurs and private actors who perceived sufficiency as a threat to business operations. For them, sufficiency was associated with a “decline in quality of life and services”. This reaction is particularly prominent in a high-end tourism destination like Verbier, where the clientele expects premium services. This aversion is consistent with the contradiction between sufficiency and the notion of luxury, as discussed in the introduction. Verbier’s positioning as a destination for the global elite—who “consume and move as they please”—seems incompatible with the restraint required by energy sufficiency. This contradiction underscores the challenge of promoting sufficiency in contexts where consumption and affluence are symbols of status. The framing of sufficiency as a limitation reveals the tension between economic imperatives and environmental sustainability, and how the former often overrides the latter in practice.

The category of contradiction was also observed among tourism entrepreneurs and lay citizens, who viewed sufficiency as fundamentally at odds with Verbier’s premium market position. One stakeholder noted, “In Verbier, you are leading with the top of the pyramid, some of the richest people on the planet who consume as they please. Sufficiency is the opposite”(interview with hotel owner). This framing exposes the cognitive dissonance between the luxury tourism model and the principles of energy sufficiency. While sufficiency advocates for reducing overall consumption, Verbier’s business model is built on providing abundant services and experiences, often with high energy demands. The contradiction between these two visions makes the implementation of sufficiency measures

more challenging and highlights the difficulty of aligning sustainable tourism strategies with the realities of luxury consumption.

Among entrepreneurs and high energy consumers, the framing of denial was prevalent. Stakeholders acknowledged that sufficiency was discussed during the winter 2022 energy crisis but noted that “There were debates of sufficiency when there was a risk of a blackout, but now it’s no longer a problem” (Energy expert). This short-term view exemplifies how energy sufficiency is often only considered during moments of crisis and then forgotten once the immediate threat passes. This pattern aligns with the literature on energy sufficiency that argues it should be a long-term strategy for reducing energy demand, not just a crisis-management tool. The OSTRAL Contingency Plan, referenced in the previous section, was designed to address energy shortages, yet this framing reveals that such plans are often seen as temporary solutions rather than opportunities for structural change. Denial of the long-term relevance of sufficiency weakens its potential to contribute meaningfully to the energy transition in tourism-heavy regions like Verbier.

4.4.3. Selective Framings

In this category, sufficiency is avoided or replaced with terms more compatible with growth-focused paradigms.

Energy and technical experts often eluded the notion of sufficiency by replacing it more palatable terms like “energy management” or “optimization”, which are more compatible with the techno-economic paradigms that dominate discussions about energy in tourism. By reframing sufficiency in technical terms, stakeholders avoid confronting the social and behavioural dimensions of energy reduction. Such elusive framings are particularly problematic as they prevent the potential for sufficiency to serve as a political principle, as suggested by Villalba (2018) [22]. Sufficiency requires a shift in both mindset and practice, but its potential is diluted when it is reduced to a purely technical exercise. By avoiding the political and social implications of sufficiency, stakeholders miss the opportunity to engage in a more democratic and equitable energy transition.

The framing of staged simplicity was most commonly observed in tourism marketing, where sufficiency was branded as part of a “less is more” holiday experience. For example, advertisements offered tourists the chance to “reconnect with life’s essentials” through immersive stays in the natural beauty of Haut Val de Bagnes (<https://www.verbier.ch/summer/inside/inspiration/holiday-ideas/less-is-more-holiday/>, accessed on 14 October 2024). This framing reflects a commodification and branding of sufficiency, turning it into a selling point for high-end tourists who seek “authentic” and eco-friendly experiences. While this approach may align with certain aspects of energy sufficiency—such as reducing energy demand by promoting slower, simpler tourism—it risks being perceived as greenwashing if it does not lead to substantial reductions in energy use. Energy sufficiency, as discussed earlier, emphasizes the need for structural change rather than superficial shifts in consumption patterns, and the “staged simplicity” framing may fall short of this deeper transformation.

4.4.4. Disempowering Framings

These framings deflect responsibility for sufficiency to others or reduce it to minor individual actions.

The deferring responsibility framing was prevalent across both private and public actors, as well as among citizens. Many stakeholders expressed that energy sufficiency strategies should be handled by others, leading to a “triangle of inaction” (The triangle of inaction is a concept used to describe a situation where three key groups—citizens, businesses, and the state—each blame the others for the lack of action on important issues,

such as climate change. This mutual finger-pointing creates a stalemate where no group takes responsibility, leading to inaction), where no single actor takes accountability for reducing energy demand. The “Triangle of Inaction” describes a situation where government, businesses, and citizens each expect the others to take the lead, resulting in a lack of progress. “it’s to the politicians to set the example and lead the energy transition properly. . .” (Private actor). This framing aligns with the cognitive dissonance observed in the theoretical framework. When sufficiency is viewed as someone else’s responsibility, the collective action required for meaningful change becomes fragmented. This framing also reinforces the challenges posed by multi-level governance in tourism destinations, where responsibilities are shared between various public and private entities, often leading to inaction.

The category of individual eco-gestures was prominent among public actors, energy experts, and citizens. Examples of small actions, such as “putting lids on pans” to save energy, were frequently cited as ways to engage with sufficiency on a personal level. While these gestures are undoubtedly positive, they tend to put the onus on individuals and distract from the larger, systemic changes needed to implement sufficiency at scale. This framing resonates with the discussion of sufficiency as a political and collective tool [22], which requires more than just individual actions.

4.4.5. Institutional Framings

This category involves formal obligations or principles related to energy sufficiency.

Sufficiency, in some cases, was framed as a legal constraint, particularly through the OSTRAL Contingency Plan. Public actors and the OSTRAL taskforce viewed sufficiency as a necessary response to legal mandates during energy shortages. This framing reveals the top-down nature of energy sufficiency in the context of energy crises. While such mandates are effective in the short term, they often fail to inspire voluntary, long-term commitment to sufficiency measures. The framing of sufficiency as a legal obligation also contrasts with the voluntary and democratic vision of sufficiency described earlier in the article.

Sufficiency was sometimes interpreted as a planning principle that inspired recent regional and national legislations, such as the Lex Weber, also known as the Second Homes Act (2016) [46], which limited the proportion of secondary residences in each Swiss municipality to 20% of the total housing stock, and the 2018 revision of the Swiss Federal Law on Spatial Planning, which aimed to ensure sustainable land use and prevent urban sprawl by prioritizing development within—or even reducing—existing building zones. This reinterpretation of existing regulations through the lens of sufficiency suggests that sufficiency is not inherently a novel concept. Rather, it already permeates existing policies and practices implicitly, without being explicitly articulated.

5. Discussion: Recommendations for Re-Framing Energy Sufficiency

To move beyond the limiting framings of energy sufficiency, we propose several re-framing strategies designed to reshape existing perspectives and representations by giving new meaning to the concept. Reframing involves consciously reinterpreting elements to align them with fresh goals or contexts, creating an understanding that resonates more effectively with stakeholders [40]. These strategies, summarized in Table 5, aim to recontextualize sufficiency in ways that enhance its attractiveness, feasibility, and alignment with the objectives of various stakeholders.

Table 5. Reframing sufficiency. Summary of definitions of categories and re-framing strategies to fit destinations principles.

Framing Category	Framing Sub-Category	Definition	Re-Framing Strategy
Oppositional Framings	Aversion	Sufficiency associated with decline, loss of quality of life and service	<ul style="list-style-type: none"> • Highlight economic and social benefits • Define transition pathways and intermediary steps
	Contradiction (with Verbier premium positioning)	<p>“In Verbier you are leading with the top of the pyramid, some of the richest people of the planet, who consume and move as they please. Sufficiency is the opposite”</p> <p>Sufficiency is not compatible with the destinations model of development based on growth</p>	<ul style="list-style-type: none"> • Reward low-carbon practices rather than punish/expose energy-intensive ones • Economic elites, local resilient entrepreneurs, and practices as example-setters, influencers
	Denial	<p>“There were debates of sufficiency when there was a risk of a blackout, but now it’s no longer a problem”</p> <p>Sufficiency is no longer something to concern due to greater efficiencies and renewable energy</p>	<ul style="list-style-type: none"> • Raise awareness among citizens • Climate change is real, risks of energy shortage are real
Off-Framings	Unawareness	Notion of energy sufficiency is not known	<ul style="list-style-type: none"> • Problem setting • Climate literacy • Carbon assessment
	Misconception	Energy sufficiency as synonym of efficiency or recycling and sharing identified to reduction in consumption	<ul style="list-style-type: none"> • Clarify definitions and differentiate with other concepts • Reducing energy needs, rather than increasing performance
Selective Framings	Elusion	Sufficiency is replaced by terms like “energy management” or “optimization”, more compatible with techno-economic paradigms	<ul style="list-style-type: none"> • Eluding the term “sufficiency” may be an option to work around resistance
	Staged simplicity	“Less is more”: Low carbon tourism offers directed to a much more concerned public concerning sustainability.	<ul style="list-style-type: none"> • Integrate energy sufficiency in the destination’s communication strategy • Sufficiency as part of the travel experience (slow tourism, agritourism, etc.)
Disempowering Framings	Deferring responsibility	Energy sufficiency strategies rely on other actors than me. “Whataboutism”. Triangle of inaction. (describe)	<ul style="list-style-type: none"> • Bringing citizens, businesses and elected politicians together around the same table • Develop a common vision while defining roles
	Individual eco-gestures	The concept is interpreted as individual behaviours to spare energy through small actions	<ul style="list-style-type: none"> • Energy sufficiency as a collective strategy • Include sufficiency in planning documents and guidelines
Institutional Framings	Legal obligation (OSTRAL)	Obligations of some local actors due to their high energy consumers status that must have energy contingency plan in case of shortage	<ul style="list-style-type: none"> • Use risk of shortage and quotas as driving equitable efforts
	Planning principle	The Commune encourages energy sufficiency and renewable energies, in partnership with the energy supplier’s user-centred office (Energithèque)	<ul style="list-style-type: none"> • Coordinate existing projects enhancing synergies • Develop a common vision on the implications of the transition • Support and identify local resilient actors by assigning a pioneering role in the transition

One key approach to addressing unawareness is through education and engagement. Public campaigns, educational programs, and workshops can raise awareness about the benefits of energy sufficiency. Integrating the concept into local curricula further ensures its inclusion in public discourse. To combat aversion, sufficiency can be reframed as a tool for reducing operational costs while maintaining high service quality. Pilot projects in hotels or restaurants can demonstrate how sufficiency enhances efficiency without compro-

misgiving the quality of life. Contradictions can be addressed by redefining luxury to align with sustainability. Promoting eco-luxury allows destinations like Verbier to appeal to affluent tourists who value environmental responsibility, positioning sufficiency as part of a premium, eco-friendly lifestyle. Similarly, denial of the concept can be countered by encouraging stakeholders to view sufficiency as a strategy for long-term resilience. Highlighting its benefits in terms of energy security and sustainability reinforces its relevance beyond immediate crises. Misconceptions about sufficiency can be clarified through well-designed communication strategies that distinguish it from efficiency and other sustainability practices. Using visual aids, infographics, and case studies helps convey its unique aspects and broader implications. To address elusion, businesses can be encouraged to embrace sufficiency as a strategic pillar, integrating it into long-term planning as part of their corporate social responsibility efforts. The risk of staged simplicity can be mitigated by ensuring authenticity in sustainable practices. Tourism operators should offer genuine experiences that truly reduce energy consumption, supported by transparent sustainability metrics to avoid greenwashing. Deferring responsibility can be reframed as collective ownership, promoting collaborative governance models that involve public, private, and community stakeholders in decision-making processes. Focusing on systemic action rather than individual eco-gestures represents another vital reframing strategy. Encouraging stakeholders to move beyond symbolic actions to adopt broader behavioral changes helps reduce energy demand on a larger scale. Similarly, while legal obligations may be necessary during crises, sufficiency should be promoted as a voluntary, proactive measure. Showcasing the successes of early adopters can inspire broader voluntary engagement.

Finally, sufficiency should be integrated into regional and local planning as part of a broader sustainability framework. By embedding sufficiency into all aspects of tourism planning—from infrastructure to marketing—it becomes a natural component of a destination's long-term strategy. This integrated approach ensures that sufficiency is not just a peripheral concept but a central tenet of sustainable tourism development.

6. Conclusions

This study highlights the various ways in which energy sufficiency is perceived, framed, and either embraced or resisted by key stakeholders within the Verbier—Val de Bagnes tourism ecosystem. In addressing our research question—“How is energy sufficiency framed by stakeholders in mountain tourism destinations, and what strategies can be employed to reframe it as a viable tool for the energy transition?”—our findings suggest that while energy sufficiency is often misunderstood or rejected in luxury tourism contexts, it can be repositioned as a strategic resilient asset.

Through interviews, participatory observations, and co-creation workshops, we identified a spectrum of cognitive framings, ranging from unawareness to aversion, misconception, and denial, all of which reveal the complexities in adopting sufficiency as a guiding principle in tourism energy transitions. The results underscore the fact that, despite its potential, energy sufficiency remains a forgotten lever in the larger energy transition discourse, especially in contexts like big ski resorts, where tourism models are built around luxury, conspicuous spending and high energy consumption.

One of the key findings of this research is that many stakeholders misunderstand sufficiency, conflating it with energy efficiency or viewing it as an imposition or a threat to quality of service. As shown in our interviews, actors usually perceive sufficiency as incompatible with the destination's premium image. This framing of sufficiency as a constraint prevents meaningful engagement with the concept and reduces it to crisis-driven responses (as seen in the case of the OSTRAL energy contingency plan) or small, symbolic actions (individual eco-gestures). These framings fail to capitalize on the potential of

sufficiency to offer a more resilient, systemic approach to energy use that could actually enhance the long-term sustainability and attractiveness of destinations like Verbier.

To overcome these challenges, we propose re-framing strategies that position sufficiency not as a limitation, but as a strategic asset for tourism destinations. Verbier can maintain its elite status while embracing sufficiency by promoting low-carbon and authentic experiences that align with the growing demand for environmentally responsible tourism [28]. This could involve repositioning sufficiency as part of the modern luxury experience, where tourists value sustainable practices such as low-energy activities, efficient accommodation, and a stronger connection with nature (“Less is more”). In this sense, sufficiency could be presented as a positive and desirable attribute, rather than an effort or sacrifice.

Furthermore, the importance of communication frameworks is evident from our results. Stakeholders often struggled to understand sufficiency because it was poorly communicated or conflated with technical solutions like efficiency. For sufficiency to be genuinely embraced in mountain destinations, there needs to be a shift in how it is communicated—moving from abstract, technical jargon to narratives that resonate with the values of the community and the aspirations of tourists. As seen in the collaborative workshops (futures wheels and Mountain tourism fresco), when stakeholders were encouraged to explore alternative futures in a collaborative setting, new perspectives on sufficiency emerged. Through this approach, the living lab methodology showed some potential. Such participatory tools, combined with effective communication strategies, can help reframe sufficiency in ways that stakeholders see as viable and attractive.

This research opens the door to several important avenues for future inquiry. First, there is a need for more in-depth exploration of how reframing sufficiency can be operationalized in mountain tourism planning. This includes examining best practices from other regions and sectors that have successfully integrated sufficiency into their sustainability strategies. Additionally, further research is needed on the role of collaborative governance models, such as living labs, as identified in our study, to understand how citizens and public and private actors can co-create policies that incorporate sufficiency while maintaining economic viability.

Finally, the question of equity in the application of sufficiency in tourism destinations can be explored further. As tourism destinations like Verbier face increasing pressures to decarbonize, ensuring that sufficiency does not exacerbate existing inequalities—between locals and tourists, or between different economic actors—will be essential to its successful implementation. This implies that future research should also focus on the social dimensions of sufficiency and how it can be framed as not only an environmental solution but a socially just one [22].

In conclusion, energy sufficiency has the potential to become a powerful lever in the energy transition of mountain destinations. However, realizing this potential requires reframing sufficiency in ways that align with local values, ensuring that communication strategies resonate with the diverse actors involved, and fostering collective ownership of sufficiency goals. By embedding sufficiency into destination management strategies and rethinking the ways in which tourism can contribute to a sustainable future, mountain destinations—like Verbier—can explore energy transition pathways that are both environmentally responsible and viable in the long term. Furthermore, as Sahakian et al. (2024) [47] highlight, advancing energy sufficiency in cities and buildings requires understanding into how energy services are shaped by social practices, infrastructure, and institutional frameworks. This approach can be also applied to tourism destinations examining the narratives and rhetoric used by various stakeholders in key sectors such as buildings and mobility, identifying which discourses effectively drive behavioral changes and energy-

saving practices on both the supply and demand sides. Future research can explore how these sufficiency principles can be systematically applied to mountain tourism in coherence with their offer, infrastructure development, and mobility systems, fostering more resilient, equitable energy pathways.

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Appendix A

Table A1. Thematic analysis: Stakeholders' cognitive analysis for energy sufficiency.

Stakeholder	Characteristics	Cognitive Framework
Municipality	- Institutional actor: Responsible for policy implementation	- Confusion with efficiency: Often mistaken for efficiency, sufficiency is perceived as an imposition, potentially affecting citizens' well-being and public service quality
	- Intersectoral master planning: Coordinates and integrates various aspects and stakeholders, considering both environmental and socio-economic factors	- Equity considerations: Aims to avoid greenwashing and sets as an example before communicating new policies
	- Provides resources, guidance and assistance to local project developers	- Visitors and second homeowners: "Imposing energy sufficiency to tourists and seasonal residents can be challenging due to their desire for comfort and enjoyment"
Energy Supplier	- Pro-development (liberal) political positioning, which may contradict post-growth implications of energy sufficiency	Fear of communicating publicly about sufficiency, incompatible with the commune's political representations.
	- Technical expertise: Technical experts play a role in designing, implementing, and maintaining energy systems	The sole actor that directly uses and recognizes sufficiency as a tool: Interprets sufficiency as a useful tool for navigating the transition: Inspiration primarily coming from Industrial Services of Geneva (SIG) and "Swiss Energysavers"
	- Their expertise ensures efficient and sustainable energy practices - Notable Programs like: «Energithèque; Ma commune et Moi, Rendre mon PPE durable»	"Sufficiency was debated (politically) when there was the risk of an energy crisis. . . Now it is completely forgotten. . ."

Table A1. Cont.

Stakeholder	Characteristics	Cognitive Framework
Ski Lift company	<ul style="list-style-type: none"> - “Backbone of the destination”: Special attention thus investments regarding the quality of the service provided to stay competitive within other ski resorts - The company plays a significant role in maintaining the hole destination’s reputation and quality of service to remain competitive among other ski resort in Switzerland and worldwide - Challenge of growth: As a private society seeking growth and benefits, they face the dual challenge of expansion and emission reduction in their operations 	<ul style="list-style-type: none"> - Duty as a Large Consumer: Within the OSTRAL plan, sufficiency is seen as a responsibility due to their significant energy consumption - Cost Reduction Opportunity: The company recognizes sufficiency as an avenue to reduce operational costs. This includes optimizing lift speed, monitoring and minimizing energy consumption, and identifying unused spaces in their infrastructure - “We aim at increasing the number of tourists in the mountain, in an ambition to grow, we would like the company to expand the business (restaurant; hotels; cabins, etc.) to generate more profit. . .” - Recognition Gap: Sufficiency is either not acknowledged or perceived as a threat to the quality of hospitality services provided - Luxury Destination Dilemma: In a place like Verbier, renowned for opulence, sufficiency efforts may seem illogical and unjust - Communication through Sustainability: hoteliers highlight sustainable and “sufficient” offerings (such as soft mobility, eco-friendly amenities, and regional products) to convey their commitment to climate responsibility - Independent Compliance: “Hotel managers, don’t comply with guidelines or regulations concerning the hotel industry (waste management, energy consumption, etc.) . . . “We’re not obliged, and we don’t follow directives. We do it because we want to. . .”
Hoteliers	<ul style="list-style-type: none"> - Individual Adaptation Strategies: Hoteliers lack a specific strategy or action plan for large energy consumers within their segment. Instead, each establishment independently adapts to cater to a more environmentally conscious clientele - The competitive landscape, with multiple actors of varying sizes, complicates the formulation of a unified vision for carbon emission reduction 	<ul style="list-style-type: none"> - Imposition and Opportunity: view sufficiency as a demand-driven trend, but also recognize it as an opportunity for regional development through shorter circuits in the economy - Quality Enhancement: Sufficiency serves as an avenue to improve service quality. Lightweight travel, affordable high-quality second-hand textiles, and efficient delivery logistics contribute to this goal - “We need support from local and public actors for our business idea to spread. . .At the beginning we felt that the business idea was not of interest for the commune, due to non-standard business growth expectations. . .”.
Skiwear rental company	<ul style="list-style-type: none"> - Innovative and resilient actors willing to have an impact in the ski business - Applied research for sustainability: Engaged in life Cycle Assessment (LCA) of textile products by understanding how business parameters impact environmental performance, they can analyse and decouple practices within real-world business operations - Driving new Business Models: Ski wear shops contribute to creating new ski business models that enhance environmental performance. Their influence can help reframe how mountain tourism is consumed and practiced 	<ul style="list-style-type: none"> - Imposition and Opportunity: view sufficiency as a demand-driven trend, but also recognize it as an opportunity for regional development through shorter circuits in the economy - Quality Enhancement: Sufficiency serves as an avenue to improve service quality. Lightweight travel, affordable high-quality second-hand textiles, and efficient delivery logistics contribute to this goal - “We need support from local and public actors for our business idea to spread. . .At the beginning we felt that the business idea was not of interest for the commune, due to non-standard business growth expectations. . .”.

Table A1. Cont.

Stakeholder	Characteristics	Cognitive Framework
Tourism office	<ul style="list-style-type: none"> - Communication Challenges and Reputation Management: The tourism office grapples with potential media scandals, such as the snow groomer incident in Zermatt (November 2023) ¹. Balancing positive marketing communication with environmental concerns is a delicate task. Their reputation hinges on addressing these issues effectively - Dual Challenges for office: Develop new segments and strategies to attract high-standards tourists year-round. Simultaneously, they need to follow their commitment to sustainability and CO₂ reduction for their activities based on the Master Plan long term vision ² - Resistance to change among tourism Partners: Tourism partners often operate in a “business as usual” manner. Encouraging radical changes aligned with sustainability goals can be perceived as a risk for all interested parts 	<ul style="list-style-type: none"> - Navigating Greenwashing and Cognitive Dissonance - Luxury Tourism Context: Verbier’s luxury and high-class tourism context adds complexity, as sufficiency can clash with the high level of customer consumption. Jeopardizing the desired satisfaction of leisure time - Fear of Greenwashing: Communicating sustainable and sufficiency strategies involves navigating a sensible subject. “There’s a fine line between genuine commitment and mere greenwashing. . .” - Master Plan (MP) Gap: Sufficiency or Energy Transition it is not addressed in the MP strategic guidelines for sustainability - Imposition and Opportunity: For some tourism actors Sufficiency is seen as both a demand-driven trend and an opportunity for regional development, particularly in relation to local products and culture <p>Risk in Partner Communication:</p> <ul style="list-style-type: none"> - Communicating sufficiency or related strategies to partners carries risks. They might perceive sufficiency as conflicting with their core purpose. - On one hand, there is concern about potential declines in service quality. On the other hand, sufficiency could be seen as relinquishing consumption, which poses risks in an environment of unbounded growth for companies and common stakeholders

¹“Zermatt Ski World Cup to Go Ahead Despite Slope Encroachment”, SWI [swissinfo.ch](https://www.swissinfo.ch/eng/business/zermatt-ski-world-cup-to-go-ahead-despite-slope-encroachment/48950016), accessed 17 October 2024, <https://www.swissinfo.ch/eng/business/zermatt-ski-world-cup-to-go-ahead-despite-slope-encroachment/48950016>. ² “Master Plan Tourism”, Commune de Val de Bagnes, <https://ourverbier.ch/2023/12/master-plan-tourism-commune-de-val-de-bagnes-2024/>, accessed on 17 October 2024.

References

1. Lenzen, M.; Sun, Y.-Y.; Faturay, F.; Ting, Y.-P.; Geschke, A.; Malik, A. The Carbon Footprint of Global Tourism. *Nat. Clim. Change* **2018**, *8*, 522–528. [[CrossRef](#)]
2. World Tourism Organization (UNWTO); International Transport Forum (Eds.) *Transport-Related CO₂ Emissions of the Tourism Sector—Modelling Results*; World Tourism Organization (UNWTO): Madrid, Spain, 2019. [[CrossRef](#)]
3. World Economic Forum. *Travel & Tourism Development Index 2024*; World Economic Forum: Geneva, Switzerland, 2024. Available online: <https://www.weforum.org/publications/travel-tourism-development-index-2024/> (accessed on 10 October 2024).
4. Stefan, G. *Carbon Management in Tourism*; Routledge: New York, NY, USA, 2010. [[CrossRef](#)]
5. Scott, D.; Hall, C.M.; Stefan, G. *Tourism and Climate Change*; Routledge: New York, NY, USA, 2012. [[CrossRef](#)]
6. Gössling, S.; Higham, J. The Low-Carbon Imperative: Destination Management under Urgent Climate Change. *J. Travel Res.* **2021**, *60*, 1167–1179. [[CrossRef](#)]
7. World Tourism Organization (UNWTO) (Ed.) *Sustainable Mountain Tourism—Opportunities for Local Communities*; World Tourism Organization (UNWTO): Madrid, Spain, 2018. [[CrossRef](#)]
8. Einhorn, B.; Eckert, N.; Chaix, C.; Ravel, L.; Deline, P.; Gardent, M.; Boudières, V.; Richard, D.; Vengeon, J.-M.; Giraud, G.; et al. Climate Change and Natural Hazards in the Alps: Observed and Potential Impacts on Physical and Socio-Economic Systems. *Rev. Géographie Alp.* **2015**, *103–2*. [[CrossRef](#)]
9. Salim, E.; Ravel, L.; Bourdeau, P.; Deline, P. Glacier Tourism and Climate Change: Effects, Adaptations, and Perspectives in the Alps. *Reg. Environ. Change* **2021**, *21*, 120. [[CrossRef](#)] [[PubMed](#)]
10. Gilaberte-Búrdalo, M.; López-Martín, F.; Pino-Otín, M.R.; López-Moreno, J.I. Impacts of Climate Change on Ski Industry. *Environ. Sci. Policy* **2014**, *44*, 51–61. [[CrossRef](#)]
11. Perch-Nielsen, S.; Sesartic, A.; Stucki, M. The Greenhouse Gas Intensity of the Tourism Sector: The Case of Switzerland. *Environ. Sci. Policy* **2010**, *13*, 131–140. [[CrossRef](#)]
12. The Shift Project. *Voyager Bas Carbone: Rapport Final*; The Shift Project: Paris, France, 2022.
13. négaWatt Association. *The négaWatt Scenario 2022: English Summary*; négaWatt Association: Valence, Drôme, 2022.

14. Darby, S.; Fawcett, T. *Energy Sufficiency—An Introduction: A Concept Paper for ECEEE*; European Council for an Energy-Efficient Economy: Stockholm, Sweden, 2018. [CrossRef]
15. Sandberg, M. Sufficiency Transitions: A Review of Consumption Changes for Environmental Sustainability. *J. Clean. Prod.* **2021**, *293*, 126097. [CrossRef]
16. Steinberger, J.K.; Roberts, J.T. From Constraint to Sufficiency: The Decoupling of Energy and Carbon from Human Needs, 1975–2005. *Ecol. Econ.* **2010**, *70*, 425–433. [CrossRef]
17. Santarius, T.; Walnum, H.J.; Aall, C. From Unidisciplinary to Multidisciplinary Rebound Research: Lessons Learned for Comprehensive Climate and Energy Policies. *Front. Energy Res.* **2018**, *6*, 104. [CrossRef]
18. négaWatt Association. *The 2017–2050 négaWatt Scenario: Executive Summary*; négaWatt Association: Valence, Drôme, 2017. Available online: https://negawatt.org/IMG/pdf/negawatt-scenario-2017-2050_english-summary.pdf (accessed on 9 June 2024).
19. Cabeza, L.F.; Bai, Q.; Bertoldi, P.; Kihila, J.M.; Lucena, A.F.P.; Mata, É.; Mirasgedis, S.; Novikova, A.; Saheb, Y. Buildings. In *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*; Cambridge University Press: Cambridge, UK; New York, NY, USA, 2022; pp. 953–1048. [CrossRef]
20. Barkin, J.S. The Logic of Sufficiency. *Glob. Environ. Polit.* **2007**, *7*, 148–150. [CrossRef]
21. Intergovernmental Panel on Climate Change (IPCC). *Climate Change 2022—Impacts, Adaptation and Vulnerability: Working Group II Contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*, 1st ed.; Cambridge University Press: Cambridge, UK, 2023. [CrossRef]
22. Villalba, B.; Semal, L. *Sobriété énergétique: Contraintes Matérielles, Équité Sociale et Perspectives Institutionnelles*; Indisciplines; Éditions Quae: Versailles, France, 2018.
23. Cour des comptes. *Les Stations de Montagne Face Aux Changements Climatiques*; Cour des comptes: Paris, France, 2024. Available online: <https://ccomptes.fr/sites/default/files/2024-02/20240206-Stations-de-montagne-face-aux-changements-climatiques.pdf> (accessed on 10 October 2024).
24. Association négaWatt. *La Sobriété Énergétique, Pièce Cachée Mais Essentielle Du Puzzle d'un Accord Ambitieux et Équitable*; Association négaWatt: Paris, France, 2015. Available online: <https://negawatt.org/IMG/pdf/151209-cop21-presse-sobriete.pdf> (accessed on 17 October 2024).
25. Guillard, V.; Ben Kemoun, N. *Penser La Sobriété Matérielle*; ADEME: Angers, France, 2019. Available online: <https://librairie.ademe.fr/consommer-autrement/488-penser-la-sobriete-materielle.html> (accessed on 17 October 2024).
26. Dwyer, L. Tourism Degrowth: Painful but Necessary. *Sustainability* **2023**, *15*, 14676. [CrossRef]
27. Hall, C.M. Degrowing Tourism: Décroissance, Sustainable Consumption and Steady-State Tourism. *Anatolia* **2009**, *20*, 46–61. [CrossRef]
28. Hall, C.M.; Lundmark, L.; Zhang, J.J. *Degrowth and Tourism: New Perspectives on Tourism Entrepreneurship, Destinations and Policy*, 1st ed.; Series: Contemporary Geographies of Leisure, Tourism and Mobility, 2020; Routledge: Abingdon, Oxon; New York, NY, USA, 2021. [CrossRef]
29. Gascón, J. Tourism as a Right: A “Frivolous Claim” against Degrowth? *J. Sustain. Tour.* **2019**, *27*, 1825–1838. [CrossRef]
30. Blázquez-Salom, M.; Blanco-Romero, A.; Vera-Rebollo, F.; Ivars-Baidal, J. Territorial Tourism Planning in Spain: From Boosterism to Tourism Degrowth? *J. Sustain. Tour.* **2019**, *27*, 1764–1785. [CrossRef]
31. Milano, C.; Novelli, M.; Russo, A.P. Anti-Tourism Activism and the Inconvenient Truths about Mass Tourism, Touristification and Overtourism. *Tour. Geogr.* **2024**, *26*, 1313–1337. [CrossRef]
32. Turhan, E.; Demiroğlu, O.C. Degrowing Tourism: Can Grassroots Form the Norm? In *Degrowth and Tourism*; Routledge: London, UK, 2020; pp. 202–219.
33. Protect Our Winters Switzerland. *Rapport de Gestion 2023*; Protect Our Winters Switzerland: Zürich, Switzerland, 2023. Available online: https://www.datocms-assets.com/40721/1713776301-pow-ch_rapport_2023_fr.pdf (accessed on 22 September 2024).
34. Hall, C.M. Changing Paradigms and Global Change: From Sustainable to Steady-State Tourism. *Tour. Recreat. Res.* **2010**, *35*, 131–143. [CrossRef]
35. Muller, P. L’analyse cognitive des politiques publiques: Vers une sociologie politique de l’action publique. *Rev. Fr. Sci. Polit.* **2000**, *50*, 189–208. [CrossRef]
36. Rein, M. Primary and Secondary Reframing. *Cybern. Hum. Knowing* **2000**, *7*, 89–105.
37. Persson, O.; Klinton, M. Framing Sufficiency: Strategies of Environmental Non-Governmental Organisations towards Reduced Material Consumption. *J. Consum. Cult.* **2022**, *22*, 515–533. [CrossRef]
38. McAdam, D.; McCarthy, J.D.; Zald, M.N. *Comparative Perspectives on Social Movements: Political Opportunities, Mobilizing Structures, and Cultural Framings*, 1st ed.; Cambridge University Press: Cambridge, UK, 1996. [CrossRef]
39. Cherqui, A.; Bombenger, P.-H. La Transition Énergétique à Travers Le Prisme Des Espaces de Vie: Les Dynamiques de Recadrages Cognitifs Autour de Projets Éoliens En Suisse Occidentale. *Lien Soc. Polit.* **2019**, *82*, 96–117. [CrossRef]
40. Brown, M. A Methodology for Mapping Meanings in Text-Based Sustainability Communication. *Sustainability* **2013**, *5*, 2457–2479. [CrossRef]

41. Klintman, M. Ambiguous Framings of Political Consumerism: Means or End, Product or Process Orientation? *Int. J. Consum. Stud.* **2006**, *30*, 427–438. [[CrossRef](#)]
42. Mastelic, J.; Sahakian, M.; Bonazzi, R. How to Keep a Living Lab Alive? *Info* **2015**, *17*, 12–25. [[CrossRef](#)]
43. Navitas Consilium, S.A. *Bilan Carbone Société 2000W et Définition d'objectifs et d'orientations Stratégiques Énergie Climat Pour La Commune de Val De Bagnes*; Navitas Consilium SA: Le Châble, Switzerland, 2023.
44. Polderman, A.; Haller, A.; Pellegrini, C.; Viesi, D.; Tabin, X.; Cervigni, C.; Sala, S.; Trebušak, B.; Daragon, Q.; Ramette, D.; et al. *Smart Altitude*; Verlag der Österreichischen Akademie der Wissenschaften: Vienna, Austria, 2021. [[CrossRef](#)]
45. Glenn, J.C.; Gordon, T.J. *Futures Research Methodology*, 3rd ed.; Millennium Project: Washington, DC, USA, 2009.
46. Swiss Confederation. *Federal Act on the Swiss Financial Market Supervisory Authority (FINMASA)*; Federal Chancellery: Bern, Switzerland, 2007. Available online: https://lex.weblaw.ch/lex.php?norm_id=702&source=SR&lex_id=19580&file=en-pdf_file_a.pdf (accessed on 17 October 2024).
47. Sahakian, M.; Fawcett, T.; Darby, S. Energy Sufficiency in Buildings and Cities: Current Research, Future Directions. *Build. Cities* **2024**, *5*, 692–703. [[CrossRef](#)]

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