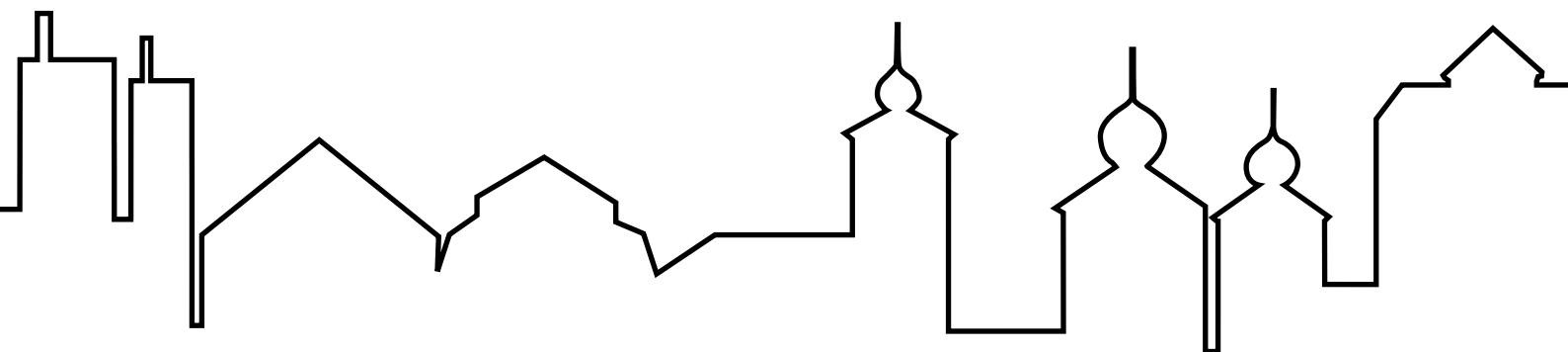


ALPINE TOWNS

Key to sustainable development in the Alpine region

Annex I: Technical Background



Content

1. Working Group	2
2. Background.....	3
2.1. Choice of the topic ‘Alpine towns’	3
2.2. Report structure.....	4
2.3. Elaboration process.....	5
2.4. Thematic base.....	6
3. Methodology of ‘Part 1: Facts, Maps and Scientific Debates’	8
3.1. Selection process of analytical data focus.....	8
3.2. Methodological approach	9
3.3. Definition of Alpine towns for the RSA9	10
3.4. Data overview.....	10
4. Methodology of ‘Part 2: Five Pictures of the Future’.....	13
4.1. Methodological background on scenario planning	13
4.2. Application of the exploratory scenario method to the RSA9.....	16
4.3. Literature on the scenario process.....	26

This Annex is part of the 9th Report of the State of the Alps RSA9:
‘Alpine Towns: Key to sustainable development in the Alpine region’

Authors: Marc Pfister (Swiss Federal Office for Spatial Development ARE), Tobias Chilla, Dominik Bertram, Markus Lambracht (University of Erlangen-Nürnberg FAU), Helen Lückge (Climonomics), Susanne Schatzinger (VS Consulting Team)

1. Working Group

The 9th report on the state of the Alps 'Alpine Towns' was drafted by an expert team, with participation and steering from an ad-hoc working group. The working group consisted of experts from all the contracting parties of the Alpine Convention, as well as the official observer organisations. For some of the workshops, additional experts were involved: From the Alpine Convention working group on spatial planning and sustainable development, from towns and regions, from the Territorial Agenda 2030 pilot '*Climate Action in Alpine Towns*' and Students from the University of Erlangen-Nürnberg.

Members of the RSA9 ad-hoc Working Group		
Name	Organisation	Role
Dominik Bertram	University of Erlangen-Nürnberg FAU	Expert
Markus Lambracht	University of Erlangen-Nürnberg FAU	Expert
Tobias Chilla	University of Erlangen-Nürnberg FAU	Expert
Helen Lückge	Climonomics	Expert
Susanne Schatzinger	VSC Consulting Team	Expert
Marc Pfister	Federal Office for Spatial Development ARE	Chair
Lenča Humerca Šolar	Ministrstvo za okolje in prostor	Slovenia
Jernej Červek	Ministrstvo za okolje in prostor	Slovenia
Tomaž Miklavčič	Ministrstvo za okolje in prostor	Slovenia, Deputy
Blanka Bartol	Ministrstvo za okolje in prostor	Slovenia, Deputy
Michele Munafò	ISPRA	Italy
Andrea Omizzolo	EURAC	Italy
Elisa Ravazzoli	EURAC	Italy
Daniela Versino	MIT (IT)	Italy, Deputy
Maria Prezioso	Uni Roma (for Italy)	Italy, Deputy
Benoît Fanjeau	Administration régionale de Provence Alpes Côte d'Azur	France
Sylvie Vigneron	Commissariat de massif des Alpes	France
Isabelle Paillet	MTE (FR)	France, Deputy
Sébastien Rieben	Federal Office for Spatial Development ARE	Switzerland
Karin Augsburg	Federal Office for Spatial Development ARE	Switzerland
Silvia Jost	Federal Office for Spatial Development ARE	Switzerland, Deputy
Andrea Bianchini	European Commission	European Union
Andreas Bartel	Umweltbundesamt Österreich	Austria
Oliver Bender	Österreichische Akademie der Wissenschaften	Austria
Andreas Haller	Österreichische Akademie der Wissenschaften	Austria, Deputy
Valerie Braun	Österreichische Akademie der Wissenschaften	Austria, Deputy
Florian Lintzmeyer	ifuplan	Germany
Andra Giehl	StMWi Bayern	Germany
Lukas Kühne	Bundesministerium des Innern, für Bau und Heimat	Germany
Stefan Hassler	LLV LI	Liechtenstein
Heike Summer	LLV LI	Liechtenstein
Astrid Claudel-Rusin	Direction de l'Environnement	Monaco
Jessica Astier	Direction de l'Environnement	Monaco
Julie Davenet	Direction de l'Environnement	Monaco

Bernhard Tschofen	ISCAR	Observer
Claire Simon	Alpine Towns of the Year Association	Observer
Elena Di Bella	Euromontana	Observer
Katharina Gasteiger	Allianz in den Alpen	Observer
Wolfgang Pfefferkorn	CIPRA	Observer
Magdalena Holzer	CIPRA	Observer, Deputy
Maarit Ströbele	ISCAR	Observer
Cristina Del Biaggio	ISCAR	Observer, Deputy
Aureliano Piva	Permanent Secretariat of the Alpine Convention	Report Coordination
Živa Novljan	Permanent Secretariat of the Alpine Convention	Report Coordination

Invited Guests to the Scenario-Workshop (September 2021, Innsbruck/Online):	
Ingrid Wildemann	Regional Manager ‚Servus Zukunft‘ Upper Bavaria (Germany)
Jimmy Baabaa	Deputy Mayor of Chambéry (France)
Claus Habfast	Chief Municipal Councillor (conseiller délégué) of the City of Grenoble (France)
Alexandre Mignotte	Head of Mission Mountain Politics, City of Grenoble (France)
Loïc Gargari	Project Manager Directorate for Agriculture and Mountains, Métropole Nice Côte d'Azur (France)
Alice Jude	European Project Manager, Métropole Nice Côte d'Azur (France)
Yuki d'Emilia	Councillor of Belluno (Italy)
Miro Kristan	Head of Unit ‚Environment, Space and Landscape‘, Soča Regional Development Center (Slovenia)
Lenka Groselj	Municipality of Idrija (Slovenia)
Madeleine Rohrer	City Councillor Meran (Italy)
Students Excursion	University of Erlangen-Nürnberg FAU

2. Background

2.1. Choice of the topic ‘Alpine towns’

The topic of Alpine towns was suggested by the Swiss Presidency and approved by the Permanent Committee of the Alpine Convention, because of their growing impact and importance; and since they are often underestimated in policies, activities, research and funding that concern the Alpine arc. Even where they are not, their state seems to be a blind spot – not alone because many of them escape from statistical categories and because ‘urban’ & ‘Alpine’ issues get too rarely combined.

The ninth report on the state of the Alps ‘Alpine Towns’ has a cross-cutting topic and therefore contributes to and expands on many works of the Alpine Convention. The fifth report of the state of the Alps *‘Demographic Change in the Alps’* from 2015 found, that over one third of the Alpine population lives in municipalities above 10’000 inhabitants and that these grow on average twice as fast as municipalities below this threshold. The impact that these settlements have will subsequently increase their importance for the work of the Alpine Convention.

The report contributes to the goals and articles of the Protocol on *'Spatial Planning and Sustainable Development'*, taking into account the decision of the XIV. Alpine Conference on the *'Declaration on Sustainable Spatial Development in the Alps'* (Declaration of Murau) and the decision of the XV. Alpine Conference on *'Climate-neutral and Climate-resilient Alps 2050'* (Innsbruck Declaration). It also touches on the protocols of *'Nature Protection and Landscape Conservation'*, *'Soil Conservation'* and *'Transport'*.

2.2. Report structure

This report follows a slightly modified structure compared to the previous reports in the series as well as a different elaboration process. A preliminary examination of the subject showed that it is desirable to unite two very contrasting perspectives in the report structure: a transnational, Alpine one and one on the town level. This meant also to address very different target groups. It was therefore decided to first define a common topic base (see Chapter 2.4) and then divide the report into two parts that each cover mainly one of the perspectives. This was seen as an opportunity to include a part that looks at the future, in addition to the common *status* part.

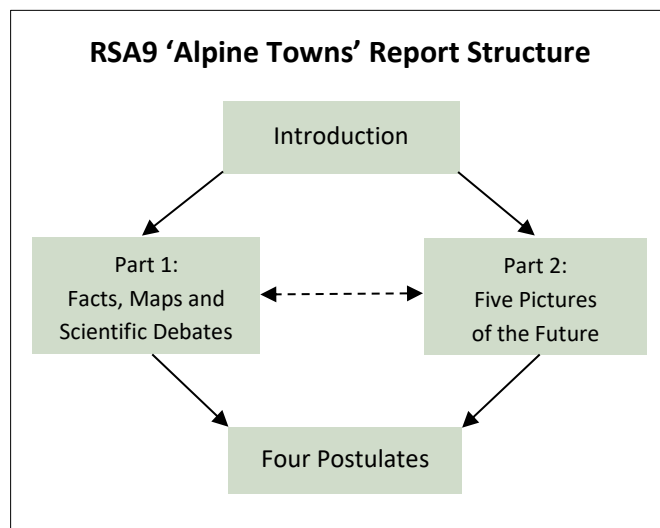


Figure 1: Report Structure of RSA9

Both parts can be used as separate reports and toolboxes of their own – but also in combination, for the findings of one part are always also reflected in the other (see Figure 1). The *'Four Postulates of Sustainable Urban Development'* act as a bridge and summarise the most important messages from the report. This is why each part is also available for download individually on the report website: www.alpinetowns.alpconv.org.

Indicators and literature are primarily addressed to a professional audience that serve in particular questions around sustainable development within the Alpine Convention. The scenario knowledge aims at local target groups and practitioners with a more application-oriented way, comparable to the added value of recommendations and best-practices.

2.3. Elaboration process

The RSA9 also followed an adapted elaboration process. Because of the desired report structure and due to the uncertain pandemic situation, it was decided to appoint a small core group of experts that design the two processes and carry out the main drafting. The working group participated actively as a 'think tank' for topics, data collection and content and acted also as the steering committee.

It was decided, that the added value of this RSA should be to highlight the most significant developments within the perimeter of the Alpine Convention and to give an overview over the most imperative debates around Alpine towns that call for action. The results should be applicable to all places and not be limited to a specific point in time, providing a decision-making tool for the whole Alpine Convention and its stakeholders. The different knowledge pillars are illustrated in figure 2.

It was therefore *not* the goal of the report to do a momentary stocktaking exercise around Alpine towns: Firstly, the scope of the subject was too extensive for the format. Secondly, there will always be evidence on a sectoral level, for specific places or research questions that can dive into individual issues in much more detail than we could ever do in our transnational process. The transnational Alpine assessment of this report shall however provide entry points to expand the content to specific contexts in a next step: Scenario adaption, case studies, model projects, comparative studies and best practice libraries are only some of the formats that seem useful to deepen the findings.

For the scientific analysis the transalpine bid's eye view meant to select topics carefully (see chapter 3): Excluding topics that are too generic or of low relevance for towns but still providing a balanced range of topics for a full picture. For the indicator analysis, we wanted to provide comparability and a full overview over the Alps, which in turn meant that data had to be available for all contracting parties (states) within the perimeter. Topics that were not suitable for a data analysis but deemed important nevertheless were taken up in debates by using current literature.

For the *'Part 2: Five Pictures of the Future'* the approach relied strongly on the collective knowledge on the people involved (see chapter 4): A participatory scenario technique involved the experts of the working group and selected guests in several online workshops. Their knowledge was used to elaborate the scenarios step by step.

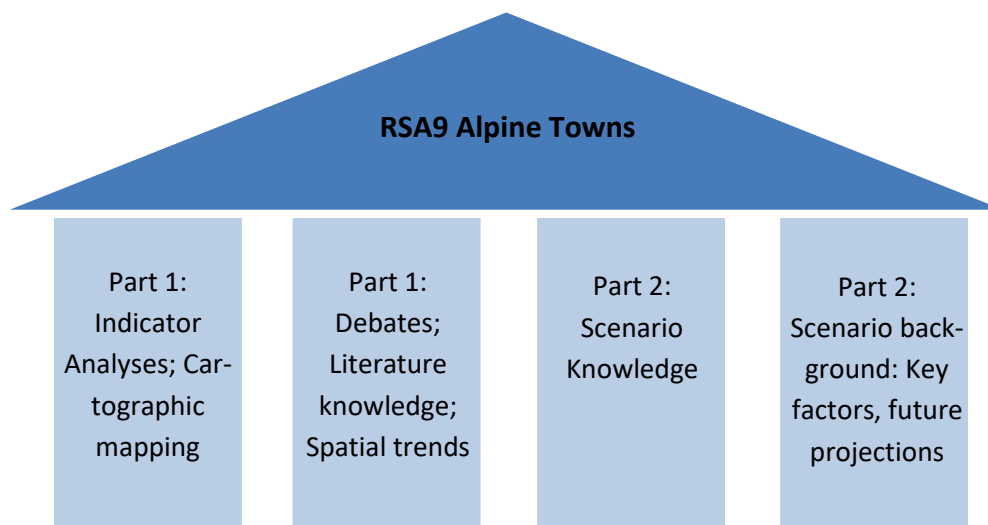


Figure 2: Knowledge pillars of the RSA9

2.4. Thematic base

The whole report is based on a selection of ‘meta-level’ topics connected to questions of sustainable development in the Alps. As a starting point for the RSA9 we relied on the ‘Drivers of change of relevance for Europe’s environment and sustainability’ as developed by the European Environmental Agency in 2019. They served as an orientation for balancing the range of topics in the analysis and they provided the base for the selected topics (key factors) of the scenarios (see *Annex II: Thematic Scenario Background*).

During a brainstorming workshop, the working group translated the six global drivers into the Alpine context and added main topics to each driver. These topics were taken up for the indicator selection as well as providing the basis for the ‘key factors’. Our six drivers are:

Driver 1 – Demography and Urbanisation: Demography and migration are considered key factors with a strong influence on the development of Alpine towns, putting pressure on spatial structures & development, urbanisation and mobility.

Driver 2 – Environment and Resources: Environmental challenges such as climate change and environmental degradation (ecosystems, biodiversity loss) are one part of this driver. The second part is dealing with resources of relevance for the Alps such as water, energy and soils.

Driver 3 – Economy, Labour market, Innovation: Topics within this driver consider economic development: innovation policies, education, economic structures, players, as well as digitalisation as a megatrend.

Driver 4 – Global positioning: Demographic and economic positioning of Alpine towns and city politics within a European and global context.

Driver 5 – Governance: Governance is meant to concern urban-rural interlinkages of Alpine towns, European and national frameworks, cross-border impact. It also includes the aspect of citizen participation.

Driver 6 – Lifestyles, Quality of Life, Accessibility: This driver covers topics that relate to accessibility, changing lifestyles, quality of life, work patterns, culture and urban qualities.

3. Methodology of ‘Part 1: Facts, Maps and Scientific Debates’

3.1. Selection process of analytical data focus

For the analytical Part 1 of the RSA ‘Facts, Maps and Scientific Debates’ the selection of the data for the analysis was taken in a multi-step participatory approach:

- The process started on February 10/11, 2021 with the kick-off meeting and the presentation of the FAU booklet ‘Alpine Towns’.
- The Working Group Meeting on March 09/10 focused primarily with the indicator discussion and was decisive for the further process of selecting suitable indicators. As described above, the thematic framework is based on the EEA Drivers. These were adopted for the ‘Alpine Towns’ context. Moreover, relevant topics beyond questions of data availability were discussed (resulting in a short-list).
- On June 23 the analytical interim results were presented and discussed in a Working Group meeting.
- The draft of the scientific analysis from October 13 was then circulated via email. The working group gave a feedback via mentimeter and in a joint video meeting on December 6/7.
- On February 17/18, 2022 the Working group gave a feedback on the updated version of the analysis. Following this, the political consultation started.
- On April 7, the Working group and further invited experts met in Innsbruck for a final meeting and discussed future dissemination strategy, stakeholder maps and project ideas.

3.2. Methodological approach

The RSA9 process is a rather compact and participatory process that cannot be compared to a classical academic research project. The objective of the analysis is not to provide a comprehensive or even complete picture of urban developments in all Alpine contexts. Instead, the aim was to provide a politically relevant background on a sound scientific base. In this context, the following characteristics of the analysis apply:

- Only those databases are taken into account that are available on the pan-Alpine level. In order to obtain as much homogenized data as possible at the municipality level. Eurostat is an important source, and ESPON data from the Alps2050 project was used and completed by involving data experts where necessary. Also data from the EU's KEEP-database, as well as data from the AlpES webGIS and the Alpine Convention webGIS were used to create figures for the topics Governance and environment.
- Purely regional statistics and case study presentations are not included in the report itself. This level of reflection is more relevant in the accompanying Alpine Towns Blog (<https://alpinetowns.alpconv.org/>) and, hopefully, in subsequent reflections and studies on the domestic level. The strength of this approach is the rapid delivery of meaningful results. The risk is to be 'data driven' in some parts. For example, data on cultural aspects, gender issues, or innovation processes are hardly present in official statistics on a fine urban scale. The ambition of the authors was to include such aspects in the textual commenting.
- The analytical tools concentrate on exploratory and descriptive statistics. High efforts focussed strongly on visualisation and cartography. In order to provide information that can be used in different contexts, maps and figures appeared to be more important than long texts.
- The data presentation differentiates two chapter formats, namely 'findings' and 'debates'. Findings present results from own data analysis; debates summarise and reflect on debates that are anchored in scientific literature and policy processes.

3.3. Definition of Alpine towns for the RSA9

The object of the RSA9 'Alpine Towns' seems to be intuitively clear, but is indeed a rather complex object. In a first step, the definition of towns and cities throughout the Alpine area were reflected. The obvious result was that

- a) there is now standardised definition of cities or towns on the transnational level but very diverse approaches (including population size, tourist beds, employment, and resulting in sophisticated categorization)
- b) a pure definition of towns comes along with serious risks – especially overseeing small towns in the inner-Alpine context (concerns in particular from FR and SI) and overrating suburban settlements in the large valleys and pre-Alpine parts (concern in particular from AT).

Against this background, and after intense debates in the working group, the following understanding was agreed:

- A simple lower threshold of 5.000 inhabitants was fixed for the data analysis and no upper boundary in order not to lose the very diverse pattern and to have a pragmatic, comparable and manageable basis for the analysis.
- A lower threshold of 3.000 inhabitants applies for those cases that are not adjacent to larger municipalities. This understanding combines accessibility and population size from 3.000 inhabitants. For the detailed RSA9 definition of Alpine towns see the scientific analysis *'Part 1: Facts, Maps and Scientific Debates'* in chapter 1.

3.4. Data overview

The basis for the scientific analysis are the EEA drivers, as mentioned earlier. They were adopted to the alpine-specific context. For the final indicator selection, a voting tool was used to understand the preferences of the group. Voting was also used to identify further topics that should be taken up outside the data analysis. The discussion and votes on the latter showed a strong interest in environmental and demographical issues. While there were many valuable suggestions coming up during the brainstorming, it became also evident that challenges for indicators are widespread: from political relevance, time and budget constraints, availability of data and their resolution, to problems with methodology and standardisation, to issues of interpretation and biases.

After discussing the indicators and using the voting tool, the following indicator list has been selected and implemented for the data analysis:

Thematic focus	Finding	Figure	Spatial	Time	Source
Settlement system, services of general interest	Alpine towns and their relevance 'beyond size'	Fig. 1 Large Alpine cities	LAU	2015	Eurostat 2021
		Fig. 2 Alpine towns – definition and mapping	LAU	2015	Eurostat 2018, ESPON Alps2050, OSM 2021, Openrouteservice.org by HeiGIT 2021
Demography	Urbanisation trends in the Alps	Fig. 3 Population change 2010-2019 (indexed: 2010=100) – Alpine towns and Alpine Convention compared with peri-Alpine areas	LAU	2010-2019	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
	The link between settlement size and development trends	Fig. 4 Population change in Alpine towns by countries 2009-19 (indexed: 2008=100)	LAU	2008-2019	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
		Fig. 5 Population development in Alpine towns by country – the zoom-in perspective	LAU	2010-2015	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
	The link between settlement size and the populations' age	Fig. 6 Ageing index in Alpine towns (2015)	LAU	2015	Eurac Research & FAU & National statistic offices 2018, ESPON Alps2050
	The link between altitude and socio-economic development	Fig. 7 Altitude and population change for Alpine towns	LAU	2010-2015	OSM 2022, Eurostat & National statistic offices 2018, ESPON Alps2050
Environment	Water consumption	Fig. 8 Water use index	LAU	2010-2013	AlpES Webgis 2021, ESPON Alps2050
	Temperature rise	Fig. 9 Changes in surface temperature	LAU	2021-2050	Alpine Convention 2021, ESPON Alps2050
Economy	Employment	Fig. 10 Employees per inhabitants 2015	LAU	2015	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
		Fig. 11 Employment change 2012-2018	LAU	2012-2018	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
		Fig. 12 Employment development in Alpine towns by country	LAU	2012-2018	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
	University locations	Fig. 13 University locations & number of students	LAU	2021	OSM 2021, & National statistic offices 2018, ESPON Alps2050

	Public transport accessibility	Fig. 14 Space-time-lines, rail passenger transport	LAU	2021	bahn.de & luftlinie.org & National statistic offices 2018, ESPON Alps2050
	Tourism capacity	Fig. 15 Tourism capacity 2015	LAU	2015	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
Global positioning	Population share	Fig. 16 Population change 2008-19 (indexed: 2008=100)	LAU	2008-2019	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
	Economic share	Fig. 17 Gross domestic product change 2008-18 (indexed: 2008=100)	LAU	2008-2018	Eurostat & National statistic offices 2018 & 2021, ESPON Alps2050
Governance	Cooperation patterns INTERREG Alpine Space	Fig. 18 Cooperation networks in thematic differentiation INTERREG B Alpine Space	LAU	2021	keep.eu 2021
	City networks	Fig. 19 Inner-Alpine Governance: Networks of Alpine towns	LAU	2021	Desktop-research respective networks 2021
	Cross-border integration and Alpine towns	Fig. 20 Alpine towns and border regions	LAU	2021	Geospatial elaboration (FAU) 2021

Figure 3: Data and indicator overview

4. Methodology of ‘Part 2: Five Pictures of the Future’

4.1. Methodological background on scenario planning

Why a scenario process in the frame of the RSA9?

In the Alps, the role of cities and towns in ongoing transformation processes takes a specific characteristic as cities and towns are closely interlinked in urban-rural relationships and as they take specific functions in the relevant regional settings. It thus seems appropriate in the frame of the RSA9 to take a perspective viewpoint and to discuss not only the current state of Alpine towns but also their potential development perspectives. Scenarios and perspectives for territorial development have been developed at European or transnational level and several countries have initiated strategic processes to develop ‘cities of the future’. But, up to now, no Alpine-specific scenarios for development of towns and cities have been designed – taking into account their particular roles and function in the broader spatial planning context. The RSA9 offers an opportunity to fill this gap and to zoom in to these scenarios with an Alpine lens.

The scenario approach has a longer-term perspective and provides a general framework – beyond specific good practices. The scenarios also have the great advantage that they can be developed in a participatory and co-creative approach. By integrating various stakeholders with their specific point of views and individual needs, the scenarios can serve more likely as toolbox for other cities and municipalities in the Alps to support their strategic processes (durability of results).

Which type of scenario process fits to the RSA9?

Scenario planning is a powerful method to manage complex planning situations. It is based on the main principles of systems thinking and multiple futures. Alternative views of the future, so-called scenarios, are a promising way to cope with growing uncertainties and with ever increasing complexity. Initially, scenario planning has its roots in operations research as developed during the Second World War and was then elaborated in corporate strategic planning in the 1970s. The scenario planning method as used today has found interest in the private-sector with the objective to look beyond short-term projections and to include broader global trends that have a potential to affect the market position of an economic player or its product range (see Reibnitz 1994, p. 12; Oteros-Rozas et al. 2015, p. 1). After first applications in the private sector, the scenario technique received more attention and was also applied by stakeholders from the public and civil-society sectors and, more recently, is also used in the frame of inter-sectoral cooperation – especially when it comes to participatory and co-creative approaches (see Oteros-Rozas et al. 2015, p. 4; Kosow & Leon 2015, p. 233).

Different types of scenario planning have been developed which are all summarized under the term 'scenario technique'. For the purpose of this overview, four different types of scenario planning can be identified which provide very different approaches and opportunities when it comes to their potential for participatory and co-creative approaches. In the literature (e.g. Kosow & Gaßner 2008, pp. 32), often only three types are identified but it seems crucial to differentiate the systematic-formalised scenarios into policy scenarios and explorative scenarios. This leads to the following four types of scenarios:

- **Trend-Scenarios:** these scenarios are based primarily or exclusively on existing and past trends and extend them into the future. The core of this technique is trend analysis and trend extrapolation: these are typically illustrated in a range from low to high (e.g. when looking at trend scenarios for a specific business sector, scenarios for a new technology can reach from low to high market penetration).
- **Policy scenarios:** Policy scenarios belong to the group of systematic-formalised scenarios and are typically developed to assess different strategies and specific instruments for sectoral policy making. They typically include a 'business as usual'-scenario as well as several different policy scenarios that focus on different strategies and types of policy instruments (e.g. regulatory approaches, market-based measures, technology-driven approaches, etc.).
- **Exploratory scenarios:** These exploratory scenarios also belong to the group of systemic-formalised scenarios but take a broader variety of options and less directly linked to policy making. Rather, they can serve as basis for strategic decision making as they open a broad viewpoint to potential future developments, including also critical aspects.
- **Creative-narrative scenarios:** These types of scenarios can be identified as normative scenarios and can thus be developed in a more pragmatic approach. They illustrate one or a range of desired future developments which can rather serve as communication tools or narratives to identify need for actions in specific policy fields or to highlight the advantages of existing objectives and targets.

These types of scenario planning are typically used in different contexts and by different stakeholders. The following table gives an overview on their major attributions.

	Trend-Scenarios	Policy scenarios	Exploratory scenarios	Creative-narrative scenarios
Typical needs and context	Strategic product planning, uptake of new technologies	Strategic decision making on policies, policy instruments and specific measures	Broaden the viewpoint on complex & cross-cutting challenges as basis for strategic decisions	Develop subjective visions or normative scenarios to support communication on already existing targets, objectives and instruments
Time-frame	Short-term (max 5 years)	Medium-term (5-10 years)	Medium-to long-term (8-15 years)	Flexible
Relevant background material	Market analysis Short term technology outlooks Forecasting studies	Data analysis, monitoring results Assumptions on global development (e.g. economic growth)	Analysis of global megatrends (e.g. Zukunftsinstitut 2021)	Flexible, according to needs. This type of scenarios can also be built without any specific background analysis
Relevance for different sectors	Public sector: basis for development of strategic decision making, e.g. short-term energy forecasts Private sector: product planning and scaling of different technologies	Public sector: defining new policies, instruments and measures Civil-society sector: assessment of policy proposals	Public sector: approaching new cross-cutting topics Private sector: developing long-term strategies for business development Civil-society sector: approaching new cross-cutting topics	Public sector: Communication on targets and strategies, making use of visions Civil society sector: normative scenarios to highlight desirable future developments from the viewpoint of relevant stakeholders
Requirements, tools	Good know-how of the relevant sector, availability of relevant forecasting model	Availability of specific modelling tools like integrated assessment models, multi-criteria analysis, etc.	Facilitation techniques Ability to apply system thinking methods	Creative facilitation techniques
Examples	World Energy Outlook (Annual publication of International Energy Agency)	Policy Scenarios 2030 on trans-alpine freight transport (iMONITRAF! network 2020)	The future of urban mobility (Scenario Management International, 2020)	General approach of the Alpine Climate Target System

Figure 4: Typology of scenario methods and their major attributions (own compilation)

Choice and adaption of the exploratory method to the RSA9

Considering the descriptions and attributions of the different scenario types, the exploratory scenario method seems most suitable to fit the needs of the RSA9 process. Trend-scenarios have a too narrow focus and policy-scenarios have a rather technical approach and are therefore not really suitable for a participatory process.

Exploratory scenarios but also creative-narrative scenarios both have a high potential for co-creative processes with an interdisciplinary and inter-sectoral working group. But the exploratory scenario technique allows for a more structured and transparent approach and hence seems to find better acceptance. The exploratory approach is not about subjective viewpoints, but rather about developing a joint understanding on potential future developments. It avoids value-laden discussions which are often emotionally charged and require substantial efforts to manage in an effective participatory process (see Oteros-Rosaz et al., p. 12).

The exploratory scenario technique thus seems to have a great potential to make the heterogeneous viewpoints on future developments of experts and stakeholders explicit, to bring them into conversation with each other and, ideally, to develop a common new view of the subject matter. It explicitly follows a co-creative and participatory approach to develop a joint understanding and for that reason has been selected for the RSA9.

4.2. Application of the exploratory scenario method to the RSA9

The literature uses different approaches to subdivide the scenario process, but the different steps can typically be clustered into a preparatory phase and then four main steps (see Reibnitz 1994, p. 30; Gausemeier et al. 1998, p. 116; Kosow and Leon 2015, p. 220). These steps as well as their main objectives can be summarized as follows (see also figure 1 for an overview):

- **Preparatory phase:** Objective of this step is the launch of the scenario process. The working group specifies leading question and undertakes a first brainstorming on topics that are linked to the leading question. The RSA9 working group had already been defined, but specific stakeholders were invited to join the process along the way to open the viewpoint.
- **Step 1 – Scenario field analysis:** The major objective of this step is to set a neutral framework to build the scenarios. This is typically done through the definition of key factors which set the boundaries for the scenario field. The interaction between the key factors are thereafter illustrated in form of an influence matrix.

- **Step 2 – Future projections:** Objective of this step is to define potential future projections for the identified key factors. This requires the take-up of different viewpoints and positions ‘outside the box’ and then to systemize the different projections.
- **Step 3 – Scenario development:** In this step, the scenarios are developed as plausible combinations of future projections from step 2. First, ‘raw’ scenarios (based on insights of the influence matrix) are established which are then further expanded with additional information. This step also includes the development of narratives and illustrations to represent the scenarios.
- **Step 4 – Evaluation of scenarios and further strategic steps:** the final step can then include the evaluation of scenarios by a broader range of stakeholders and all follow-up activities. For example, specific decision making tools can be developed that help stakeholders to implement desirable elements of the scenarios.

The implementation of these steps for the RSA9 process is summarized in the following figure. The implementation of each step is illustrated in the following chapters, including detailed information on the involvement of the working group.

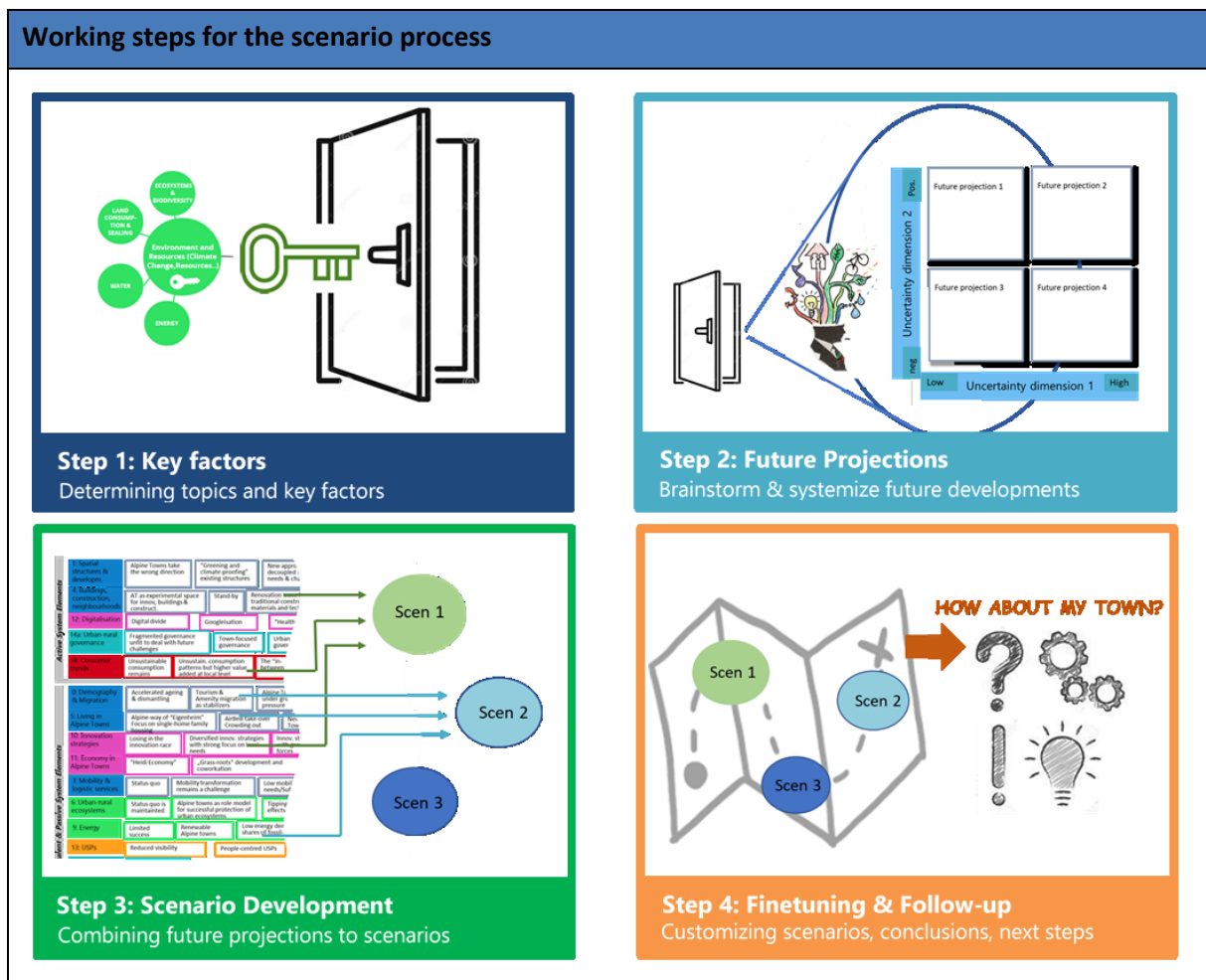


Figure 5: The scenario process for Alpine towns

Preparatory phase

During the kick-off meeting of the RSA9 process in February 2021, the scenario method and its objectives were first presented to the group and some major questions were discussed:

- Which specific objectives can a scenario process fulfil within the RSA9 and how is the scenario process linked to the analytical research on today's situation of Alpine towns?
- How can the scenario process be developed in a co-creative way, even if only online meetings will be possible for major stretches of the RSA9 development phase?
- Which additional stakeholders could be integrated in the process to take on board additional viewpoints and ideas?

First discussions highlighted several open questions on the scenario process as most members of the RSA9 working group had not yet worked with this method. It was decided to develop detailed information material along the way: this was first done in the form of additional technical notes, then along the way as preparatory material for each of the major workshops.

Also, a structure to summarize global drivers that are also relevant for the Alps (e.g. demography and urbanisation) was discussed and finetuned (based on EEA 2019). The participants of the WG meeting then joined a first brainstorming (on a padlet board) based on the following question:

“Starting from the main drivers of change: Please identify major topics/transformation processes/challenges with specific need for action in Alpine towns?”

This first brainstorming provided many insights on relevant topics for the scenarios and was used as basis for developing an initial proposal for key factors in the next step.



Role of the RSA9 Working Group in this step:

- Setting the scene for the scenario process: first brainstorming on relevant topics that became the basis for developing the key factors
- Identify open questions on the scenario process and need for in-depth information and guidance
- Identify additional stakeholders and experts that could be integrated in the process (e.g. via Alpine Town of the Year network, TA2030 process, youth organisations, ...)

Step 1 – Identifying key factors

The major objective of this step is to set a neutral framework of important topics to build the scenarios. This has been done through the definition of 21 key factors which set the boundaries for the scenario field. These have been developed during a 'key factor workshop' in June 2021.

The key factors are the 'door openers' to the future: they set the boundaries for the scenario process. They are defined in a neutral way so that different future projections are possible in the next step and are limited to a manageable number. Also, with defining the key factors, the group develops a joint understanding on which topics shall be included in the scenario process and which are less relevant; this already fosters exchange and mutual understanding along the way.

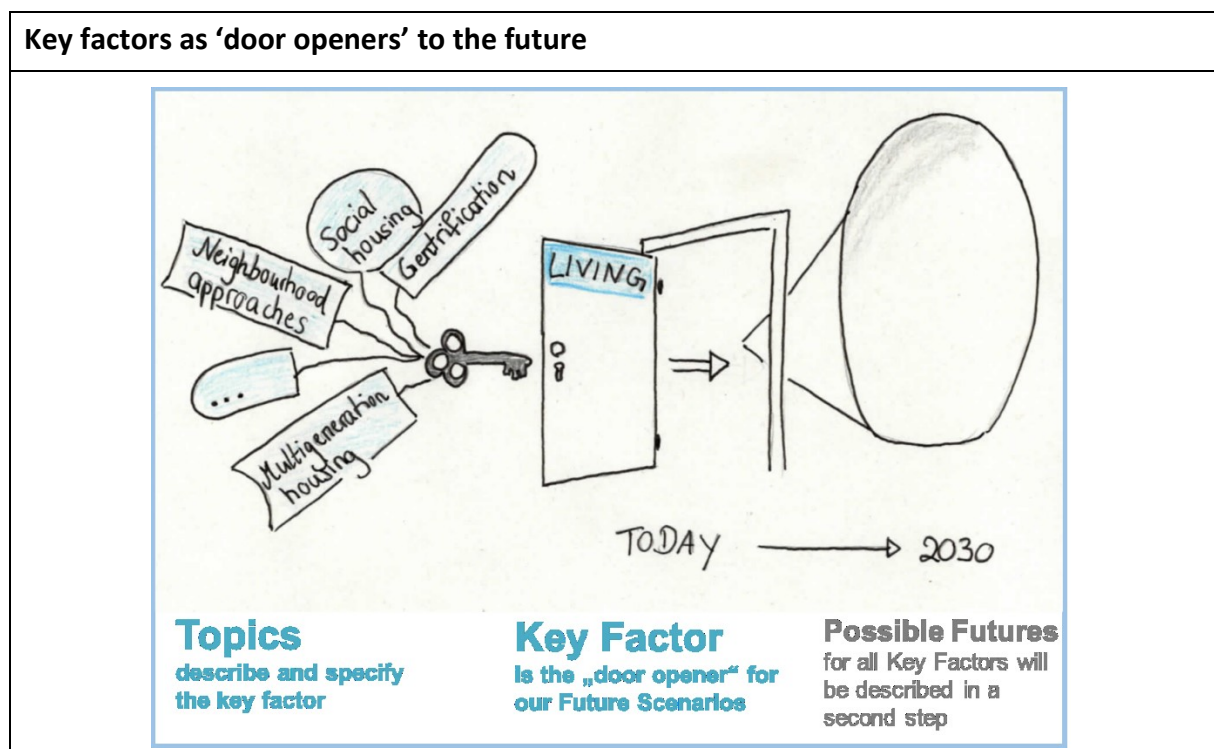


Figure 6: Key factors and topics within the scenario process

As preparation for the key factor workshop, the scenario team has prepared a list of potential key factors, linked to the six drivers of change as adapted from the EEA. For each key factor, draft factsheets have been shared with the group, including a short description and a list of topics that describe the key factor. These key factors were discussed in an interactive session during the key factor workshop with the RSA9 working group, based on the following leading questions:

- *“Are the key factors structured in an appropriate way to combine the topics from the kick-off meeting?”*

- “Are the key factors appropriate to open the doors to future scenarios for Alpine towns?”

After the workshop, the list of key factors was fine-tuned by the scenario team: some additional key factors were integrated, some of them merged and some were structured in another way to make the boundaries more visible. The final list of key factors was then shared with the group for further comments. In addition, a survey was initiated with the group to assess further information needs regarding the key factors. The final factsheets on key factors are illustrated in a separate Annex to this report.



Role of the RSA9 Working Group in this step:

- Interactive discussion and further development of key factors: all topics, viewpoints and ideas raised by the group were taken up in the further process
- Definition of further information needs: for which key factors do the participants require further information to discuss future developments in the next step?
- Review of final list of key factors and topics

Transitioning from step 1 to step 2 – Influence matrix

As transition from step 1 to step 2, the scenario team prepared an influence matrix which is used in the scenario process to highlight interactions between key factors and their role in the overall system. The underlying question is: How does each key factor influence the other key factors that were identified for the RSA9 process? (with 0 = no interaction, 1 = weak or indirect interaction and 1 = strong interaction). The influence matrix then illustrates active sums which expresses how strongly the key factor influences all other key factors. Also, passive sums are derived from the matrix which show how strongly each key factor is influence by the others (Reibnitz v. 1994, p. 35; Panula-Ontto et al. 2016).

The matrix thus illustrates which role the key factors play in the overall system of Alpine towns as identified in the process so far and helps to structure the following steps of the scenario process: key factors with strong active and/or passive roles are crucial system elements and thus require a more systematic analysis. They also become the starting points for developing the scenarios in step 3. The influence matrix is thus not a tool for prioritization, it is about understanding the overall system and the role of our key factors within it.

Results of the Influence matrix are transposed into a 'system grid':

- Field I is the area of active system elements: System elements positioned in this field are characterized by a very high active role. They strongly influence all other factors in the system, but are themselves influenced only slightly.
- Field II is the field of the so-called ambivalent elements: They are characterized by relatively high activity and high passivity. They influence the system as much as they are influenced by the system.
- Field III is the field of the buffering elements: elements in this field are characterized by the fact that they have relatively little influence on the system and are themselves only slightly influenced by the other elements. These elements can be integrated in the scenarios rather independently without the need to consider many overlaps/synergies/trade-offs.
- Field IV is the field of the passive system elements: They are characterized by the fact that they are relatively strongly influenced by all other system elements.

The results of the influence matrix for Alpine towns is illustrated in the following figure:

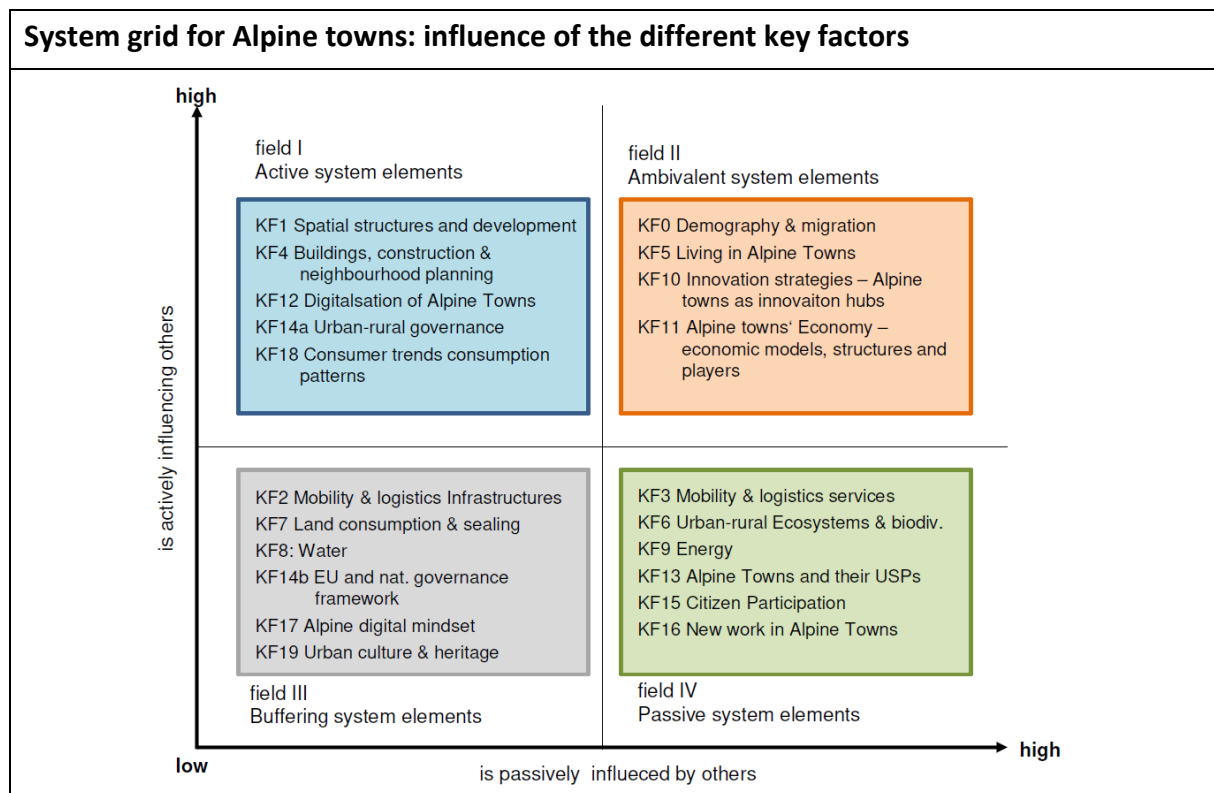


Figure 7: System grid to illustrate results of the influence matrix

Step 2 – Future projections

Objective of this step is to identify potential future projections for each of the key factors. This requires the take-up of different viewpoints and positions 'outside the box' and then to systemize the different projections (e.g. for the key factor 'Living in Alpine towns' these future projections need to include traditional vs. new living formats as well as different degrees of pressures on the housing market). For this step, the working group was taken to a 'travel to the future' with a two-day hybrid workshop in September 2021. To get some broader viewpoints, a group of students from the University of Erlangen-Nürnberg as well as some representatives from Alpine towns joined the workshop.

For the discussion during this workshop, some initial thoughts on future projections were prepared by the scenario team and shared with the group before the workshop. For each key factor, potential future projections were listed and major uncertainties were identified. Future projections were then illustrated along these major uncertainties in the form of small future portfolios (see figure 8).

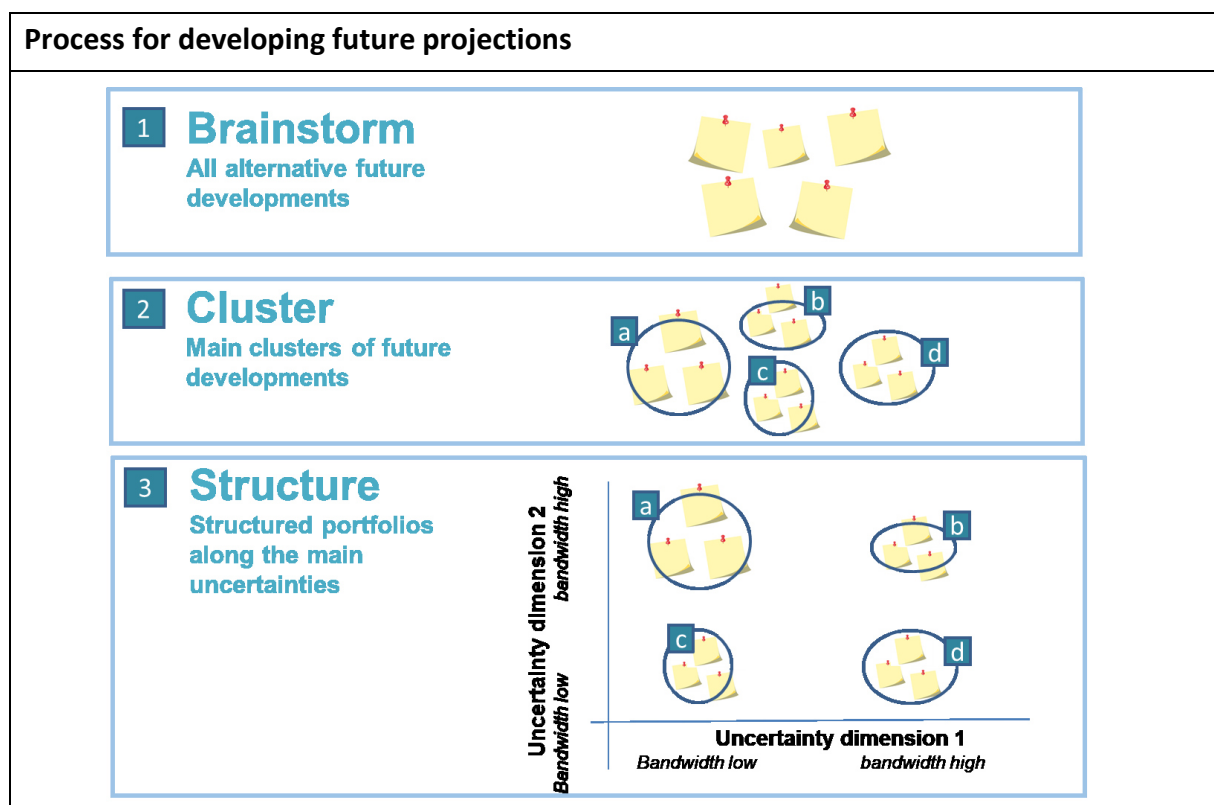


Figure 8: System grid to illustrate results of the influence matrix

During the workshop, the group was taken through this process in an interactive form.

- In a first step, the group started with a discussion of alternative future projections:
"If you envisage a time travel to the future... Which additional future projections can you envisage for the different key factors (positive but also negative/ambivalent developments are possible)?"
- In a second step, the group was then asked to further develop the future portfolios:
"Did the scenario team identify the most relevant uncertainties to develop the future portfolios? Which other uncertainties could be selected for the axes?"

Throughout the discussion, workshop participants were asked to keep the Alpine needs and challenges in mind: Which are the Alpine-specific aspects of the future projections? Which specific functions will Alpine towns have to take to deal with these need and challenges? After the workshop, the future projections were finalized by the scenario team and cross-checked with the working group during a feedback round. The complete overview of future projections provides the 'future map' for Alpine towns that serves as basis for building the scenarios. A summary of this 'future map' is included in the main report, the detailed future projections per key factor are part of the separate Annex with the key factor factsheets.



Role of the RSA9 Working Group in this step:

- Interactive discussion on future projections for each of the key factors during 2-day workshop
- Discuss main uncertainties for each of the key factor
- Cross-check and finetuning of proposed future projections

Step 3 – Scenario development

In this step, the scenarios are developed by combining future projections – building bundles of future projections that show consistent pictures of the future. As a start, ‘raw’ scenarios were developed by the project team based on all future projections. For building the scenarios, the results of the influence matrix were taken into account again: for each scenario, future projections from one or two key factors with either a high active or high passive role in the overall system were selected as starting points:

- Scenario 1 – Joining forces: starting point is key factor 14a ‘Urban-rural governance’
- Scenario 2 – Taking high risks: starting point are key factors 0 ‘Demography and migration’ and 18 ‘Consumer trends and consumption patterns’
- Scenario 3 – Eco-model town approach: starting point are all key factors related to the driver ‘environment and resources’ which all have a very high passive score in the influence matrix in combination with key factor 12 ‘Digitalisation’
- Scenario 4 – Citizen-based approaches: Starting from a different future projection on key factor 0 ‘Demography and migration’ in combination with key factor 5 ‘Living in Alpine towns’. Then, the passive key factor 14 ‘Citizen participation’ is added as starting point.
- Scenario 5 – Emergency break: starting point are again the different key factors related to driver ‘environment and resources’ (different perspective than in scenario 3), together with key factor 1 ‘Spatial structures and development’.

From these starting points, additional key factors were selected to build consistent pictures of the future. The ‘raw’ scenarios were presented during the meeting of the Working Group in October 2021. Members of the Working Group had the task to discuss these raw scenarios and to identify additional future projections that could fit to each of the scenario. Again, the discussion was organised in an interactive format to allow all participants to contribute their feedbacks and an additional follow-up survey was launched to take on board further ideas on the scenarios. Based on the workshop, the initial list of 7 scenarios was reduced to 5 scenarios and the focus of each scenario was more clearly developed.

The scenarios were then further developed by the scenario team, including detailed descriptions, illustrations and the different boxes that are now part of the scenario report. A first draft was again discussed by the working group during a meeting in December and the scenarios were fine-tuned again on the basis of this discussion. Members of the Working Group were invited to contribute to the illustration of scenarios by contributing a ‘Story from the future’.



Role of the RSA9 Working Group in this step:

- Feedback on raw scenarios during October Workshop: General impression on the proposed raw scenarios? Do they cover the discussions during the workshop on future projections? If not, which aspects are missing? Any proposals for an additional scenario altogether?
- Feedback on each of the raw scenarios: Which key factors drive the scenario? Which stakeholders drive the scenario? Which elements could be added?
- Feedback and discussion of draft scenarios during December Workshop: finetuning needs for the scenarios, balanced illustration, focus on Alpine-specific aspects
- Potential to provide additional written feedbacks on the scenarios and further ideas, personal contribution to the text with a 'Story from the future'.

Step 4 – Finetuning of scenarios and further strategic steps:

The results of the scenario process as illustrated in this report shall be used by decision-makers at all different policy levels to discuss strategic implications. Some finetuning to the specific local/regional context might be necessary beforehand – this can be part of follow-up activities of the Alpine Convention. The following illustration gives an overview on all workshops of the scenario process for the RSA9 and major tasks of the working group during these workshops.

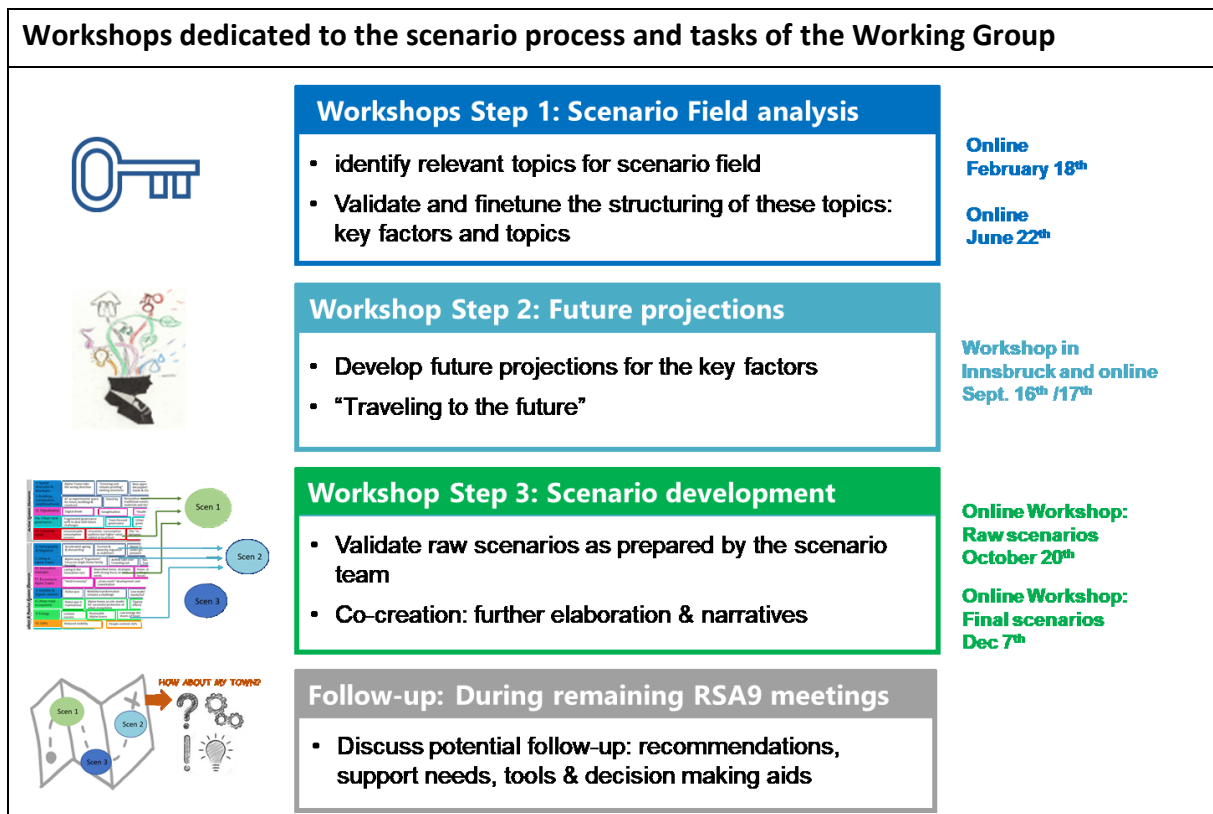


Figure 9: Co-creation in the frame of the RSA9

4.3. Literature on the scenario process

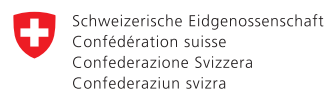
- European Environment Agency (2019): Drivers of change of relevance for Europe's environment and sustainability, EEA Report No 25/2019, Copenhagen. Online: <https://www.eea.europa.eu/publications/drivers-of-change>, Abfrage v. 03.07.2021.
- Gausemeier, Jürgen/ Fink, Alexander/ Schlake, Oliver (1998): Scenario Management: An Approach to Develop Future Potentials. In: Technological Forecasting and Social Change 59, p. 111–130.
- Hagemeyer-Klose, Maria/ Albers, Meike/ Richter, Michael/ Deppisch Sonja (2013): Szenario-Planung als Instrument einer „klimawandelangepassten“ Stadt- und Regionalplanung – Bausteine der zukünftigen Flächenentwicklung und Szenarienkonstruktion im Stadt-Umland-Raum Rostock. In: Raumforschung Raumordnung (2013) 71:413–426.
- iMONITRAF! Network (2020): Policy Scenarios 2030 – Alpine freight transit traffic. Online: <http://www.imonitraf.org/DesktopModules/ViewDocument.aspx?DocumentID=h7Zsw+aO35U=>, Abfrage v. 05.07.2021.
- International Energy Agency (2020): World Energy Outlook 2020, OECD Publishing, Paris, <https://doi.org/10.1787/557a761b-en>, Abfrage v. 05.07.2021.
- Kosow, Hannah/ Gaßner, Robert (2008): Methoden der Zukunfts- und Szenarioanalyse: Überblick, Bewertung und Auswahlkriterien, Werkstattbericht Nr. 103, Institut für Zukunftsstudien und Technologiebewertung, Berlin. Online: https://www.izt.de/fileadmin/downloads/pdf/IZT_WB103.pdf, Abfrage v. 16.05.2021.
- Kosow, Hannah/ León, Christian D. (2015): Die Szenariotechnik als Methode der Experten- und Stakeholdereinbindung. In: Niederberger M./Wassermann S. (Hrsg.): Methoden der Experten- und Stakeholdereinbindung in der sozialwissenschaftlichen Forschung, Wiesbaden, Springer Fachmedien, p. 217-241.
- Oteros-Rozas, E., B. Martín-López, T. Daw, E. L. Bohensky, J. Butler, R. Hill, J. Martín-Ortega, A. Quinlan, F. Ravera, I. Ruiz-Mallén, M. Thyresson, J. Mistry, I. Palomo, G. D. Peterson, T. Plieninger, K. A. Waylen, D. Beach, I. C. Bohnet, M. Hamann, J. Hanspach, K. Hubacek, S. Lavorel and S. Vilaridy 2015. Participatory scenario planning in place-based social-ecological research: insights and experiences from 23 case studies. In: Ecology and Society 20(4):32.
- Panula-Onttoa, J., Luukkanena J., Kaivo-ojaa, J., Majanneb, Y. and J. Vehmasa (2016): Complex energy futures. The use of Express Cross-Impact Technique

(EXIT) with participatory expert workshops to analyse complex systems and interactions. Online: https://www.researchgate.net/publication/296486535_Complex_energy_futures_The_use_of_Express_Cross-Impact_Technique_EXIT_with_participatory_expert_workshops_to_analyse_complex_systems_and_interactions, Abfrage v. 26.01.2022.

- Reibnitz, Ute v. (1992): Szenario-Technik: Instrumente für die unternehmerische und persönliche Erfolgsplanung. 2. Aufl., Wiesbaden, Springer Fachmedien.
- Scenario Management International (2020): The Future of Urban Mobility 2040. Scenarios and perspectives for tomorrow's mobility systems. Online: https://www.scmi.de/images/downloads/dateien/scmi_study_urban-mobility.pdf, Abfrage v. 05.07.2021.
- Zukunftsinstitut (2021): Dokumentation Megatrends. Online: <https://online-shop.zukunftsinstitut.de/shop/megatrend-dokumentation/>, Abfrage v. 20.01.2022.

www.alpinetowns.alpconv.org

© Swiss Presidency of the Alpine Convention 2021/2022



Swiss Confederation

Federal Office for Spatial Development ARE