ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

Green Economy Progress Report

Green Economy in the Alpine Region

Martin Erdniss - stock.adobe.com

Imprint

Environmental Research Plan of the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

Reference number (FKZ) 3719 18 102 0

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

Umwelt Bundesamt

By

Vivien Führ, agado
Stefan Marzelli and Claudia Schwarz, ifuplan
Konstantin Geiger, Umweltbundesamt GmbH

On behalf of the German Environment Agency.

Date of finalisation:
December 2020

Graphic design: Nicole Sillner, alma grafica UG

Proofread by: INTRALP - Italy

Green Economy Progress Report

Green Economy in the Alpine Region

The recommendations of the Green Economy Progress Report were approved by the Alpine Conference on 10 December 2020 during its XVI meeting in Nice (France).

The text has been drafted by the contracted consultants of the Green Economy Editorial Team, with the collaboration of its members and of the Permanent Secretariat of the Alpine Convention.

The text can be downloaded here: www.alpconv.org

Coordination of the Green Economy Editorial Team:

Chair
Hans-Joachim Hermann, Richard Landgraf, Carmen Gottwald (Umweltbundesamt Deutschland - German Environment Agency)

Permanent Secretariat of the Alpine Convention
Aureliano Piva

Members of the Green Economy Editorial Team:

Nominated members

Austria
Konstantin Geiger (Umweltbundesamt GmbH – Austrian Environment Agency)

Germany
Annette Schmidt-Räntsch (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit – Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)

Italy
Luca Cetara (Delegazione italiana delle Convenzione delle Alpi, Italian Delegation to the Alpine Convention, Eurac Research, European School of Economics)

Liechtenstein
Heike Summer (Amt für Umwelt – Office for the Environment)

Slovenia
Tatjana Orhini Valjavec (Ministrstvo za okolje in prostor - Ministry of the Environment and Spatial Planning)

Contributions

France
Isabelle Paillet (Ministère de la Transition écologique et solidaire - Ministry for the Ecological and Inclusive Transition)

Germany
Björn Bünger (Umweltbundesamt Deutschland - German Environment Agency)

Switzerland
Marc Pfister (Bundesamt für Raumentwicklung ARE, Swiss Federal Office for Spatial Development ARE)

European Union
Federico Porra (European Commission, Directorate General Environment)

Observers of the Green Economy Editorial Team:

Wolfgang Pfefferkorn (CIPRA international)

Contracted consultants:

Vivien Führ (agado), Stefan Marzelli, Claudia Schwarz (ifuplan), Konstantin Geiger (Umweltbundesamt GmbH)

Focal points of the Alpine Convention:

Austria
Katharina Zwettler (Bundesministerium für Nachhaltigkeit und Tourismus - Federal Ministry for Sustainability and Tourism)

France
Isabelle Paillet (Ministère de la Transition écologique et solidaire - Ministry for the Ecological and Inclusive Transition)

Germany
Christian Ernstberger (Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit - Federal Ministry for the Environment, Nature Conservation and Nuclear Safety)

Italy
Paolo Angelini (Ministero dell'Ambiente e della Tutela del Territorio e del Mare - Ministry of the Environment and for the Protection of Land and Sea)

Liechtenstein
Heike Summer (Amt für Umwelt — Office of Environment)

Monaco
Wilfrid Deri (Ministère d'État, Département des Relations extérieures et de la coopération - State Ministry, Department of External Relations and Cooperation)

Slovenia
Majda Lovrenčič (Ministrstvo za okolje in prostor - Ministry of Environment and Spatial Planning)

Switzerland
Marc Pfister (Bundesamt für Raumentwicklung ARE — Federal Office for Spatial Development)

European Union
Andrea Bianchini (European Commission, DG Environment)

Table of Contents

List of figures

List of tables

List of abbreviations

ACB	Alpine Climate Board
ALPACA	Alpine Partnership for Local Climate Action
ASP	Alpine Space Programme
BBG	Bundesbeschaffung (Federal Public Procurement Agency)
CaSCo	Carbon Smart Communities
CBD	Convention on Biological Diversity
CIPRA	Commission Internationale pour la Protection des Alpes – International Commission for the Protection of the Alps
CMU	Circular Material Use
CO_2	Carbon Dioxide
CORINE	Coordination of Information on the Environment
DMC	Domestic Material Consumption
EAP 7	Seventh Environment Action Programme
EEA	European Environmental Agency
EED	Energy Efficiency Directive
EFESE	Évaluation Française des Écosystèmes et des Services Écosystémiques
ESS	Ecosystem Services
EU	European Union
EUSALP	EU Strategy for the Alpine Region
GDP	Gross Domestic Product
GE	Green Economy
GEAP	Green Economy Action Programme
GHGs	Greenhouse Gas Emissions
GPP	Green Public Procurement
HLEG	High-level expert group on sustainable finance
IEA	International Energy Agency
IMEAS	Integrated and Multi-level Energy models for the Alpine Space
INCA	Integrated system of Natural Capital and ecosystem services Accounting
KOINNO	Kompetenzzentrum innovative Beschaffung (Competence Center for innovative procurement)
KNB	Kompetenzzentrum Nachhaltige Beschaffung (Competence Center sustainable procurement)
MAP	Multi Annual Programme
NC	Natural Capital
NCA	Natural Capital Accounting
NCAs	Natural Capital Assessments
NOx	Nitrogen Oxides
NUTS	Nomenclature des unités territoriales statistiques – Nomenclature of Territorial Units for Statistics
OECD	Organisation for Economic Cooperation and Development
PM	Particulate Matter
PPS	Purchasing Power Standard
SACA	Strategic Alpine Connectivity Areas
SDGs	Sustainable Development Goals
SPI	Social Planning Instrument
SP	Sustainable Procurement
UBA	Umweltbundesamt (German Environment Agency)
UNEP	United Nations Development Programme
VC	Value Chains
WEI+	Water Exploitation Index plus

Executive summary

The progress report "Green Economy in the Alpine Region" is based on the findings of the Sixth Report on the State of the Alps (RSA6), in which a green economy is defined as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities". RSA 6 defines four key thematic areas which describe and present data on the status of a green economy in the Alps:

- Energy-efficient and low carbon economy
- Resource-efficient economy
- Ecosystem services and natural capital-based economy
- An economy supporting quality of life and well-being.

The present report describes the recent political, societal and economic development in selected aspects aligned with these four thematic areas and aims at providing a picture of the current status and ongoing activities regarding the a green economy in the Alps. It also points out shortcomings in the different areas. Where possible, promising approaches for the Alpine region are identified based on the situation described.

The report then sets out how developing the Alpine area into a model region for a green economy can be supported. It proposes to sharpen the profile of an Alpine green economy by defining concrete measures in selected key topics for future action. These are based on the promising approaches identified in the thematic chapters and include:

- Application of energy efficiency and sufficiency policies
- Efficient use of land
- Setting up natural capital assessments
- Implementation of sustainable/green/circular procurement processes.

The key topics are selected according to specific criteria: there has to be a cross-sectoral effect for a green economy, The resulting action must be feasible at local level, and they must be relevant to the Alps and linked to the Green Economy Action Programme (GEAP), which was adopted by the Alpine Conference in 2019. They are meant to serve as a focus for a defined period without preventing actions in other fields, also facilitating future monitoring and reporting on a green economy.

Also illustrated are pathways for the transition to a green economy supporting the implementation of the key topics proposed for future action.

Lastly come the conclusions, which are further developed in a number of strategic and thematic recommendations to speed up and further the development of a green economy in the Alps. These update the recommendations of the RSA6 and focus, for the strategic part, on mainstreaming the green economy idea in the bodies and programmes of the Alpine Convention and improving the monitoring and reporting of green economy developments. The thematic recommendations take up the four key topics for future action and make concrete proposals for actions to implement them.

Recommendations

As this report shows, progress in the green economy in the Alpine region has been uneven and rather slow. We need to step up our efforts to achieve a climate-neutral, climate-resilient, resource efficient Alpine region by 2050 that can preserve biodiversity and ecosystem services and ensure public well-being and equity. Therefore, we are proposing a number of recommendations, which update the recommendations of the RSA 6, to speed up and further the development of a green economy in the Alps.

These updated recommendations are divided into two main sections:

- Strategic recommendations to coordinate and monitor green economy development in the Alpine Convention area
- Thematic recommendations (as an update of the RSA 6 recommendations).

Strategic recommendations

The strategic recommendations describe how to strengthen and monitor the overall development of the green economy in the Alpine Convention area:

- **Coordinating green economy activities in the Alps:** Green economy activities should be coordinated across the Alps and between the different working bodies of the Alpine Convention, particularly the Alpine Climate Board, the thematic groups of the EU Strategy for the Alpine Region (EUSALP) and the Alpine Space Programme (ASP). Having a central coordinating body within the Alpine Convention, such as a Green Economy Board for bundling green economy activities and linking this to ongoing activities at national, European and international levels, could be a major milestone in the development of a model green economy region. Green economy issues should be aligned with the work of Alpine-wide working groups and institutions dealing with issues touching on the green economy. Furthermore, relevant actors in the field of a green economy, above all umbrella organisations, (e.g. business, civil society, consumers), banks and financial institutions, municipalities and their administration, should be addressed and included in these activities by the bodies of the Alpine Convention.
- **Development of a framework for measuring a green economy:** As part of the future work programme, the Permanent Committee should discuss which group in the Alpine Convention should develop a framework for how to measure and report on progress in the green economy in the Alps in order to report on the progress in and evaluation of implementing the GEAP.
- **Progress reports on the green economy:** Progress reports on the green economy should be drawn up every four years for the Alpine Conferences. The progress reports should describe how the situation in the Alpine Convention area has developed regarding selected topics of a green economy. They should also report on the implementation of the Green Economy Action Programme.
- **Next Multi Annual Programme: (MAP):** The next MAP should include the green economy as a separate key topic. Green economy should be mainstreamed in other topics included in the programme where relevant.
- **Alpine Space Programme (ASP):** Green economy should be considered by the relevant decision-makers in the Alpine region when implementing the next Interreg Alpine Space Programme 2021-2027.
- **Policy coordination in border regions:** The Alpine Convention as an international organisation should work towards the harmonisation of policies with relevance to a green economy in transnational regions/neighbouring regions in the Alpine Convention area via its working bodies.
- **Introducing integrated concepts:** Integrated concepts such as efficiency and sufficiency concepts should be explored, defined and introduced at a strategic level particularly in the areas of energy, mobility and land use by the appropriate Alpine-wide organisations. This includes the EUSALP action groups, the Alpine Space Programme and the mandates of the working bodies of the Alpine Convention.

Thematic recommendations

These short-term thematic objectives are in line with the four thematic fields of RSA 6 and result from the findings of the present progress report.

Energy efficiency and low carbon economy

The Innsbruck Declaration launched the Alpine Climate Target System in order to achieve climate-neutral and climate-resilient Alps by 2050. The target system already includes sectoral emission reduction targets, but besides these efficiency targets, energy sufficiency should be promoted as a key approach to limit resource and energy consumption comprehensively. The Alpine Convention should support the implementation of energy efficiency and sufficiency policies at local level. Municipalities could define energy standards and support innovative energy consumption patterns.

Resource efficiency

Efficient land use practices including inner-urban development should be supported by the Alpine Convention and recommended as good practices to Alpine municipalities. The application of different, already existing approaches at local level should be fostered by the Alpine Convention. Examples of such approaches are the reuse of brownfields, performing cost benefit and environmental impact assessments and reassuring that there is an actual demand before developing the land. Economics can provide significant operational instruments to induce better land use patterns and management that are still rarely adopted in the region. The Alpine Convention should provide and/or generate summarised and easily accessible information and launch pilot projects at local level for applying these approaches. Regional responsibility and co-operation across the boundaries of local communities for resource-conserving land management should be strengthened.

Ecosystem services and natural capital

One concrete way to support the recognition of ecosystem services and their economic relevance is to develop a pathway for the introduction of Natural Capital Assessments (NCA) at local level. Municipalities should be encouraged to arrange for NCA in their area and to consider the results in their local decision-making processes. Demonstration projects on the potential benefits provided by green infrastructures and natural capital to local and regional economies and well-being can be encouraged. The set-up of pilot NCA municipalities can be supported by relevant project calls in the upcoming Alpine Space Programme.

Quality of life and well-being

Sustainable procurement is a powerful instrument for the practical implementation of a green economy at local, regional and national levels. Procurement efforts should be based on EU-wide criteria and future developments so as to fully harness their transformative potential. It is useful for there to be an exchange of experiences, including the legal/technical point of view, taking into account the feasibility of setting up a platform for sustainable public procurement across the Alps. Such a platform could support governmental authorities as well as municipalities in taking over sustainable procurement procedures in their day-to-day businesses and connect suppliers to procurers from the Alpine region.

A second approach is to study and use existing Alpine-specific indicators of well-being instead of the conventional economic indicators. If necessary, existing indicators could be adapted to Alpine conditions or new ones could be developed.

Frederica Violin - stock.adobe.com

Introduction

In 2016, the XIV Alpine Conference adopted the Sixth Report on the State of the Alps – Greening the economy in the Alpine region (RSA 6, Alpine Convention 2017) in which a green economy is defined as "one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities". The report provides a comprehensive picture of the situation of the green economy in the Alps. It defines four key thematic areas for which data is assembled and analysed. These are:

- Energy-efficient and low carbon economy
- Resource-efficient economy
- Ecosystem services and natural capital-based economy
- An economy supporting quality of life and well-being.

Based on the analysis, the report identifies opportunities for the successful transformation to a green economy, which are further developed into operative recommendations. These include a call for a "Green Economy Action Programme" to further identify fields of actions.

The XIV Alpine Conference also adopted a declaration on Fostering a Sustainable Economy in the Alps which calls for the elaboration of a comprehensive Action Programme for a Green Economy in the Alpine region for consideration at the next Alpine Conference. Furthermore, one of the six main topics in the Multiannual Work Programme of the Alpine Conference 2017-2022 prioritises "Greening the Economy", also calling for an action programme.

From 2017 to 2019, the "Action Programme for a Green Economy in the Alpine Region" (GEAP) was developed in a co-creation process with stakeholders from all Alpine countries. A series of stakeholder workshops, online consultations and close cooperation with Alpine Convention bodies has led to a comprehensive programme containing five action fields and 33 actions serving as a basis to implement future green economy projects. The GEAP was adopted in 2019 at the XV Alpine Conference.

A first follow up project looks at the sectoral development of a green economy and works with selected pilot regions in the Alps to implement projects in different economic sectors particularly relevant for the transition to a green economy. The present progress report has been produced under a second follow up project, aiming at implementing the GEAP and the priority given to a green economy in the Alpine Convention's Multiannual Programme.

This report looks at the recent political, societal and economic developments in the four thematic areas of the RSA 6 since its publication and aims to provide a picture of green economy activities in the Alps. However, as the GEAP was adopted shortly before this report, it was too early to take stock of its implementation. The progress report identifies selected areas aligned with the RSA topics where some progress has been made and which were identified as having the potential to contribute to a more sustainable economy in the Alps. The information compiled in this report will provide a guide for identifying actions and measures to further support the development of a green economy. The above recommendations to turn the Alps into a model green economy region build upon the findings of this progress report and previous activities, and update the recommendations included in RSA 6.

1 Changes in framework conditions

Since starting work on RSA 6, some important changes have occurred internationally and nationally in the framework conditions of relevance to the development of a green economy.

UN Sustainable Development Goals

In 2015, the United Nations adopted the Sustainable Development Goals (SDGs) at the United Nations summit for the adoption of the post-2015 development agenda. The 17 goals and their associated 169 targets intend to safeguard sustainable development from an economic, social and environmental point of view. More precisely, they aim to end poverty, hunger and inequality, take action on climate change and the environment, improve access to health and education, and build strong institutions and partnerships. Unlike the Millennium Development Goals that had focused on developing countries, the SDGs address all countries. The great majority of the 17 SDGs are relevant for a green economy, for example SDG 8 on decent work and economic growth, SDG 9 on industry, innovation and infrastructure and SDG 12 on responsible consumption and production. Governments at all levels shall integrate the SDGs into their existing national, regional and local strategies and plans to ensure their practical implementation and achievement. They have become a reference not only for political action, but also for activities of private economic actors and associations. The Sustainable Development Goals build an important framework for actions to achieve the transition to a green economy.

European Green Deal

In Europe, an important policy initiative extremely relevant to greening the economy is the European Green Deal. It is a roadmap presented in 2019 by the European Commission for making the EU's economy more sustainable. It sets out how to make Europe the first climate-neutral continent by 2050 and to decouple economic growth from resource use. The roadmap includes actions to boost the efficient use of resources by moving to a clean, circular economy and stop climate change, reverse biodiversity loss and cut pollution. It outlines the investments needed and financing tools available and explains how to ensure a just and inclusive transition to a sustainable economy.

The European Green Deal covers all sectors of the economy, notably transport, energy, agriculture, buildings, and industries such as steel, cement, ICT, textiles and chemicals. To achieve the goal of climate neutrality, in 2020 the European Commission proposed a European Climate Law. It aims to write into law the goal set out in the European Green Deal and to ensure that all EU policies contribute to this goal and that all sectors of the economy and society play their part. The European Commission also presented a "Circular Economy Action Plan" focusing on sustainable resource use, a "Farm to fork strategy" to make food systems more sustainable and a "EU Biodiversity Strategy 2030".

EU Action Plan on Sustainable Finance

In 2017, the European Commission set up a high-level expert group on sustainable finance (HLEG) to provide advice for actions and plans to ensure green finance. In 2018, an action plan on sustainable finance formulated by the HLEG was adopted. Key actions also include the establishment of EU labels for green financial products, a clear and detailed EU classification on sustainable activities, and measures to clarify asset managers' and institutional investors' duties regarding sustainability (European Commission 2019b).

Alpine Convention

In the Alps, issues relating to a green economy have been taken up by several thematic working bodies of the Alpine Convention since the adoption of the RSA 6 and the GEAP. The XIV Alpine Conference in 2016, which also adopted the RSA6, established the Advisory Committee on the Alpine Climate. This "Alpine Climate Board" has a mandate to bundle climate change related activities taking place in the framework of the Alpine Convention and to develop ideas and proposals for a "climate neutral Alpine space". The Declaration of Innsbruck "Climate-neutral and climate-resilient

Alps 2050", taken at the XV Alpine Conference in 2019, adopted the Alpine Climate Target System developed by the Climate Board. It sets climate targets for the Alpine region, taking into consideration the specific characteristics of the Alpine area and the existing experience of the Alpine Convention. The overall goal is a climate-neutral and climate-resilient Alpine region in 2050. During its 2019-2021 mandate, the Alpine Climate Board is also working on the Alpine Climate Action Plan 2.0 that will be presented to the XVI Alpine Conference.

The XV Alpine Conference also established thematic working groups dealing with green economy issues. Recognising the key role of biodiversity and natural capital in the Alps, one of these groups is the Alpine Biodiversity Board. The objectives of this board are to undertake a stock-taking analysis of relevant biodiversity and landscape strategies, guidelines and policy recommendations for Alpine countries, including the Convention on Biological Diversity and relevant EU legislation and biodiversity strategies as well as the results of recent research.

The Mountain Agriculture and Mountain Forestry Working Group was established to contribute to the concrete operationalisation of the Alpine Climate Target System 2050 of the Alpine Convention. Its mandate also includes contributing to the implementation of the GEAP by supporting actions in the fields of mountain farming and forestry, especially eco-innovation, regional development, valorising ecosystems and biodiversity, and living and working in a green economy.

Aware of the increased pressure on the soils of the Alpine region and increased risk in relation to climate change, the XV Alpine Conference also founded the Soil Protection Working Group. Its role is to foster exchange and raise awareness in matters of soil protection also by cooperating with the relevant networks, supporting the collection of data and addressing the interlinkages between qualitative and quantitative aspects of soil protection.

The most important framework conditions at Alpine and national level are described in chapter 2 under the different topics.

Interreg Alpine Space Programme 2021+

Preparations began in 2019 for a new period of the Alpine Space Programme, the most important funding programme for the Alpine region. The Interreg Alpine Space Programme 2021+ will have four priorities, all of which have a link to the green economy and will contribute to greening the economy in the Alps. These are (1) Climate resilient and green Alpine region, (2) Carbon neutral and resource sensitive Alpine region, (3) Innovation and digitalisation-oriented green Alpine region and (4) Cooperatively managed and developed Alpine region.

Covid as an impulse for a green economy?

The current Covid crisis has far-reaching consequences on the economy and society as a whole and presents additional challenges, but also opportunities for the transition to a green economy. Environmental and climate protection were high on the political agenda when the emergency started in early 2020. The challenge is now to use this historic disruption as an opportunity for positive changes in the economic system and to pave the way for a more sustainable development.

At the time of preparing this progress report, the medium and long term consequences of Covid-19 on the environment and society are not yet clear. It is uncertain if short term positive effects such as improved air quality and lower CO_2 emissions, mainly as a result of reduced traffic, will have a lasting impact on the environment. This will depend on the policy measures and strategies currently being developed, since long term improvements can only be achieved through a targeted climate and environmental policy that triggers structural changes in production, consumption and mobility patterns (UBA GmbH 2020).

The crisis underlines the potential for a comprehensive socio-ecological transformation. The underlying concepts of a green economy, such as regional value chains and circular economy, present decisive advantages in situations like the one we are currently facing. Current stimulus programmes for the economic sector can and must be used to transform the economic system and set incentives for a climate friendly and resource efficient economy and thus a more stable and sustainable system (UBA 2020).

The Sustainable Development Goals as well as the goals of the European Green Deal and its underlying strategies can provide guidance in this respect.

2 Main topics

The present progress report looks at the most important developments in the four main topics of the 6th Report on the State of the Alps on the green economy. It describes the current status of the four topics and their progress in selected fields on a qualitative basis and only refers to quantitative indicators to a very limited extent. On this basis, the report identifies promising approaches for the Alps and makes proposals for future activities in connection with the Green Economy Action Programme.

2.1 Energy efficiency and low carbon economy

The central piece of European legislation that covers these fields is the EU 2030 climate and energy framework (COM/2014/015) defining EU-wide key targets. To reach these goals and to ensure compatibility with the Paris Agreement, the European Commission presented the European Green Deal to the European institutions in 2019. Besides the ambitious goal of binding to climate neutrality by 2050, the Green Deal envisages huge investments across the continent for renovating existing housing and building new infrastructure for decarbonised mobility, energy supply and industry as well as ambitious Action Plans to accelerate the transition towards a circular economy and protect biodiversity.

With the Declaration of Innsbruck, the Alpine Convention defined an Alpine Climate Target System for 2050, which is embedded in the international framework of the climate goals and the Sustainable Development Goals (SDGs), especially SDG 7 on affordable and clean energy. The sectoral climate targets define goals and measures for the energy sector in detail (Alpine Convention 2019b).

The temporary effects of the Coronavirus crisis on greenhouse gas emissions (GHGs) and energy consumption can only be seriously estimated once quality-assured data are available. For example, the reduction in traffic and industrial processes during the health crisis might be cancelled out in the medium term if there are no structural changes in the way we produce and consume that are able to create the conditions for long-term sustainable growth within planetary boundaries. Therefore, whether the crisis will also have positive effects in the long term depends on the policy measures and future perspectives that are being developed and discussed now.

2.1.1 Carbon emissions

The 2030 Climate and Energy Framework of the European Union sets out the goal of a 40% cut in GHG emissions (from 1990 levels) (EC 2014). The European Union's Climate and Energy Package up to 2020 consists of laws for binding targets to achieve the goal of a 20% reduction of GHG emissions (from 1990 levels). For the Alps, the Alpine Convention´s Declaration of Innsbruck sets two strategic targets drawn up by the Alpine Climate Board (Alpine Convention 2019a): climate-neutral Alps and climate-resilient Alps by 2050. For the first target, greenhouse gas emissions will be reduced in the Alps in line with science-based reduction targets. To simultaneously achieve the second target, climate change vulnerabilities and impacts must be included in policies in order to minimize negative effects on the ecosystems, the communities and the regional economy.

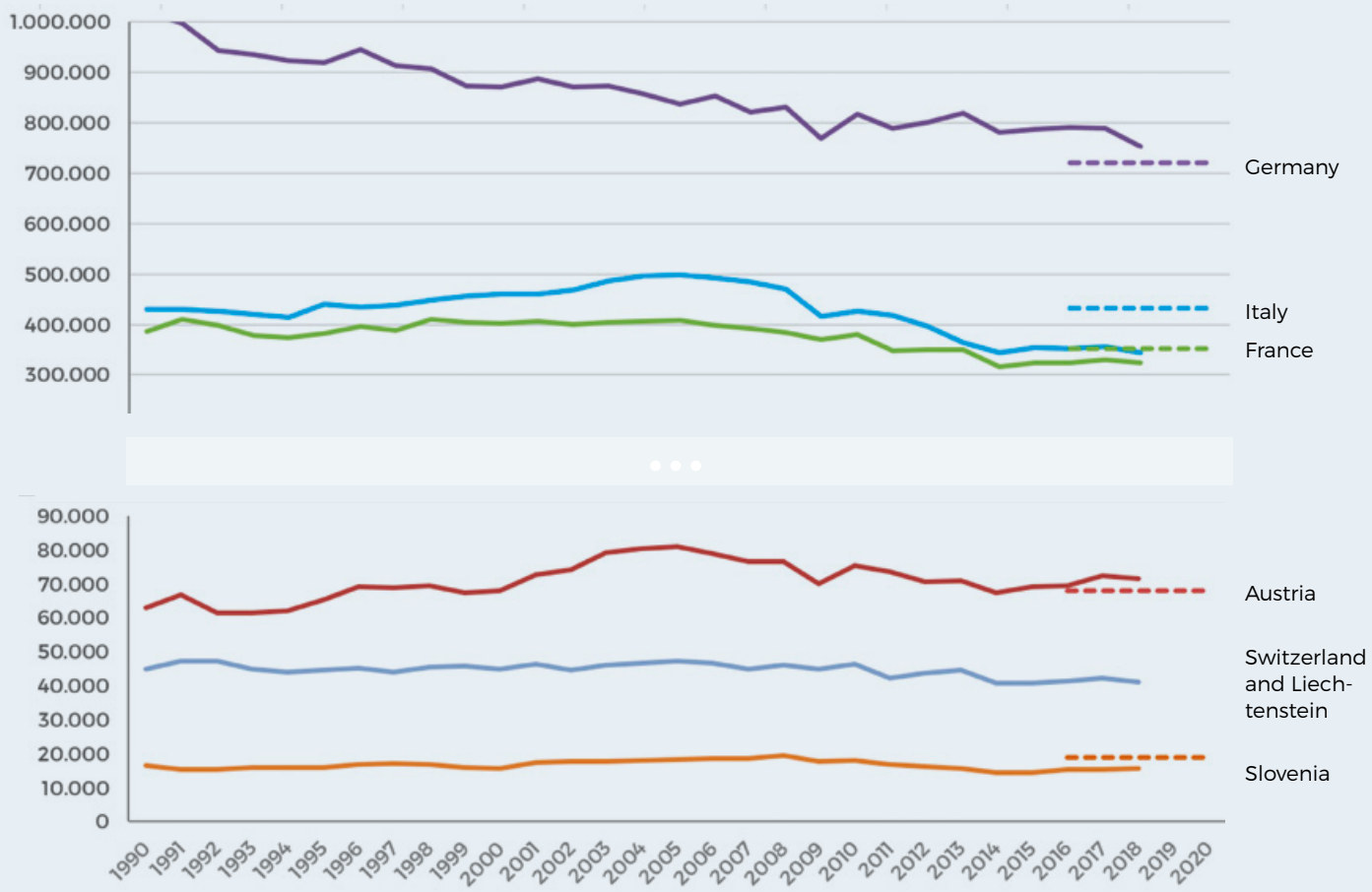
Figure 1 offers a view on the GHG emission trends of the Alpine countries. In the RSA 6, time series were shown until 2013. For the years 2013 to 2018, the data show a heterogeneous picture. From 2014 to 2016, emissions increased in some countries, while after 2016 they tend to decrease in all countries except Slovenia.

Good Practice: Alpine Partnership for Local Climate Action - ALPACA

Through the Alpine Partnership for Local Climate Action (ALPACA), cities, municipalities and network organisations have committed to ensuring more climate protection. The initiative was launched by the international networks "Alliance in the Alps", "CIPRA International" and "Alpine Town of the Year" as part of the conference "Let us turn climate visions into reality" 2018 in Innsbruck. With ALPACA, cities, municipalities and network organisations have joined forces to promote climate protection at local level. They work together to develop implementation instruments and partnerships and to boost the exchange of experience between different climate actors in the Alps. ALPACA was initiated by the Alpine Convention and adopted by the contracting parties at the 2016 Alpine Conference. On 30th June & 1st July 2020, an "Online conference on climate change communication: Listening, Storytelling, Networking" was organised.

More information: https://www.cipra.org/en/cipra/international/projects/current/climate-partnership-of-alpine-communities?set_language=en

Figure 1: National GHG emissions (CO2, CH4, N2O, F-gases) in Alpine countries from 1990 (base year) to 2018, in kt (Gg) GHG per year



Data source: JRC 2019, graph: Umweltbundesamt GmbH 2019. Liechtenstein's data are aggregated with Swiss data, Monaco is included in the data for France. The dotted lines show the EU 2020 goal for GHG reduction. For the common data of Switzerland and Liechtenstein, no data concerning the target is available.

2.1.2 Renewable energy sources

In the EU Renewable Energy Directive (2009/28/EC), which is part of the 2020 Climate and Energy Package and 2030 Climate and Energy Framework, the overall goal is to cover at least 20% of Europe's total energy needs with renewables by 2020. The revised Directive establishes a new binding EU target of at least 32% renewable energy in gross final energy consumption (EC 2014). For the Alpine Convention area, the Declaration of Innsbruck sets targets for the Alpine energy system. According to the Alpine Climate Target System 2050, the region's potential for renewable energies for electricity, heat and mobility demands should be fully used by that time. All coal-fired power plants in the Alps are to be shut down by 2030 (Alpine Convention 2019b: 14).

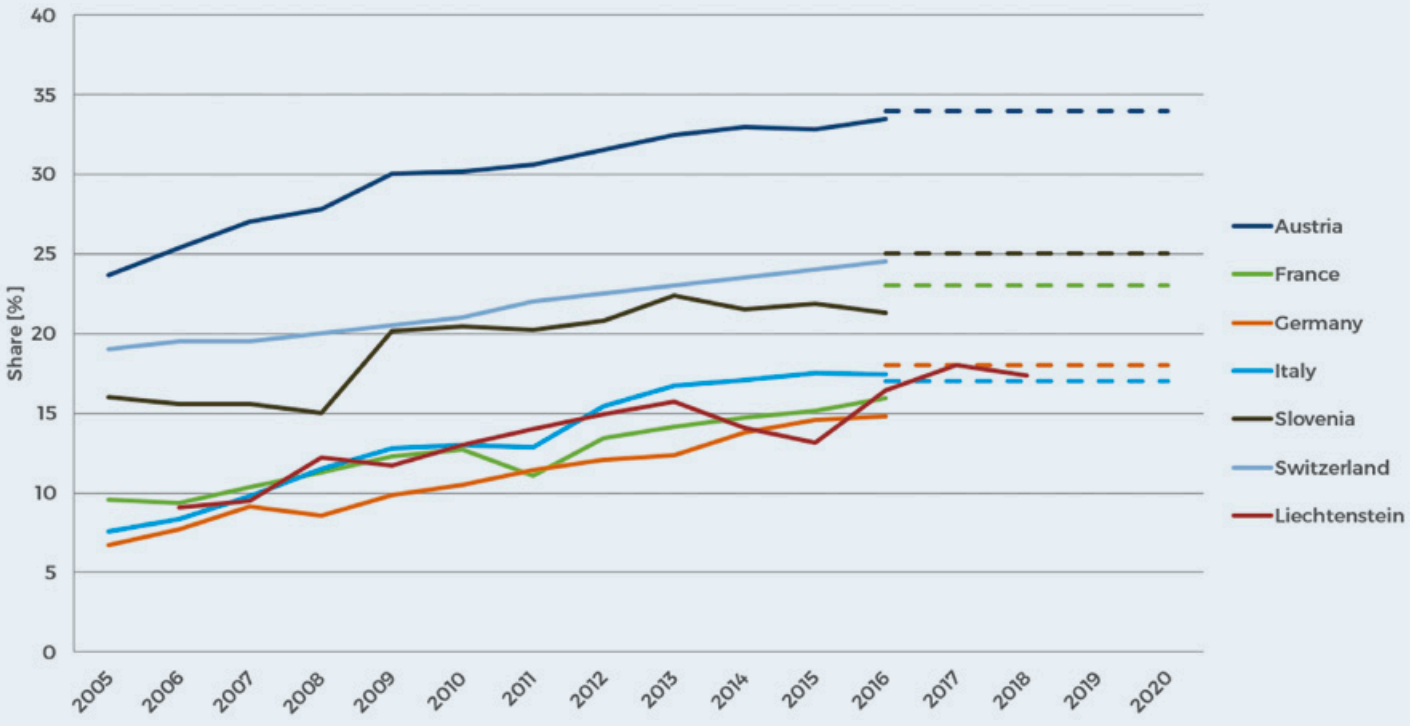
Figure 2 shows the shares of renewable energy in gross final energy consumption in Alpine countries from 2005 to 2016 compared to the EU 2020 targets. In all Alpine countries, there is an increasing tendency towards renewable energy production. Overall, the countries increased their shares by around 10% over the period considered. It is important to note that the overall energy supply also increased over the same time period. Austria's high share stems from its high use of renewables for electricity production. The figure shows that Germany, France and Slovenia are the countries with the highest gap between their 2020 targets and their 2016 levels. Italy and Austria are on an excellent way to achieve their targets.

Good Practice:
Interreg Alpine Space - IMEAS

"IMEAS - Integrated and Multi-level Energy models for the Alpine Space" is a project in which a multi-disciplinary team of technical, sociological and territorial partners develops a consistent methodology and practical guidance for the creation and integration of roadmaps based on multi-level approaches to climate change mitigation, energy innovation potentials, economic structures and monitoring of energy plans. Project leader is the Italian National Agency for New Technologies, Energy and Sustainable Economic Development. The project started in 2016 and was finished in November 2019.

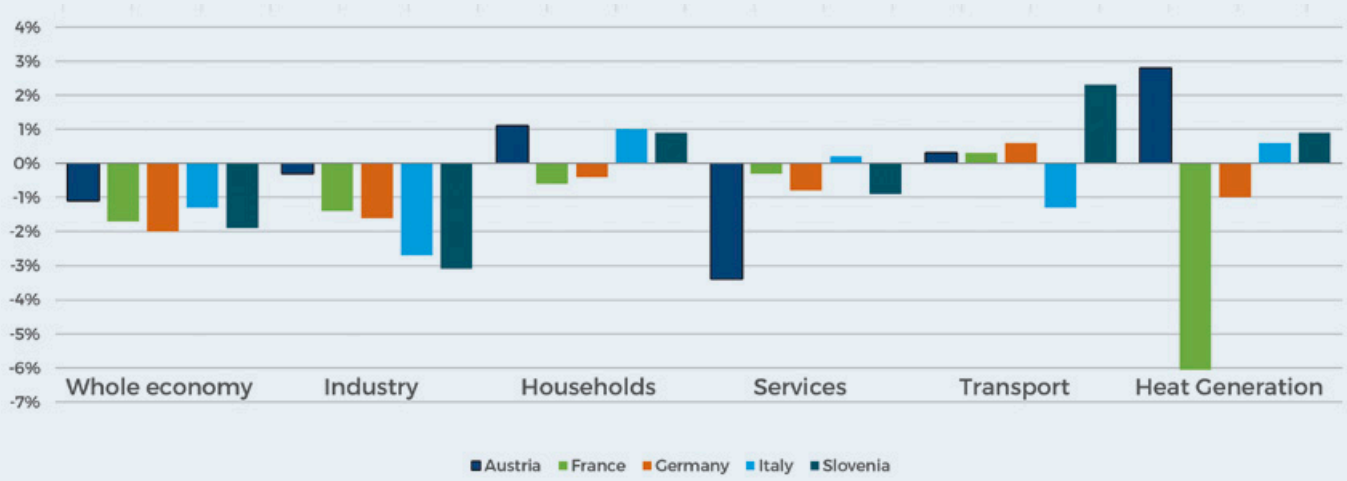
More information: https://www.alpine-space.eu/projects/imeas/en/home

Figure 2: Share of renewable energy in gross final energy consumption in Alpine countries from 2005 to 2016 (for Liechtenstein to 2018) in %.



Data source (except Switzerland and Liechtenstein): EEA 2019; for Switzerland: IEA 2019; for Liechtenstein: Amt für Statistik 2012, own calculations. Graph: Umweltbundesamt GmbH 2019. The dotted lines show the EU 2020 goal for renewable energy shares where available.

Figure 3: Average annual change of energy intensity from 2005 to 2017 in different sectors of the EU Alpine countries in percent.



Data source: European Commission 2018a, graph: Umweltbundesamt GmbH 2019.

2.1.3 Efficient use of energy

The concept of energy efficiency implies either consuming less energy while maintaining our current levels of amenities (e.g. availability of lighting, heating and electric motors), or achieving higher levels of amenities with unchanged energy input. Improving energy efficiency can lead to declining energy consumption, but this is not necessarily the case: so-called rebound effects can limit the effects of efficiency measures. For example, the financial savings due to reduced energy intensity often lead to higher energy demand (Alpine Convention 2017: 81pp.). Additionally, other concepts such as energy sufficiency should be investigated (see also chapter 3.2.2). Energy demands from a 'sufficient' building or transport system, by definition, will be low in absolute terms (eceee 2018: 4). Due to the fact that higher energy sufficiency can be caused by two effects[1] and energy intensity is just one of them, the data presented here in Figure 3 cannot capture the whole picture of energy sufficiency.

The EU Energy Efficiency Directive (EED) (2012/27/EU) from 2012 (European Commission 2012) promotes energy efficiency and was, in its 2012 version, meant to ensure that the EU's overarching objective to improve energy efficiency by 20% by 2020 was met. In 2018, as part of the 'Clean energy for all Europeans' package, the revised EED (2018/2002) was agreed on to update the policy framework to 2030 and beyond.

Figure 3 presents the average annual change of energy intensity between 2005 and 2017 in five sectors in the EU countries of the Alps. It shows a reduction of energy intensity throughout the economy as well as in all individual sectors. There are no significant differences from the data in the RSA6. In the industry sector, efficiencies have increased in all Alpine countries over the past 15 years. Austria has a specific monitoring body for energy efficiency, which is reflected in the low value for industry and services. France has been able to decrease energy intensity in heat generation through targeted policies (e.g. Réglementation thermique (RT 2012), or Crédit d'impôt pour la transition énergétique (CITE 2005)). Compared to RSA6, Italy has made a slight improvement in the household sector. Austria and France increased their energy intensity in the transport sector. Germany improved in heat generation; Slovenia increased its energy intensity in the household sector, compared to RSA6.

Good Practice:
ClimaHost - AlpineConvention

The ClimaHost climate protection competition for hotels and restaurants in the Alpine region honours ambitious hotel and gastronomic businesses that have implemented exemplary climate protection - especially energy efficiency - measures and thus contribute to sustainable tourism in the Alpine region. The award ceremony took take place during the XV Alpine Conference in April 2019 in Innsbruck/Austria. The competition was held during Austria's presidency of the Alpine Convention in cooperation with the German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety and the Austrian Federal Ministry for Sustainability and Tourism.

More information: https://climahost.eu/

1 Higher energy intensity and lower energy consumption

2.2 Resource efficient economy

2.2.1 Efficient Use of Non-Energy Resources

In 2019, the European Commission presented the European Green Deal. An important part of the strategy is to boost the efficient use of resources by moving to a clean, circular economy.

Within the European Green Deal, the European Commission adopted a new Circular Economy Action Plan in March 2020. In the Plan it is said that the EU needs to accelerate the transition towards a regenerative growth model that gives back to the planet more than it takes, advances towards keeping its resource consumption within planetary boundaries and, therefore, strives to reduce its consumption footprint and double its circular material use rate in the coming decade. To monitor developments, indicators on resource use, including consumption and material footprints to account for material consumption and environmental impacts associated with production and consumption patterns, shall be developed and be linked to monitoring and assessing the progress towards decoupling economic growth from resource use and its impacts in the EU and beyond. An alignment with the indicators in the EU Circular Economy Monitoring Framework would be fruitful.[2]

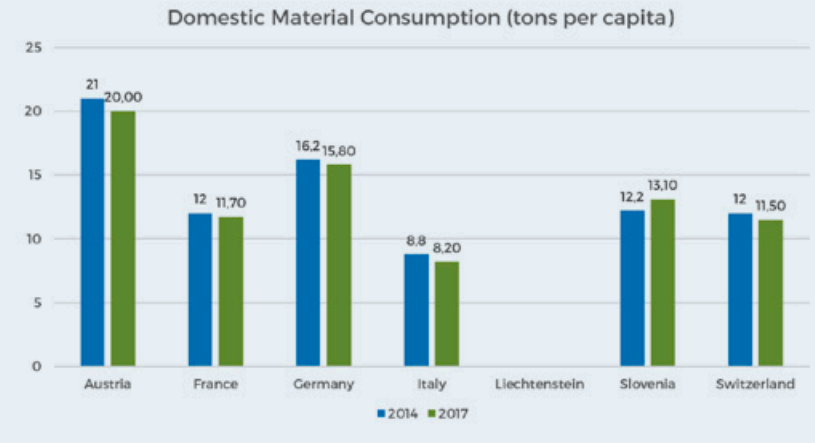
This is accompanied by the EU industrial strategy whose goal is to strengthen the economic competitiveness of the EU but also to support the transition of Europe's industry towards digitalisation and climate neutrality (EU 2020 a). Furthermore, the EU also adopted its "SME Strategy for a sustainable and digital Europe" whose aims also include capacity-building and support for the transition to sustainability and digitalisation of small and medium sized enterprises (EU 2020 b).

Domestic Material Consumption - Situation in the Alpine countries

For obtaining quantitative information about resource consumption and resource efficiency, the most common approach is to measure 'resource productivity'. This means calculating the Domestic Material Consumption (DMC) per capita and comparing that national figure to the national Gross Domestic Product (GDP). The higher the resource productivity, the more resource-efficient the national economy is. This indicator depends on highly aggregated data and describes the entire national economy, but does not give information about individual regions or different branches or quantify the worldwide demand for material extractions triggered by consumption and investment by households, governments and businesses in the EU. It is the lead indicator of the EU Resource Efficiency Scoreboard to measure resource efficiency and the progress in this field. Figure 4 shows the development of DMC at national level between 2014 and 2017. In the most recent period, DMC has decreased in most countries with only Slovenia showing an increase. However, during the 2007-2017 period a clear decrease can be observed in all Alpine countries, especially in Italy and Slovenia. In Slovenia this decrease is due to a reduction in the use of mineral resources owing to a crisis in the building sector. Italy has been showing some of the lowest DMC rates in EU28 for a long time (around 10 tons p.c.) as a result of a steady reduction of internal consumption of materials (down 32% from 2009 to 2019), net imports, and an increase of municipal waste recycling (+21% for 2009-2019) (Eurostat 2020).

2 https://ec.europa.eu/eurostat/web/circular-economy/indicators/monitoring-framework

Figure 4: Domestic material consumption (data by Eurostat: 2019, provisional data for other countries, estimation for France) and reduction of DMC for the period 2007-2017 in Alpine countries



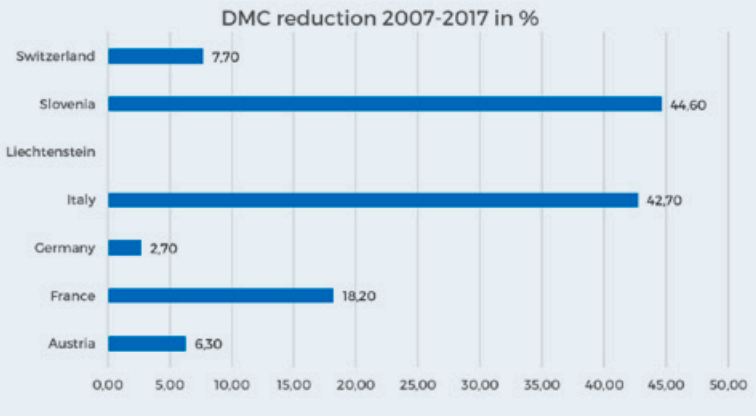
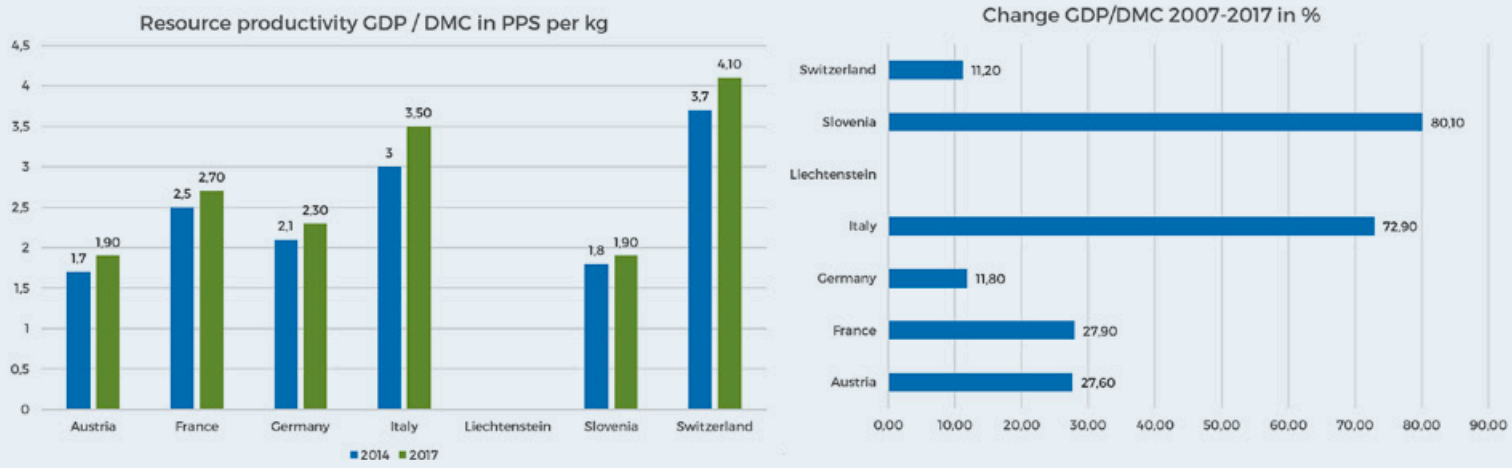


Figure 5: Resource productivity (Purchasing Power Standard PPS) in Alpine countries for the period 2014 to 2017 and change of resource productivity in the period 2007-2017



Resource productivity in Alpine countries has increased in all countries in the last few years. Looking at the longer period 2007-2017 (see Figure 5), a significant increase in resource productivity can be seen in Italy and Slovenia.

The DMC and resource efficiency indicator are only available at national level. The Alpine-specific case study further ahead in this chapter presents the efficient use of water resources complementing the RSA6 indicators on forest and wood resources used.

Resource Efficient Use of Water

Alpine water resources are important not only for the Alpine economy but also for the areas of the Prealps as their runoff is an important contributor to the main central European river systems of the Danube, Rhine, Rhone and Po. Their runoff plays an important role for the economy, particularly agriculture, hydropower, drinking water supply and river transport. The Water Exploitation Index (WEI) provides a quantitative description by showing the mean annual total demand for freshwater divided by the long-term average freshwater resources in a certain geographic unit expressed as a percentage. For a better understanding of the index, the EEA has defined a WEI of 20% as the warning level at which a region borders on becoming water-scarce and talks about water-scarce regions from 40% upwards. The Water Exploitation Index plus (WEI+) is a further developed version which considers river basins (EEA 2020). The EEA has compiled data from several sources for the European water basins and sub-basins.

Figure 6 shows the WEI+ for the year 2015 in each season. It illustrates the development of the WEI over the year and the spatial distribution of water exploitation. While the northern parts of the Alps are still quite distant from the warning threshold in all seasons, some sub-basins in the southern parts come already quite close to it during the summer. One of them (Po main – Upper –Tanaro) has already significantly exceeded this level and got close to water scarcity. Even if this picture only shows the development in 2015, it illustrates that also in the Alps water stress can occur and an efficient use of water is advisable. With ongoing climate change and the associated change in precipitation, it may be assumed that even in the Alps more catchment areas may be affected by summer water stress in a few years. Certainly, there are more effects on water management caused by climate change such as increasing floods due to extreme precipitation, loss of water storage by snow and glaciers due to higher average temperatures and higher evaporation caused by higher average temperatures. In terms of water use efficiency, the water exploitation index summarises several of these effects.

The Forum Alpinum 2018 and the 7th Water Conference identified four fields of action as most urgent for the Alps (Scheuer et al. 2018):

- Balance water availability and water use
- Reduce water pollution
- Prevent conflicts along rivers and in riverain plains
- Preserve the remaining near-natural aquatic ecosystems and landscapes.

Agriculture plays a significant role as a polluter (nutrient and pesticide inputs) and is a major

user of the resource. Improved irrigation methods may contribute to reduced water consumption especially during spring and summer when more water is needed in agriculture. ViVaCCAdapt is a good practice example in this context.

Good Practice ViVaCCAdapt (LIFE Project in Slovenia)

The purpose of the project is to establish measures to avoid the adverse effects of climate change on agriculture in the area of the Vipava Valley.

One objective of the project is dedicated to optimising irrigation by developing and testing the decision-making system for irrigation. The system will inform growers about the recommended time and quantity of irrigation by taking the following information into account:

- Water retention properties of the soil,
- The current amount of water in the soil,
- The water needs of plants depending on the stage of growth
- A weather forecast.

More information: www.life-vivaccadapt.si

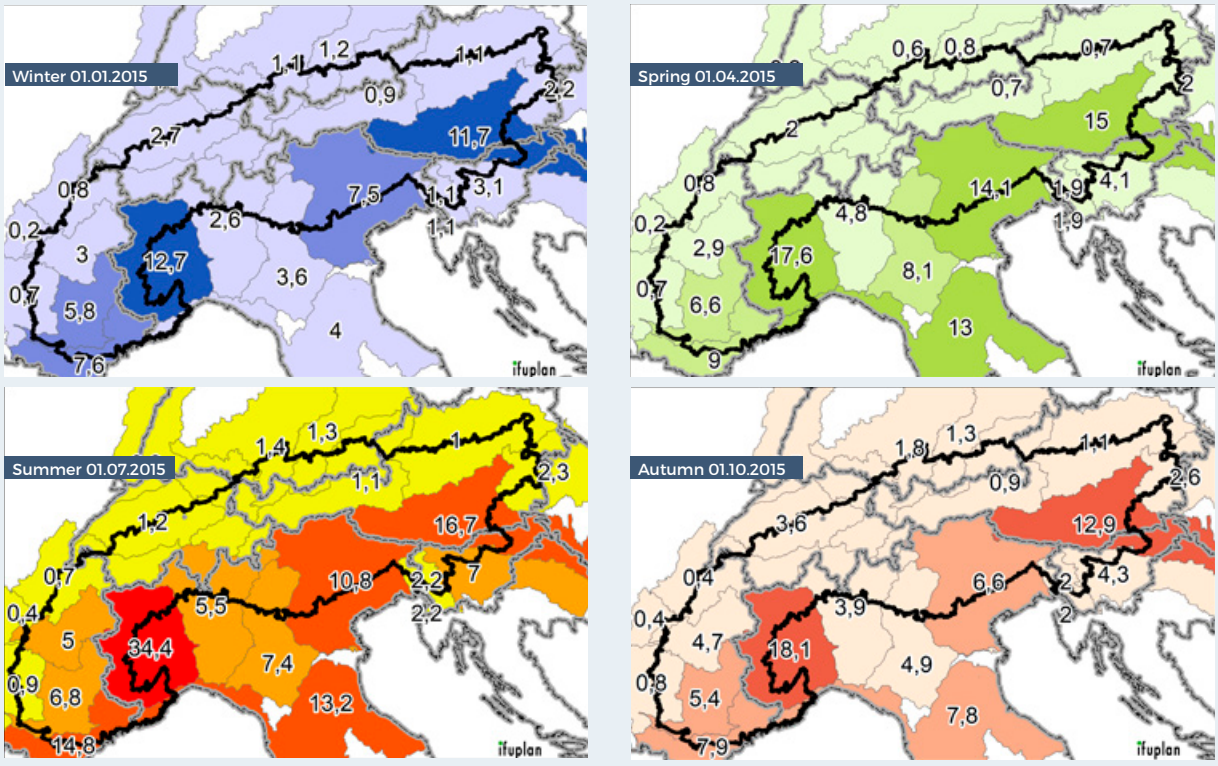
2.2.2 Efficient Use of Land - Land Use Changes

Land use changes and the issue of land take were presented in the RSA6 based on national land use statistics. A new map created by the European Environmental Agency (EEA) in 2018 illustrates land take intensity in the Alps according to CORINE data and in NUTS 3 regions. Even though CORINE data are less precise than national statistics, they still provide current data processed according to a uniform method across national borders. Therefore, these data provide comparable information.

The EEA data show an increase from 0.1 to 5% in the intensity of land take in the period 2000 to 2018 throughout the Alpine Convention area. Hot spots of land take at between 5.1 and 10% can be seen in single areas in almost all Alpine countries, sometimes in excess of 10%, particularly in parts of Austria, France and Italy.

Since the RSA6, there have been different political commitments concerning land take in the Alps. In 2016, the Declaration of the XIV Alpine Conference on Fostering a Sustainable Economy in the Alps states: "Land and soil in the Alps are limited resources. The Parties to the Alpine Convention will

Figure 6: Water exploitation index during 2015
Water exploitation index plus (WEI+) for river basin districts in the alps.



Source: www.eea.europa.eu/data-and-maps/explore-interactive-maps/water-exploitation-index-for-river-2

therefore support policies and activities aimed at a sustainable land and soil management and spatial development." Action group 6 of the EU Strategy for the Alpine Region (EUSALP), dealing with the preservation and valorisation of natural resources, published an Alpine-wide declaration on intelligent land use and soil protection. It also contains a statement that the signatories will co-operate to foster inner-urban development.

To bring about less land take, national, regional and local authorities can define administrative limitations by, for instance, changing laws for land use planning and launching programmes for inner-urban development activities. Action must be taken at a local level and should be fostered by strategic agendas nationally or sub-nationally. Early examples for such spatial development concepts exist in Austria (Raumbild 2030 Vorarlberg), Switzerland (Spatial concept Switzerland[3], Cantonal structure plan[4]), and Germany (Land saving programme Bavaria[5]). Economics can provide significant operational instruments to induce better land use patterns and management that are still rarely adopted in the region. The Good Practice example shows how inner-urban development could work.

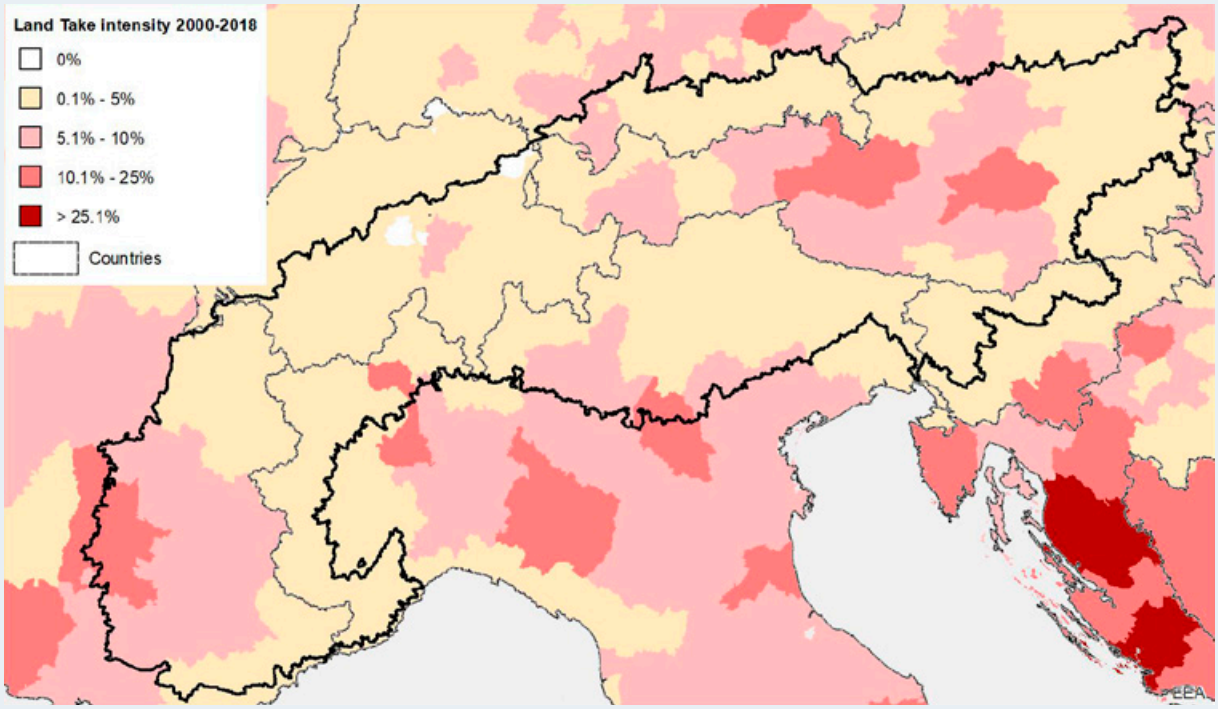
3 Raumkonzept Schweiz
4 Kantonaler Richtplan
5 Flächensparoffensive Bayern

Good Practice Market hall Glarus (Switzerland)

A historical building (former Post office) in the town centre of Glarus (about 12,000 inhabitants in the Canton of Glarus) had many shop vacancies. The building was rented by a private entity to house a year-round market that had previously been located outdoors for two days a week and restricted to the summer. The private association gained support from the municipal council, which intends to shape the social and political centre by the project "Zukunft Innenstadt" (Future of the Inner City). The market hall opened in January 2017 for two days a week. However, the plans go beyond the pure market: a meeting place is to be created to bring people together and promote exchange. In addition to the two market days, events such as concerts, readings or company events are to take place in future. A bar is to provide a framework for all this.

More information: www.densipedia.ch/markthalle-glarus-vom-leeren-postgebaeude-zum-publikumsmagneten

Figure 7: Land take intensity within NUTS 3 regions between 2000 and 2018



Source: https://land.discomap.eea.europa.eu/arcgis/rest/services/Land/LandTakeIntensityNUTS3/MapServer

2.2.3 Circular Economy – Turning Waste into a Resource

Waste management and recycling are crucial issues for a circular economy. Municipal waste in the Alps is quite high as Figure 8 shows. Even though municipal waste only accounts for about 10% of the weight of total waste generated or about 30% of the amount of waste without major mineral waste, it gives an indication about consumption patterns. In the EU 28, the average municipal waste per capita was 486 kg in 2017. Only Slovenia was below this average in 2017, Italy was quite close, but all other Alpine countries produced more waste per capita than the EU 28 average. Further progress has to be made to reduce this amount.

In terms of identifying progress towards a circular economy, an informative indicator is the 'Circular Material Use' rate (CMU) sometimes also called 'circularity rate', which measures the contribution of recycled materials to overall material demand. It is the ratio of recycled waste material to total material demand. While recycling rates regard only waste, the CMU takes into account all materials which are fed into our economy. Therefore, the circularity rate is much lower than recycling rates.

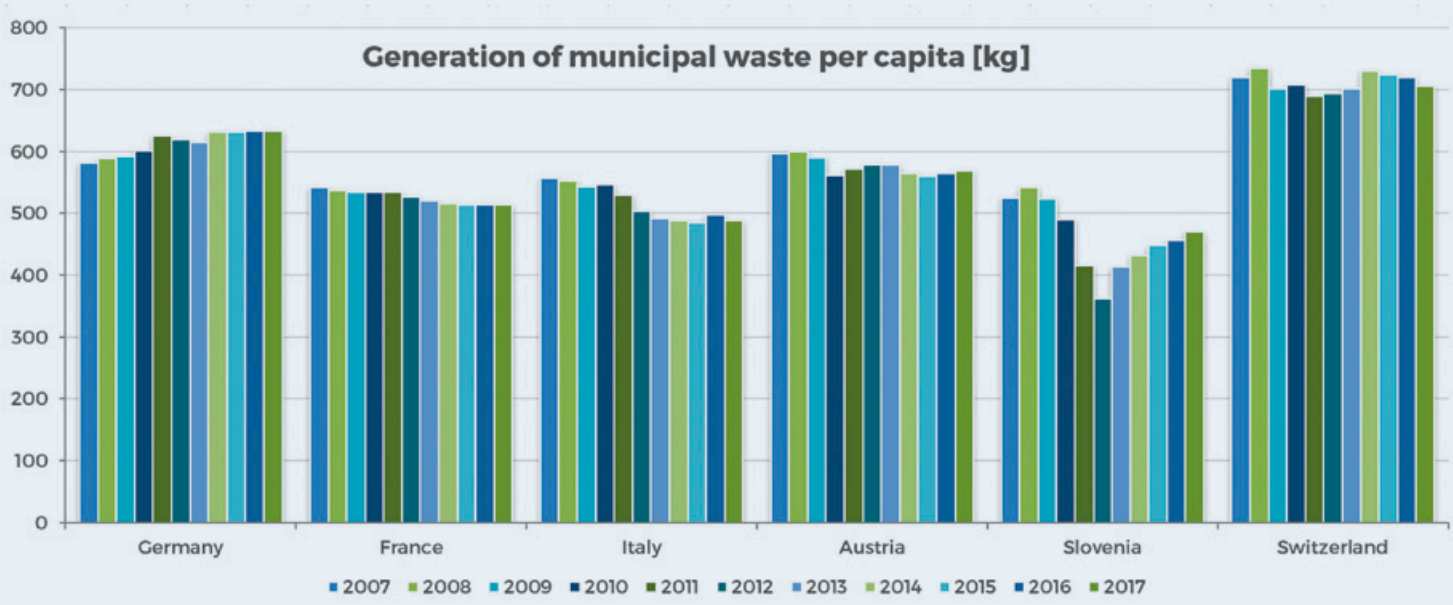
For EU 28, the circularity rate was 12% in 2016, but shows big differences between the various material categories. While it stood at 25% for metal ores and 15% for non-metallic minerals (incl. glass), it was less than 3% for fossil energy materials (incl. plastics). Figure 9 shows the development of circular use rate in Alpine countries other than Switzerland and Liechtenstein. A sharp increase in Italy and Austria can be seen between 2010 and 2016, while the trend is not as significant in Germany, France and Slovenia. The circular material use rate is not collected in Switzerland and Liechtenstein, therefore no data can be presented for these countries.

Promising approaches for the Alps

Considering the development of the indicators DMC per capita and resource productivity, progress can be seen in a relative decoupling of resource use from gross domestic product (GDP). Even though these figures can only be presented at national level, this also probably applies to the full Alpine region. With regard to water resources, which are still provided on a large scale by the Alps, the following picture emerges. It is likely that as climate change proceeds, droughts may occur more often even in the "Water towers" of Europe. Therefore, water management will become more important. The Alpine Convention is an important voice for this issue and is taking responsibility for adapting Alpine water management to climate change (see for example, the Alpine Space project ADO - Alpine Drought Observatory). The greening of the economy can help by developing water saving solutions for each use case: this could consist of water-saving farming practices in food production (irrigation methods, crop diversification etc.), as presented in the ViVaC-CAdapt good practice example. Also, a focus on water reuse could be beneficial.[6]

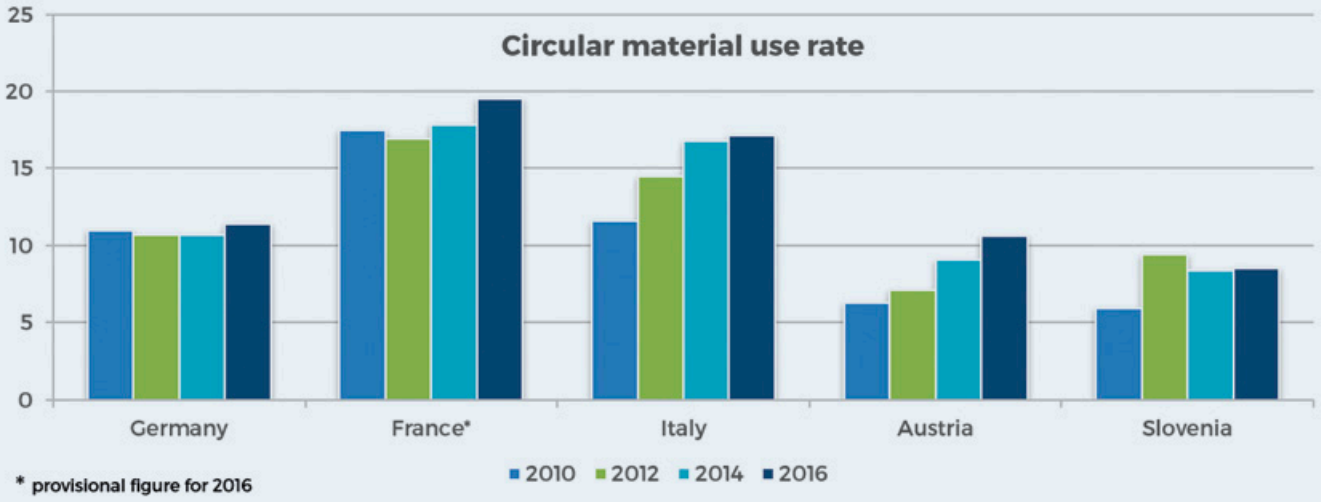
6 https://www.consilium.europa.eu/en/press/press-releases/2020/04/07/water-reuse-for-agricultural-irrigation-council-adopts-new-rules/

Figure 8: Generation of municipal waste per capita



Source: Eurostat [CEI_PC031], France: Eurostat estimation

Figure 9: Circular material use rate as a percentage



(Source Eurostat [CEI_SRM030])

Land is an important and limited resource for all kinds of economic activities and all ecological functions, not least food production. The way land is used has a strong impact on local climate (evapotranspiration), groundwater renewal, soil fertility and many other natural resources. Sustainable land use may even augment the resilience to drought by strengthening ecosystems, especially if peatlands, wetlands, riparian and natural forests are protected or managed near-naturally. With regard to land take, it should be noted that there are a large number of political and institutional commitments at supranational, national and even regional levels in Alpine countries. However, changes in land use and land take occur at local level. The example of good practice shows that the activation of vacant buildings can be successful, but that this normally requires a great deal of private commitment and often the financial support by public funding (e.g. Market Hall Glarus).

To reach the target of no net land take by 2050 it is necessary to re-use and re-purpose land already taken. The EEA identified it as cheaper in economic terms "... to preserve land and soil resources than to restore or remediate them.... Moreover, compact cities with well-connected mobility options often provide the highest quality of urban life with fewer direct environmental impacts." (EEA, 2019: 8)

The concept of circular economy has gained attention in recent years. There are a lot of activities to turn our economic system into a circle. Some of them are initiated and supported by public policy and public funds, but some are kicked off by private initiatives and private enterprises. For example, certification of buildings going beyond energy efficiency already exists.

Waste, recycling and the use of secondary raw materials are suitable indicators to measure progress towards a circular economy. Municipal waste per capita is still at a rather high level. Although circular material use rates have increased in most Alpine countries over the last few years, the economy is still far from achieving closed material loops.

Reference to GEAP action fields

The Green Economy Action Programme states: "The Alpine green economy will increase resource efficiency and transform its production and consumption patterns into a circular economy, thereby focusing on a sustainable economic use of forest, water and soil in the framework of an ESS-approach.... Special attention should be paid to incentives for sustainable land use." (GEAP: p. 9). In relation to resource efficiency, the GEAP especially encourages eco-innovation, which is defined as "the process of developing new products, processes or services which provide customer and business value but significantly decrease environmental impact".

2.3 Ecosystem services and natural capital

The RSA6 has dealt extensively with the provision and the valuation of ecosystem services. The topic is also included in the Sustainable Development Goals. For example, target 15.9 states that by 2020, signatories will integrate ecosystem and biodiversity values into national and local planning, development processes, poverty reduction strategies and accounts (United Nations, 2015). The Convention on Biological Diversity (CBD) is going to adopt a post-2020 global biodiversity framework. In the zero draft of this framework, the open-ended working group proposes five long-term goals for 2050 which include *inter alia* quantitative contributions of benefits from ecosystem services. These quantitative contributions represent quantitative objectives to be implemented by the different member states of the CBD. The objectives will be implemented by 20 action-oriented targets for 2030 (such as enhancement of nature-based solutions, integration of biodiversity values into national and local planning, and reformation of economic sectors towards sustainable practices).

Relevant topics for progress towards a green economy are the development of natural capital, ecosystem service provision and the economic valuation of ecosystem services in the Alpine Convention area. These aspects are mainly covered by the action field 4.4 "Valorising ecosystems and biodiversity" of the Green Economy Action Programme. The focus in this chapter is natural capital accounting which includes the physical assessment of ecosystem services but also economic valuation of natural capital and ecosystem services.

Generally speaking, the topic of ecosystem services and natural capital is still shifting from scientific research to practical implementation in regional and local studies. Certainly, progress has been made specifically as a result of publicly funded and private projects and initiatives in the Alps in recent years and new aspects have arisen. However, to arrive at practical effects in decision-making at local level, further steps are required. Progress in three main aspects has been observed:

- Natural Capital (NC) and its accounting has gained more attention in the last few years and its potential for fostering the implementation of a green economy is undoubted. However, systematically collected environmental data are still not sufficient for Natural Capital Accounting (NCA). They are needed for considering NC in economic and planning decisions. Therefore, further data on the extent and condition of ecosystems as well as capacity, capability and potential supply and demand of ecosystem services across different spatial and statistical units are needed.
- Ecosystem services are increasingly acknowledged as providing a crucial contribution to human well-being. Thus, not only the provision of ecosystem services but the monitoring of ecosystem conditions is recognised as an important activity. The ecosystem condition is considered a unifying concept for biodiversity maintenance and ecosystem service provision as well as for the inclusion of ecosystem conditions in the existing legal framework.
- Economic valuation of ecosystem services is one basis for a further development of green economy monitoring. At a strategic level, the KIP INCA project[7] (LaNotte 2017) fosters the recognition of the economic role of ecosystem services. If integrating such values in environmental accounting is to succeed, policies must take greater account of natural capital and ecosystem services. This holds true also for economic policies.

Development of Natural Capital Accounting – current status and progress made

Natural capital accounting (NCA) has been further developed in Europe and nationally. It is a tool to measure the changes in the stock of natural capital on a variety of scales and to integrate the value of ecosystem services into accounting and reporting systems both nationally and in the European Union. According to the 6th Report on Natural Capital Accounting, the purpose of an NCA "is to enable governments, businesses and individuals to value natural assets sufficiently to take responsibility for maintaining and monitoring their health" (European Commission, 2019a). The report further states that NCA can help to mainstream biodiversity and ecosystems in economic decision-making, promote more resource efficient and sustainable choices and ensure that natural capital continues delivering ecosystem services in the long-term.

7 "Knowledge Innovation project on an integrated system for Natural Capital and ecosystem service accounting"

The development of a sound method to carry out NCA is a key objective in the European Seventh Environment Action Programme (EAP 7) and the EU Biodiversity Strategy. The strategy requires Member States to assess the economic value of ecosystem services and integrate these values into their national accounting and reporting systems by 2020. The Environmental Indicator Report 2018 (EEA 2018), however, finds that the EU's natural capital is not yet being protected, maintained and enhanced in line with the ambitions of the 7th EAP.

Recent approaches taken for the development of NCA are mostly still in an experimental phase. The European INCA project (see box below) uses the UN System of Environmental-Economic Accounting as working guidance to develop EU pilot ecosystem accounts. One suggestion for NCA implementation is to first establish a Natural Capital Asset register as an inventory of spatial data, then develop a Natural Capital Risk register which identifies risks for the registered natural capital assets, and thirdly to construct a Natural Capital assessment based on the aforementioned registers. Guidelines on integrating ecosystem and their services into decision-making are currently being prepared by the European Commission.

The INCA-project

The "Integrated system of Natural Capital and ecosystem services Accounting" in the EU (INCA) project aims to design and implement an integrated accounting system for ecosystems and their services in the EU. INCA was established in 2015 in the context of the European Knowledge community, a platform in the European Commission with the aim of working jointly to improve the generating and sharing of knowledge.[8]

As a practical approach, the EU Business@Biodiversity Platform has set up a NCA work stream. The objectives of this thematic work stream are to enhance knowledge, development and knowledge-sharing on biodiversity accounting approaches amongst EU businesses. In 2018, a report on the assessment of biodiversity accounting approaches for businesses and financial institutions was published (B@B 2018).

The XV Alpine Conference in 2019 recognised the key role of biodiversity and natural capital in the Alps by establishing an "Alpine Biodiversity Board" which will undertake a stock-taking analysis of relevant biodiversity and landscape strategies, guidelines and policy recommendations for Alpine countries. It also looks at international and European strategies and agreements such as the Convention on Biological Diversity.

No NCA work has been found in the Alpine area. However, a survey[9] currently being carried out by the Alpine Biodiversity Board on Alpine regulations for biodiversity, although not strictly focused on NCA, might be relevant to it.

Research carried out for this progress report shows that, at national level, there have been activities in mapping and assessing ecosystems and their services in **Austria** (Schwaiger et al 2015, Schwaiger et al 2018). In France, the national assessment of ecosystems and their services is carried out by the EFESE (Évaluation Française des Écosystèmes et des Services Écosystémiques) programme led by the Ministry for ecological transition (2013). The concept of "ecosystem services" designates the benefits (e.g. food) derived by humans from the use of certain ecological functions (e.g. pollination). EFESE is intending to study and publicize the state of French biodiversity, and thus lead public and private decision-makers to integrate these issues into their strategies. The programme aims to: 1/enhance awareness, 2/ improve knowledge, 3/ produce assessments, 4/ integrate results into decisions. A scientific board and a steering committee associating stakeholders were established to ensure the legitimacy and the influence of the programme.

In **Germany**, the main project on natural capital accounting is the "Natural Capital Germany- TEEB DE" project. The project delivered four topic-based reports and presented options and policy instruments for better integrating the value of natural capital. The summary report provides recommendations on measuring natural capital and on integrating it into other policy areas (Naturkapital Deutschland, 2018).

In **Italy**, various activities for the assessment of national ecosystems and natural capital have been carried out. Meanwhile, three reports on the state of natural capital[10] were published between

8 https://ec.europa.eu/environment/nature/capital_accounting/index_en.htm

9 https://www.alpconv.org/en/home/organization/thematic-working-bodies/detail/alpine-biodiversity-board/

10 https://www.minambiente.it/sites/default/files/archivio/allegati/sviluppo_sostenibile/sintesi_raccomandazioni_primo_rapporto_capitale_naturale_english_version.pdf; https://www.minambiente.it/sites/default/files/archivio/allegati/sviluppo_sostenibile/II_Rapporto_Stato_CN_2018_3.pdf; https://www.minambiente.it/pagina/terzo-rapporto-sullo-stato-del-capitale-naturale-italia-2019

2017 and 2019. These provide information about ecosystem mapping, ecosystem conservation status, assessment of natural capital and ecosystem services, biophysical evaluation of terrestrial ecosystems, ex-ante and ex-post evaluations of the impact of public policies on the natural capital and new monetary valuation methods for ecosystem services. The results of the monetary valuation give an indication of the economic value of a (not complete) set of ecosystem services and bring Italy closer to the implementation of sound accounting to integrate ecosystem and biodiversity values into national and local planning and development processes.

The "Italian Natural Capital Committee" was established in 2018, a unique institution among Alpine countries, and is in charge of preparing the above-mentioned annual reports on natural capital.

Liechtenstein has carried out a literature study on ecosystem services and their monetarisation, which has not yet been published.

Slovenia carried out a national assessment of ecosystem services which will feed into a map of such services. The government is currently collecting projects and research on ecosystem services to prepare a database of case studies. In 2018, a national partnership of organisations dealing with ecosystem services (SOES)[11] was established.

For **Switzerland,** no information about recent activities was found.

Promising approaches for a greening of the economy

The status of natural capital accounting and its integration into other policy fields in Alpine countries varies widely. Whereas countries like Italy and France have a coordinated national approach on methodologies and assessment, in other countries government coordinated activities on the estimation of natural capital is rather scarce. Further steps need to be taken to ensure its application across the Alpine Convention area.

Given that natural capital in the Alps is one of the most important resources for the economy, an Alpine-wide initiative on natural capital accounting will be most beneficial for a transition to a green economy. Data provision on natural capital assessment in the Alps is far from perfect, but some options for improving the situation could be used. These could include using data from environmental reporting under EU Directives or national legislation, the database of the EU Copernicus programme, and to call for Alpine Space projects to collect data, to include citizen science and also include information from the EU Common Agricultural policy.

A small-scale approach would also be to implement NCA at local level as pilot projects, where data provision and collection is far easier than for the entire Alps and NCA results could immediately be transferred into decision-making by municipalities. Worth mentioning in this respect are the Alpine Space project LUIGI - Linking Urban and Inner-Alpine Green Infrastructure - Multifunctional Ecosystem Services for more liveable territories, as well as the surveying of companies that make use of green infrastructures and NC as a basis for producing and providing their goods/services by EUSALP Action Group 7.

Good Practice
AlpLink-BioEco Linking BioBased Industry Value Chains Across the Alpine Region

AlpLinkBioEco will develop a cross-regional, circular, bio-based, economic strategy and support the transition from a fossil-based economy. For this objective, it connects diverse bio-feed-stock producers with intermediate product developers and end users of high value applications addressing critical societal needs.
The project will set up a methodology to create new cross-regional value chains for a bio-based, circular economy, including a roadmap, demonstrations for intelligent assessments, selection and creation of innovative bio-based value chains (VC). The project's focus is on four sectors: agriculture, wood, chemicals and food/pharma packaging.
The valuation of bio-based value chains can contribute significantly to the development of NCA and give valuable inputs.

More information: https://www.alpine-space.eu/projects/alplinkbioeco/en/home

11 https://www.es-partnership.org/community/regional-chapters/europe/

Good Practice: ALPBIONET2030

Integrative Alpine wildlife and habitat management for the next generation

Ecological connectivity is the basis of Alpine and global habitat and species protection. However, since different regions having different tools to measure and improve biodiversity, a priority is to create an integrative concept for the protection of ecosystems and biodiversity within the Alps. The project results refer to the integration of the ecosystem service approach in the political system of the Alpine space. The overall objective is to suggest a harmonized concept of preserving natural habitats and common planning tools to realize a high level of ecological connectivity for biodiversity conservation. For this purpose, the project suggests "Super-SACA" (Strategic Alpine Connectivity Areas), areas of high importance for biodiversity interconnection. These SACA are areas grouped in three categories: ecological conservation areas, ecological intervention areas and ecological connectivity areas. These kinds of areas and the natural values they provide could be important factors in the implementation of NCA.

More information: https://www.alpine-space.eu/projects/alpbionet2030/en/home

Proposal for future activities and reference to the GEAP

The Alpine Convention's declaration on Sustainable Economy and the Multi-Annual-Working Programme 2017-2022 call for an evaluation and internalisation of external costs and a reduction in greenhouse gas emissions by measures for greening the economy. In terms of these objectives, little immediate progress has been made and the burden for future generations through the failure to pursue environmental protection is increasing.

The COVID-19 pandemic has clearly shown the vulnerability of the present economic system. In a broader sense, the neglecting of natural functions and resources and the loss of regional markets in favour of a globalised economy have reinforced the economic effects of the crisis. One lesson learned from this crisis could be to check all political measures in terms of their sustainability and their consistency with the EU climate targets and the European Green Deal. Such an approach could clearly be supported by NCAs.

The GEAP addresses the successful economic applications of ecosystem services and the fostering of business cases in the field of ecological connectivity for municipalities and regions. Also the cross-cutting action field of digitalisation might contribute a module in a NCA. The topic of NCA is not explicitly mentioned but could be supported by local pilot implementations as proposed in the GEAP. However, NCA applications will reach much further than the actions proposed in the action programme.

2.4 Quality of life and well-being

Quality of life and well-being as one aspect of a green economy embraces a variety of different topics. In the RSA6, the chapter "Quality of life and well-being" covers employment and education, economic well-being and social inclusion, sustainable consumption and health issues resulting from harmful emissions. Follow-up research done in preparation of the present progress report has included the topics of green jobs, green finance, digitalisation, sustainable consumption (public and private) and health and harmful emissions.

Since the publication of the RSA6, the number of green jobs has been increasing in the Alpine region, in particular in the field of energy resource management (Eurostat 2019). Digitalisation and green finances, both closely linked to the creation of green jobs, are emerging topics in a green economy and have been taken up by politics and business at European, Alpine and national levels. Significant developments have occurred in the field of sustainable consumption and mainly in the field of public procurement, where a vast majority of Alpine countries have introduced policies and helpdesks for public procurers.

This chapter focuses on public procurement and private consumption, touching on the topics of regional brands and sustainable tourism. Indicators for well-being as well as air quality issues are also looked at. Given the wide range of topics referring to quality of life and well-being, the topics selected were only those that were considered as being the most promising and future-oriented for a

green economy in the Alps. They don't necessarily build on one another or have a strong connection, but all contribute to a stronger identification with a more sustainable life in the Alpine region.

2.4.1 Sustainable public procurement

The development in sustainable public procurement has been dynamic in recent years, both across Europe and in individual Alpine countries. The European Commission is supporting sustainable procurement in the Member States by providing procurement criteria, called EU GPP (Green Public Procurement) criteria, and practical guidance for public authorities above all in the field of life-cycle analysis and circular procurement. The European Green Deal explicitly mentions green procurement: public authorities, including the EU institutions, should lead by example and ensure that their procurement is green. The Commission will propose further legislation and guidance on green public purchasing (European Commission, 2020c). Equally important is the 2020 EU Circular Economy Action Plan, where it is planned to prepare EU Mandatory Green Public Procurement criteria and targets in sectoral legislation and the phasing-in of mandatory reporting on GPP as of 2021.

Description of the current status and progress made

In most Alpine countries, specific sustainable procurement policies have been adopted or revised to support their implementation nationally since the publication of RSA6. In Austria, France and Italy, National Action Plans have been adopted containing minimum product criteria and specific targets (European Commission 2018b). In Slovenia, green public procurement has been obligatory for public procurers since 2012. A decree on GPP was revised in 2018 (Republic of Slovenia 2018), increasing the number of product groups for which GPP is obligatory to 20. Switzerland included procurement issues in the Swiss Sustainable Development Strategy 2016-2019 (Swiss Federal Council 2016).

Austria launched a Sustainable Public Procurement Platform in 2019[12] It represents a one stop-shop for all questions related to sustainable public procurement and is managed by the Federal Public Procurement Agency (BBG). Similar supporting activities have also been set up in other Alpine countries. In Germany, support for sustainable procurement is also provided by the Competence centre for sustainable procurement (KNB)[13] which offers expert advice for procurers at federal, state and local level. This is done individually via telephone hotline or e-mail or even by means of tailor-made advice and training on site. In addition, the German Environment Agency provides a wide range of information and practical guidance for procurers on green public procurement such as tender recommendations, legal opinions, training scripts, life-cycle costing tools or good practice examples on their procurement website[14]. The aim of the Competence centre for innovative procurement (KOINNO)[15] is to strengthen the innovation orientation of public procurement in Germany.

In France, a national platform provides useful information and good practice examples to public procurers[16]. In several regions, networks for sustainable public procurement (réseaux régionaux d'acheteurs publics) have been created, including the regions Provence-Alpes-Côte d'Azur and Rhône-Alpes. These networks provide useful resources for public procurers, support them in their efforts to integrate social and environmental criteria in tender documents and organise conferences on various sustainable procurement topics.

In Italy, GPP is a legal requirement as set out in the national law on bidding processes. Minimum environmental criteria set by a national committee and consistent with prevailing environmental standards must be complied with by bidding companies. An initiative begun in 2018 aims to provide training and technical assistance to support public procurers via a project run by the Ministry for the Environment (CReIAMO PA)[17]. Several Italian Alpine regions have also initiated activities to support sustainable procurement, including regional action plans, criteria, support platforms and regional networks.

12 http://www.nachhaltigebeschaffung.at/
13 http://www.nachhaltige-beschaffung.info
14 www.beschaffung-info.de
15 https://www.koinno-bmwi.de/
16 http://rapidd.developpement-durable.gouv.fr/
17 https://creiamopa.minambiente.it/

In Slovenia, the national authorities have developed guidelines for the implementation of green public procurement activities. They organise conferences and offer training for procurers. A national helpdesk has been set up and is currently being developed further. A range of actions is currently being implemented to support GPP in Slovenia under the EU LIFE project Care4Climate[18].The Swiss Federal Procurement has set up an "Expert Group Sustainability" providing support for the development of instruments for the implementation of sustainable procurement activities.

Promising approaches for a green economy

These recent developments show that sustainable procurement has become an important motor for the transition to a green economy in the Alpine countries. It is particularly relevant for local authorities, as these are the most important group of public purchasers.

Through their purchasing activities, public authorities can provide industry with incentives for developing innovative and green technologies and products. For sectors in which public purchasers command a significant share of the market, green public procurement can stimulate a critical mass of demand and thus influence the market. In Italy for example, there is a national programme for eco/organic food catering services in school canteens[19].

Circular procurement approaches that have been developed in recent years seem to be a promising concept for more resource efficient consumption patterns in the Alps. Furthermore, joint procurement activities among (local) Alpine authorities may lead to a more cost-efficient and rapid introduction of new and innovative technologies and products. Supporting public authorities in their efforts to integrate sustainable criteria in their tender documents is therefore an important step in the process of transforming to a green economy in the Alps.

Proposal for future activities and connection to the GEAP

An Alpine wide platform for sustainable procurement could be a good way to foster sustainable procurement activities in the Alpine region. In addition to providing knowledge and tender documents, it could also coordinate joint procurement activities among Alpine authorities and provide information on suppliers of sustainable products from the Alps.

Even if not explicitly mentioned by the Green Economy Action Plan, sustainable procurement touches on the action field "Encouraging eco-innovation" as it creates supportive framework conditions by providing incentives. There are also close links to the action field "Living and working in a green economy" as it supports green choices by local authorities.

With its broad approach embracing resource efficiency, climate aspects and global justice, sustainable procurement contributes to several SDGs. First among them is SDG 12 "Responsible Consumption and Production", but also SDG 11 "Sustainable Cities and Communities", SDG 13 "Climate Action", SDG 7 "Affordable and Clean Energy" and SDGs 14 and 15 on life below water and life on land.

Good Practice: CaSCo - Procurement of low carbon timber products in the Alps

The Alpine Space Programme project CaSCo - Carbon Smart Communities – aims at reducing the emissions of carbon dioxide in the Alpine Space by promoting local timber supply chains.

To achieve this, the project developed policy instruments to support the procurement of regional low carbon timber products by public bodies and other key actors such as architects. The policies developed were implemented in pilot communities in the Alps. At the same time, the project worked with small and medium sized enterprises in the Alps to improve the delivery of low carbon timber in order to meet increased public demand.

Some of the project results have been the "Contracts Incorporating Low Carbon Timber" guide, policy recommendations and a training concept for promoting low carbon timber in the Alpine Space.

More information: https://www.alpine-space.eu/projects/casco/en/home

18 https://www.care4climate.si

19 https://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/12048

Good Practice

Joint procurement of small electric waste collection vehicles

CIDIU, a consortium serving 17 municipalities in the province of Turin, published a tender for the supply of 20 vehicles with reduced environmental impact (all meeting EURO VI standard), with one lot focusing on the procurement of eight electric vehicles. The purchase was carried out as a joint procurement by the 17 municipalities and included market engagement events, through which the consortium of cities presented its environmental policy and future intentions to purchase new electric vehicles.

The fleet of eight vehicles will lead to an estimated reduction in fuel-based CO_2 emissions of 66% (17 tons of CO_2 per year avoided). These electric waste vehicles also emit no local pollutants – specifically nitrogen oxides (NOx) and particulate matter (PM) - and they are almost noiseless. Their use is thus ideal in the historical centres of the towns served by CIDIU.

More information: https://sppregions.eu/fileadmin/user_upload/Tenders/SPP_Regions_Tender_model_-_CIDIU_Final.pdf

Good Practice

AlpFoodway – A cross-disciplinary, transnational and participative approach to Alpine food cultural heritage

Foodways are socioeconomic and cultural practices related to food production and consumption. Food cultural heritage is a strong identity source for Alpine populations. Depopulation, ageing population and globalisation put Alpine food heritage at risk.

The Alpine Space Programme project AlpFoodway has created a sustainable development model for peripheral mountain areas based on promoting the Alpine Space cultural food heritage and on the adoption of innovative marketing and governance tools. It also fosters the creation of a transnational Alpine identity based on the common cultural values expressed in food heritage.
Project results include an inventory of Alpine foodways and identification of methods of legal protection, a Value Charta, courses and educational units, and a cultural exchange platform based on events and tourist tours.

More information: https://www.alpine-space.eu/projects/alpfoodway/en/home

Sustainable private consumption

In the Alpine region, food production and tourism are probably the most important areas to look at in terms of private consumption, as these are particularly relevant for and present in the Alpine economy. There are a high number of Alpine areas producing high quality regional food products, using traditional agricultural practices. The existence of numerous territorial brands in the Alps shows that there is a market and thus an opportunity for further developing green economy approaches in this area.

Closely linked to this is the development of sustainable tourism. The Alps are a very popular tourist destination with, however, high environmental risks concerning landscape and mobility. Efforts to achieve a new culture of travel are certainly an important contribution towards a green economy in the Alps. Initiatives like the Alpine Pearls, an umbrella organisation bringing together Alpine villages that stand for car free holidays, environmental friendliness and green mobility, the Mountaineering villages, showcasing sustainable Alpine tourism, or the French label “Flocon vert” for ski resorts engaged in a sustainable dynamic, are positive examples.

Fostering regional brands in tourism and private consumption can contribute to regional added value and support traditional local production in the Alps. Often located in pleasant but fragile locations, tourist accommodations can put pressure on water and energy resources and threaten local biodiversity through inappropriate waste management. The EU Ecolabel on tourist accommodations supports accommodations with limited energy consumption, water consumption, reduced waste production,

etc.[20] Hence, the promotion of the EU Ecolabel can support sustainable tourism and the green economy in the region. The support and further development of regional currencies, following successful examples from the Alpine region, may further enhance sustainable regional consumption in the Alps.

Due to the heavy dependence of many Alpine areas on tourism, in particular on skiing with its direct link to the increasing scarcity of the snow resource, France is focusing to a greater extent on the issue of sustainable development of mountain resorts and sport areas. In February 2018, the French Court of Auditors (Cour des Comptes) issued a report "The ski resorts of the northern Alps in the face of global warming: increasing vulnerability, the need for a new development model". It aims to lead communities to change the governance and management of ski areas quickly in order to adapt early enough to a future where skiing and snow sports will no longer be their only resource. The Court encourages the low altitude resorts to already prepare their reconversion now.

In April 2019, the French Ministry of Ecological Transition (Ministère de la transition écologique) published a first "Environmental Atlas of ski resorts". Mobilizing a wide range of data, it presents, for each massif, the territorial characteristics and environmental impacts linked to the development of winter tourism in the mountains and ski resorts. "Espaces Valléens", created in 2014, is a French Alps campaign intended to promote tourist diversification (outdoor activities, well-being and health, discovery of the territory and its know-how, development of notable sites, mountain accommodation including refuges, amenities, its history, in connection with agricultural resources, landscape, ...) to renew the use of the mountains beyond the winter period. The overcrowding of some Alpine tourist sites, such as the Mont Blanc Massif, is a matter of growing concern.

20 https://ec.europa.eu/environment/ecolabel/

2.4.2 Well-being indicators

The most used indicator for measuring a population's material well-being is its gross domestic product (GDP). It serves as a monetary measure of the market value of all goods and services produced in a country during a given period. Over the last decade, using GDP as indicator for well-being has been increasingly criticised, given its focus on purely economic aspects and consequent shortcomings in providing an accurate and holistic picture of a country's general well-being.

Alternative indicators, reflecting aspects such as natural and living environment, health issues, access to education, quality of life and social inclusion, have been developed by international and national institutions, reflecting the global challenges of the 21st century.

Organisations like the Organisation for Economic Co-operation and Development (OECD) and United Nations Development Programme (UNEP) have come up with alternatives to the GDP. In 2017, an expert group of the EU developed quality of life indicators including nine dimensions and related indicators to assess the well-being of European citizens (Eurostat 2017).

Alpine countries have also developed national approaches to well-being indicators, going beyond mere economic criteria.

Description of the current status and progress made

Among Alpine countries, Italy has published the "Bes Report 2019 - Equitable and Sustainable well-being in Italy" (Istat 2020) presenting regional indicators for measuring well-being in Italy. The German initiative "Wellbeing in Germany – what matters to us" measures the current status and trends in wellbeing (Bundesregierung 2020). Under the notion "Quality of life", the French Statistical Institute has conducted measurements for exploring and stating the drivers of subjective well-being (Insee 2017). In 2019, Switzerland released an indicator system for comprehensive well-being measurements (BFS 2019). In Austria, the project „How is Austria?" established indicators providing concise and interactive information on

the various dimensions of wealth and progress (Bundesanstalt Statistik Österreich 2020). "Indicators of well-being in Slovenia" were developed in 2020 including a system of indicators measuring the well-being of present and future generations (Republic of Slovenia 2020).

Proposal for future activities and reference to GEAP actions

Developing alternative indicators to GDP can support the transition from mainstream economy to a green economy. Applied research as well as practice-oriented pilot projects are urgently needed to develop this further. Within the "Economy for the Common Good" movement, alternative indicators for drawing up a "Common Good Balance" for businesses and municipalities have been developed and are already implemented by many organisations in the Alpine area where the movement is particularly popular[21]. Experiences of municipalities and organisations in working with the common good approach could be a valuable basis and input into the further work on well-being indicators at a macroeconomic level. The Alpine region would be an ideal testing ground for this.

Well-being has links to all action fields of the green economy action plan since it is a fundamental principle of all green economy activities. The GEAP's action field "Living and working in a green economy" is particularly relevant to indicators for well-being going beyond pure economic considerations, as being closely linked to alternative lifestyles and consumption patterns.

Internationally, the development of alternative well-being indicators contributes in particular to SDG 3 "Good health and well-being", goal number 4 on "Quality education", goal number 11 on "Sustainable cities and communities" and to goal number 16 on "Peace, justice and strong institutions".

2.4.3 Air quality in the Alps

The quality of air has a large influence on human health. Economic activities, however, influence its quality since most processes emit harmful matters leading to degradation of air, water and soil. In order to reduce or even avoid negative effects on human health caused by economic activities, harmful emissions and people's exposure to environmental pollution need to be decreased.

The 8th Report on the State of the Alps (RSA8, Alpine Convention 2020) is dedicated to the theme of "Air quality in the Alps". It provides an overview of air quality in the Alps, lists relevant regulations, informs about health issues linked with air pollution and the impacts of air pollution on ecosystems, identifies good practices to improve air quality in the Alps and formulates a set of policy recommendations.

It finds that the Alpine region has generally benefitted from quite clean air. Sources of atmospheric pollutants are, however, present within the Alpine region, e.g. large cities and motorways as well as emissions from wood burning or industry. This especially regards particulate matters stemming mainly from wood burning. In addition, it might be that regional and long-range transported air masses contribute to Alpine air pollution. Although some natural emissions are linked with atmospheric chemical phenomena driving air pollution, human activities are the major causes of the degradation of air quality in the Alps.

The policy recommendations take up the findings of the data analysis and are based on smart solutions implemented by actors at national, regional and local levels to improve the air quality in the Alps. They include measures related to the monitoring of air quality in the Alps, the reduction of domestic heating emissions, sustainable mobility solutions and the development of good agricultural practices. Further references on the topic of air quality can be found in RSA8.

21 https://www.ecogood.org/

3 Development of the Alps as a model region for a green economy

Why should the Alps become a model region for a green economy? The declaration of the XIV Alpine Conference for fostering a green economy in the Alps emphasises that the extraordinary richness of natural and cultural landscapes of the Alpine area, its role as an international and European hotspot of biodiversity and as an area of many crossing borders and neighbouring economies in Europe make the Alps a special area for a green economy. It should also be noted that the Alps offer many natural resources and ecosystem services such as water, timber, extensive grassland, landscapes for recreation and a high diversity of cultural traditions in using these resources in a sustainable manner.

This chapter will describe activities and ideas which can support the Alpine area's development as a model region for a green economy.

3.1 Activities in the Alpine region

The introduction and chapter 1 of this progress report have already introduced most of the current green economy activities within the Alpine Convention area.

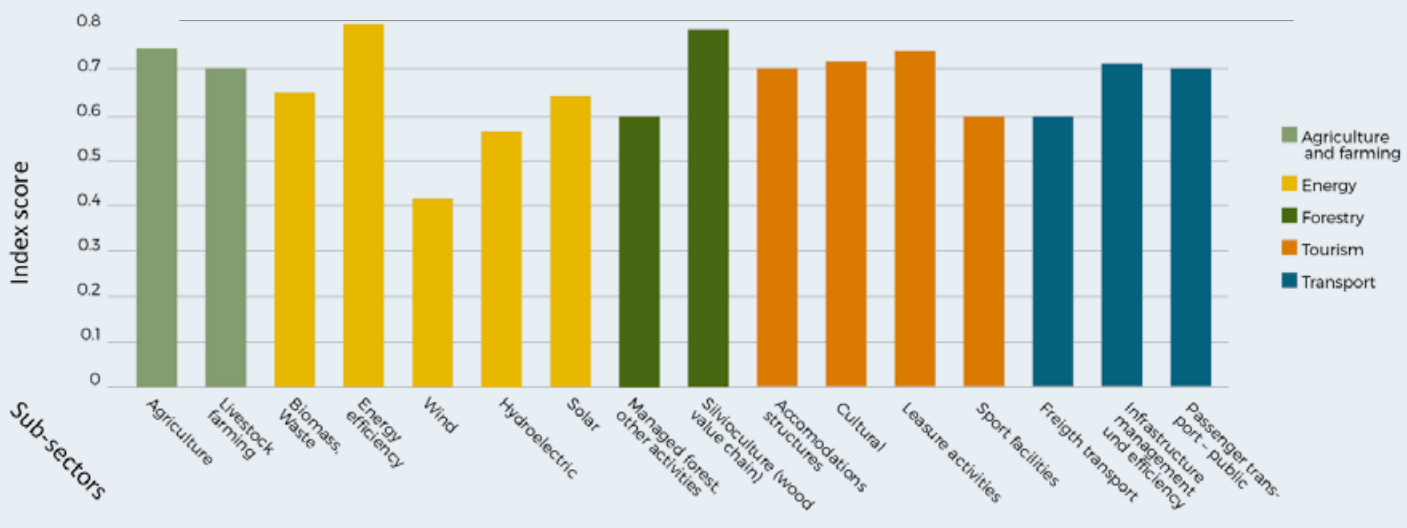
The follow up project of the Green Economy Action Programme on "Sectoral development of the Green Economy in the Alpine region" analyses and supports green economy developments in four pilot regions (Diois, France; Goms, Switzerland; Soca Valley, Slovenia; Euregio Zugspitze-Wetterstein-Karwendel, Austria-Germany). The project will cover the economic sectors of agriculture and food processing, sustainable tourism, renewable energy and sustainable transport.

The project "Alpine Green Economy: Screening Opportunities and Challenges for the Italian Alps" identifies detailed steps for implementing the "Green Economy Action Programme" in the Italian Alpine region, coherently with the RSA 6 and the latest advice from the Alpine Green Economy Board. The project's goals are: to identify specific solutions and a suitable procedure in order to deliver significant improvements in the green economic performance of some economic sectors in the Italian Alps; to identify suitable procedures that may ease and support processes of innovation and ensure sustainability in the economic context of the Italian Alps; to define a strategy for replicating the developed approach in other Alpine contexts.

A survey-based multi criteria analysis has been conducted to provide a quantitative measurement of the heterogeneous contribution that different economic sectors may provide for the development of the green economy. Then the study identifies 36 indicators and adopts an index-based procedure for the evaluation of the performance of different Alpine areas (Provinces and municipalities) with respect to the development of the green economy. It finally analyses thirteen best practices of the development of the green economy in the

Figure 10: Green Economy Index scores across sub-sectors

Source: Croci E., Colelli F. (2020) ALPINE GREEN ECONOMY: SCREENING OPPORTUNITIES AND CHALLENGES FOR THE ITALIAN ALPS



Alps, with a focus on the financial instruments and governance models adopted.

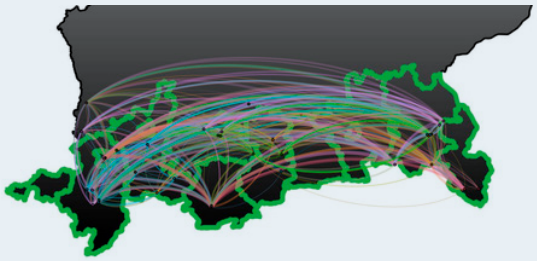
The Alpine Nodes[22] project by CIPRA Germany developed a platform for actors in civil society for sustainability in the German Alpine area. The project carried out a network analysis of actors from initiatives, associations, enterprises etc. based on interviews and an online survey, and compiled common interests and topics. A geographic presentation of such network relations is shown in.

The project also held a number of meetings covering green economy topics such as the green economy in the Allgäu, economy for the common good in the Oberland region and, lastly, a workshop on green finances at the final network conference.

The Austrian project "Good and environmentally-friendly living in the Alps – municipalities in harmony with environment and nature" within the project "8A programme for Alpine Convention municipalities" carried out a digital workshop on green economy topics. The project will support municipalities in developing better environmental and living quality for their residents and will use the tool "Social Planning Instrument" (SPI), to certify the municipalities as 8A Alpine Convention municipalities.

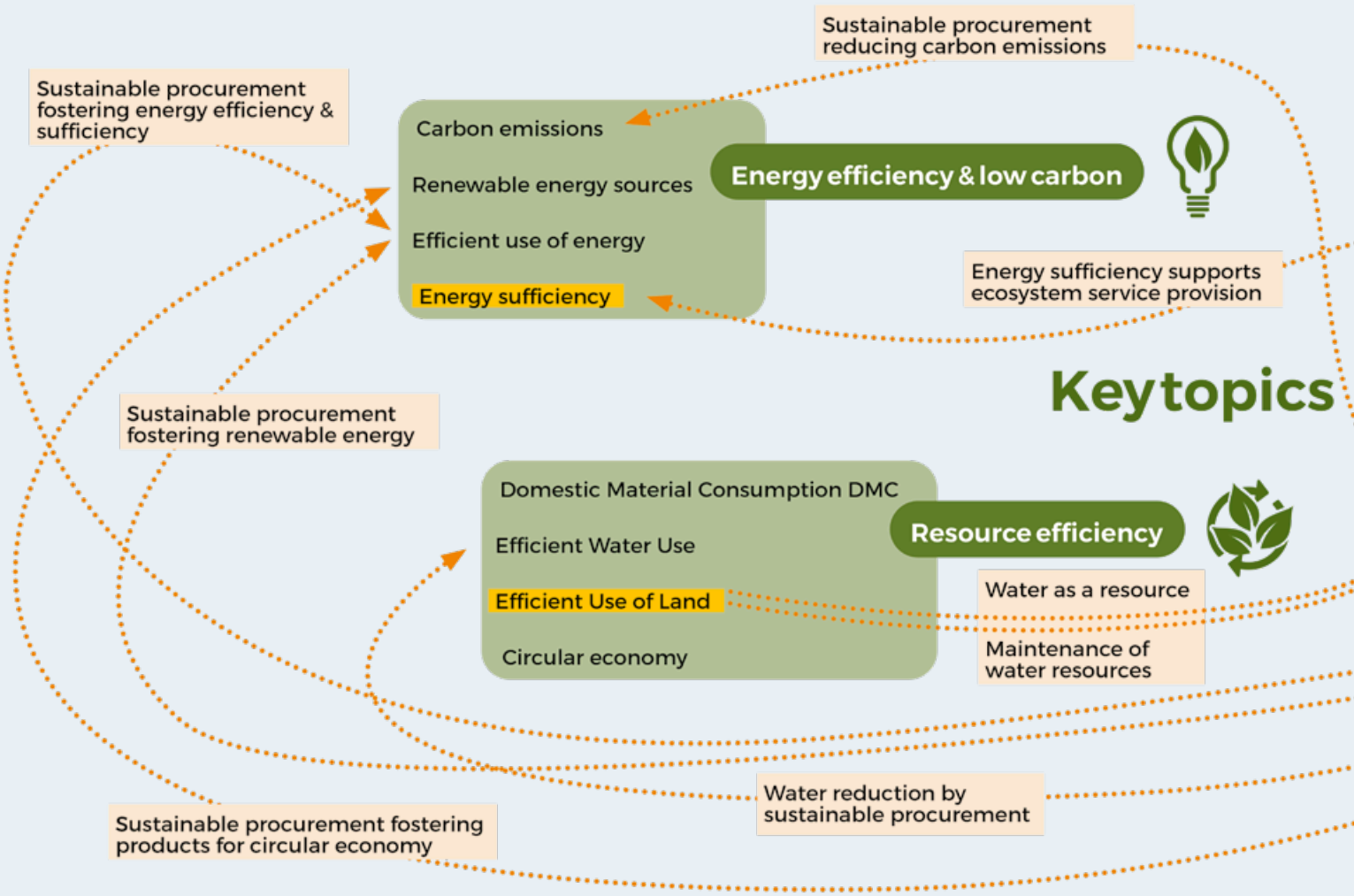
Locally and as part of the project, further activities took place which cover different aspects of a green economy. An overview of such examples for green economy-related activities is given in Table 1 in the annex.

Figure 11: Potential networking of actors in the German Alpine Convention area.



Source CIPRA Germany 2020

22 Knotenpunkt Alpen



3.2 Approaches for a model region

3.2.1 Raising the profile of the green economy in the Alpine area

The RSA6 has covered a broad spectrum of topics. Even the selection of topics in chapter 2, albeit restricted with respect to the RSA, still covers many different aspects of a green economy. This variety of themes makes the green economy a very interesting field, but at the same time it is extremely difficult to distinctly separate 'green economy' from the concept of sustainable development and thus to give it a clear political profile.

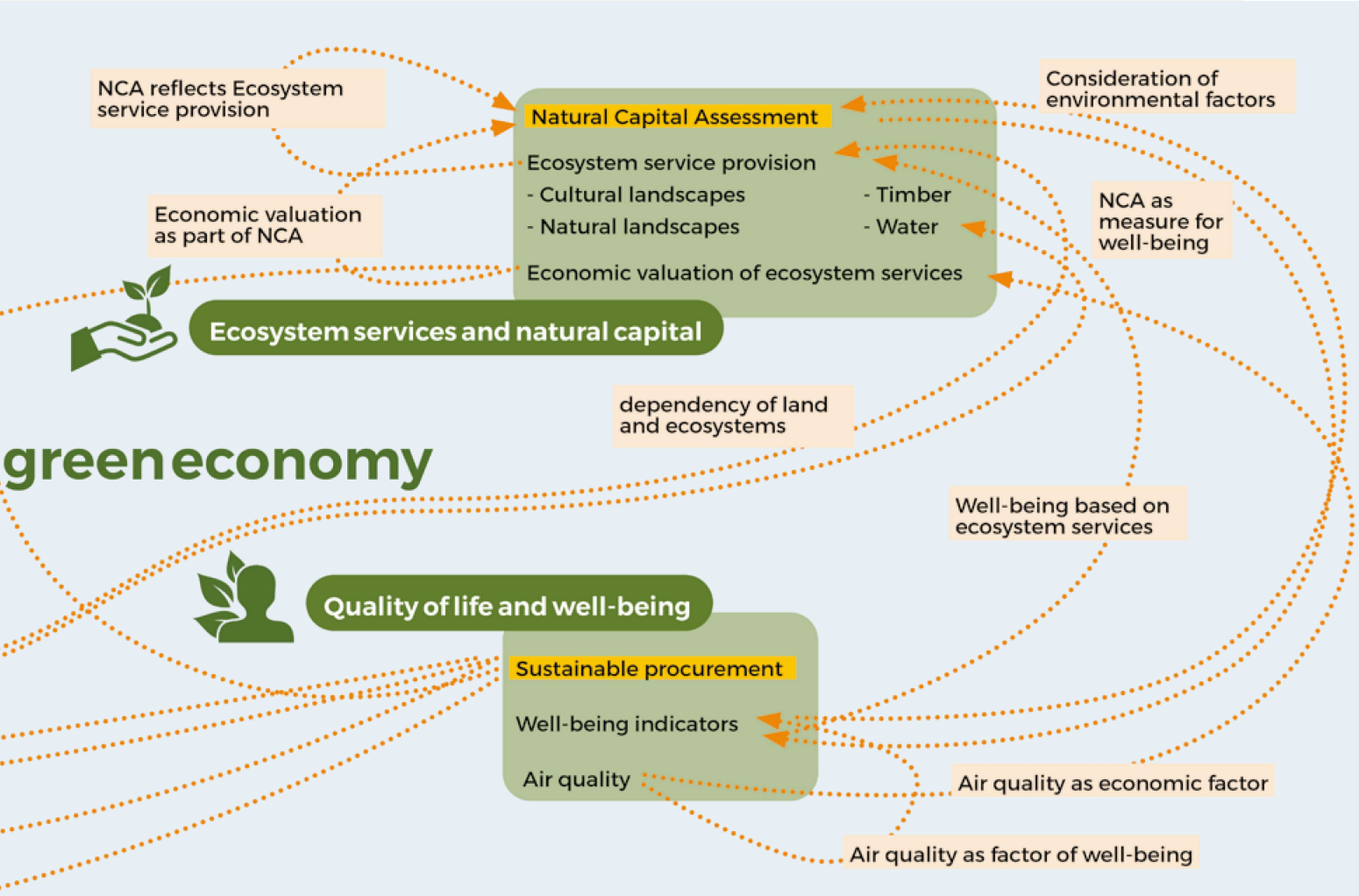
Figure 12 shows the interlinks between the topics described in this report. An example of such effects is when considering a water footprint in public procurement, presenting a possible synergy between sustainable procurement (SP) and resource efficiency.

To sharpen the political profile of a green economy and to define concrete measures for the development of a model region, it is suggested to identify some key topics for future action without, however, preventing activities in other fields. Focusing on these key areas would also facilitate monitoring and reporting on a green economy and should be limited to a defined period, at the end of which a new focus could be defined. The proposed key topics are:

- Application of energy efficiency and sufficiency policies
- Efficient use of land
- Establishment of natural capital assessments
- Implementation of sustainable/green/circular procurement processes.

The recommendations at the beginning of this progress report consider these key topics.

Figure 12: Selected interlinkages and cross-sectoral effects of green economy topics



Source: ifuplan, 2020

3.2.2 Key topics for developing a green economy model region

The key topics have been selected according to three criteria.

Cross-sectoral effects for a green economy

The selected topics all provide multiple effects within different sectors of a green economy and contribute to international, European and Alpine-wide sustainability strategies (see Figure 12).

Feasibility at local level

The GEAP underlines that the transition towards a green economy should happen at local level, driven by frontrunners consisting of local actors or entrepreneurs who promote and implement green economy activities. Therefore, it must be ensured that a local implementation of the key topics is also feasible.

Key topics were thus selected with a view to their feasibility at local level, whatever the framework conditions set by higher administration levels. In that way, green economy processes can start independently at different places in the Alpine Convention area. This could launch the development of model green economy municipalities where, on a smaller scale, immediate measures can be taken and effects can be observed locally.

Alpine relevance and link to the Green Economy Action Programme (GEAP)

All proposed actions are relevant to the Alpine area and are reflected within the GEAP and different working bodies of the Alpine Convention and the EUSALP. Activities for key topics could also extend the range of the GEAP which tends to be limited to the strategic level.

Application of energy efficiency and sufficiency policies

- Apart from all the efforts of reducing carbon emissions, efficient energy use and the use of renewable energy sources, energy sufficiency is a key approach to limit resource and energy consumption comprehensively. Energy sufficiency describes the situation "where everyone has access to all the energy services they need and a fair share of the energy services"[23] without exceeding environmental boundaries. Energy sufficiency also means avoiding the rebound effects, where expected efficiency gains from new technologies are reduced because of behavioural or other systemic responses (i.e. using more or larger devices than necessary). It contributes to human well-being and improvement of air quality, aims at the lowering of carbon emissions and by this maintains natural capital and ecosystem services.
- Energy sufficiency assessment requires accounting tools not yet widely available in the Alpine countries, and requires the analysis of several aspects not limited to energy consumption and availability. It includes for instance, dimensions of fairness, energy pricing, societal costs of regional energy sufficiency, equity, and others. Some of them should be identified or set up to assess the viability and successful implementation of the concept in the area under investigation.
- Energy sufficiency policies can be implemented at local level since municipalities can adapt statutes to require energy saving standards in new constructions, the connection to local district heating networks or the purchase of renewable energy by households. In this way, municipalities can support innovative energy consumption patterns.
- Energy sufficiency is related to the GEAP action field "Encouraging eco-innovation" and particularly to the action "Supporting the Alps as a green climate-neutral trademark".

Efficient use of land

- The limitation of land take and an efficient use of land is a crucial approach to limit the loss of ecosystem services and avoid negative effects on human well-being. Land take always results in the complete loss of an area's ecological functions with all the indirect effects related to it. Therefore, an efficient use of land is an issue applying very extensively across a green economy.
- Land use policy is, to the highest degree, a matter of local policy and is strongly influenced by municipalities. This is therefore an action field which can be tackled by municipalities independently of European, Alpine or national framework conditions.
- Economic instruments can play a pivotal role in driving land use patterns and management policies in the Alps (e.g. pricing, opportunity costs, existence of payments for ecosystem services). Thus, the Alpine Convention could investigate the potential economic, ecological and societal benefits that a wider use of these instruments might bring about in the region.
- Efficient use of land is a topic related to the GEAP action field "Greening regional development" even if not mentioned explicitly there. It also supports the objectives of the Alpine

23 https://www.energysufficiency.org/about/undersida/

Convention Soil Protection Working Group.

Establishment of natural capital assessments

- Natural capital assessments are based on the assessment of the provision of ecosystem services and consider economic valuations. They reflect important information for well-being and related indicators. The preservation of natural capital is connected to the reduction of carbon emissions and the efficient use of natural resources such as water, land and energy.
- Municipal councils could decide to introduce natural capital assessments to provide additional information about the local administration's performance and to inform civil society on how the municipality deals with its natural resources. NCA thus delivers an additional steering and decision-making instrument. However, this is not meant to replace legal measures, the precautionary principle or the polluter-pays principle in local environmental development.
- The development of actual projects demonstrating the ability of NC to provide economic gains and human well-being in some regions of the Alps (including towns and metropolitan areas) can greatly help more thought being given to biodiversity, NC, and ESS in public and private decision-making (e.g. the LUIGI ASP project aims to show the potential of green infrastructures for creating wealth, entrepreneurship and well-being in perialpine sites).
- The development of NCA is relevant to some actions of the GEAP such as "Awareness raising on greener value chains in the field of forest management and biodiversity conservation", "Campaigns, dialogues and training on ESS in an economic context at local level", and "Initiating, monitoring, evaluating and promoting pilot implementation at local level".

Implementation of sustainable procurement processes

- Public administrations certainly have a role as a model by transforming their consumption to sustainable patterns. Sustainable procurement procedures can contribute to climate protection, the development of renewable energies, circular economy, attributing greater value to natural capital and a socially fair globalisation, and is cross-cutting by definition.
- Sustainable procurement can best be implemented at a local level, even by small individual municipalities. Joint procurement by several municipalities is also a promising approach.
- Sustainable procurement contributes to the GEAP's action field "Living and acting in a green economy". It is not mentioned explicitly as an activity, but its main components are described in this action field.

3.2.3 Transition pathways towards a green economy

Pathway concept of the Alpine Climate Target System

The Alpine Climate Board (ACB) is presently developing different pathways on how to implement the Alpine Climate Target System. These pathways are elaborated in relevant fields of action for climate-neutral and resilient Alps (such as spatial development, energy, soil). There may be synergies between pathways for implementing climate-neutral and -resilient Alps and a green economy in the Alpine area. The pathway concept of the ACB describes ways of implementation and provides the content of pathways according to the topics in the box below.

Issues of Alpine Climate Board pathways

Background and description of the pathway

Final output

Alpine specific character

Implementation timeframe

Sequence of the implementation steps from starting point / initiation, strategy and initiation of an operational network, support and promotion action, training and exchange and diffusion of experiences

Identification of stakeholders needed for implementation

Indicators for monitoring the pathway

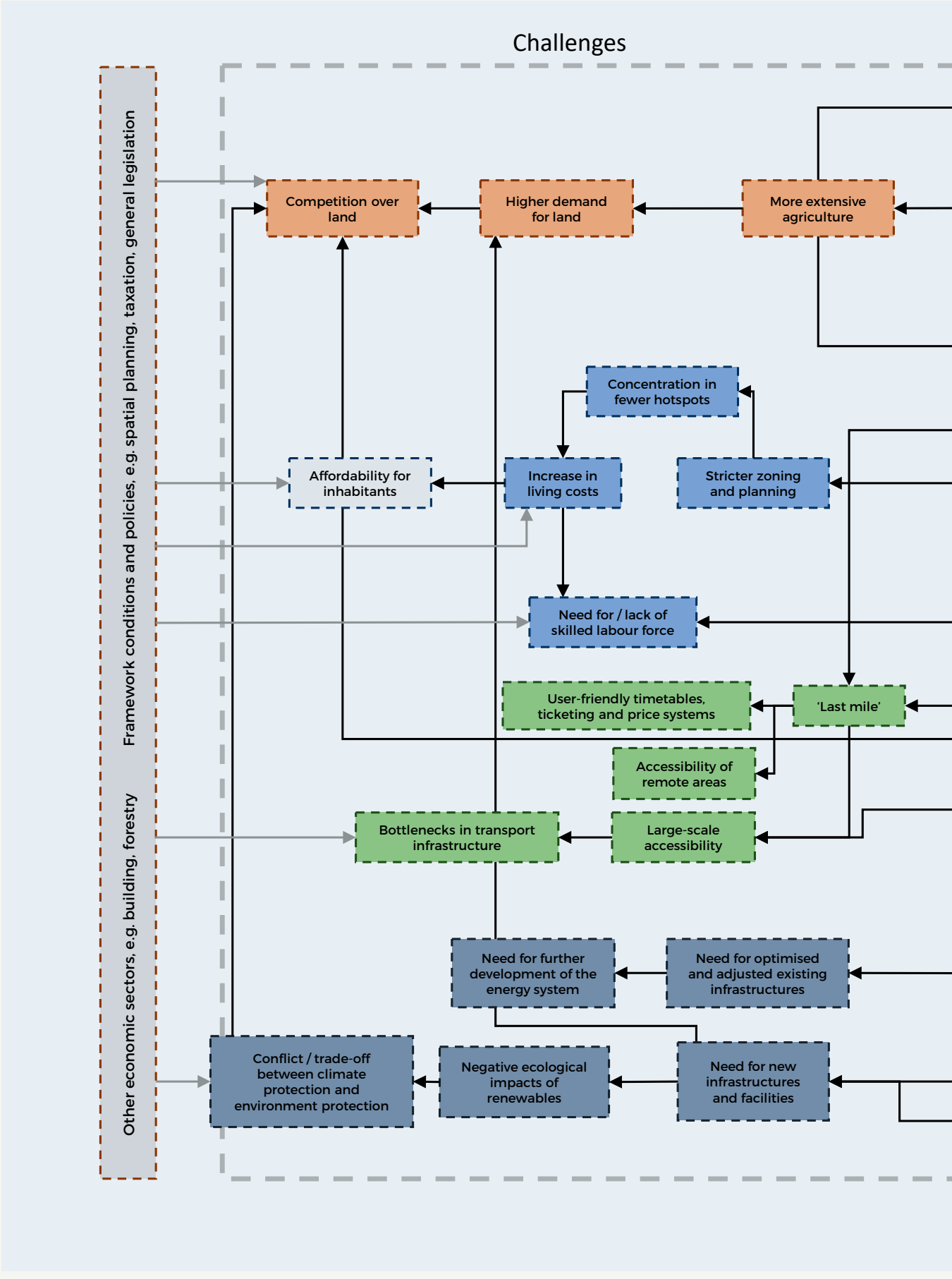
Links to other pathways

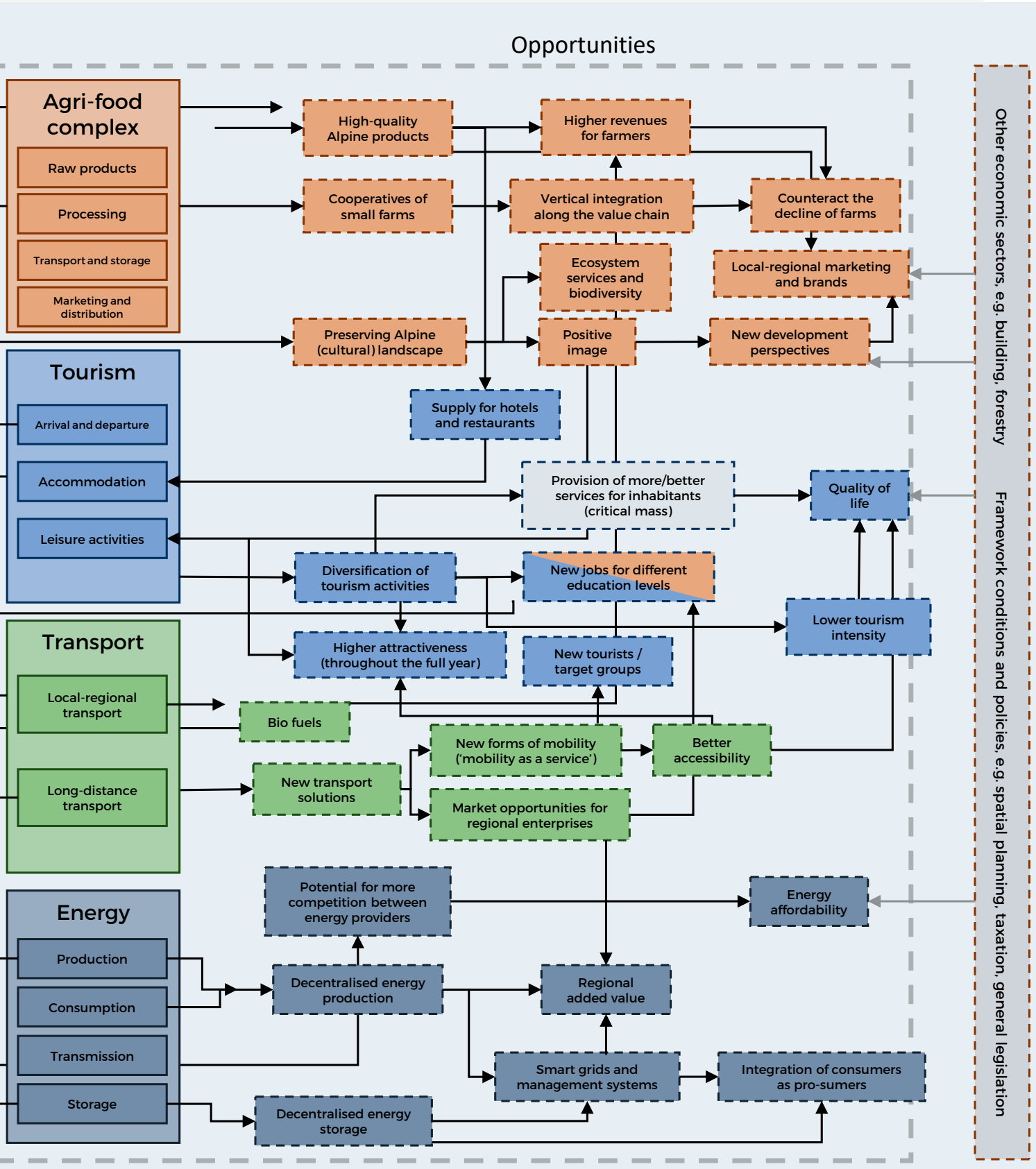
Information on the role of the Alpine Convention in the implementation

Political acceptance and feasibility of focus topics

Responsibilities and commitment and potential focus topics

Figure 13: Network model of four green economy sectors and their relations, challenges and opportunities





Source: Lüer & Zillmer, 2019

Pathways for a sectoral development of a green economy

As part of the current project "Sectoral development of the green economy in the Alpine region", ideal-typical transformation paths and their interdependencies, challenges and opportunities are analysed regarding four selected sectors: agriculture, tourism, energy and transport. Their interdependencies are shown in Figure 13. The pathways go through at least three phases:

- Initiation of change triggered by general willingness of stakeholders, economic pressures and missing information
- First development and diffusion, with up- and downstream processes, horizontal integration, benefits from economies of scale and the diffusion of good practices
- Gaining durability and permanence by maintaining customer loyalty, development of good relationships with partners in the value chain and, lastly, adaptation of policies for better and comprehensive change.

These phases occur in three simplified transformation processes: bottom-up, top-down and intermediate processes.

The relevance of key stakeholders in the different sectors will vary for the transformation process over time. While research and development, public institutions and civil society play a major role at the outset, in the final stage enterprises and public institutions have greater relevance.

The study on sectoral development concludes that transformation to a green economy is possible in all economic sectors. Different access points – depending on the sector – can be used to start and support a transformation process. The GEAP has identified five cross sectoral action fields[24] which form a basis for identifying such access points. The key topics identified here are in general in compliance with these action fields.

Both concepts can be combined for a concrete description of different pathways for green economy implementation relating to the key topics. Contents, processes and potential turning points for pathways for a greening of the economy could be further developed in a joint workshop with actors from the ACB, the GE Sectorial project and the progress report. In this workshop, also effects and opportunities of the current COVID19 pandemic might be analysed.

3.2.4 Action within the Alps

To achieve a transformation to a green economy in the Alps, successful local action should be disseminated and applied throughout the Alps.

There are several active networks in the Alps that bring together actors from local authorities, the economy and civil society. Networks like ALPACA, Alliance in the Alps, Alpine Town of the Year and business umbrella organisations would profit from a mutual exchange of topics related to a green economy. This issue could be discussed by the Permanent Committee, taking into account the format for implementing the Alpine Climate Action Plan.

24 1 Green financing and financial support structures; 2 Encouraging eco-innovation; 3 Greening regional development; 4 Valorising ecosystems and biodiversity; 5 Living and working in a green economy

4 Conclusions and outlook

Scope of a green economy

With the adaptation of the 6th Report on the State of the Alps on a green economy and the Declaration on Fostering a Sustainable Economy in the Alps, the XIV Alpine Conference paved the way for developing the Alps into a model green economy region. The Green Economy Action Programme, adopted by the XV Alpine Conference in 2019, constitutes a further step in this direction and provides concrete proposals for green economy actions.

'Green economy', as defined by the RSA6, embraces a wide range of topics. From a sector specific point of view, it includes economic sectors dealing with agriculture, buildings, energy, forestry, tourism and transport. In terms of environmental issues, green economy touches on air pollution, biodiversity, climate change, health, circularity, natural resources and waste. Furthermore, there are social aspects closely linked to a green economy, such as demographic change, labour and quality of life.

Supporters of a green economy in the Alps

Given this wide range of topics, there are also many different actors and institutions dealing with a green economy, even if not explicitly. Chapter 1 of this progress report mentions the recently created thematic working bodies of the Alpine Convention, whose mandates have a strong connection to a green economy. Alongside these working bodies there are the action groups of the EU Strategy for the Alpine region (EUSALP). EUSALP aims at preserving the Alps as one of the most attractive areas in Europe by taking advantage of its assets and seizing its opportunities for sustainable and innovative development. Its three thematic policy areas are all connected to the green economy: economic growth and innovation, mobility and connectivity, and environment and energy. All in all, there are nine different action groups working on the three thematic areas, that all carry out projects having a link to a green economy[25].

Mainstreaming the green economy topic in these different bodies of the Alpine Convention and the EUSALP would already help better understand the issue and give an improved overview on ongoing activities in this field. That could happen through an obligation to consider green economy-related aspects when proposing actions and taking decisions. Also, the reporting and the evaluation of the work by the different bodies could include the green economy view.

In terms of financial support, the Interreg "Alpine Space Programme" is financially the most important funding programme in the Alps. The Interreg Alpine Space programme for the period 2021-2027 has been in preparation since early 2019 and was still open for input from stakeholders at the time this report was drafted. It sets out four priorities: (1) Climate resilient and green Alpine region, (2) Carbon neutral and resource sensitive Alpine region, (3) Innovation and digitalisation-oriented green Alpine region and (4) Cooperatively managed and developed Alpine region. Like the priorities of the former programme running from 2014 – 2020, all the new priorities have a connection with a green economy, and the projects being funded under the Alpine Space Programme have contributed and will continue to contribute substantially to greening the economy in the Alps. Designing the funding programme to make the transition to a green economy an underlying principle would certainly help spread existing innovative approaches throughout the Alps.

Several civil society organisations, mainly networks and associations, also initiate activities in the field of green economy. These include Alpine-wide networks for local authorities such as the "Alpine Town of the Year association" and "Alliance in the Alps" as well as CIPRA, the international commission on the protection of the Alps.

Missing coordination of green economy activities

The status described in chapter 2 shows the recent progress towards a green economy in the Alps as well as the shortcomings. A wide range of projects and initiatives from various stakeholders at local, regional and transalpine level work on the development and the practical implementation of innovative solutions for a more sustainable

25 See: https://www.alpine-region.eu/action-groups

economy. However, research for this progress report has evidenced a central failing: there is no coordinated action to bring together all the different green economy initiatives in the Alpine region.

Most of the above-mentioned initiatives would profit from an exchange of experiences with other projects. Especially where there are strong correlations, win-win situations could be created to further advance the transformation to a green economy. There is a will and engagement to drive this development forward, but a coordinated approach bundling the activities and knowledge is necessary to fully exploit the potential for a green economy in the Alps. This could happen in the form of a platform to exchange best practices and lessons learned.

The Green Economy Action Programme that was developed as a central instrument to turn the Alps into a model green economy region clearly sets out for each of the proposed actions which organisation would be most suitable to carry out the activities. However, given that there is no central institution following and supporting the activities, the implementation of the GEAP is difficult to monitor and takes place slowly.

Having a central coordinating body within the Alpine Convention, such as a Green Economy Board bundling green economy activities and linking this to ongoing activities at national, European and international levels could be a major milestone in the development of a model green economy region.

The need to raise the profile of a green economy and focus on key topics

The wide range of topics creates a blurred perception of what a green economy means, particularly in politics. It remains open to discussion what the exact contents of a green economy are, how it differs from other fields of sustainability and which measures can concretely contribute to its timely and straightforward implementation.

Therefore, a greater recognition and political support of green economy topics at a political level is needed. The present framework of the European Green Deal and the potential opportunities in the Covid-19 crisis could additionally support such recognition.

The subsequent step is to reduce the complexity of green economy topics to a select few which then gain the full attention and support of stakeholders and decision-makers. These key topics should be selected for their effects across the board, their feasibility at local level and their Alpine relevance. This report proposes focusing on the following key topics for a defined period:

- Application of energy efficiency and sufficiency policies
- Efficient use of land
- Setting up natural capital assessments
- Implementation of sustainable/green/circular procurement processes.

Pedro Salaverria - stock.adobe.com

5 Bibliography

Alpine Convention (2017): Report on the state of the Alps 6 – Greening the economy in the Alpine region. Online: https://www.alpconv.org/en/home/news-publications/publications-multimedia/detail/RSA 6-greening-the-economy-in-the-alpine-region/ . Last downloaded 06-2020.

Alpine Convention (2019a): Declaration of Innsbruck: Climate-neutral and Climate-resilient Alps. On-line: https://www.alpconv.org/fileadmin/user_upload/Convention/EN/Declaration_Innsbruck_EN.pdf. Last downloaded 06-2020.

Alpine Convention (2019b): Climate-neutral and Climate-resilient Alps 2050 Declaration of Innsbruck: Alpine Climate Target System 2050. On-line: https://www.alpconv.org/fileadmin/user_upload/Publications/Climate2050_EN.pdf. Last downloaded 09-2020.

Alpine Convention (2020): Report on the State of the Alps 8 - Air quality in the Alps, upcoming publication (to be added when available)

Amt für Statistik Liechtenstein (2020): Energiestatistik 2019: https://www.llv.li/files/as/energiestatistik-2019.pdf Last downloaded 08-2020.

Bundesamt für Statistik (BFS) (2019): Indikatorensystem Wohlfahrtsmessung Schaffung, Verteilung und Erhalt der Wohlfahrt: https://www.bfs.admin.ch/bfsstatic/dam/assets/10567383/master. Last downloaded 06-2020.

Bundesanstalt Statistik Österreich (2020): How's Austria?: www.statistik.at/web_en/statistics/------/hows_austria/index.html. Last downloaded 06-2020.

Bundesregierung (2020): Well-being in Germany: www.gut-leben-in-deutschland.de/en. Last downloaded 06-2020.

Crédit d'impôt pour la transition énergétique (CITE) (2005): Ministère de la Transition écologique: https://www.ecologique-solidaire.gouv.fr/credit-dimpot-transition-energetique-cite-et-maprimerenov#:~:text=Depuis%202005%2C%20l'objectif%20du,plus%20efficaces%20en%20termes%20de. Last downloaded: 08-2020.

European Commission (2020a): Communication from the Commission to the European Parliament, the European council, the council, the European Economic and Social Committee and the Committee of the regions. A New Industrial Strategy for Europe.

European Commission (2020b): Communication from the Commission to the European Parliament, the European council, the council, the European Economic and Social Committee and the Committee of the regions. An SME Strategy for a sustainable and digital Europe.

European Commission (2020c): Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal

European Commission (2019b): Sustainable Financing. Online: ec.europa.eu/info/business-economy-euro/banking-and-finance/green-finance_de#overview. Last downloaded 04-12-2019.

European Commission (2018a): Report from the Commission to the European parliament and the council: assessment of the progress made by Member States towards the national energy efficiency targets for 2020 and towards the implementation of the Energy Efficiency Directive as required by Article 24(3) of the Energy Efficiency Directive 2012/27/EU. Online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM:2019:224:FIN. Last downloaded 06-2020.

European Commission (2018b): National Green Public Procurement Action Plans (policies and guidelines): https://ec.europa.eu/environment/gpp/pdf/GPP_NAPs_June_2018.pdf. Last downloaded 07-2020

European Commission (2014): 2030 Climate & Energy Framework. Online: https://ec.europa.eu/clima/policies/strategies/2030_en. Last downloaded 06-2020.

European Commission (2012): The Energy Efficiency Directive 2012/27/EU. Online: https://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1399375464230&uri=CELEX:32012L0027. Last downloaded 08-2020.

European Council for an energy efficient economy (eeece) (2018): Energy sufficiency: an introduction Online: https://www.energysufficiency.org/static/media/uploads/site-8/library/papers/sufficiency-introduction-final-oct2018.pdf . Last downloaded 06-2020.

European Environment Agency (EEA) (2019): Database - Share of renewable energy in gross final energy consumption. Online: https://www.eea.europa.eu/data-and-maps/indicators/renewable-gross-final-energy-consumption-4/assessment-3 . Last downloaded 12-2019.

European Environment Agency (EEA) (2018): EEA Report No 19/2018. EEA Environmental indicator report 2018 – in support to the monitoring of the Seventh Environment Action Programme

Eurostat (2020): The Resource Efficiency Scoreboard: https://ec.europa.eu/eurostat/web/europe-2020-indicators/scoreboard. Last downloaded 09-2020.

Eurostat (2019): Environmental economy – statistics on employment and growth. Online: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Environmental_economy_%E2%80%93_statistics_on_employment_and_growth#Development_of_key_indicators_for_the_environmental_economy. Last downloaded 11-2019.

Eurostat (2017): Final report of the expert group on quality of life indicators: https://ec.europa.eu/eurostat/documents/7870049/7960327/KS-FT-17-004-EN-N.pdf/f29171db-e1a9-4af6-9e96-730e7e11e02f. Last downloaded 06-2020.

Institut national de la statistique et des études économiques (Insee) (2017): France, portrait social: https://www.insee.fr/fr/statistiques/3197283?sommaire=3197289. Last downloaded 06-2020.

International Energy Agency (2019): Share of renewable energy in gross final energy consumption in Switzerland. Online: https://www.iea.org/countries/switzerland . Last downloaded 12-2019.

Istituto Nazionale di Statistica (Istat) (2020): Bes 2019 Equitable and Sustainable well-being in Italy: https://www.istat.it/it/files/2019/12/BES-2019-en.pdf. Last downloaded 06-2020.

Joint Research Centre (JRC) (2019): EDGAR database - Fossil CO_2 and GHG emissions of all world countries. Online: https://edgar.jrc.ec.europa.eu/overview.php?v=booklet2019&dst=CO2pc . Last downloaded 12-2019.

La Notte A, Vallecillo S, Polce C, Zulian G, Maes J. (2017): Implementing an EU system of accounting for ecosystems and their services. Initial proposals for the implementation of ecosystem services accounts, EUR 28681 EN; Publications Office of the European Union, Luxembourg, http://publications.jrc.ec.europa.eu/repository/handle/JRC107150

Lüer, C. and s. Zillmer (2019): Ideal-typical transformation paths of selected economic sectors and their interdependencies – Discussion paper. Sectoral development of the Green Economy in the Alpine region (ReFoPlan) FKZ 3718 16 105 0 / AZ 90 088 / 103

Naturkapital Deutschland – TEEB DE (2018): Werte der Natur aufzeigen und in Entscheidungen integrieren – eine Synthese. Helmholtz-Zentrum für Umweltforschung – UFZ, Leipzig

New Economics Foundation (NEF) (2020): Happy Planet Index: https://happyplanetindex.org. Last downloaded 06-2020.

Organisation for Economic Co-operation (OECD) (2020): Better Life Index: http://www.oecdbetterlifeindex.org. Last downloaded 06-2020.

Réglementation thermique (RT) (2012). Ministère de la Cohésion des territoires et des Relations avec les collectivités territoriales: https://www.cohesion-territoires.gouv.fr/rt2012#:~:text=La%20r%C3%A9glementation%20thermique%202012%2C%20tout,confondre%20avec%20l'%C3%A9nergie%20finale.&text=L'%C3%A9nergie%20primaire%20(kWhEP),production%20de%20cette%20%C3%A9nergie%20finale. Last downloaded: 08-2020.

Republic of Slovenia (2018): GPP decree 2018: https://www.uradni-list.si/glasilo-uradni-list-rs/vsebina/2017-01-2381/uredba-o-zelenem-javnem-narocanju. Last downloaded 12-2019

Republic of Slovenia (2020): Indicators of well-being in Slovenia: http://www.kazalniki-blaginje.gov.si/en/project.html. Last downloaded 06-2020.

Rewitzer, S., Huber, R., Grêt-Regamey, A., Barkmann, J. et al. (2018): Economic valuation of cultural ecosystem service changes to a landscape in the Swiss Alps. Ecosystem services, 26: 197-208., https://doi.org/10.1016/j.ecoser.2017.06.014

Schwaiger Elisabeth, Färber Barbara, Svehla-Stix Sigrid, Vogel Johanna, Weiß Michael, Stagl Sigrid, Kühnen Lukas (2018): Bewertung von Ökosystemleistungen. Methodenvergleich Kosten-Nutzen-Analyse und Multikriterienanalyse anhand einer Österreichischen Region. Wien, Reports, Band 0670

Schwaiger, E., Berthold, A., Gaugitsch, H., Götzl, M., Milota, E., Mirtl, M., Peterseil, J., Sonderegger, G., Stix, S. (2015): Wirtschaftliche Bedeutung von Ökosystemleistungen. Monetäre Bewertung: Risiken und Potenziale. Report 0523. Wien.

Swiss Federal Council (2016): Sustainable Development Strategy 2016–2019, 27th January 2016: https://www.are.admin.ch/are/en/home/sustainable-development/strategy-and-planning/sustainable-development-strategy-2016-2019.html. Last downloaded 07-2020.

Umweltbundesamt GmbH (UBA GmbH) (2020): Corona Krise und die Umwelt; https://www.umweltbundesamt.at/news200416. Last downloaded 07-2020.

Umweltbundesamt (UBA) (2020): Nachhaltige Wege aus der Wirtschaftskrise - Umwelt und Klima schützen, Beschäftigung sichern, sozialverträgliche Transformation einleiten, Position Mai 2020: https://www.umweltbundesamt.de/publikationen/nachhaltige-wege-aus-der-wirtschaftskrise. Last downloaded 07-2020.

United Nations (2015): UN General Assembly- Transforming our world: the 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1, available at: https://www.refworld.org/docid/57b6e3e44.html. Last downloaded 07-2020

United Nations Development Programme (UNDP) (2019): Human Development Report 2019: http://hdr.undp.org/sites/default/files/hdr2019.pdf. Last downloaded 06-2020.

United Nations Economic Commission for Europe (2016): The Pan-European Strategic Framework for Greening the Economy: https://www.unece.org/environmental-policy/environment-for-europe/initiatives/greening-the-economy-in-the-pan-european-region. Last downloaded 10-2020.

6 Annex

Table 1: Projects with reference to green economy topics

Key thematic area: Energy efficiency and Low Carbon Economy

Focus: Carbon emissions

Project / Initiative	More information
LIFE ClimatePath2050 - Slovenian Path Towards the Mid-Century Climate Target	http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6308
DAV Klima-Soli (Alpine tax)	https://www.alpenverein.de/natur/klimaschutz/resolution-fuer-eine-konsequente-klimapolitik_aid_34219.html
Climate emergency in Pfaffenhofen (Bavaria/ Germany)	https://www.donaukurier.de/lokales/pfaffenhofen/Pfaffenhofen-ruft-Klimanotstand-aus;art600,4389841
Research project Smart Altitude	https://www.alpine-space.eu/projects/smart-altitude/en/home
MyClimate Liechtenstein	https://www.myclimate.org/de/informieren/news-presse/news/newsdetail/detail/News/klimabildung-in-liechtenstein/
Climate Plan of Grenoble of Conurbation	https://www.cipra.org/en/good-practice/climate-plan-of-grenoble-conurbation
Alpine Partnerschaft für lokale Klimaaktionen (ALPACA)	https://www.cipra.org/de/cipra/international/projekte/laufend/klimapartnerschaft-der-alpengemeinden?set_language=de
ESPON ALPS 2050 project	https://www.espon.eu_

Focus: Renewable energy sources

Project / Initiative	More information
Second EUSALP Energy Conference	https://www.Alpine-region.eu/action-group-9
Energy autonomy 2050 Vorarlberg/Austria.	https://www.cipra.org/en/good-practice/energy-autonomy-vorarlberg
Lead projects of the Austrian Climate and Energy model regions	https://www.klimaundenergiemodellregionen.at/ausgewaehlte-projekte/leitprojekte/
Interreg Alpine Space - IMEAS	https://www.alpine-space.eu/projects/imeas/en/home
Interreg Alpine Space - GRETA	https://www.alpine-space.eu/projects/greta/en/home

Focus: Efficient use of energy

Project / Initiative	More information
E5 programme Austria	https://www.klimaaktiv.at/english/savingenergy/e5.html
ClimaHost - AlpineConvention	https://climahost.eu/
Energy efficiency projects in Climate and Energy model regions Austria	https://www.klimaundenergiemodellregionen.at/ausgewaehlte-projekte/best-practice-projekte/showbpp/271
	https://www.klimaundenergiemodellregionen.at/ausgewaehlte-projekte/best-practice-projekte/showbpp/254

KLIMAHOUSE, Tradeshow for Energy Efficiency and Building Sustainability	https://www.buildup.eu/en/events/klimahouse-tradeshow-energy-efficiency-and-building-sustainability
EuroACE, Workshop on Energy Efficiency in Buildings & Renovation in Slovenia	https://euroace.org/wp-content/uploads/2019/05/2019_05_08-EuroACE-Conference-Slovenia-Speakers-Presentations.pdf
Eco Fund – Slovenian Environmental Public Fund – Slovenia	https://www.buildup.eu/en/explore/links/eco-fund-slovenian-environmental-public-fund-slovenia

Key thematic area: Resource efficiency

Focus: Efficient use of non-energy resources

Project / Initiative	More information
Triple wood Sustainable Wood Building Culture in the Alpine Region (DE, AT, SI, LI, FR, IT)	https://www.triplewood.eu
ECO-S (SI, AT)	https://www.m-sora.si/en/development/eco-innovation
Constructive Alps	http://www.constructivealps.net
ViVaCCAdapt (SI)	http://www.life-vivaccadapt.si
Holz von hier	https://www.holz-von-hier.eu/
ADO - Alpine Drought Observatory	https://www.alpine-space.eu/projects/ado/en/home

Focus: Land use changes

Project / Initiative	More information
Market hall Glarus (CH)	https://www.densipedia.ch/markthalle-glarus-vom-leeren-postgebaeude-zum-publikumsmagneten
Cham (CH)	www.densipedia.ch/ein-staedtebauliches-und-architektonisches-leitbild-weist-den-weg
Revitalisation of a vacant inn (DE)	http://www.stmelf.bayern.de/mam/cms01/landentwicklung/dokumentationen/dateien/staatspreis_2019_web.pdf

Focus: Circular economy, recycling and waste management

Project / Initiative	More information
CirculAlps	www.alpine-region.eu/projects/circulalps
AlpLinkBioEco	www.alpine-space.eu/projects/alplinkbioeco/en/home
GREENCYCLE	www.alpine-space.eu/projects/greencycle
Make furniture circular	www.make-furniture-circular.ch

Key thematic area: Ecosystem Services and Natural Capital

Focus: Natural capital

Project / Initiative	More information
ALPBIONET2030 Integrative Alpine wildlife and habitat management for the next generation	https://www.alpine-space.eu/projects/alpbionet2030/en/home
Eco-AlpsWater Innovative Ecological Assessment and Water Management Strategy for the Protection of Ecosystem Services in Alpine Lakes and Rivers	https://www.alpine-space.eu/projects/eco-alpswater/en/home
Links4S Caring for Soils - Where Our Roots Grow	https://www.alpine-space.eu/projects/links4soils/en/home
ALPTREES Sustainable use and management of non-native trees in the Alpine region	https://www.alpine-space.eu/projects/alptrees/en/home
SPARE: Alpine rivers as society's lifelines	https://www.alpine-space.eu/projects/spare/en/home
AlpFoodway – A cross-disciplinary, transnational and participative approach to Alpine food cultural heritage	https://www.alpine-space.eu/projects/alpfoodway/en/home
AlpLinkBioEco – Linking BioBased Industry Value Chains Across the Alpine Region	https://www.alpine-space.eu/projects/alplinkbioeco/en/home
WWF Italia Oasi	http://www.wwf.it/oasi/
LUIGI: Linking Urban and Inner-Alpine Green Infrastructure - Multifunctional Ecosystem Services for more liveable territories	https://www.alpine-space.eu/projects/luigi/en/home

Focus: Ecosystem service provision

Project / Initiative	More information
AlpES: Alpine Ecosystem Services - mapping, maintenance, management	https://www.alpine-space.eu/projects/alpes/en/home
BioCorridors: The LIFE Biocorridors project	https://www.lifebiocorridors-vosgesnord-pfaelzerwald.eu/

Focus: Economic valuation of ecosystem services

Project / Initiative	More information
Alp BioEco	https://www.alpine-space.eu/projects/alpbioeco/en/home_
HyMoCARES HydroMorphological assessment and management at basin scale for the Conservation of Alpine Rivers and related Ecosystem Services	https://www.alpine-space.eu/projects/hymocares/en/about/the-project/overview_
AlpES: Alpine Ecosystem Services - mapping, maintenance, management	https://www.alpine-space.eu/projects/alpes/en/home
RockTheAlps Alpine Forests are Rock Stars!	https://www.alpine-space.eu/projects/rockthealps/en/home
Garden Village Bled	http://gardenvillagebled.com/
Gorla Maggiore water park, Italy	https://www.naturvation.eu/nbs/milano/gorla-maggiore-water-park

Key thematic area: Quality of life and well-being

Focus: Green jobs

Project / Initiative	More information
DuALPlus: Promoting excellence in dual education	https://www.alpine-space.eu/projects/dualplus/en/home
YOUrALPS: Educating youth for the Alps: (re) connecting Youth and Mountain heritage for an inspiring future in the Alps	https://www.alpine-space.eu/projects/youralps/en/home
Smart SME's	https://www.alpine-region.eu/projects/smart-smes
MountErasmus: Establishing a training network on education in Alpine farming	https://www.alpine-region.eu/projects/mounterasmus https://wwwhttps://www.alpine-region.eu/projects/mounterasmus
Young academics award	https://www.alpconv.org/en/home/projects/young-academics-award
EUSALP Youth Competition "Pitch your project"	https://www.alpine-region.eu/news/pitch-your-project-2019 https://wwwhttps://www.alpine-region.eu/news/pitch-your-project-2019
SMART-SPACE Digital Innovation to meet Alpine social & economic challenges	https://www.alpine-space.eu/projects/smart-space/en/home
Smart Villages: Smart digital transformation of villages in the Alpine Space	https://www.alpine-space.eu/projects/smartvillages/en/home
Cross-Border Mobility	https://www.alpine-region.eu/projects/arpaf-crossborder
Technopark Liechtenstein	https://www.technopark-liechtenstein.li
Network Green Workplace	https://www.gruene-arbeitswelt.de/
Digital village Bavaria	https://digitales-dorf.bayern

Focus: Sustainable Consumption

Project / Initiative	More information
CaSCo: Procurement of low carbon timber products in the Alps	https://www.alpine-space.eu/projects/casco/en/about-casco
SPP Regions: Joint procurement of small EV waste collection vehicles, with tipping tank	https://sppregions.eu/fileadmin/user_upload/Tenders/SPP_Regions_Tender_model_-_CIDIU_Final.pdf
SPP Regions Organic catering for hospitals in Piedmont	https://sppregions.eu/fileadmin/user_upload/Tenders/APE/SPP_Regions_Tender_model_-_SCR_Hospital_Catering_Final_updated.pdf
AlpFoodway: A cross-disciplinary, transnational and participative approach to Alpine food cultural heritage	https://www.alpine-space.eu/projects/alpfoodway/en/home
Alpina Vera Regional mountain products in Switzerland	https://www.alpinavera.ch
MyCabin App for natural accommodation in the Alps	https://www.mycabin.de
Alpine Pearls – Holidays in Eco-Motion	https://www.alpine-pearls.com/
Mountaineering villages	https://www.bergsteigerdoerfer.org
Next generation mountain farming 2030	https://www.alpine-region.eu/projects/next-generation-moutain-farming-2030
Regional currencies – Le Cairn - France	https://www.cairn-monnaie.com/
Fairzone Liechtenstein	https://www.fairzone.green

ALPENKONVENTION
CONVENTION ALPINE
ALPSKA KONVENCIJA
CONVENZIONE DELLE ALPI

www.alpconv.org

EKH-Pictures - stock.adobe.com